CITY of TRAVERSE CITY MICHIGAN

CWSRF WASTEWATER IMPROVEMENTS PROJECT PLAN

PREPARED BY:

APRIL 2021

HRC
HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

1925 Breton Road SE, Suite 100
Grand Rapids, Michigan 49506

HRC Job Number 20200232

Versions:

Draft April 1, 2021 (Submittal to EGLE)

Draft April 15, 2021 (Submittal to Public)

Final #######

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1 Executive Summary

1.1 Summary

The Project Plan for the City of Traverse City Sanitary Sewer Rehabilitation Program has been prepared using the Project Plan Preparation Guidance of the Clean Water State Revolving Fund (CWSRF) Administrative Rules. While the rates have not been set yet for FY2022, the rate in 2021 is 1.875% for 20-year loans (note 2% is used for cost estimates). These rules call for compliance with the basic Federal Planning Requirements and the National Environmental Policy Act (NEPA). This Project Plan will serve as a basis for project prioritization and must be submitted to the Michigan Department of Environment, Great Lakes, & Energy (EGLE) by June 1, 2021, to be on the project priority list for the fiscal year of 2022.

The proposed projects listed herein as part of this CWSRF Project Plan are the Lower Boardman River Wall Sanitary Sewer, Primary Treatment Improvements, UV Disinfection Update, I&I Removal, East Front Sewer Improvements, and a US-31 Utility Replacement. These projects were a result of the conditions found during the recent Stormwater, Asset Management, and Wastewater System (SAW) Program and other evaluations completed. Several of the sanitary sewer collection system projects are long overdue and are needed to ensure the sanitary collection system and WWTP can operate properly. Inflow and Infiltration (I/I) was also a concern that needs to be addressed as part of this project plan to address Sanitary Sewer Overflows (SSOs) that have occurred.

1.2 Conclusions

The following is a summary of the existing issues identified by the City of Traverse City:

- Improvements to the Headworks and Primary Treatment necessary to improve the reliability of treatment and address the system deficiencies
- New UV system constructed and installed to replace the aged system, minimize the potential for flow surges and minimize interruption of the disinfection process
- Restoration and management of the lower Boardman River wall sanitary sewer to reinitiate the support for the sewer service connections and avoid the release of raw sewage into the river
- Completion of sewer rehabilitation to address sources of infiltration and inflow and continued flow monitoring
- East Front Street updates including 720 feet of 24-inch sewer lining, 300 feet of force main replacement with a 20-inch pipe, and 40 lateral replacement subject to high infiltration and inflow to address high dry weather flow
- Removal of existing 8-inch sanitary sewer on the north side of US-31 and extend all laterals from the north side to the south 24-inch sanitary sewer in US-31 from Garfield to Hope Street.

1.3 Recommendations

The selected projects identified in this Plan are the most cost-effective and environmentally sound alternatives. The following recommendations are therefore made:

- The City Commission should pass a resolution formally adopting this Plan.
- The City should apply for low-interest loans under the CWSRF program.

2 Project Background

2.1 Study Area Description

2.1.1 General

The City of Traverse City is in Grand Traverse County, Michigan. The total City area is approximately 8.66 square miles. The Traverse City Regional Wastewater Treatment Plant (TCRWWTP) is located at 606 Hannah Avenue, Traverse City, MI 49686. The Traverse City Regional WWTP treats the wastewater discharges from the entire City as well as portions of Acme, Blair, East Bay, Elmwood, Garfield, and Peninsula Townships. The sanitary sewer system map is shown in Figure 2-1.

Wastewater from the City's collection system is conveyed to the Traverse City Regional WWTP located in the City of Traverse City along Franklin Street on the northern end of Boardman Lake. Conveyance of wastewater to the Traverse City Regional WWTP is accomplished by a sanitary sewer collection system and nine remote pumping stations. This network of collection and transmission infrastructure is spread throughout the City of Traverse City and portions of East Bay, Garfield, Peninsula, and Elmwood Townships. A map showing the sanitary sewer collection system is provided in Figure 2-2.

2.1.2 Land Use

The largest land-use types within the City of Traverse City (excluding open spaces and utilities) are residential and commercial. A map with the current zoning districts within the City of Traverse City can be seen in the attached Figure 2-3. A map of the future land use within the City of Traverse City can be seen in the attached Figure 2-4. Future land use for the City was obtained from the City of Traverse City Master Plan.

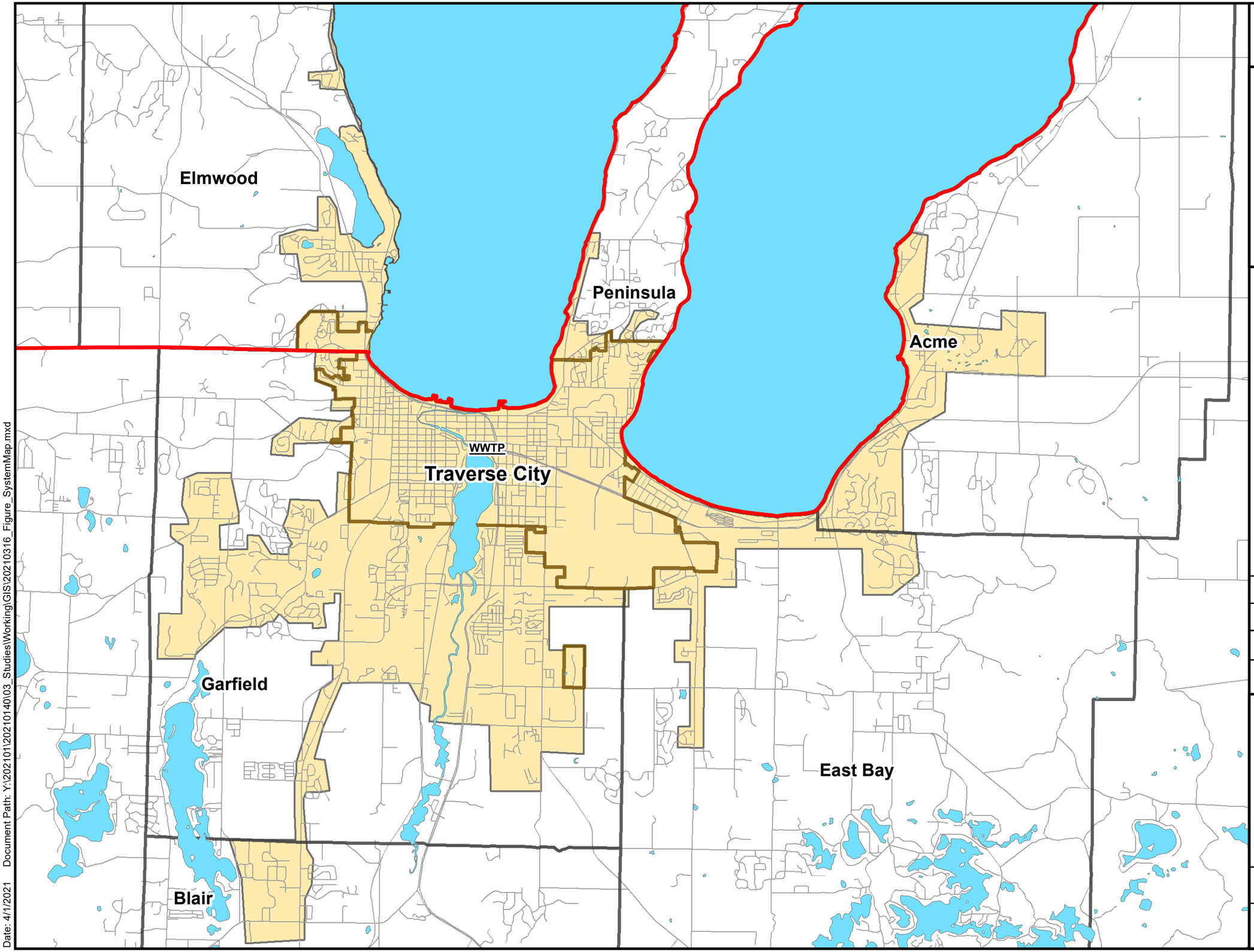
2.1.3 Population Data

Population numbers and projections for Grand Traverse County and the City of Traverse City came from the United States Census Bureau database. The U.S. 2010 Census Bureau data estimated the average household size in the City at 2.18 people per household. The population projections for the City of Traverse City and Grand Traverse County are shown below in Table 2-1.

Table 2-1. Population Projections

Year	City of Traverse City	Grand Traverse County
2010	14,674	86,986
2014	14,736	91,701
2019	14,805	97,380
2024	14,870	103,121
2029	14,924	108,314
2034	14,968	112,734

*Census projections: https://www.census.gov/quickfacts/fact/table/traversecitycitymichigan,grandtraversecountymichigan/PST045219 & https://milmi.org/datasearch/popproj



CITY of TRAVERSE CITY MICHIGAN

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LEGEND

- County Boundary
- Traverse City
- Other Townships
- Sanitary Sewer System Extents
- Roads

