UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

WW-16J

DEC 2 3 2019

Glenn Skuta, 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 has conducted a complete review of the final Total Maximum Daily Loads (TMDLs) and supporting documentation for the six Total Suspended Solids (TSS) TMDLs and six *E. coli* TMDLs to address aquatic life and aquatic recreational use. Some of the TMDLs may also indirectly improve fish and macroinvertebrate communities. Locations included from the 2014 Integrated Report 303(d) list are the Upper Red Lake River, Red Lake River / the City of St. Hilaire, Black River, the City of Crookston, Burnham Creek, and the Lower Red Lake River, as well as the smaller tributaries of Cyr Creek, the Gentilly River, and judicial ditches in Pennington, Red Lake, and Polk Counties.

These TMDLs meet the requirements of Section 303(d) of the Clean Water Act and EPA's implementing regulations at 40 C.F.R. Part 130. Therefore, EPA hereby approves Minnesota's TMDLs. This approval addresses six river segments and tributaries for TSS, and six for *E. coli* for a total of 12 TMDLs. The statutory and regulatory requirements, and EPA's review of Minnesota's compliance with each requirement, are described in the enclosed decision document.

We wish to acknowledge Minnesota's effort in submitting these TMDLs and look forward to future TMDL submissions by the State of Minnesota. If you have any questions, please contact Mr. David Pfeifer, Chief of the Watersheds, Wetlands and Standards Branch, at 312-353-9024.

Sincerely,

Thomas R. Short Jr.
Acting Director, Water Division

Enclosure

cc: Celine Lyman, MPCA
Denise Oakes, MPCA

wq-iw5-17g

TMDL: Red Lake River MN
Date: December 2019

DECISION DOCUMENT FOR APPROVAL OF THE RED LAKE RIVER MINNESOTA TMDL

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 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. 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 EPA's TMDL regulations should be resolved in favor of the regulations themselves.

1. Identification of Waterbody, Pollutant of Concern, Pollutant Sources, and Priority Ranking

The TMDL submittal should identify the waterbody as it appears on the State's/Tribe's 303(d) list. The waterbody 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 waterbody 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 waterbody. 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 waterbody 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 (chl-a) and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comment:
Location Description/Spatial Extent: The Minnesota Pollution Control Agency (MPCA) has developed TMDLs to address multiple impairments in the Red Lake River in northwestern Minnesota. The Red Lake River begins at the western outlet of Red Lake in the Red Lake Nation and flows about 12-13 miles westward to the western edge of the Red Lake Nation, formed by a dam built on the Lower Red Lake outlet. The River flows generally westward to Thief River Falls, southward to Red Lake Falls where it is joined by the Clearwater River watershed, flows southwest to Crookston, and continues westward then changes direction northward where it joins the Red River of the North at East Grand Forks. The Red River of the North flows generally northward from Minnesota into Canada and forms a portion of the western state boundary between Minnesota and North Dakota. The Red Lake River is the source of drinking water for Thief River Falls and East Grand Forks. There are also several tributaries, channelized streams and judicial ditches (JDs) that flow into the River along its course, including Burnham, Kripple, and Cyr Creeks, and the Gentilly River between Thief River Falls and Crookston.

There are many impoundments, reservoirs and dams that have altered the natural flow of the rivers and streams in this watershed. Some of the structures negatively impact the biota and fish communities, while others function as flood control for downstream farms, reduction of peak flows, addition to the formation of wetlands, and preservation of wildlife habitat.

The Executive Summary of the TMDL states that this project includes impairments in aquatic life use and aquatic recreation in river and creek segments, totaling six Total Suspended Solids (TSS) TMDLs and six *E. coli* TMDLs. The TMDLs will also improve low Dissolved Oxygen (DO) and biota (fish and macroinvertebrate) impairments. HUC 10s included from the 2014 Integrated Report 303(d) list are 09020303-02 Upper Red Lake River, -03 Red Lake River / the City of St. Hilaire, -04 Black River, -05 City of Crookston, -06 Burnham Creek, and -07 Lower Red Lake River. Additional impairments of aquatic life use and aquatic recreation have been identified by MPCA due to low DO, and biological impairment as demonstrated in low scores in the Fish Index of Biotic Integrity (F-IBI) and the Macroinvertebrate Index of Biotic Integrity (M-IBI) have been identified in the Red Lake River watershed due to excess sediment and low base flow. These impairments will be addressed at a future date.

Land Use: data for land use in the watershed from 2011 is shown in Table 3-2 of the TMDL. Land uses are 60.63% cultivated crops; 12.96% emergent herbaceous wetlands; 9.98% woody wetlands; 5.34% pasture/hay; 3.68% deciduous forest; 4.03% open space; 1.32% open water and less than 1% for each of the other land uses and land covers.

Problem Identification: The TMDLs were developed for TSS and *E. coli*. Due to greater amounts of data collected, overall the impaired reaches and individual impairments doubled during the 2014 assessment. That year was also the first time IBI scores and *E. coli* were assessed; 2012 was a very dry year when the watershed was reviewed in preparation for the 2014 sampling season, which resulted in low biota scores due primarily to stressed in-stream habitat from low flow conditions.

MPCA noted that Impaired biota are found in many segments of the watershed and are caused by stressors to their habitat (Section 4.3 of the TMDL), primarily low flow and excess sediment. Lack of sufficient base flow affects IBI and low DO impairments. When flows are too low, there are minor channel barriers that affect the fish. Stagnant water results in low DO, which is another stressor. Some of the low base flow is related to climate, but the primary cause is also believed to be the extensive hydrologic modification, especially drainage projects.

The fish community showed several indicators of impairment: high relative abundance of abundant species; high relative abundance of early-maturing individuals; low number of individuals per meter; low relative abundance of sensitive taxa; and high relative abundance of tolerant taxa (Section 4.3 of the TMDL).

Excess TSS is a stressor to habitat, as macroinvertebrates need clean, coarse substrates for attachment, while others are tolerant of degraded benthic habitat. There are many details by stream reach of various taxa abundance, depletions or richness of the community in response to the changing habitat, but only two segments are reviewed here (Section 4.3 and Section 4.3.2 of the TMDL). In general, past studies completed on macroinvertebrate stressors indicate that the communities are degraded due to: high relative abundance of burrowers; low taxa richness of clinger taxa; low relative abundance of collector-filterer individuals; and high relative abundance of legless individuals.

Pollutant of Concern: The pollutants of concern are TSS and *E. coli*. Bacteria is addressed with TMDL calculations for *E. coli*. The fish and macroinvertebrates, and low DO, are not directly addressed with TMDL allocations, but MPCA has supplied documentation regarding the linkage of TSS to biological impairment and the TSS will assist in addressing biota impairments. Low DO is very often associated with no flow or a low stage, creating stagnant water. Studies show that a majority of low DO measurements are in times of no flow (Section 4.3.2 of the TMDL submittal, in Burnham Creek). When there is flow, often the DO measurements meet standards.

Source Identification: there are both point and nonpoint sources of contaminants in many reaches in the watershed (Section 4.1 in the TMDL).

<u>TSS Point Sources</u> – the general permit TSS point sources, that are from construction and industrial stormwater combined, account for about 0.061% of the watershed (Section 4.1.1 of the TMDL).

The only Municipal Separate Storm Sewer System (MS4) is the City of East Grand Forks (#MS 400088). In the future there may be MS4s for Crookston and Thief River Falls. Recent stormwater sampling shows that both sites have TSS concentrations in runoff that exceed water quality standards. Thief River Falls and segments of the River show many man-made influences that affect water quality in different segments, such as a dam which can assist in settling out sediment from the River.

There are eight Wastewater Treatment Facilities (WWTF) discharging into the Red Lake River, but they are believed to add less than 0.1% to the TSS load in the River. Several facilities have not exceeded or discharged to the Red Lake River in many years. Several have stabilization pond systems and only discharge when flows are high enough in the river to dilute the inflows. The dischargers (from Table 1 of the TMDL) are:

- Thief River Falls MN0021431
- Regional Airport MN0044415
- St. Hilaire MN0024741
- 7 Clans Casino MN0063452
- Red Lake Falls MNG580161
- American Crystal Sugar MN0001929
- Crookston MN0021423
- Fisher MNG580170.