N
W E
S

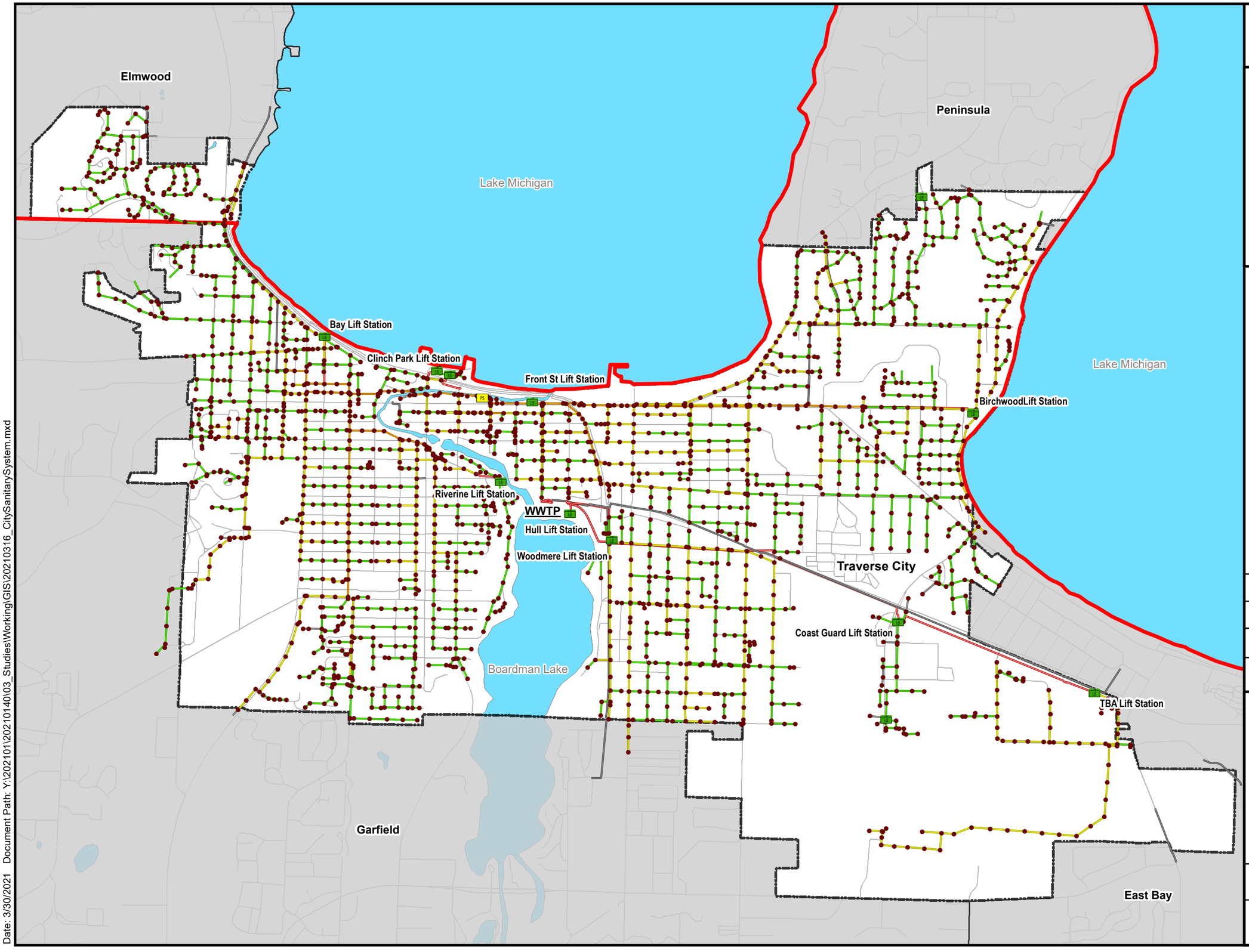
0 0.5 1 2 Miles

DRAWN: DRM/NAC CHECKED: DIU

CWSRF PROJECT PLAN SANITARY SEWER SYSTEM MAP

HRC JOB NO: 20210140	SCALE: AS SHOWN
MAY 2021	**FIGURE 2.1**

Date: 4/1/2021 Document Path: Y:\20210\20210140\03_Studies\Working\GIS\20210316_Figure_SystemMap.mxd



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LEGEND

- County
- City of Traverse City
- Townships
- Roads
- Lift Station
- Pump Station
- Sanitary Sewer Manholes

Sewer Gravity Mains

Diameter (in.)

- Unknown
- 4" - 8"
- 9" - 15"
- 16" - 36"

Sewer Force Mains

- Traverse City Owned
- Maintained by Others

N W E S

0 0.175 0.35 0.7 Miles

DRAWN: DJM/NAC CHECKED: DIU

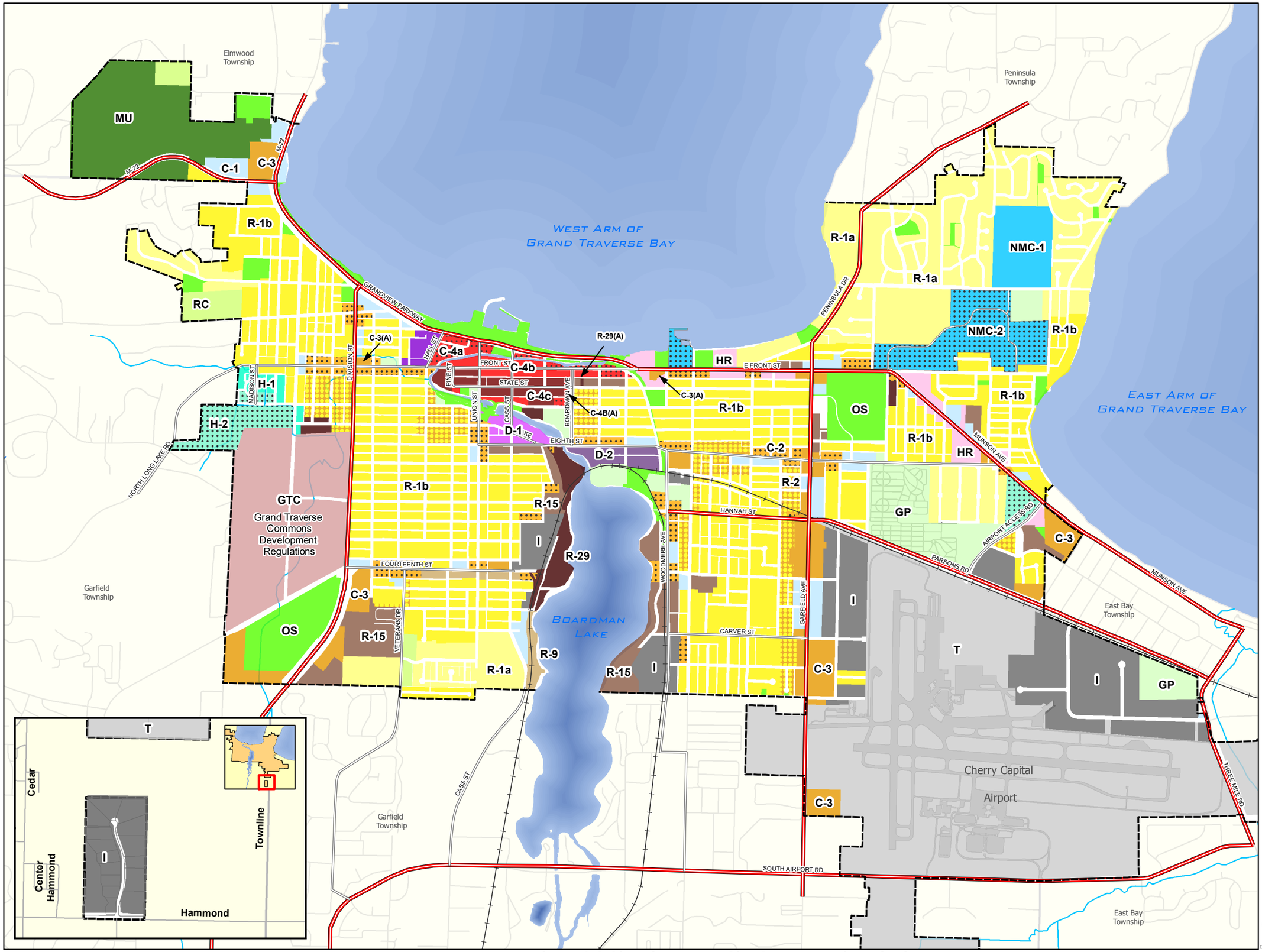
CWSRF PROJECT PLAN

CITY OF TRAVERSE CITY SANITARY SEWER COLLECTION SYSTEM

HRC JOB NO: 20210140	SCALE: AS SHOWN
MAY 2021	**FIGURE 2.2**

Date: 3/30/2021 Document Path: Y:\20210\20210140\03_Studies\Working\GIS\20210316_CitySanitarySystem.mxd

CITY OF TRAVERSE CITY
ZONING MAP



Street Classification

- Arterial
- Collector

Zoning Districts

- C-1 Office Service
- C-2 Neghborhood Center
- C-3 Community Center
- C-4a Regional Center
- C-4b Regional Center
- C-4c Regional Center
- D-1 Development
- D-2 Development
- D-3 Development
- GP Government/Public
- H-1 Hospital
- H-2 Hospital
- HR Hotel Resort
- I Industrial
- R1/b Mixed Use
- NMC-1 University
- NMC-2 University
- OS Open Space
- GTC Grand Traverse Commons
- R-15 Multi Family Dwelling
- R-1a Single Family Dwelling
- R-1b Single Family Dwelling
- R-2 Two Family Dwelling
- R-29 Multi Family Dwelling
- R-9 Multi Family Dwelling
- RC Residental Conservation
- T Transportation
- (A) - Zoning Agreement

PLANNING DEPARTMENT
ZONING ADMINISTRATOR - DAVE WESTON
231-922-4464

City of TRAVERSE CITY GEOGRAPHIC INFORMATION SYSTEMS

0 1,000 2,000 Feet

5/24/2019 GWS

THIS MAP IS BASED ON DIGITAL DATABASES FROM THE CITY OF TRAVERSE CITY. TRAVERSE CITY CANNOT ACCEPT ANY RESPONSIBILITY FOR ERRORS, OMMISSIONS OR POSITIONAL ACCURACY. THERE ARE NO WARRANTIES EXPRESSED OR IMPLIED.

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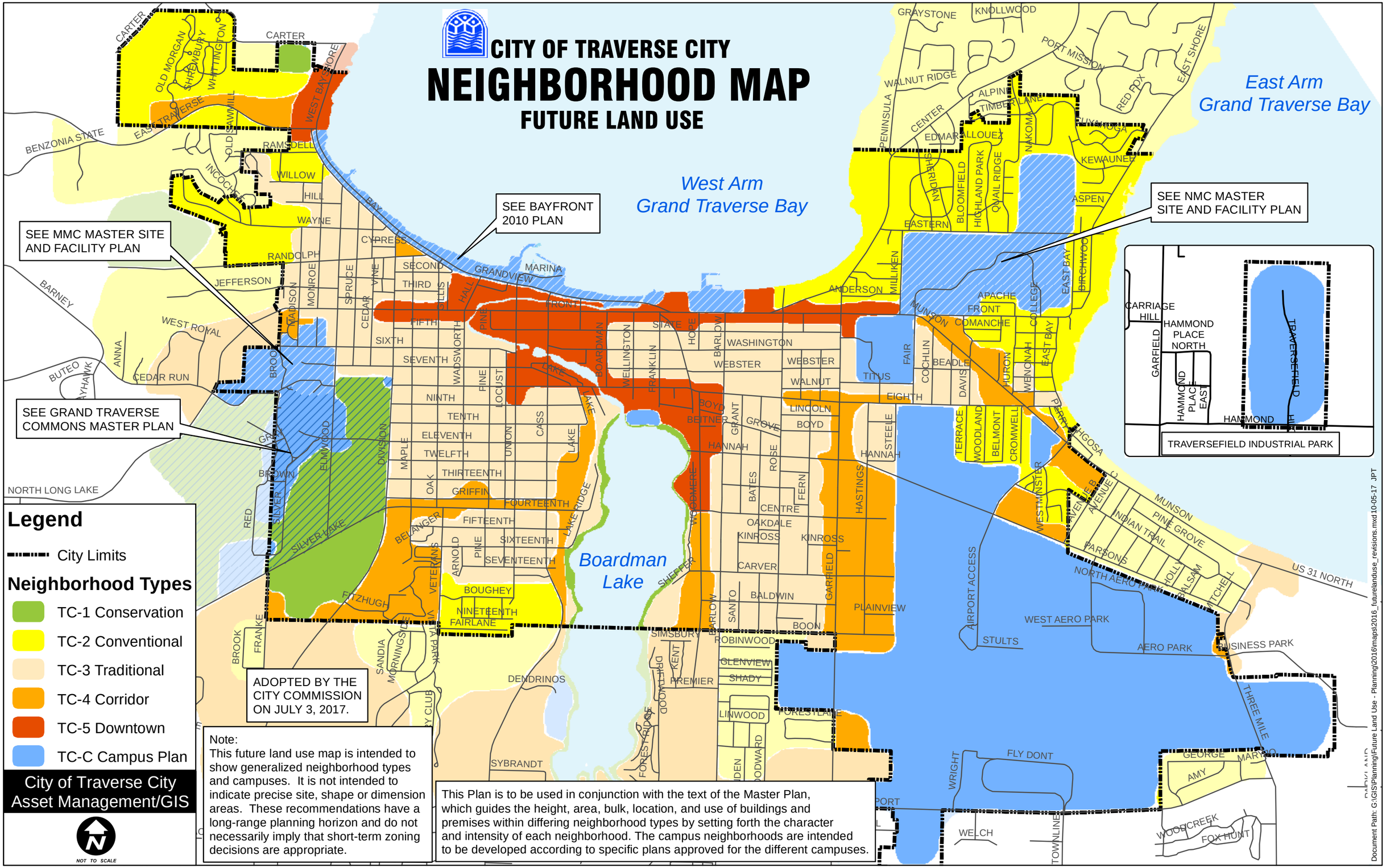
Figure 2-3 City of Traverse City Current Zoning Districts

**Courtesy of City of Traverse City*

CITY OF TRAVERSE CITY
NEIGHBORHOOD MAP
FUTURE LAND USE



Legend

- City Limits

Neighborhood Types

- TC-1 Conservation
- TC-2 Conventional
- TC-3 Traditional
- TC-4 Corridor
- TC-5 Downtown
- TC-C Campus Plan

City of Traverse City
Asset Management/GIS

NOT TO SCALE

ADOPTED BY THE CITY COMMISSION ON JULY 3, 2017.

Note:
This future land use map is intended to show generalized neighborhood types and campuses. It is not intended to indicate precise site, shape or dimension areas. These recommendations have a long-range planning horizon and do not necessarily imply that short-term zoning decisions are appropriate.

This Plan is to be used in conjunction with the text of the Master Plan, which guides the height, area, bulk, location, and use of buildings and premises within differing neighborhood types by setting forth the character and intensity of each neighborhood. The campus neighborhoods are intended to be developed according to specific plans approved for the different campuses.

Document Path: G:\GIS\Planning\Future Land Use - Planning\2016\maps\2016_futurelanduse_revisions.mxd 10-05-17 JPT

Figure 2-4 City of Traverse City Future Land Use

Courtesy of City of Traverse City

Recent projections show the 2019 population has increased slightly since the 2010 Census in the City of Traverse City and Grand Traverse County. Projections predict the population will continue to increase through 2034.

Forecast from the Census Bureau projects population in 2034 to be approximately 14,968. This increase in population may also cause an increase in sanitary waste; however, the sanitary sewer collection system was built to handle larger populations and therefore higher flow than it is currently experiencing or will experience based on the projected 2034 population.

2.1.4 Economic Characteristics

The major industries in the City of Traverse City are Health Care & Social Assistance (1,396 people), Retail Trade (1,008 people), and Accommodation & Food Services (844 people). The median household income for the City of Traverse City was $57,076 in 2019. The median household income is approximately 0.11% lower than the median Michigan household income and 9.18% less than the U.S. median household income. Table 2-2 shows the City of Traverse City, Grand Traverse County, and Leelanau County median household income comparison below.

Table 2-2. Study Area Household Income

Municipality	Median Annual Household Income
City of Traverse City	$57,076
Grand Traverse County	$61,485
Leelanau County	$63,575

*Source: https://www.census.gov/quickfacts/fact/table/MI,traversecitycitymichigan,grandtraversecountymichigan/PST045219

2.1.5 Cultural and Environmental Settings

Cultural Setting:

The City of Traverse City has 4 historical districts and 5 historical properties listed under the National Register of Historic Places. However, none are within the project limits and will not be impacted by the proposed project. If the I/I Alternative 2 is selected (described below for future evaluation) the State Historic Preservation Office (SHPO) will be contacted to aid in the identification of significant historical and archeological sites which may be affected by the project

Air Quality:

Mobile source emissions, mainly from automobiles, are the primary source of outdoor air pollution in this area. The area has the noise pollution characteristics of a typical, tourist-driven community. No noise pollution problems exist in residential areas, other than from traffic noise from adjacent major roadways. Commercial and business areas experience only normal traffic noise.

Air quality is not anticipated to be an issue for this project, apart from temporary dust and debris from construction and minimal odors from the CIPP curing material. All necessary notifications will be distributed to the public when this occurs and all regulations for this odor will be followed.

Wetlands:

There are no localized wetlands associated with the existing project footprint where the work is anticipated. For the final design, any wetlands that may be impacted would be flagged and the appropriate EGLE and USACE permits will be applied for. However, it is not anticipated to be an issue for this project. Wetland maps are shown in Figure 2-5.

Great Lake Coastal Zones:

The major body of water north of the City of Traverse City is Grand Traverse Bay, which is approximately 0.5 miles north of the WWTP. The WWTP is located on the North end of Boardman Lake which leads into the Boardman River. The Boardman River carries on for approximately 2 miles until it hits the Grand Traverse Bay which then leads out into Lake Michigan. For this project plan, no impacts will be made to the Bay or tributary areas.

Floodplains & Surface Waters:

The study area is located entirely in the Grand Traverse Bay Watershed. The watershed encompasses 976 square miles with nine sub-watersheds that drain directly into the Grand Traverse Bay.

The City of Traverse City is located along the Grand Traverse Bay. Area groundwater is not used as a source of drinking water within the City. Water supply for the City is obtained via the City of Traverse City Water Treatment Plant. There will be no major impacts to the great lake coastal zones, floodplains, and surface waters, however, proper permits will be acquired, and steps will be taken to avoid any damage or permanent disruption which could affect the nearby floodplain. Any work which impacts the floodplain will only be undertaken after first contacting EGLE and obtaining the appropriate permits.

FEMA floodplain maps are shown in Figure 2-6.

Natural or Wild and Scenic Rivers:

The scope of this project is scattered throughout the City of Traverse City, surrounding Townships, and at the WWTP. Kids Creek is located within the City. The WWTP is located along the shoreline of the Boardman River. The location of these improvements and construction will be planned to not occur or impact the nearby Rivers.

The proposed work will also decrease the amount of TSS discharged to the Boardman River during wet weather events, improving the water quality of the effluent to the river. See Appendix A for attached documentation of the Nationwide Rivers Inventory, showing that no Nationwide Rivers will be impacted by the proposed project.

Recreation Facilities:

The City of Traverse City owns 34 parks and recreational properties, ranging from a small downtown parcel to the larger Hickory Hills Ski Area, Grand Traverse Commons, and Brown Bridge Quiet Area. Much of the park land is heavily concentrated along the Boardman River and along the shoreline of the West Grand Traverse Bay. In total, over 1,600 City-owned acres are currently dedicated to recreational pursuits including Hickory Hills Ski Area and Grand Traverse Commons that are each approximately 125 acres and Brown Bridge Quiet Area, located 10 miles southeast of the City, has nearly two square miles (1,310 acres) of natural area along the Boardman River. The proposed work will limit all impacts to parks or other publicly owned facilities by ensuring pedestrian access if maintained and maintaining quality aesthetics of facilities.

Topography:

The terrain within the City of Traverse City is characterized as relatively flat but has relatively low spots near the Grand Traverse Bay. The lowest point at about 582 feet above sea level is in the north region of the City on the bay along the shoreline. The highest point is about 950 feet above sea level in the western hillier extents of the City.

A set of United States Geological Survey (USGS) topography maps of the City and surrounding townships are shown in Figure 2-7 through Figure 2-11.

Geology:

The City of Traverse City is typified by eolian, lake, and glacial deposits. The lake sand deposits make up the larger portion of the City of Traverse City. Two types of bedrock make up the bedrock surface in the City of Traverse City, Ellsworth Shale and Coldwater Shale.

Soils:

According to the USDA Natural Resources Conservation Service Web Soil Survey, the City of Traverse City the 3 main soils located within the City are Loamy Sand (27.53%), Sandy Loam (14.78%), and Sand (39.73%). See Appendix B for documentation of the Web Soil Survey results.

As part of the final design process, soil borings will be taken near the proposed work areas to determine if any special construction methods will be needed.

Agricultural Resources:

There is no agricultural land located within the project limits. The project area is within developed and human use land cover; therefore, no agricultural resources will be impacted by the proposed work.

Existing Plant and Animal Communities:

Wildlife within the study area includes animals and birds normally associated with urban or agricultural environments. However, EGLE will be coordinating with Michigan Natural Feature Inventory (MNFI) and U.S Fish and Wildlife (USFW) Information for Planning and Consultation (IPaC) for an official review of federally or state listed threatened and endangered species within this proposed project area.