<u>TSS Nonpoint Sources</u> – Section 4.1.2 of the TMDL states that there are various nonpoint sources that contribute to TSS loads. MPCA determined that instream erosion accounts for approximately 54% of the sediment and runoff from cultivated land accounts for 25% of the sediment entering the Red Lake River (based on HSPF simulations). MPCA developed an erosion inventory at 63 sites examined by canoe along the river reaches. Overland erosion, streambank erosion, wind erosion and stormwater runoff contribute to the problems in the watershed. Outlets of public drainage systems are unstable and include headcutting, gully formation, instability and mass wasting, as well as eroding outlets. Overland erosion and gully erosion occur in both cultivated fields and ditch outlets. Tributaries carry TSS loads into the Red Lake River. In Section 3.1.4 of the Watershed Restoration and Protection Strategy (WRAPS) document, model simulations along the river, and longitudinal sampling taken on one day, show trends of sediment yields increasing downstream, as does Burnham Creek and Kripple Creek. For Gentilly Creek, the TSS and turbidity shows both increases and decreases at various points downstream from its headwaters.

Additionally, wind erosion is a source of TSS in the spring and early summer before the fields have developed crop growth. Dry weather and winds have caused dust storms that occur in multiple areas, and trees used as buffers and windbreaks are dying and being removed without replacement. Extensive terrain and geomorphological studies were completed to assist with the TMDL nonpoint source identification and BMPs, discussed later in methodology and implementation sections of this document.

<u>*E. coli* Point Sources</u> – Section 4.2.1 of the TMDL states that the permitted (State) feedlots are a source of *E. coli,* but they are smaller and not categorized as CAFOs. There are no Wastewater Treatment Facilities (WWTFs) or MS4s in the drainage area of the Red Lake River watershed that are sources of *E. coli*. (Figure 4-15 of the TMDL, map of feedlot locations, incorporated by reference into this Decision Document.)

<u>*E. coli* Nonpoint Sources</u> – Section 4.2.2 of the TMDL describes the nonpoint source influences of *E. coli* in the watershed. Wildlife has been documented through Bacteria Source Tracking (BST) to be from many birds and waterfowl. Livestock sources are from many livestock operations near Kripple Creek, Cyr Creek, and Black River. Microbial source tracking results showed human sources from failing septic systems in Black River and Kripple Creek.

Longitudinal sampling of *E. coli* in some of the tributaries showed Kripple Creek has exceedances, with sampling taken on one day, resulting in lower *E. coli* values at the downstream portions of the creek, with exceptions. Gentilly Creek has lower *E. coli* values at the downstream portions of the creek as well, and meet standards at some of those sampling sites, but upstream sampling sites show exceedences. The Black River shows exceedences of standards along the River of both chronic and acute standards (Figures 4-18, 4-19, and 4-20 in the TMDL, respectively).

Priority Ranking: In Section 1.3 of the TMDL submittal, the MPCA describes its TMDL Priority Framework Report, to coincide with and meet the needs of EPA's national measure (WQ-27) under EPA's Long-Term Vision for Assessment, Restoration and Protection (Vision) in the 303(d) Program. The MPCA identified water quality impaired segments that were prioritized to meet EPA's Vision that will be addressed by TMDLs by 2022.

Future Growth: Section 5.3 states that the population is generally steady in the watershed. East Grand Forks lost 17% of its population after the Red River flood of 1997. Section 5.4 of the TMDL states that changes will be made for new or expanding MS4 for TSS, and transfers will be made from LA to WLA within the MS4 boundaries or other expansions, such as highways. Reserve capacities for *E. coli* have been set to zero as most of the reaches receive water from rural, agricultural watersheds.

Surrogate measures: TSS will be a surrogate to assist in addressing biota (fish and macroinvertebrates) impairment as described in the sources section above. As stated previously, low DO may be addressed indirectly where sediment may affect flow, but more directly the low DO is linked with no flow or stagnation.

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 waterbody, 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.

Comment:
Designated Uses – There are several uses in each of the stream segments in this TMDL. The sites below are taken from Table 1-1 of the TMDL, a portion of the table only for those segments with a calculated TMDL.

Table 1-1

Use Class	AUID Description
1C, 2Bd, 3C	Red Lake River 0902030303 504 – Pennington County Ditch (CD) 96 to Clearwater River
2B, 3C	Red Lake River 0902030303 504 – Headwaters to Red Lake River
2B, 3C	Black River 0902030304 529 – Little Black River to Red Lake River
2Bg, 3C	Black River 0902030304 558 – lat/long location to Little Black River
1C, 2Bd, 3C	Red Lake River City of Crookston 0902030305 502 – Black River to Gentilly River
1C, 2Bd, 3C	Red Lake River City of Crookston 0902030305 506 - CD 99 to Burnham Creek
1C, 2Bd, 3C	Red Lake River City of Crookston 0902030305 512 – Gentilly River to CD 99
2B, 3C	Red Lake River City of Crookston 0902030305 525 – Kripple Creek unnamed creek to Gentilly
2C	Red Lake River City of Crookston 0902030305 554 – Gentilly to CD 140 Red Lake River
2Bg, 3C	Red Lake River City of Crookston 0902030305 556 – Cyr Creek Co Rd 14 to Red Lake River
1C, 2Bd, 3C	Lower Red Lake River 0902030307 501 – Red Lake River Burnham Creek to unnamed creek
1C, 2Bd, 3C	Lower Red Lake River 0902030307 503 – Red Lake River unnamed creek to Red River

The waters addressed in the TMDL are classified Class 1, 2 and 3, including several subcategories. Class 2 waters support "the propagation and maintenance of a healthy community of cool or warm water sport or commercial fish and associated aquatic life, and their habitats. These waters shall be suitable for aquatic recreation of all kinds…" [Minn. R. 7050.0222, subp. 4]. Class 2B is the most restrictive, and is for warm water fishery; however, there have been recommendations to change the classification to Class 1, designating the river as a drinking water source (Section 1.1 in the TMDL). The definitions in each Class are:

1C- Domestic Consumption (requires heavy treatment)
2B-Aquatic Life and Recreation-Warm and Cool Water Habitat (lakes and streams)
2Bd-Aquatic Life and Recreation-Warm and Cool Water Habitats (also protected for drinking water)
2Bg-Aquatic Life and Recreation-General Warm Water Habitat (lakes and streams)
2C-Aquatic Life and Recreation-Indigenous aquatic live and their habitats (streams)
2D-Aquatic Life and Recreation-Wetlands
3C-Industrial Consumption (heavy treatment)

The quality of Class 1C (Minn. R. 7050.0221, subp. 1) waters of the state shall be such that with treatment consisting of coagulation, sedimentation, filtration, storage, and chlorination, or other equivalent treatment processes, the treated water will meet both the primary (maximum contaminant levels) and secondary drinking water standards issued by the EPA.

Class 2B (Minn. R. 7050.0222, subp. 4) and shall be such as to permit the propagation and maintenance of a healthy community of cool or warm water sport or commercial fish and associated aquatic life, and their habitats, and suitable for aquatic recreation of all kinds, including bathing.

The quality of class 3C (Minn. R. 7050.0223, subp. 4) waters of the state shall be such as to permit their use for industrial cooling and materials transport without a high degree of treatment being necessary to avoid severe fouling, corrosion, scaling, or other unsatisfactory conditions.

Criteria – Section 2 of the TMDL presents the standards that Minnesota is using to develop the TMDL for TSS and *E. coli*. There are two water quality standards (WQS) for TSS depending on the location within the watershed under study, but it should be noted that the Southern Nutrient Region is not only in the southern portion of the state, but also extends upward to the western portion of the state, as shown in Figure 2-1 in the TMDL (a map showing TSS WQS Regions in Minnesota), incorporated by reference. Table 2-1 below indicates the standards, and the following table indicates standards applied to the specific locations.

Table 2-1. Applicable water chemistry standards

Parameter	Use Class	Water Quality Standard	Criteria	Standard's Applicable Time Period
Total Suspended Solids – Central Nutrient Region	1C. 2B, 2Bd, 2Bg, 3C	Not to exceed 30 mg/l	Maximum = 10% of Samples	April 1 – September 30
Total Suspended Solids – South Nutrient Region	1C. 2B, 2Bd, 2Bg, 3C	Not to exceed 65 mg/l	Maximum = 10% of Samples	April 1 – September 30
Dissolved Oxygen	2B, 2Bd	Daily minimum of 5 mg/l	>90% of daily minimums need to exceed the standard	Open Water Months
Escherichia Coli	2A, 2B, 2Bd, 2C, 2D	126 MPN/100 ml	Maximum Geometric Mean of not less than 5 samples	April 1 – October 31
Escherichia Coli	2A, 2B, 2Bd, 2C, 2D	1260 MPN/100 ml	Maximum = 10% of Samples within a calendar month	April 1 – October 31

Table of standards applied in the TMDL calculations

AUID 09020303	Location	TSS Standard
-503	East Grand Forks	65 mg/l
-501	Red Lake River at Fisher	65 mg/l
-506	Red lake River in Crookston	65 mg/l
-512	Red Lake River near Gentilly	65 mg/l
-502	Red Lake River near Huot	30 mg/l
-504	Red Lake River in Red Lake Falls	30 mg/l
AUID 09020303	**Location**	***E. coli* Standard**
-505	Pennington CD 96 at MN Hiway 32	126 MPN/100ml
-525	Kripple Creek at 180th Ave SW	126 MPN/100ml
-529	Black River at CSAH 18	126 MPN/100ml
-558	Black River at Red Lake CR 101	126 MPN/100ml
-554	Gentilly River at CSAH 11	126 MPN/100ml
-556	Cyr Creek at CR 110	126 MPN/100ml

MPN = Monthly geometric mean

For the IBI for both fish and macroinvertebrates, the standards are shown below in Table 2-2 taken from the TMDL submittal. The threshold scores are the standards and vary depending on the size of the stream. For example, county ditch standards are lower than creek standards.

From Section 2.4 of the TMDL:

> "To develop biocriteria that are protective of the structural and functional health of biological communities, Minnesota used the median of BCG level 4. Communities at the middle of this level can be best characterized as possessing *"overall balanced distribution of all expected major groups; ecosystem functions largely maintained through redundant attributes"*(italics in original document).

Table 2-2. Summary of Fish IBI standards that were applied to impaired reaches

Impaired Reach Name (AUID)	Station #	F-IBI Class	F-IBI Score Threshold	M-IBI Class	M-IBI Threshold
Burnham Creek (09020303-515)	10EM112 12RD001 12RD032 12RD115	2 (GU)	50	7 (GU)	41
Kripple Creek (09020303-525)	05RD077	6 (GU)	42	7 (GU)	41
Kripple Creek (09020303-525)	12RD022	2 (GU)	50	7 (GU)	41
Kripple Creek / CD 66 (09020303-526)	07RD006 12RD044	6 (GU)	42	7 (GU)	41
Little Black River (09020303-528)	12RD024	6 (GU)	42	Unassessed	Unassessed
Br 2 CD 96 (09020303-545)	12RD039	6 (MU)	23	7 (MU)	22
County Ditch 43 (09020303-547)	12RD045	7 (MU)	15	7 (MU)	22
Burnham Creek (09020303-551)	12RD030	2(MU)	35	7 (MU)	22
Burnham Creek (09020303-554)	12RD021	2 (GU)	50	7 (GU)	41
	12RD043	6 (GU)	42	6 (GU)	42
Cyr Creek (09020303-556)	12RD023	6 (GU)	42	Unassessed	Unassessed
Black River (09020303-558)	05RD122	5 (GU)	47	Unassessed	Unassessed
	12RD012	5 (GU)	47	7 (GU)	41
	12RD102	5 (GU)	47	5 (GU)	37

(GU) =General Use Class; (MU)=Modified Use Class

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 waterbody 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)). 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.

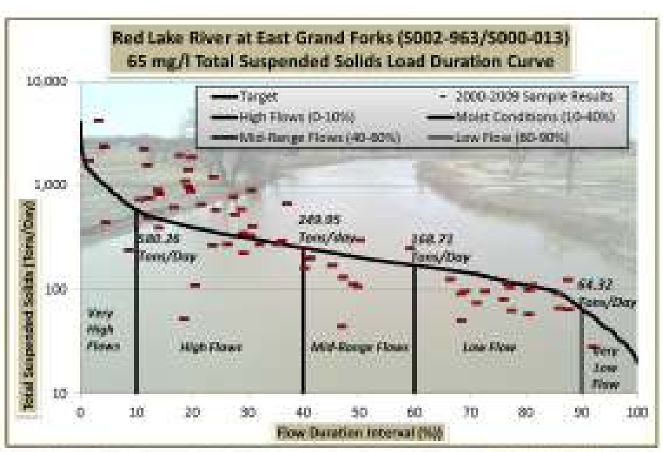
The TMDL submittal should contain documentation supporting the TMDL analysis, including the basis for any assumptions; a discussion of strengths and weaknesses in the analytical process; and results from any water quality modeling. EPA needs this information to review the loading capacity determination,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

<u>Comment:</u>
The loading capacities for TSS and *E. coli* for the Red Lake River watershed are shown in Tables 5-4 to 5-24 at the end of this document, from Sections 5.1.1 and 5.2.1 of the TMDL.

Methodology: The Load Duration Curve (LDC) methodology, and the Hydrologic Simulation Program Fortran (HSPF) was used by MPCA to determine the TMDL for the Red Lake River watershed. Many other supporting GIS-based and HSPF-based tools were used to assemble details for targeting future implementation work in the TMDL watershed.

Load duration curves were developed using the full range of hydrological conditions at each monitoring site to ensure all flow conditions were considered, including critical conditions. This method includes ranking daily flow values from highest to lowest, computing the percentage of days in the period of record with flows that exceed each daily value, and then plotting daily flow versus the exceedance percentage (or flow duration interval). The resultant load curves show flow values and the frequency that the standard is exceeded. Both flood conditions and low flow are represented, as well as conditions in the middle range.

The example TSS curve below (from Figure 5-2 of the TMDL) was divided into five flow duration intervals (very low flow, low, mid-range, high, and very high flow conditions). Higher flow exceedences more often occur from precipitation-related sources and more under spring conditions (run-off from uplands, erosion) on the left portion of the plot, and non-precipitation related events occur in the fall and exceedences occur under low flow conditions (low flow or minimal dilution) on the right portion of the plot. The values in Figure 5-2 show the high and low TSS values in tons/day that define the range of each flow regime. The TMDL for each flow regime was established by using the midpoint flow condition between those values, multiplied by the concentration target. In the figure below, the midpoint was used in each flow regime to determine the TMDL in Table 5-4 at the end of this document; for example, the TMDL at the mid-range flow regime is 200.91 tons/day TSS, which is the midpoint in Figure 5-2 below between 249.95 and 168.71 tons/day. Although the TMDL summaries contain five points for loading, the TMDL curve is what is approved by the EPA as the TMDL loading capacity for each impaired segment.



Review of the LDCs for TSS indicate that exceedences are occuring under higher-flow conditions. Although some isolated exceedences occur under low flows, the greatest number and magnitude of exceedences occur under mid-range to very high flows. This would be consistent with the major source of TSS being precipitation-related runoff. For the *E. coli* TMDLs, the exceedences occur under a wider range of flow conditions. This would suggest a wider range of sources, including both precipitation-related runoff and dry weather sources such as septic systems.

HSPF was used by MPCA to simulate flows when there were no gages or there were incomplete flow records. It was used for simulation of both TSS and *E. coli* values. HSPF can simulate flow, sediment, nutrients and other substances in a water body. Observed data are used in the model and it can then simulate interconnected processes. Instream sources are a large contributor of sediment, but when the source is overland erosion, a great percentage is from cultivated fields. There are also additional tools within HSPF that assist in making decisions for the placement of BMPs where they can be most effective. The Scenario Application Manager (HSPF-SAM) tool extracts information from an existing HSPF model to assist in management decisions.

The Prioritizing, Targeting and Measuring Application PTMApp is used with an online interface or GIS tool to create smaller drainage units to estimate sediment and nutrient loss. Tools such the Stream Power Index (SPI) were used to determine where gullies could be developed where the SPI has high erosive power. LiDAR (Light Detection and Ranging) is used to detect earth features such as culverts, channels and flow paths to determine whether they are actively eroding and need protection or have a high potential for erosion.