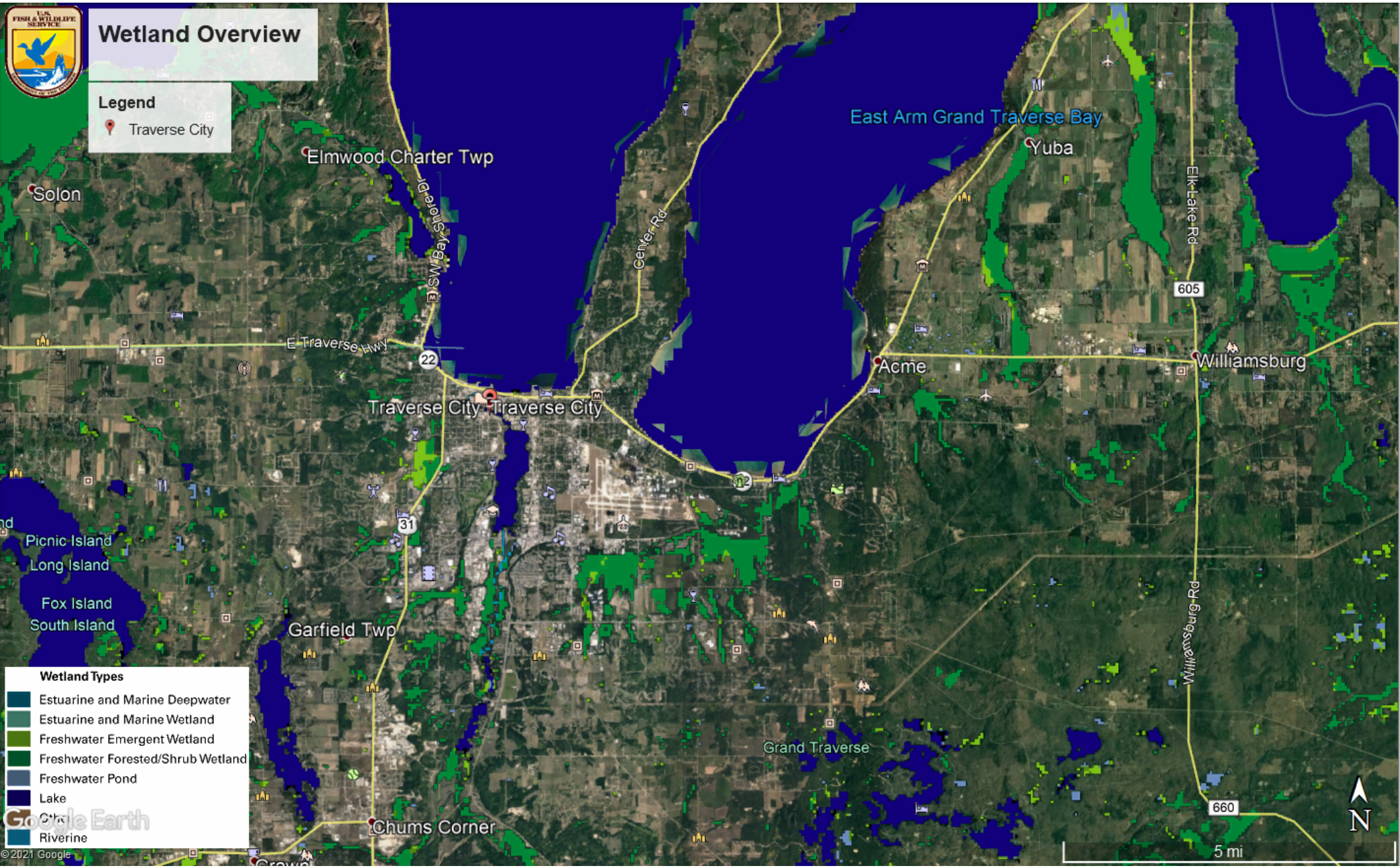


Figure 2-5 Wetlands Map

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 16. The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by the National Agricultural Imagery Program (NAIP). This information was photogrammetrically compiled at a scale of 1:12,000 from aerial photography dated 2007 or later.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

Figure 2-6 FEMA Floodplain Map

LEGEND

▨ SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

▨ FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

▩ OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

☐ OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

▧ COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

▧ OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

———	1% Annual Chance Floodplain Boundary
———	0.2% Annual Chance Floodplain Boundary
— —	Floodway boundary
— — —	Zone D boundary
• • • • • •	CBRS and OPA boundary
▨ ◀—	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
~~ 513 ~~~	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A ——— A	Cross section line
(23) - - - - - (23)	Transect line
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
$^{49}89^{000m}$ N	1000-meter Universal Transverse Mercator grid values, zone 16
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
August 28, 2018

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

N

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0113C

FIRM

FLOOD INSURANCE RATE MAP

GRAND TRAVERSE COUNTY, MICHIGAN
(ALL JURISDICTIONS)

PANEL 113 OF 425
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PENINSULA, TOWNSHIP OF	260747	0113	C
TRAVERSE CITY, CITY OF	260082	0113	C