The Soil and Water Assessment Tool (SWAT) is discussed within the Red Lake River WRAPS document. SWAT was used on all the sub-basins and considered for estimating benefits of certain BMPs and targeting the best locations for implementation efforts.

Critical Conditions: MPCA determined, as discussed in Section 5.1.5 of the TMDL, that critical conditions for TSS occur during runoff under high flow conditions. Section 5.2.5 states that warm summer months are also critical periods for *E. coli*, but reductions may be needed at nearly all levels of flow; low flow regimes become critical because there is no flushing or dilution, especially in September in some of the creeks. All conditions are included in the LDC methodology.

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

4. Load Allocations (LAs)

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.

Comment:
The load allocation is shown in the TMDL tables at the end of this document. For TSS, the WLA is subtracted from the LC to achieve the LA values. For *E. coli*, there are no point sources (WLA) for this contaminant and all the loading is through nonpoint sources.

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

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 and does not result in localized impairments. These individual WLAs may be adjusted during the NPDES permitting process. If the WLAs are adjusted, the individual effluent limits for each permit issued to a discharger on the impaired water must be consistent with the assumptions and requirements of the adjusted WLAs in the TMDL. If the WLAs are not adjusted, effluent limits contained in the permit must be consistent with the individual WLAs specified in the TMDL. If a draft permit provides for a higher load for a discharger than the corresponding individual WLA in the TMDL, the State/Tribe must demonstrate that the total WLA in the TMDL will be achieved through reductions in the remaining individual WLAs and that localized impairments will not result. All permittees should be notified of any deviations from the initial individual WLAs contained in the TMDL. EPA does not require the establishment of a new TMDL to reflect these revised allocations as long as the total WLA, as expressed in the TMDL, remains the same or decreases, and there is no reallocation between the total WLA and the total LA.

Comment:
The point source TSS allocations are shown in the tables below taken from the TMDL. The TSS point sources include MS4s, NPDES permits of WWTF, industrial and construction stormwater, and the stormwater related to the Minnesota Department of Transportation roadways. The industrial stormwater has an estimated 0.021% - 0.016% of the land area and the construction stormwater covers 0.010% – 0.008% of the land area. There are no *E. coli* point source allocations.

Table 5-1. Daily and annual TSS WLAs for WWTFs that discharge to the Red Lake River.

Facility	Secondary Cell Size (acres)	Permitted Max Daily Discharge (gpd)	Liters per Gallon	Permitted Max Daily Discharge (L/day)	Average # of Days per Year of Discharge	Permitted TSS Concentration mg/l)	TSS WLA (kg/day)	Kg/ton	TSS WLA (tons/day)	TSS WLA (tons/year)
Thief River Falls WWTF MN0021431	219.00	35,680,000	3.79	135,048,800	44.50	45	6077.20	907.20	6.70	298.10
St. Hilaire WWTF MNG580139	2.29	373,270	3.79	1,412,827	24.00	45	63.58	907.20	0.07	1.68
7 Clans Casino WWTF MN0063452	3.47	535,610	3.79	2,029,962	40.00	45	96.35	907.20	0.10	4.03
Red Lake Falls WWTF MNG580161	15.40	2,510,000	3.79	9,500,350	18.00	45	427.52	907.20	0.47	8.48
Crookston WWTF MN0021423	74.90	12,208,700	3.79	46,209,930	33.80	45	2079.45	907.20	2.29	77.47
American Crystal Sugar WWTF MN0001929	--	10,000,000	3.79	37,850,000	33.80	30	1135.50	907.20	1.26	42.31
Fisher WWTF MNG580170	5.04	820,070	3.79	3,103,965	19.70	45	139.68	907.20	0.15	3.03

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

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)). 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.

Comment:
Section 5.1.4 of the TMDL submittal states that MPCA allocated 10% of the loading capacity as an explicit MOS for the TMDLs. The MPCA expects this will account for uncertainty in calculations made for the TMDL. These uncertainties include the daily flow record, water quality data, variability in concentrations in any flow regime, variability in pollutant concentrations at any given flow, and lack of homogeneity throughout the water column. EPA also notes there has been extensive field work completed in this watershed using kayaks and canoes to explore the eroding streambanks and perform geomorphic assessment (Sections 4.1.1 and 7 of the TMDL), which adds confidence to the process via detailed streambank characterization.

The EPA finds that the TMDL document submitted by the MPCA satisfies 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)).

Comment:
MPCA considered seasonal variation for TSS (Section 5.1.5) and recognized that for TSS the primary season for deposition is during very high flows, but load reductions are necessary across almost all flow regimes. Further, TSS values are high downstream throughout the season, but in upstream segments could be more seasonal. Section 5.2.5 describes the consideration of seasonal variation for *E. coli* values, shows higher concentrations during summer months in general, but low flows may also have high values when flushing and dilution decrease. In some creeks there is no flow in the summer and there is not an entire annual record of flow.

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

8. Reasonable Assurances

When a TMDL is developed for waters impaired by point sources only, the issuance of a National Pollutant Discharge Elimination System (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’s August 1997 TMDL Guidance also directs Regions to work with States to achieve TMDL load allocations in waters impaired only by nonpoint sources. However, EPA cannot disapprove a TMDL for nonpoint source-only impaired waters, which do not have a demonstration of reasonable assurance that LAs will be achieved, because such a showing is not required by current regulations.

Comment:
Section 6 of the TMDL states that there are Red Lake River WRAPS processes in progress to support local groups. The WRAPS document was put on public notice along with the TMDL document. Further, the WRAPS information is a strong foundation for future projects,

incorporating the WRAPS information into the Board's One Watershed One Plan (1W1P), used for local watershed planning. This incorporation increases the potential for grant funding. The groups involved in the watersheds include the Red Lake Watershed District (RLWD), the Red Lake Department of Natural Resources, the Pennington County Soil and Water Conservation District (SWCD), the Red Lake SWCD, West Polk SWCD, the Natural Resources Conservation Service (NRCS), the US Fish and Wildlife Service (USFWS), the Minnesota Department of Natural Resources (DNR), the MPCA, and the Minnesota Board of Water and Soil Resources (BWSR).

In Section 6 MPCA also reviews many projects either funded or completed. They include watershed restoration and improvement projects: rain gardens, water inlets, ditch inventory, erosion site inventory, culvert inventory, septic system inventory, buffer installation, stream bank stabilization, erosion control, grade stabilization, soil health inventory, and drainage system outlet analysis.

Reasonable assurance measures are ongoing and expected to continue because of current actions in the watershed, including specifications for construction and maintenance of tile drainage. Tile drainage must be permitted in the RLWD. The permits must:

- be protective of the fields by erosion,
- have subsurface tile outlets and pumps located out of a legal drainage system and roadway right-of-way unless approved by the RLWD, and visibly marked,
- have recommendations for outlet controls to be drained after harvest,
- have permittees comply with other permits/authorizations,
- have plans to be provided to the RLWD after completion, and,
- make consideration for the ability to turn off pumps for maintenance.

Minnesota also has a Buffer Law that was signed in June of 2015, amended by the legislature and signed into law in April 2016. There must be new perennial vegetation buffers of 50 feet along public waters and 16.5 feet along ditches. The law is expected to improve water quality by trapping sediment which is eroded from agricultural fields and enters waterbodies. The buffers will likely reduce bacteria loads entering the waterbodies as well.

Clean Water Legacy Act (CWLA) - The CWLA was passed in Minnesota 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 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 provided 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). https://www.pca.state.mn.us/sites/default/files/wq-ws4-03.docx. 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 action. MPCA has developed guidance on what is required in the WRAPS. The WRAPS for the Big Fork River is a work in progress and its status may be accessed at https://www.pca.state.mn.us/sites/default/files/wq-ws4-37a.pdf

Minnesota voters approved the CWLA amendment in 2008, which increased the state sales and use tax rate by three-eighths of 1% on all taxable sales, starting July 1, 2009, and continuing through 2034. Approximately one third of the funds have been dedicated to a Clean Water Fund to, "protect, enhance, and restore water quality in lakes, rivers, streams, and groundwater, with at least 5% of the fund targeted to protect drinking water sources." (MPCA 2014). Funding for implementation is also available through other nonpoint source programs and the 319 funding mechanism.

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

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.

Comment:

In Section 7 of the TMDL, MPCA identified several major objectives of monitoring, including assessing the condition of the waters, trend detection, calculating pollutant loads, performance of projects, and compliance with standards. The goals of monitoring are both short term or long term. TP, Orthophosphate, TSS, ammonia nitrogen, total Kjeldahl nitrogen, nitrates and nitrites, and *E. coli* are the basic parameters. Additional parameters are chemical oxygen demand, biochemical oxygen demand (BOD), sulfates, total organic carbon, and/or chlorophyll-a (Chl-*a)* that may be collected, dependent upon project needs. Total organic carbon sampling is useful to public water suppliers along the river in Thief River Falls and East Grand Forks. Oxygen demand data is collected on reaches impaired by low DO.

Biological sampling efforts are not complete and are not considered to be fully representative in 2012 due to exceptionally dry conditions that year, which affected the fish. Collection of macroinvertebrates are encouraged and the RLWD is equipped for that collection. MPCA proposes sampling sites and goals, to improve the IBI scores, aquatic habitat, and monitor restoration sites.

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

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.

<u>Comment:</u>
Section 8 of the TMDL identifies implementation actions that would result in achieving the TMDL reductions. There are suggested strategies, BMPs, storage options and WRAPS to support improvement of physical changes in the river and riparian areas, such as establishing buffers with deep rooted vegetation, restoration of meandering channels, ditch maintenance, controlling upland erosion through cover crops and crop residue management, and establishment of windbreaks, to name a few.

- Construction stormwater permits - are required at sites greater than one acre, including stormwater control in general stormwater permits for construction (Section 8.1.1 of the TMDL).
- Industrial stormwater - requires permits for 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) (Section 8.1.2 of the TMDL).
- MS4 permits – required for several of the municipalities in the watershed, including East Grand Forks, and Crookston in the future. The permits include Stormwater Pollution Prevention Program (SWPPP) to ensure the permit requirements are addressed, as well as public outreach and education activities. SWPPP practices may also be implemented in locations without MS4s, such as Thief River Falls, Red Lake Falls, St. Hilaire, and Fisher (Section 8.1.3 of the TMDL).
- Wastewater Treatment Plants (WWTPs) - must meet requirements of their permits. This TMDL does not require any reductions from WWTPs.

For nonpoint sources (Section 8.2 of the TMDL), the physical degradation is to be addressed by reduction of stream bank and ditch bank erosion, reduction of agricultural and overland erosion, stream bank stabilization, and selection and installation of BMPs. MPCA describes details about the use of BMPs, models, mapping of the sediment reduction potential via filtration BMPs, watershed habitat improvement, grazing management, and septic system compliance. Costs were also provided, as well as descriptions of the adaptive management approach for implementation and monitoring to check effectiveness of BMPs. MPCA states that the watershed will be reassessed in 2024.

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

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. When EPA establishes a TMDL, EPA regulations require 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 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.

<u>Comment:</u>
Public participation in the Red Lake River TMDL process occurred several times before the TMDL was completed. Two meetings occurred within the Watershed to discuss the Red Lake River and TMDL development with the public and the WRAPS Technical Advisory Committee on December 15, 2011 and August 27, 2014. The project was public noticed from July 15, 2019 through August 14, 2019.

Two letters from the public were received during the public notice period. One letter from the City of Thief River Falls wanted to ensure that the Red Lake River took the Thief River into consideration as one of the sources of contaminants as a major stressor to the Red Lake River. MPCA responded that they are aware of the problems in the Thief River and since there are already WRAPS and TMDLs associated with these segments of the Thief River, MPCA referred the City to the other documents where detailed work was discussed and completed.

The second letter was from the RLWD regarding format suggestions for the TMDL document, including one error regarding the name of a website within the TMDL document. MPCA adequately addressed all comments, including those from EPA in the pre-notice draft.

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

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 waterbody, and the pollutant(s) of concern.

Comment:
EPA received a submittal letter dated November 20, 2019, signed by Glenn Skuta, MPCA Watershed Division Director, addressed to Tom Short, EPA Region 5, Acting Water Division Director, on November 21, 2019. The submittal letter identified the name and location of the waterbody for which the TMDL was developed. The letter stated that the Red Lake River TMDL is being submitted for final approval by USEPA under Section 303(d) of the Clean Water Act.

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

13. Conclusion

After a full and complete review, the EPA finds that the TMDL for Red Lake River Watershed for TSS and *E. coli* meets all the required elements of an approvable TMDL. This decision document addresses six Turbidity/TSS and six bacteria TMDLs in the Red Lake River watershed.
EPA's approval of this TMDL does not extend to those waters that are within Indian Country, as defined in 18 U.S.C. Section 1151. EPA is taking no action to approve or disapprove TMDLs for those waters at this time. EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities under the CWA Section 303(d) for those waters.

EPA sent a letter to the Red Lake Band of Lake Superior Chippewa Indians. In the letter, EPA offered the Tribal representatives the opportunity to consult with the EPA regarding these TMDLs. EPA received no responses.

TSS TMDLs

Table 5-4. TSS Load Allocation Summary for the Red Lake River at East Grand Forks on AUID 503.

Site ID: S002-963/S000-013 (Murray Bridge) Total Suspended Solids Standard: 65 mg/l Drainage Area (square miles): 5,756 % MS4: 0.376% Total WWTF Design Flow (mgd): 39.92	Loading Capacity and Load Allocations for Total Suspended Solids in the Red Lake River in East Grand Forks AUID: 09020303-503				
	Duration Curve Zone				
	Very High	High	Mid	Low	Very Low
TMDL Component	Values Expressed as Tons per Day of Sediment				
TOTAL DAILY LOADING CAPACITY*	**946.62**	**346.01**	**200.90**	**125.39**	**40.97**
Wasteload Allocation**					
NPDES Permitted WWTF	11.03	11.03	11.03	11.03	11.03
East Grand Forks NPDES Permitted MS4 Community	0.65	0.23	0.13	0.08	0.02
Crookston NPDES Permitted MS4 Community	2.53	0.91	0.52	0.32	0.09
East Grand Forks MnDOT Urbanized ROW WLA	0.80	0.29	0.17	0.10	0.03
Construction and Industrial Stormwater	0.18	0.07	0.04	0.02	0.01
Reserve Capacity	47.33	17.30	10.05	6.27	2.05
Daily Load Allocation	789.44	281.58	158.87	95.03	23.64
Daily Margin of Safety	94.66	34.60	20.09	12.54	4.10
	Values Expressed as Tons per Day of Sediment				
TOTAL MONTHLY LOADING CAPACITY	946.62	346.01	200.90	125.39	40.97
Wasteload Allocation					
NPDES Permitted WWTF	1.165%	3.188%	5.490%	8.797%	26.922%
East Grand Forks NPDES Permitted MS4 Community	0.077%	0.077%	0.077%	0.077%	0.077%
Crookston NPDES Permitted MS4 Community	0.299%	0.299%	0.299%	0.299%	0.299%
East Grand Forks MnDOT Urbanized ROW WLA	0.095%	0.095%	0.095%	0.095%	0.095%
Construction and Industrial Stormwater	0.021%	0.021%	0.021%	0.021%	0.021%
Reserve Capacity	5%	5%	5%	5%	5%
Load Allocation	83.395%	81.379%	79.079%	75.788%	57.701%
Margin of Safety	10%	10%	10%	10%	10%
MEDIAN FLOW*	5400.09	1973.84	1146.05	715.28	233.70
FLOW DURATION INTERVAL OF MEDIAN FLOW	5%	25%	50%	75%	95%

*the 1996-2009 flow record was simulated by the Red Lake River HSPF Model.
** Wasteload Allocations are rounded to the nearest 2 digits (1/100th of a ton)

Table 5-6. TSS Load Allocation Summary for the Red Lake River at Fisher on AUID #09020303-501.