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
26055C0113C

EFFECTIVE DATE
AUGUST 28, 2018

Federal Emergency Management Agency

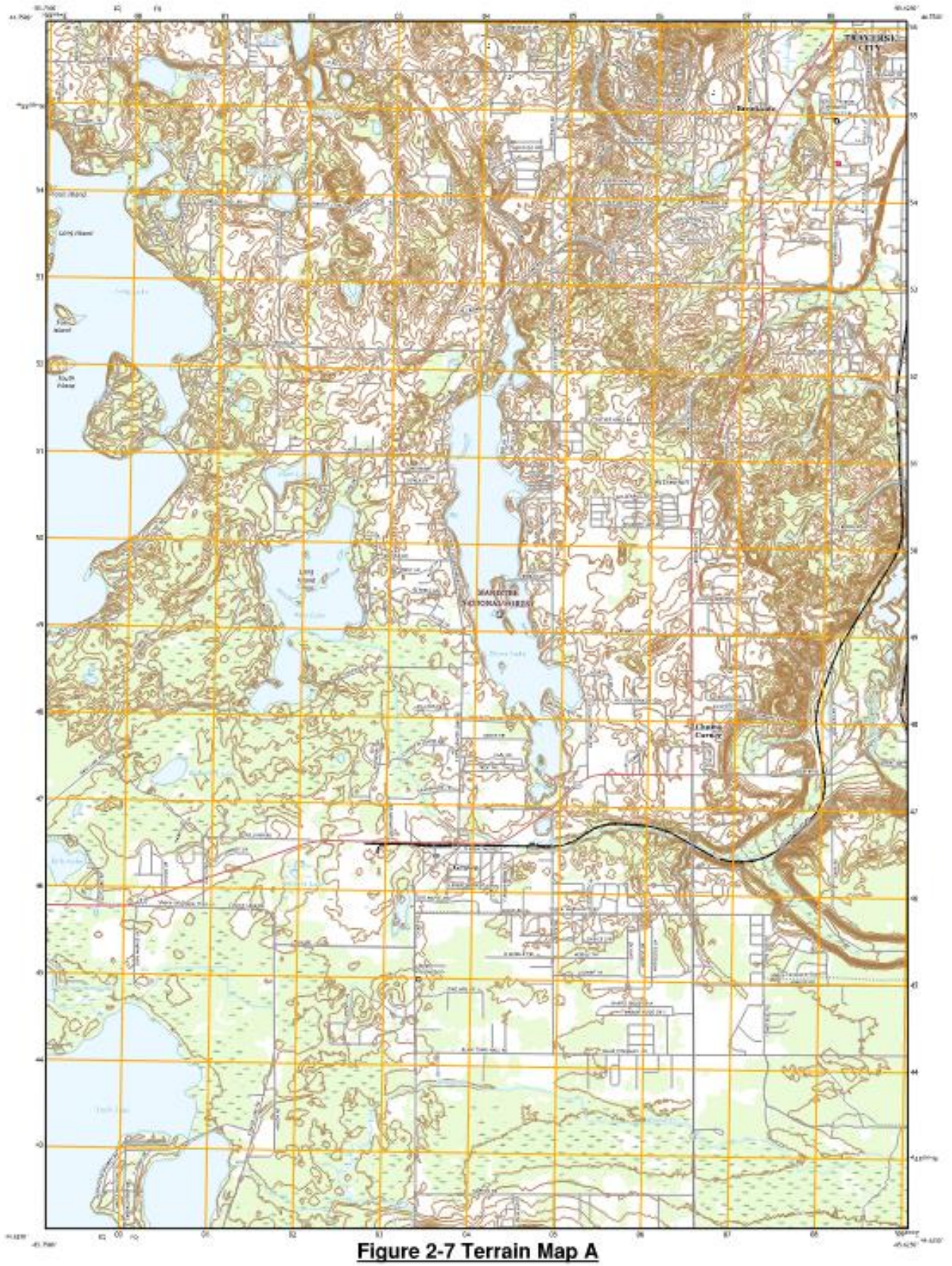


Figure 2-7 Terrain Map A

USGS
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map
US Topo

MAYFIELD QUADRANGLE
MICHIGAN - GRAND TRAVERSE COUNTY
7.5-MINUTE SERIES

Figure 2-8 Terrain Map B

Produced by the United States Geological Survey

SCALE 1:24 000

MAYFIELD, MI
2019

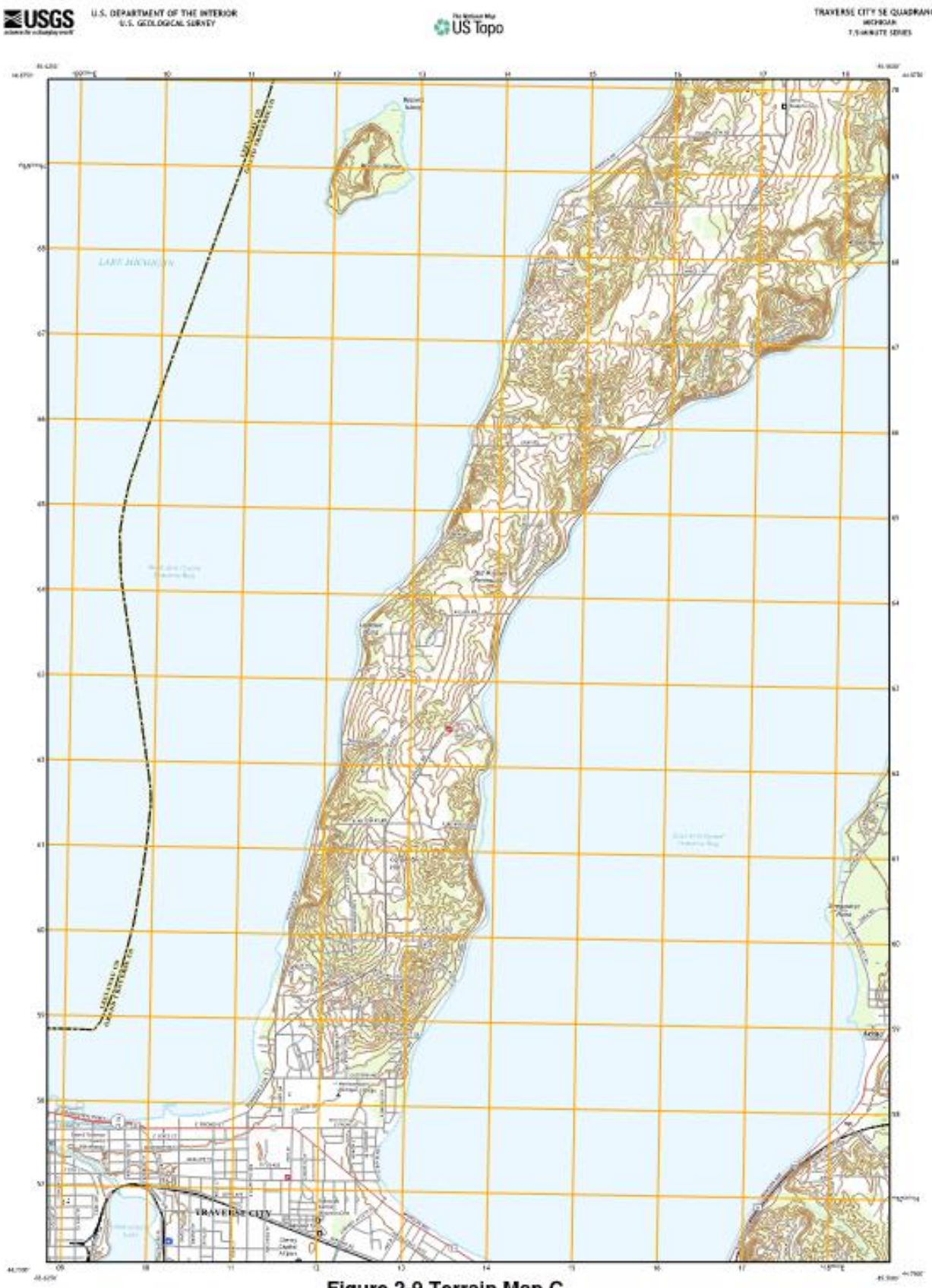


Figure 2-9 Terrain Map C

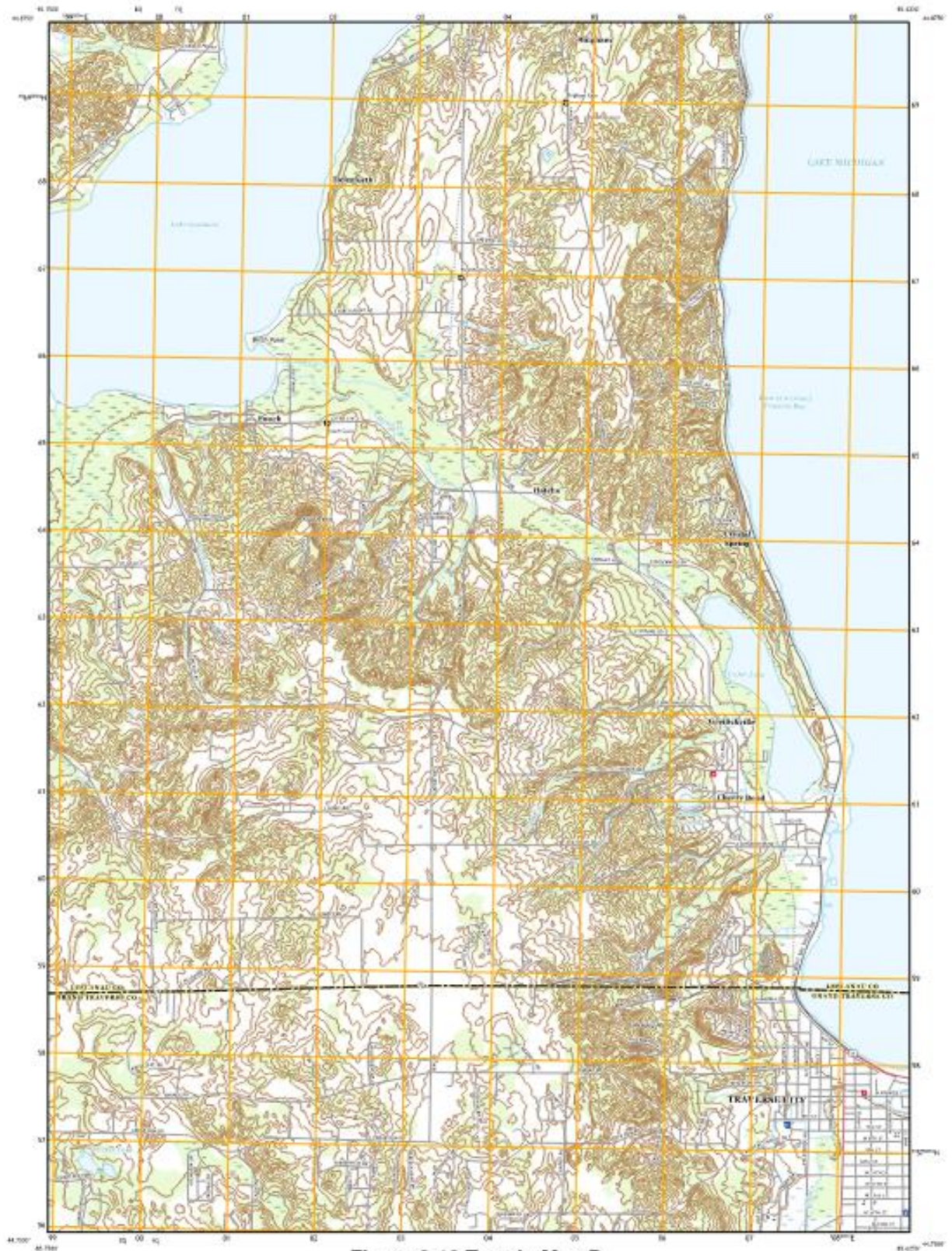


Figure 2-10 Terrain Map D

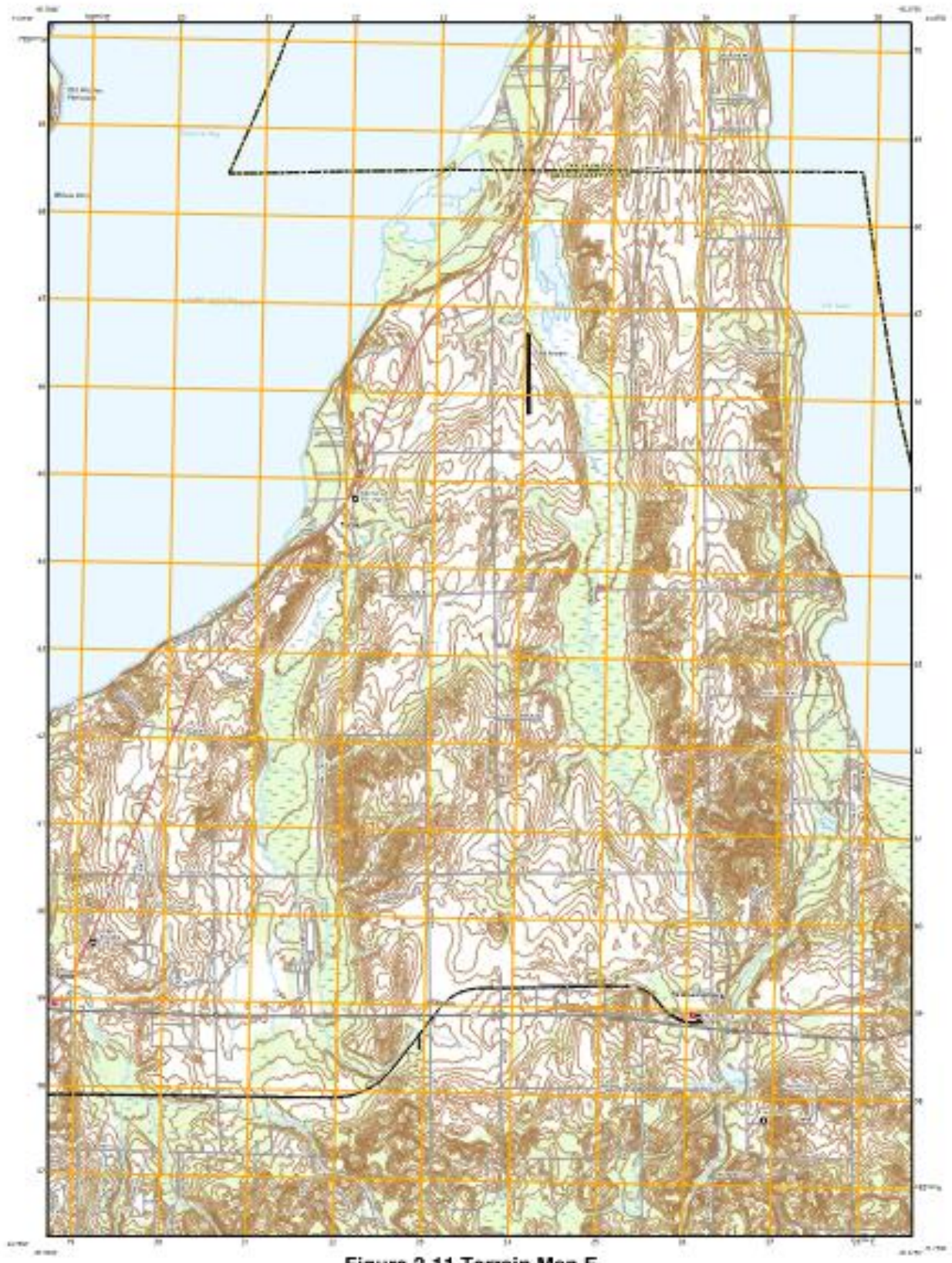


Figure 2-11 Terrain Map E

2.2 Existing Facilities – General

The City of Traverse City sewer and wastewater collection, transmission, and treatment infrastructure are critical assets for conveying and treating waste and preventing the introduction of pollutants into Boardman Lake, Boardman River, and the Grand Traverse Bay. A description of the City's wastewater collection and treatment infrastructure is provided in the following sections.

2.2.1 Sewer Collection System and Lift Stations

Conveyance of wastewater to the TCRWWTP is accomplished by a sanitary sewer collection system with nine lift stations. The network of collection and transmission infrastructure collects and treats wastewater from the City of Traverse City, Garfield Township, Acme Township, Blair Township, East Bay Township, Peninsula Township in Grand Traverse County, and Elmwood Township in Leelanau County.

The City owns and maintains its sanitary sewer collection system, which is comprised of approximately 1,902 manholes, 81 miles of sanitary sewer pipeline, 4.7 miles of public force mains, and 9 lift stations. Flow collected via the collection system can have significant infiltration and inflow contributions to the collection system and WWTP. Wet weather contributions throughout the collection system cause the delivery of low strength waste to the WWTP but simultaneously provide a flushing effect which resuspends settled grit and solids allowing them to travel to the WWTP for treatment. Table 2-3 below lists the locations and capacities of the City of Traverse City lift stations.

Each lift station was constructed with ancillary support systems, such as telemetry, cathodic protection, and emergency power. These systems ensure maintenance staff can respond to alarms and emergencies in a timeframe that keeps the City from violating its level of service goals and protects the buried metal housing from corrosion. Backup emergency power for lift stations is provided through either a standby generator onsite or portable power generation equipment.

Table 2-3. City of Traverse City Lift Stations

	Lift Station	Location	Pump Station	Pumping Capability (gpm at ft TDH)
1	Bay Street	2060 East Front Street	Non-clog dry pit Hydrodynamic (2)	800 gpm at 40 ft TDH
2	Birchwood	580 Bay Street	4-inch submersible 9.4 HP (2)	430 gpm at 32 ft TDH
3	Clinch Park	111 East Grandview Parkway	Submersible 3 inch 2.4 HP Flygt (2)	175 gpm at 21 ft TDH
4	Coast Guard	911 Airport Access Road	Submersible 4 inch 17.5 HP ABS (2)	400 gpm at 70 ft TDH
5	Hull Park	660 Hannah Avenue	Submersible 1 ¼ inch 2.0 HP Hydromatic Grinder (1)	-
6	Front Street	439 East Front Street	Dry Pit VFD ITT A-C (3)	3100 gpm/Ea
7	Riverine	318 East Eight Street	Nonclog Dry Pit 4-inch 7.5 HP (2)	350 gpm at 37 ft TDH
8	Woodmere	645 Woodmere Avenue	Submersible 4 inch 6.4 HP Flygt (2)	450 gpm at 25 ft TDH
9	TBA	890 Parsons Road	Dry Pit 5-inch 15 HP	700 gpm at 35 ft TDH

2.2.2 Infiltration and Inflow

Infiltration and inflow have been a concern in the City which can cause the TCRWWTP to treat low strength waste at a higher cost to rate payers. In addition, the substantial volumes of wastewater during wet weather events which reach the plant are difficult to manage. Nine (9) temporary sewer flow meters and one rain gauge were installed for a period of five months, from April – August 2015. The flow meters were used to identify areas for future condition assessment, to assess the system capacity, as an indicator of current system function, and to help capture the amount of infiltration and inflow in the system. Infiltration and inflow mitigation efforts have been completed on portions of the collection system including sump pump disconnections, sealing manholes, and additional inspections.

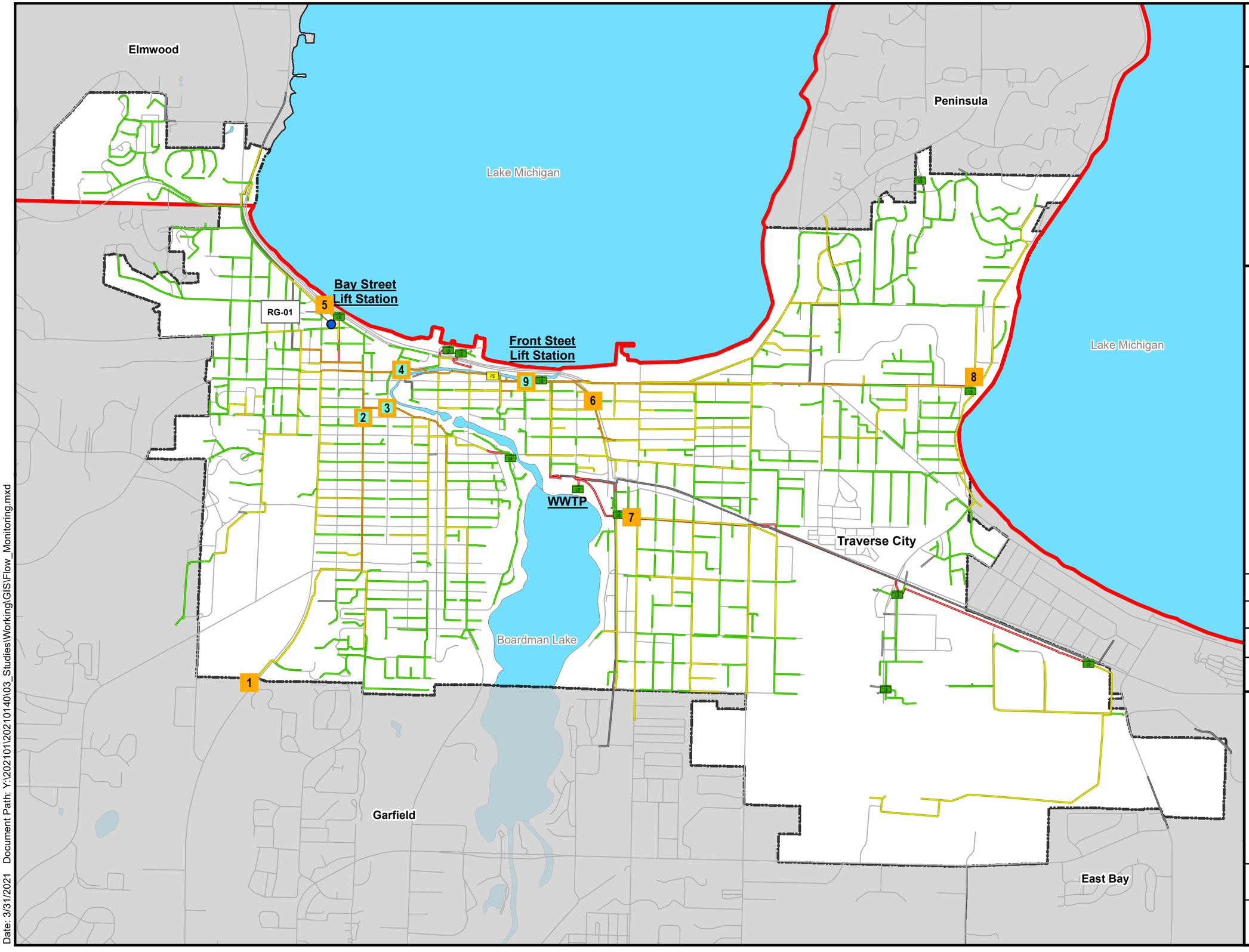
During the spring/summer of 2020, the City of Traverse City (City) experienced three major storm events with >50-year frequency which resulted in sanitary sewer overflows (SSOs) at the downstream end of the Boardman River sanitary sewer siphon. To better understand the sources of high flows, the City purchased four area velocity laser flow meters and installed August 31st, 2020, to further evaluate the flows in the West Front. Flow monitoring locations from the 2015 and 2020 monitoring are shown in Figure 2-12.

High dry weather infiltration in the meter district M09 (West Front; 100 feet west of Front Street Lift Station in SSM-1414) and M04 (Parking Lot; at the corner of the building, CCM-1387) has resulted in increased daily flows. These flows are directly correlated with the high groundwater levels due to the high levels in West Grand Traverse Bay specifically in sewers below the levels of the bay (582.9' NAVD88). CCTV inspections of sewers near Bay Street in August 2020 identified high sources of infiltration from sanitary sewer leads.

The wet weather flows that occurred before this flow monitoring effort appears to have occurred as a result of flooding from Kids Creek in meter district M04. Flooding at Munson hospital recorded peak flows as a result of flooding on May 28th, 2020, in the lower levels to drains connected to the City's gravity sewers. Subsequent storm events did not produce these flows at Munson Hospital.

An initial hydraulic model simulation of the West Front Street Sewer was developed using SewerGEMS, using the City's GIS shapefiles of the sewers and manholes. The estimated design flows from the flow monitoring study completed as part of the Wastewater AMP in addition to the increased dry weather flows from these events as a result of the high groundwater elevations predict SSOs downstream of this siphon in manholes SSM-1395, SSM-1396, and SSM-1397. This modeling effort confirmed the high wet weather flows over the capacity of the sewer downstream of the Boardman River siphon from the three major storm events caused the overflows at the location of the siphon were due to:

1. High infiltration from the elevated water levels of Lake Michigan (WSL 580.5 to 582.9' NAVD88) during these summer events relative to the past monitoring in 2015 (WSL 579.5' to 580.0' NAVD88)
2. Significant rainfall events exceeded the capacity of the sanitary sewer downstream of this siphon causing the surcharging and overflow events. The three storms were 50-yr and 150-yr events.



CITY of TRAVERSE CITY MICHIGAN

HRC
HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

1925 BRETON ROAD SE SUITE 100
GRAND RAPIDS, MI 49506

PHONE: (616) 454-4286

WEBSITE: http//www.hrcengr.com

LEGEND

- Lift Station
- Pump Station

Sewer Gravity Mains Diameter (in.)

- Unknown
- 4" - 8"
- 9" - 15"
- 16" - 36"

Sewer Force Mains

- Traverse City Owned
- Maintained by Others

- Roads
- County
- City of Traverse City
- Townships
- Hydrology

Flow Metering Locations

- 2015 Flow Meter
- 2020 Flow Meter

N W E S

0 1,000 2,000 4,000 Feet

DRAWN: DIU CHECKED: DIU

CWSRF PROJECT PLAN

CITY OF TRAVERSE CITY FLOW MONITORING

HRC JOB NO: 20210140	SCALE: AS SHOWN
MAY 2021	FIGURE 2.12

Date: 3/31/2021 Document Path: Y:\2021\01\20210140\03_Studies\Working\GIS\Flow_Monitoring.mxd

2.3 Existing WWTP Facilities

All wastewater received at the facility is treated and discharged to the Boardman River, in accordance with its National Pollutant Discharge Elimination System (NPDES) permit (MI0027481). Appendix C contains a copy of the City's current NPDES permit. The design and permitted annual average daily flows are 8.5 MGD, with a design peak flow of approximately 17 MGD. An overall site plan of the WWTP is shown in Figure 2-13. The WWTP facilities can be broken up into four sectors: preliminary and primary treatment, secondary treatment, disinfection, and solids handling. A complete hydraulic flow schematic of the WWTP is shown in Figure 2-14.

The TCRWWTP effluent discharges into the Boardman River and ultimately Grand Traverse Bay. The facility has been designed to comply with the EGLE requirements for wastewater treatment including monthly average effluent five-day biochemical oxygen demand (BOD5) and total suspended solids (TSS) of 25 mg/L and 30 mg/L respectively. The current discharge permit also establishes a seasonal effluent limit for ammonia nitrogen (NH3-N) of 11 mg/L and an effluent total phosphorus (TP) limit of 1 mg/L. The Traverse City effluent objectives have been established as 4 mg/L for BOD5 and TSS, 1 mg NH3-N /L, and 0.5 mg TP/L.