Site ID: S000-031 (EQuIS), 05080000 (USGS) Total Suspended Solids Standard: 65 mg/l Drainage Area (square miles): 5,680 % MS4: 0.322%	Loading Capacity and Load Allocations for Total Suspended Solids in the Red Lake River at 252nd Street NW at Fisher AUID: 09020303-501				
	Duration Curve Zone				
	Very High	High	Mid	Low	Very Low
TMDL Component	Values Expressed as Tons per Day of Sediment				
TOTAL DAILY LOADING CAPACITY*	**916.63**	**298.01**	**182.31**	**79.23**	**28.57**
Wasteload Allocation**					
NPDES Permitted WWTF	11.03	11.03	11.03	11.03	11.03
Crookston NPDES Permitted MS4 Community	2.63	0.84	0.51	0.21	0.06
MnDOT Urbanized ROW WLA	0.00	0.00	0.00	0.00	0.00
Construction and Industrial Stormwater	0.17	0.06	0.03	0.01	0.01
Reserve Capacity	45.83	14.90	9.12	3.96	1.43
Daily Load Allocation	765.31	241.38	143.39	56.10	13.18
Daily Margin of Safety	91.66	29.80	18.23	7.92	2.86
	Values Expressed as Tons per Day of Sediment				
TOTAL MONTHLY LOADING CAPACITY	916.63	298.01	182.31	79.23	28.57
Wasteload Allocation					
NPDES Permitted WWTF	1.203%	3.701%	6.050%	13.921%	38.607%
NPDES Permitted MS4 Communities	0.322%	0.322%	0.322%	0.322%	0.322%
MnDOT Urbanized ROW WLA	0.000%	0.000%	0.000%	0.000%	0.000%
Construction and Industrial Stormwater	0.021%	0.021%	0.021%	0.021%	0.021%
Reserve Capacity	5%	5%	5%	5%	5%
Load Allocation	83.492%	80.997%	78.652%	70.807%	46.132%
Margin of Safety	10%	10%	10%	10%	10%
MEDIAN FLOW*	5,229	1,700	1,040	452	163
FLOW DURATION INTERVAL OF MEDIAN FLOW	5%	25%	50%	75%	95%

*The flow record from USGS Gauge 05080000 was used to develop flow zones and loading capacities.
** Wasteload Allocations are rounded to the nearest 2 digits (1/100th of a ton)

Table 5-8. TSS load allocations for the Red Lake River in Crookston on AUID # 09020303-506.

Site ID: S002-080 (EQuIS), 05079000 (USGS) Total Suspended Solids Standard: 65 mg/l Drainage Area (square miles): 5,270 % MS4: 0.394% Total WWTF Design Flow (mgd): 16.89	Loading Capacity and Load Allocations for Total Suspended Solids in the Red Lake River in Crookston AUID: 09020303-506				
	Duration Curve Zone				
	Very High	High	Mid	Low	Very Low
TMDL Component	Values Expressed as Tons per Day of Sediment				
TOTAL DAILY LOADING CAPACITY*	**722.23**	**241.92**	**132.35**	**52.59**	**11.04**
Wasteload Allocation**					
NPDES Permitted WWTF	7.34	7.34	7.34	7.34	7.34
Crookston NPDES Permitted MS4 Community	2.55	0.85	0.46	0.17	0.03
MnDOT Urbanized ROW WLA	0.00	0.00	0.00	0.00	0.00
Construction and Industrial Stormwater	0.14	0.05	0.03	0.01	0.00
Reserve Capacity	36.11	12.10	6.62	2.63	0.55
Daily Load Allocation	603.87	197.39	104.66	37.18	2.02
Daily Margin of Safety	72.22	24.19	13.24	5.26	1.10
	Values Expressed as Tons per Day of Sediment				
TOTAL MONTHLY LOADING CAPACITY	722.23	241.92	132.35	52.59	11.04
Wasteload Allocation					
NPDES Permitted WWTF	1.016%	3.034%	5.546%	13.957%	66.486%
Crookston NPDES Permitted MS4 Community	0.394%	0.394%	0.394%	0.394%	0.394%
MnDOT Urbanized ROW WLA	0.000%	0.000%	0.000%	0.000%	0.000%
Construction and Industrial Stormwater	0.021%	0.021%	0.021%	0.021%	0.021%
Reserve Capacity	5%	5%	5%	5%	5%
Load Allocation	83.612%	81.593%	79.078%	70.698%	18.297%
Margin of Safety	10%	10%	10%	10%	10%
MEDIAN FLOW*	4120.00	1380.00	755.00	300.00	63.00
FLOW DURATION INTERVAL OF MEDIAN FLOW	5%	25%	50%	75%	95%

*The flow record from USGS Gauge 05079000 was used to develop flow zones and loading capacities.
**Wasteload Allocations are rounded to the nearest 2 digits (1/100th of a ton)

Table 5-10. TSS Load Allocation Summary for the Red Lake River at CSAH 11 on AUID #09020303-512.

Site ID: S000-042 Total Suspended Solids Standard: 65 mg/l Drainage Area (square miles): 5,281 % MS4: 0.00 Total WWTF Design Flow (mgd): 16.89	Loading Capacity and Load Allocations for Total Suspended Solids in the Red Lake River at CSAH 11, near Gentilly AUID: 09020303-512				
	Duration Curve Zone				
	Very High	High	Mid	Low	Very Low
TMDL Component	Values Expressed as Tons per Day of Sediment				
TOTAL DAILY LOADING CAPACITY*	**843.51**	**319.49**	**189.04**	**116.06**	**37.03**
Wasteload Allocation**					
NPDES Permitted WWTF	7.34	7.34	7.34	7.34	7.34
NPDES Permitted MS4 Communities	0.00	0.00	0.00	0.00	0.00
MnDOT Urbanized ROW WLA	0.00	0.00	0.00	0.00	0.00
Construction and Industrial Stormwater	0.16	0.06	0.04	0.02	0.01
Reserve Capacity	42.18	15.97	9.45	5.80	1.85
Daily Load Allocation	709.48	264.17	153.31	91.29	24.13
Daily Margin of Safety	84.35	31.95	18.90	11.61	3.70
	Values Expressed as Tons per Day of Sediment				
TOTAL MONTHLY LOADING CAPACITY	843.51	319.49	189.04	116.06	37.03
Wasteload Allocation					
NPDES Permitted WWTF	0.870%	2.326%	3.883%	6.324%	19.822%
NPDES Permitted MS4 Communities	0.000%	0.00%	0.000%	0.000%	0.000%
MnDOT Urbanized ROW WLA	0.000%	0.000%	0.000%	0.000%	0.000%
Construction and Industrial Stormwater	0.021%	0.021%	0.021%	0.021%	0.021%
Reserve Capacity	5%	5%	5%	5%	5%
Load Allocation	84.110%	82.685%	81.099%	78.658%	65.163%
Margin of Safety	10%	10%	10%	10%	10%
MEDIAN FLOW*	4811.90	1822.58	1078.42	662.07	211.26
FLOW DURATION INTERVAL OF MEDIAN FLOW	5%	25%	50%	75%	95%

*An area-weighted flow record was calculated by using outputs from the Red Lake River HSPF Sub-Basin 450) and used to develop flow zones and loading capacities.
**Wasteload Allocations are rounded to the nearest 2 digits (1/100th of a ton)

Table 5-11. TSS Load Allocation Summary for the Red Lake River at CSAH 3 near Huot on AUID 502.

Site ID: S002-976 Total Suspended Solids Standard: 30 mg/l Drainage Area (square miles): 5,148 % MS4: 0.00 Total WWTF Design Flow (mgd): 16.89	Loading Capacity and Load Allocations for Total Suspended Solids in the Red Lake River at CSAH 3, near Huot AUID: 09020303-502				
	Duration Curve Zone				
	Very High	High	Mid	Low	Very Low
TMDL Component	Values Expressed as Tons per Day of Sediment				
TOTAL DAILY LOADING CAPACITY*	376.95	145.14	86.05	52.93	16.87
Wasteload Allocation**					
NPDES Permitted WWTF	7.34	7.34	7.34	7.34	7.34
NPDES Permitted MS4 Communities	0.00	0.00	0.00	0.00	0.00
MnDOT Urbanized ROW WLA	0.00	0.00	0.00	0.00	0.00
Construction and Industrial Stormwater	0.05	0.02	0.01	0.01	0.00
Reserve Capacity	18.85	7.26	4.30	2.65	0.84
Daily Load Allocation	313.01	116.01	65.79	37.64	7.00
Daily Margin of Safety	37.70	14.51	8.61	5.29	1.69
	Values Expressed as Tons per Day of Sediment				
TOTAL MONTHLY LOADING CAPACITY	376.95	145.14	86.05	52.93	16.87
Wasteload Allocation					
NPDES Permitted WWTF	1.947%	5.057%	8.530%	13.867%	43.509%
NPDES Permitted MS4 Communities	0.00%	0.00%	0.00%	0.00%	0.00%
MnDOT Urbanized ROW WLA	0.00%	0.00%	0.00%	0.00%	0.00%
Construction and Industrial Stormwater	0.016%	0.016%	0.016%	0.016%	0.016%
Reserve Capacity	5%	5%	5%	5%	5%
Load Allocation	83.304%	79.930%	76.456%	71.113%	41.494%
Margin of Safety	10%	10%	10%	10%	10%
MEDIAN FLOW*	4,6590.4	1,794.93	1,063.56	654.16	208.48
FLOW DURATION INTERVAL OF MEDIAN FLOW	5%	25%	50%	75%	95%

*The 1996-2009 flow record was simulated by the Red Lake River HSPF Model.
**Wasteload Allocations are rounded to the nearest 2 digits (1/100th of a ton)

Table 5-13. TSS Load Allocations for the Red Lake River at Red Lake Falls on AUID # 09020303-504.

Site ID: S003-072 Total Suspended Solids Standard: 30 mg/l Drainage Area (square miles): 3,635 % MS4: 0.00 Total WWTF Design Flow (mgd): 14.38	Loading Capacity and Load Allocations for Total Suspended Solids in the Red Lake River at CSAH 13, in Red Lake Falls AUID: 09020303-504				
	Duration Curve Zone				
	Very High	High	Mid	Low***	No Flow
TMDL Component	Values Expressed as Tons per Day of Sediment				
TOTAL DAILY LOADING CAPACITY*	225.00	93.85	35.49	12.77	0.00
Wasteload Allocation**					
NPDES Permitted WWTF	6.87	6.87	6.87	6.87	0.00
NPDES Permitted MS4 Communities	0.00	0.00	0.00	0.00	0.00
MnDOT Urbanized ROW WLA	0.00	0.00	0.00	0.00	0.00
Construction and Industrial Stormwater	0.03	0.01	0.01	0.00	0.00
Reserve Capacity	11.25	4.69	1.77	0.64	0.00
Daily Load Allocation	184.35	72.89	23.29	3.98	0.00
Daily Margin of Safety	22.50	9.39	3.55	1.28	0.00
	Values Expressed as Tons per Day of Sediment				
TOTAL MONTHLY LOADING CAPACITY	225.00	93.85	35.49	12.77	0.00
Wasteload Allocation					
NPDES Permitted WWTF	3.053%	7.320%	19.358%	53.800%	0.000%
NPDES Permitted MS4 Communities	0.000%	0.000%	0.000%	0.000%	0.000%
MnDOT Urbanized ROW WLA	0.000%	0.000%	0.000%	0.000%	0.000%
Construction and Industrial Stormwater	0.016%	0.016%	0.016%	0.016%	0.016%
Reserve Capacity	5%	5%	5%	5%	5%
Load Allocation	81.193%	77.666%	65.624%	31.167%	0.000%
Margin of Safety	10%	10%	10%	10%	10%
MEDIAN FLOW*	2781.00	1160.00	438.68	157.88	0.00
FLOW DURATION INTERVAL OF MEDIAN FLOW	5%	25%	50%	67%	95%

*The flow record from site S003-172 was used to develop flow zones and loading capacities.
**Wasteload Allocations are rounded to the nearest 2 digits (1/100th of a ton)
***Flow only persists to an exceedance probability of 73.26%

E. coli TMDLs

Table 5-15. *E. coli* loading capacity and allocations for Pennington County Ditch 96 at Highway 32.

Site ID: S005-683 *E. coli* Standard: 126 MPN/100ml Drainage Area (square miles): 41.51 % MS4: 0.00 Total WWTF Design Flow (mgd): 0.00	Loading Capacity and Load Allocations for *E. coli* in Pennington CD96 at MN Highway 32 AUID: 09020303-505 Duration Curve Zone		
	Very High	High	No Flow
TMDL Component	Values Expressed as Billions of Organisms/Day		
TOTAL DAILY LOADING CAPACITY*	**225.12**	**26.84**	**0.00**
Wasteload Allocation			
NPDES Permitted WWTF	0.00	0.00	0.00
NPDES Permitted MS4 Communities	0.00	0.00	0.00
NPDES Permitted Livestock Facilities	0.00	0.00	0.00
Reserve Capacity	0.00	0.00	0.00
Daily Load Allocation	**202.61**	**24.16**	**0.00**
Daily Margin of Safety	22.51	2.68	0.00
	Values Expressed as Billions of Organisms/Day		
TOTAL MONTHLY LOADING CAPACITY	225.12	26.84	0.00
Wasteload Allocation			
NPDES Permitted WWTF	0%	0%	0%
NPDES Permitted MS4 Communities	0%	0%	0%
NPDES Permitted Livestock Facilities	0%	0%	0%
Reserve Capacity	0%	0%	0%
Load Allocation	90%	90%	90%
Margin of Safety	10%	10%	10%
MEDIAN FLOW*	73.0	8.7	0.0
FLOW DURATION INTERVAL OF MEDIAN FLOW	5%	23.5%	68.5%
*The flow record from site S005-683 was used to develop flow zones and loading capacities.			

Table 5-17. *E. coli* loading capacity and allocations for Kripple Creek at 180th Ave SW.

Site ID: S004-835 *E. coli* Standard: 126 MPN/100ml Drainage Area (square miles): 32.28 % MS4: 0.00 Total WWTF Design Flow (mgd): 0.00	Loading Capacity and Load Allocations for *E. coli* in Kripple Creek at 180th Avenue SW AUID: 09020303-525 Duration Curve Zone				
	Very High	High	Mid	Low	No Flow
TMDL Component	Values Expressed as Billions of Organisms/Day				
TOTAL DAILY LOADING CAPACITY*	**93.54**	**23.59**	**11.47**	**4.46**	**0.00**
Wasteload Allocation					
NPDES Permitted WWTF	0.00	0.00	0.00	0.00	0.00
NPDES Permitted MS4 Communities	0.00	0.00	0.00	0.00	0.00
NPDES Permitted Livestock Facilities	0.00	0.00	0.00	0.00	0.00
"Straight Pipe" Septic Systems	0.00	0.00	0.00	0.00	0.00
Reserve Capacity	0.00	0.00	0.00	0.00	0.00
Daily Load Allocation	**84.19**	**21.23**	**10.32**	**4.01**	**0.00**
Daily Margin of Safety	9.35	2.36	1.15	0.45	0.00
	Values Expressed as Billions of Organisms/Day				
TOTAL MONTHLY LOADING CAPACITY	93.54	23.59	11.47	4.46	0.00
Wasteload Allocation					
NPDES Permitted WWTF	0%	0%	0%	0%	0%
NPDES Permitted MS4 Communities	0%	0%	0%	0%	0%
NPDES Permitted Livestock Facilities	0%	0%	0%	0%	0%
"Straight Pipe" Septic Systems	0%	0%	0%	0%	0%
Reserve Capacity	0%	0%	0%	0%	0%
Load Allocation	90%	90%	90%	90%	90%
Margin of Safety	10%	10%	10%	10%	10%
MEDIAN FLOW*	30.34	7.65	3.72	1.45	0.00
FLOW DURATION INTERVAL OF MEDIAN FLOW	5.0%	25.0%	50.0%	72.1%	92.1%
*The flow record from site S004-835 was used to develop flow zones and loading capacities.					

Table 5-19. *E. coli* loading capacity and allocations for the Black River at CSAH 18 (S002-132).