FACILITY	TITLE
10	Preliminary Treatment Bldg.
15	FINE SCREENING BUILDING
20	West Grit System
21	East Grit System
30	Primary Settling Tanks
35	Primary Effluent Screw Pumps
40	Aeration Tanks
41	SLUDGE STORAGE NO. 5 AND NO. 6 (former Final Settling Tanks)
45	Aeration Blowers
50	MEMBRANE TANKS AND PROCESS CONTROL BUILDING
60	UV Disinfection Channel
70	SLUDGE LOADOUT (former Sludge & Thickening Building)
75	SLUDGE STORAGE NO. 7 (former Sludge Thickener)
80	Sludge Concentrator Area
85	WAS CONCENTRATOR BUILDING
90	Existing Digesters No. 1 and No. 2
91	Existing Digesters No. 3 and No. 4
95	Existing Digester Control Building No. 1
96	DIGESTER NO. 5
97	DIGESTER CONTRO. BUILDING NO. 2
100	Existing Sludge Holding Tanks (No. 1-4)
120	Odor Control Building
130	Office Building

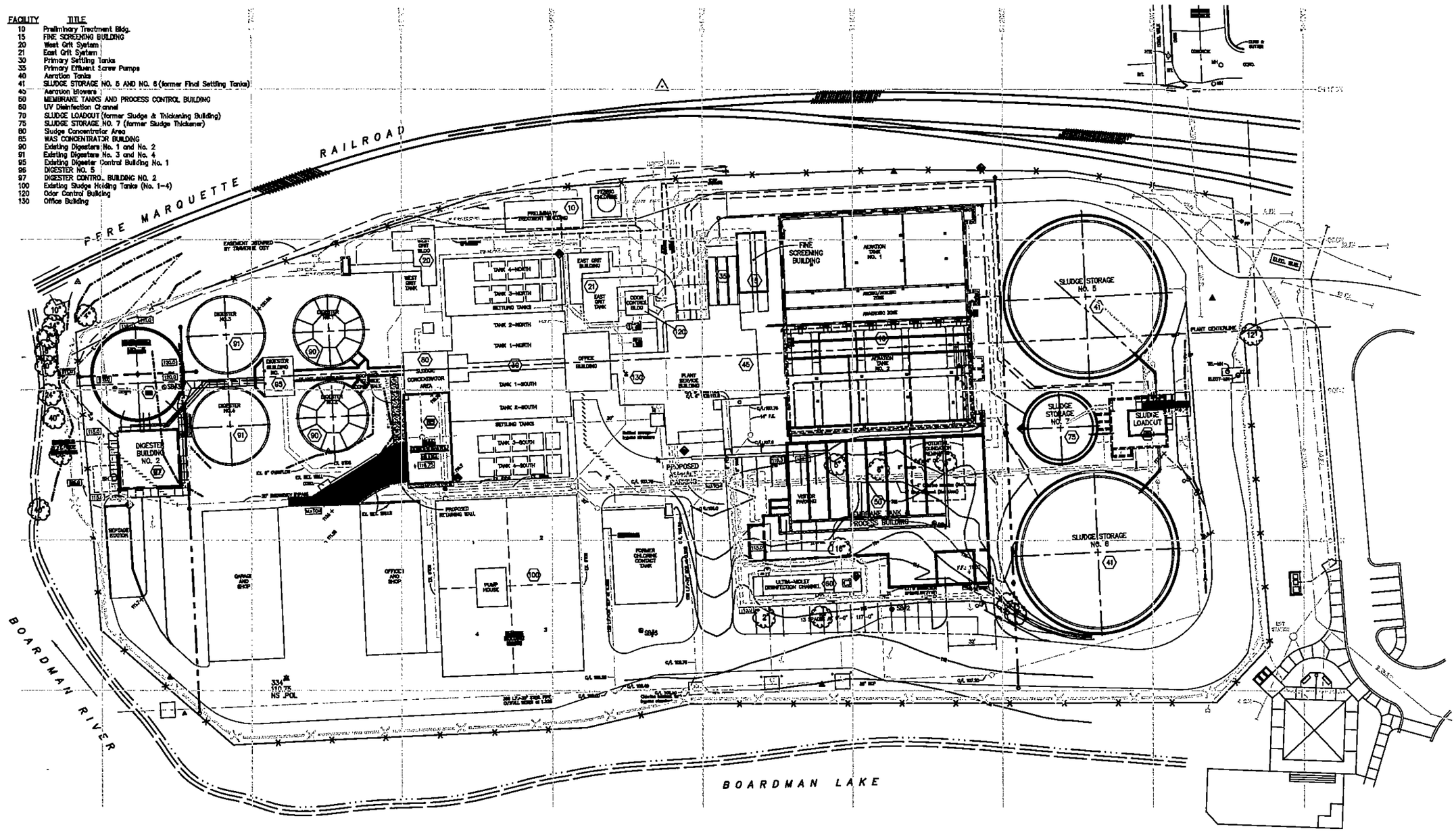
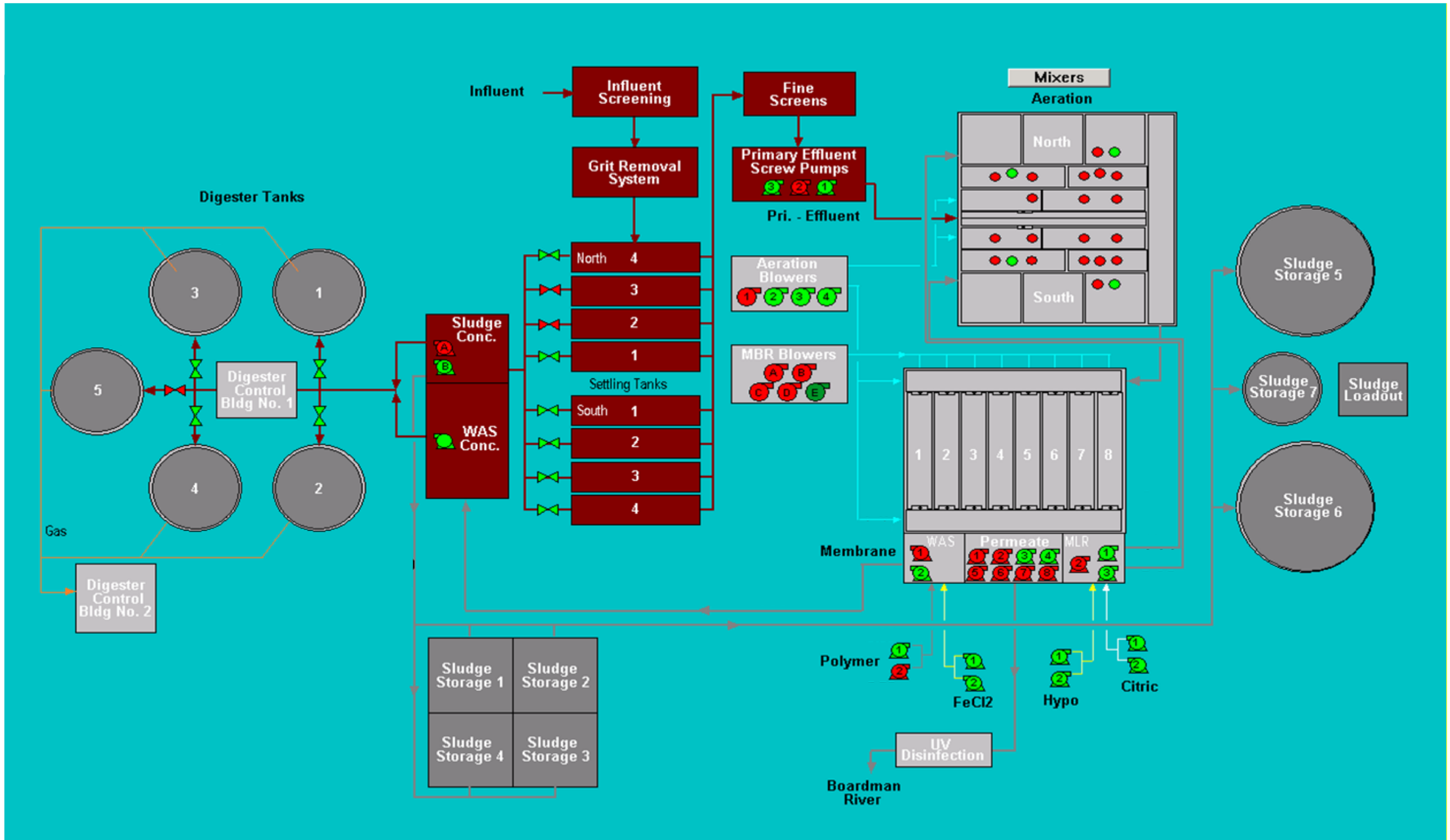


Figure 2-13 Traverse City Regional WWTP Site Plan

Courtesy of City of Traverse City

Figure 2-14 TCRWWTP Process Flow Schematic



**Courtesy of City of Traverse City*

2.3.1 Primary Treatment

Preliminary Screening

Currently, raw sewage enters the TCRWWTP through four force mains which flow into the influent channel of the Preliminary Treatment Building. The influent channel directs the wastewater through a Rotary (Lakeside Rotamat) Semi-Fine Screen (3/8-inch +/- openings). The screened wastewater then flows by gravity through two 24-inch pipes to the two separate grit removal systems (East and West). The influent wastewater flow is measured through two 24-inch Parshall Flumes located upstream of both grit tanks each with a range of 0–10 MGD. The design capacity of the WWTP is 8.5 MGD with a peak flow capacity of 17 MGD.

If the flow is in excess of the rotary screen's capacity, it can overflow a slide gate and proceed through a bypass channel that is equipped with a manually cleaned coarse bar screen with 1-inch openings. Since it is a manually cleaned screen, it can become blinded rather quickly and result in problematic overflows of both of the channels or bypassing around the rotary screen since the rotary screen has points of overflow that are below the top of the channel walls. It has been indicated that equipping the overflow channel with a fine screen mechanism would be desirable.

Grit Removal

Grit removal is achieved using two 18' x18' square Detritor Style grit chambers (East and West Grit Tanks). The effluent from the West Grit Tank then flows through three cast iron sluice gates to the Primary Settling Tanks: one 24-inch diameter sluice gate/pipe and one 18-inch diameter sluice gate/pipe to the North Primary Settling Tanks and one 24-inch diameter sluice gate/pipe to the South Primary Settling Tanks. The effluent from the East Grit Tank flows through one 24-inch diameter sluice gate/pipe to the South Primary Settling Tanks and through one 24-inch diameter sluice gate/pipe to the North Primary Settling Tanks. The existing gates from each grit tank are nearly inoperable and the TCRWWTP is unable to isolate flows downstream of each grit chamber.

Primary Settling

The eight rectangular Primary Settling Tanks (each 66.5 feet long) are used to remove suspended solids and organics via gravity settling. The inner tanks are the original Primary Settling Tanks and located closest to the center plant walkway (original plant axis) are each 14 feet wide and was originally constructed in the 1930s. The newer tanks are each 16-ft wide and were constructed in the 1950s. The primary setting tank effluent discharges via overflow weirs and then flows to the Secondary Influent Screw pumps which then lifts the flow to the secondary biological process. The primary settling tanks are entirely covered with fiberglass covers supported by fiberglass beams that are anchored to the concrete walls with mild steel hardware that has indications of severe corrosion.

The sludge that settles to the bottom of the primary settling tanks is collected using chain and flight sludge removal mechanisms. Reportedly there is some grit carryover from the grit tanks that end up in the primary sludge and has accumulated in the digesters.

Most of the influent pipe between the grit tanks and both sets of Primary Settling Tanks is spiral welded steel pipe. This pipe also has several points of connection that were completed using bolted flexible connections (BFC's or "Dresser Couplings"), some are exposed but most were buried. The buried BFC's were likely coated with an asphaltic material before burying. A significant section of this piping adjacent to the south primary settling tanks has since ended up under the Sludge Thickening Building and is thus not easily accessible for any maintenance or repairs.