Site ID: S002-132 *E. coli* Standard: 126 MPN/100ml Drainage Area (square miles): 144.35 % MS4: 0.00 Total WWTF Design Flow (mgd): 0.00	Loading Capacity and Load Allocations for *E. coli* in Black River at CSAH 18 AUID: 09020303-529		
	Duration Curve Zone		
	Very High	High	No Flow
TMDL Component	Values Expressed as Billions of Organisms/Day		
TOTAL DAILY LOADING CAPACITY*	**502.70**	**18.91**	**0.00**
Wasteload Allocation			
NPDES Permitted WWTF	0.00	0.00	0.00
NPDES Permitted MS4 Communities	0.00	0.00	0.00
NPDES Permitted Livestock Facilities	0.00	0.00	0.00
"Straight Pipe" Septic Systems	0.00	0.00	0.00
Reserve Capacity	0.00	0.00	0.00
Daily Load Allocation	**452.43**	**17.02**	**0.00**
Daily Margin of Safety	50.27	1.89	0.00
	Values Expressed as Billions of Organisms/Day		
TOTAL MONTHLY LOADING CAPACITY	502.70	18.91	0.00
Wasteload Allocation			
NPDES Permitted WWTF	0%	0%	0%
NPDES Permitted MS4 Communities	0%	0%	0%
NPDES Permitted Livestock Facilities	0%	0%	0%
"Straight Pipe" Septic Systems	0%	0%	0%
Reserve Capacity	0%	0%	0%
Load Allocation	90%	90%	90%
Margin of Safety	10%	10%	10%
MEDIAN FLOW*	163.07	6.13	0.00
FLOW DURATION INTERVAL OF MEDIAN FLOW	5%	23.22%	68.18%

*The flow record from site S002-132 was used to develop flow zones and loading capacities.

Table 5-21. *E. coli* loading capacity and allocations for the Black River AUID 558 at CR 101 (S008-112).

Site ID: S008-112 *E. coli* Standard: 126 MPN/100 ml Drainage Area (square miles): 78 % MS4: 0.00 Total WWTF Design Flow (mgd): 0.00	Loading Capacity and Load Allocations for *E. coli* in the Black River at Red Lake CR 101 AUID: 09020303-558				
	Duration Curve Zone				
	Very High	High	Mid	Low	Very Low (No)
TMDL Component	Values Expressed as Billions of Organisms/Day				
TOTAL DAILY LOADING CAPACITY*	**365.88**	**87.22**	**27.31**	**7.73**	**0.43**
Wasteload Allocation					
NPDES Permitted WWTF	0.00	0.00	0.00	0.00	0.00
NPDES Permitted MS4 Communities	0.00	0.00	0.00	0.00	0.00
NPDES Permitted Livestock Facilities	0.00	0.00	0.00	0.00	0.00
"Straight Pipe" Septic Systems	0.00	0.00	0.00	0.00	0.00
Reserve Capacity	0.00	0.00	0.00	0.00	0.00
Daily Load Allocation	**329.29**	**78.50**	**24.58**	**6.96**	**0.39**
Daily Margin of Safety	36.59	8.72	2.73	0.77	0.04
	Values Expressed as Billion Organisms/Day				
TOTAL MONTHLY LOADING CAPACITY	365.88	87.22	27.31	7.73	0.43
Wasteload Allocation					
NPDES Permitted WWTF	0%	0%	0%	0%	0%
NPDES Permitted MS4 Communities	0%	0%	0%	0%	0%
NPDES Permitted Livestock Facilities	0%	0%	0%	0%	0%
"Straight Pipe" Septic Systems	0%	0%	0%	0%	0%
Reserve Capacity	0%	0%	0%	0%	0%
Load Allocation	90%	90%	90%	90%	90%
Margin of Safety	10%	10%	10%	10%	10%
MEDIAN FLOW*	118.7	28.3	8.9	2.5	0.1
FLOW DURATION INTERVAL OF MEDIAN FLOW	5%	25%	50%	75%	95%
FLOW REGIME OF MEDIAN FLOW	Very High	High	Mid	Low	Very Low

*The 1995-2016 flow record was simulated by the Red Lake River HSPF Model. Station S008-112 captures 99.08% of the drainage area of the HSPF model's reach number 409. That percentage was used to adjust the simulated Reach 409 discharge records slightly downward and create an area-weighted flow record.

Table 5-22. *E. coli* loading capacity and allocations for the Gentilly River at CSAH 11 (S004-058).

Site ID: S002-132 *E. coli* Standard: 126 MPN/100 ml Drainage Area (square miles): 34.18 % MS4: 0.00 Total WWTF Design Flow (mgd): 0.00	Loading Capacity and Load Allocations for *E. coli* in the Gentilly River at CSAH 11 AUID: 09020303-554				
	Duration Curve Zone				
	Very High	High	Mid	Low	Very Low (No)
TMDL Component	Values Expressed as Billions of Organisms/Day				
TOTAL DAILY LOADING CAPACITY*	**222.05**	**53.33**	**31.17**	**21.38**	**0.00**
Wasteload Allocation					
NPDES Permitted WWTF	0.00	0.00	0.00	0.00	0.00
NPDES Permitted MS4 Communities	0.00	0.00	0.00	0.00	0.00
NPDES Permitted Livestock Facilities	0.00	0.00	0.00	0.00	0.00
"Straight Pipe" Septic Systems	0.00	0.00	0.00	0.00	0.00
Reserve Capacity	0.00	0.00	0.00	0.00	0.00
Daily Load Allocation	**199.85**	**48.00**	**28.05**	**19.24**	**0.00**
Daily Margin of Safety	22.20	5.33	3.12	2.14	0.00
	Values Expressed as Billions of Organisms/Day				
TOTAL MONTHLY LOADING CAPACITY	222.05	53.33	31.17	21.38	0.00
Wasteload Allocation					
NPDES Permitted WWTF	0%	0%	0%	0%	0%
NPDES Permitted MS4 Communities	0%	0%	0%	0%	0%
NPDES Permitted Livestock Facilities	0%	0%	0%	0%	0%
"Straight Pipe" Septic Systems	0%	0%	0%	0%	0%
Reserve Capacity	0%	0%	0%	0%	0%
Load Allocation	90%	90%	90%	90%	90%
Margin of Safety	10%	10%	10%	10%	10%
MEDIAN FLOW*	72.03	17.30	10.11	6.94	0.00
FLOW DURATION INTERVAL OF MEDIAN FLOW	5%	25%	50%	69.33%	89.29%
*The flow record from site S002-132 was used to develop flow zones and loading capacities.					

Table 5-24. *E. coli* loading capacity and allocations for Cyr Creek at County Road 110 (S004-818).

Site ID: S004-818 *E. coli* Standard: 126 MPN/100 ml Drainage Area (square miles): 18.98 % MS4 Urban: 0.00 Total WWTF Design Flow (mgd): 0.00	Loading Capacity and Load Allocations for *E. coli* in Cyr Creek at CR 110 AUID: 09020303-556			
	Duration Curve Zone			
	Very High	High	Mid	Very Low (No)
TMDL Component	Values Expressed as Billions of Organisms/Day			
TOTAL DAILY LOADING CAPACITY*	**239.57**	**48.01**	**3.87**	**0.00**
Wasteload Allocation				
NPDES Permitted WWTF	0.00	0.00	0.00	0.00
NPDES Permitted MS4 Communities	0.00	0.00	0.00	0.00
NPDES Permitted Livestock Facilities	0.00	0.00	0.00	0.00
"Straight Pipe" Septic Systems	0.00	0.00	0.00	0.00
Reserve Capacity	0.00	0.00	0.00	0.00
Daily Load Allocation	**215.61**	**43.21**	**3.48**	**0.00**
Daily Margin of Safety	23.96	4.80	0.39	0.00
	Values Expressed as Billions of Organisms/Day			
TOTAL MONTHLY LOADING CAPACITY	239.57	48.01	3.87	0.00
Wasteload Allocation				
NPDES Permitted WWTF	0%	0%	0%	0%
NPDES Permitted MS4 Communities	0%	0%	0%	0%
NPDES Permitted Livestock Facilities	0%	0%	0%	0%
"Straight Pipe" Septic Systems	0%	0%	0%	0%
Reserve Capacity	0%	0%	0%	0%
Load Allocation	90%	90%	90%	90%
Margin of Safety	10%	10%	10%	10%
MEDIAN FLOW*	78	16	1	0
FLOW DURATION INTERVAL OF MEDIAN FLOW	5%	25%	46.51%	76.48%
FLOW REGIME OF MEDIAN FLOW	Very High	High	Mid-Range	No Flow
*The flow record from site S004-818 was used to develop flow zones and loading capacities.				

ERRATA Red Lake River TMDL

p. 15 error	p. 15 correction
The WRAPS for the Big Fork River is a work in progress and its status may be accessed at https://www.pca.state.mn.us/sites/default/files/wq-ws4-37a.pdf	The WRAPS for the Red Lake River (2019) may be accessed at https://www.pca.state.mn.us/sites/default/files/wq-ws4-60a.pdf