The section of these 24-inch pipes from the buried section outside of the south and north ends of the pipe gallery to the 18-inch pipe inside is a high point and not vented. At these locations, air tends to accumulate in this piping at the headspace. In wastewater, this air gap allows hydrogen sulfide to off-gas and collect in the pipe headspace. Bacteria in the biofilm of the pipe oxidize hydrogen sulfide to form corrosive acids (typically sulfuric acid) which cause crown corrosion at the top of the metal pipe. Visual inspection of this steel pipe exterior at the south end of the gallery indicates severe corrosion and exposed holes. Also, the noticeable sound of the pipe "gulping" was present at the south end of the pipe gallery indicating that the trapped bubble at the larger diameter section of the buried pipe outside was periodically being released into the pipe within the building. At the pipe gallery sump pump discharge pipe

connection, a severe leak developed previously. This leak almost resulted in a catastrophic failure of the entire pipe system but was averted by the TCRWWTP maintenance personnel. At the north end of the pipe gallery, any accumulated air in the pipe can also relieve itself through the 24-inch pipe section that connects to the West Grit tank provided that the sluice gate at the west grit tank is open. However, there could still be small sections of air pockets since pipes are never perfectly level, and bubbles in level pipes move very slowly so acids could still accumulate at the top of the pipe.

Likely, most of the primary influent piping is submerged given that the pipe centerline is typically at centerline elevation 112.0 (from the East Grit) or 113.0 (from the West Grit) at the point where it leaves the grit tanks and then rises to the centerline elevation 113.0 for tanks. The older tanks are all at a lower centerline elevation, 111.50. Given that the water surface elevation in the primary settling tanks is usually always at or above the weir elevation of 116.0, the pipes should be submerged except at the location in the south pipe gallery entrance where the pipe transitions from 24 to 18-inch diameter where the top air (or off gas generated within the pipe) gets trapped. As mentioned above, the air at the north end is not trapped since it can relieve itself to the north grit tank which is relatively close to this location. Installing vents at the north and south ends of the pipe gallery would help serve to eliminate any potential gas bubble buildup.

Fine Screening

Fine screen equipment provides for the screening of primary settling tank effluent, before conveyance to the secondary treatment system. Two screening channels, each 2 feet wide, are provided with a mechanically cleaned band screen rated at 10 MGD. The channels have a design water surface depth of approximately 3 feet. The channel depth is controlled by a fixed weir, installed in the effluent channel of each screen. The screened effluent discharges to the influent bay of the screw pumps. The screens have perforated openings of 2 mm, which is the opening size preferred by the membrane system manufacturer. Material collected on the screen is lifted out of the channel by the rotating screen and removed using a rotating brush and spray water. Each screen discharges the collected screenings to a screenings flume. Effluent water flushes the screenings from the screen and serves as sluicing water to convey the screenings, via the flume, to a screening compactor for removal of excess water. The compacted or dewatered screenings are bagged to prevent excessive odors with a screening bagger for periodic removal.

Primary Effluent Pumping

Screened primary effluent is conveyed by gravity from the fine screens to the screw pump influent well. Spiral screw pumps lift the screened primary effluent to the level of the Aeration Tanks. The pump discharge is hydraulically split into two parallel Aeration Tank inlet channels. A motorized slide gate is located in each channel and positioned to adjust the desired flow split between the north and south Aeration Tanks. The secondary influent flow is monitored downstream of the motorized slide gates via Parshall flumes.

2.3.2 Membrane Bioreactor Secondary Treatment

The influent to the Membrane Bioreactor (MBR) is pumped from the primary effluent screening facility to two secondary influent channels, each with a Parshall flume and individual sluice gates that are controlled to split the flow to the in-service Aeration Tanks.

The Aeration Tanks are arranged into two parallel trains. The tanks are configured in three passes: an anaerobic zone representing a percentage of the first pass, an anoxic zone for the remainder of the first and all the second pass (with swing zone capabilities), and the final pass an aerated zone. The secondary influent and mixed liquor recycle containing biological solids are introduced into the anaerobic zone. The combined wastewater is referred to as mixed liquor because of the presence of biological solids flows through the anaerobic zone, anoxic zones, and aerated zones of the Aerations Tanks. The flow pattern is generally plug flow through the individual Aeration Tank zones. The ML ultimately overflows from the discharge end of the aerated zone into a common Membrane Tanks influent channel.

The mixed liquor (ML) from the Aeration Tanks is channeled to the in-service Membrane Tanks. The membrane equipment effectively separates the solids from the liquid phase of the ML by applying suction to the inside of individual membranes with large centrifugal pumps. The separated solids from the ML side (outside) of the membranes, referred to as activated sludge, overflows adjustable gates at the discharge site of the Membrane Tanks. Most of the activated sludge (AS) is recirculated to the front of the aerated zones in the Aeration Tanks as return activated sludge (RAS) and the remaining portion of the activated sludge is directed to the solids handling processes as waste active sludge (WAS).

The membranes require cleaning on a routine basis. Two methods of in-tank cleaning, also referred to as Clean-In-Place (CIP), has been provided. Separate chemical systems are in place to feed sodium hypochlorite or citric acid to the membranes without removing the membrane cassettes from their respective tanks. The citric acid cleaning system is presented first followed by the sodium hypochlorite system.

The Membrane Building contains a chemical storage area and feed systems used for all membrane cleaning operations. Citric acid is fed to the membranes via a system of pumps and delivery piping. Two (2) citric acid dosing pumps are available and operate as duty-standby to deliver chemicals as required. The bulk chemical is delivered in totes to the chemical storage area and transferred to a storage tank in the storage area. Concrete curbs provide containment in the event of a spill.

Biological phosphorus removal is the main mechanism for phosphorus removal, but the chemical may be added to the MBR to supplement the phosphorus removal process.

The process air blower system consists of four (4) inlet throttled constant speed drive centrifugal multistage process air blowers, a low-pressure air piping system, and fine bubble diffusers to supply process air to the aerated zones of the Aeration Tanks. The process air blower output is varied by pneumatic butterfly valves, one valve located on the inlet side of each process air blower, to maintain a pressure set point in the air header.

2.3.3 Ultraviolet Disinfection

Wastewater from the membrane permeate pump enters the UV channel inlet wet well. The inlet wet well splits the flow into two channels. Normally, both UV channels are in service, but isolation gates are available if one channel requires service. Isolation gates are also available to stop the flow to the UV channel and divert it directly to the outfall.

The existing UV disinfection system is achieved using a low-pressure, low-output Aquaray 40 model by Infilco Degremont, Inc. (IDI), now a subsidiary of Suez Environmental (Suez). Suez UV equipment is marketed under the brand name Ozonia. The UV modules contain multiple lamps in a vertical arrangement. The system was designed in 1995 and included two channels with six modules per channel and space for an additional module in each. Design peak flow for the UV system was 11 to 12.2 million gallons per day (mgd) with final effluent. In 1998, two additional modules were added to the available spaces, resulting in up to 14 in-service UV modules.

2.3.4 Sludge Digestion and Solids Handling

<u>WAS Concentration</u>

The waste-activated sludge (WAS) is pumped from the WAS Box to the Gravity Belt Concentrator (GBC). The GBC consists of a permeable, continuous belt that travels horizontally across a series of rollers. Polymer is injected into the WAS in the pump discharge header upstream of the GBC to flocculate the activated sludge solids. Conditioned activated sludge fills a floc tank at the head of the GBC, which is designed to provide adequate mixing and reaction time of the polymer with the sludge solids. The conditioned activated sludge fills the tank and overflows onto the traveling belt. The belt travel speed is operator adjustable to optimize the retention time of the conditioned sludge on the belt to allow maximum water release and, therefore, maximize the concentration of the activated sludge at the end of the belt travel. The lateral position of stationary plows or chicanes along the belt is manually adjustable to create furrows and open clear sections of the belt to aid in free water release and belt drainage. A polyethylene doctor blade,

with an adjustable tensioning arm, removes the thickened sludge from the belt at the discharge end of the machine. Concentrated waste activated sludge (CWAS) is discharged to a thickened sludge hopper that directly feeds an open throat progressive cavity pump. From there it is pumped to the Anaerobic Digestion system. The liquid released from the sludge drains through the belt to a filtrate collection box. Ferric chloride can be added to the WAS upstream or the CWAS downstream of the GBC to chemically fix the phosphorus that was taken up biologically in the activated sludge system.

Anaerobic Digestion

The anaerobic digestion system consists of five anaerobic digesters, complete with sludge recirculation, sludge heating system, sludge mixing, and digester gas handling. The digesters are equipped with recirculation pumps. The recirculation pumps are used to provide digester mixing by pumping the sludge through mixing nozzles located throughout Digesters 1, 2, and 5. Digester 4 uses gas lift mixers for primary mixing, and their sludge recirculation pump provides secondary mixing. The efficiency of the gas lift mixing is limited and the mixing in Digester 3 was replaced with a linear motion mixer installed in 2020.

Digested sludge is stored in the sludge holding tanks before being transported by tanker truck to be land applied. The thickening of the digested sludge is to both reduce the volume of biosolids to be hauled from the plant, as well as provide a suitable product for land application.

Digested sludge is normally concentrated via two sieve drum concentrators (SDCs). Four digested sludge transfer pumps are used to transfer the digested sludge to the SDCs. Polymer is added upstream of the SDCs to assist the thickening process. The concentrated digested sludge, CDS, is pumped to the sludge storage tanks.

Sludge Storage and Offloading

The sludge storage recirculation and loading system are operated manually. Sludge flows to storage from the sieve drum concentrators are monitored with a flow meter. In the event, that both sieve drum concentrators are out of service and the gravity belt concentrator is processing digested sludge, the concentrated digested sludge is conveyed to the sludge storage tanks using a different metered line.

In the Sludge Loadout Building, the piping and recirculation pumps are arranged such that either of the two pumps can be used for any one of the three tanks. Normally, only one pump is in service, mixing one tank at any given time. The incoming concentrated sludge can be directed to the suction line of the operating recirculation pump or conveyed directly to a storage tank without using the recirculation pump.

In the Sludge Storage Facility, sludge is directed to one of the four sludge storage tanks (Tanks 1 to 4) by opening the appropriate inlet valve. Recirculating mixers are available to mix the sludge if needed. Telescoping valves are available for each tank to decant supernatant. Each sludge storage tank is provided with high-level float switches, which will initiate an alarm when the tank liquid level reaches a high level.

2.3.5 Odor Control

Foul air is generated at several locations at the plant. Two odor control systems are provided to capture and treat foul air to control odors. One system uses activated carbon to remove hydrogen sulfide and other odor-producing compounds. The other system uses the aerated zones of the Aeration Tanks to treat foul air. The activated carbon system (Phoenix system) treats foul air from the east and west grit buildings, the primary settling tanks, the sludge concentrator building, and the WAS thickening building. Air is drawn from these buildings by a blower, located outside of the odor control building. Foul air is delivered to the Phoenix system and flows through the activated carbon canisters and is discharged to the atmosphere.

2.4 Need for Project

The WWTP is generally in compliance with the requirements of their NPDES permit. An order of enforcement is in place for the UV replacement. However, numerous issues need to be addressed immediately due to the age and condition of the plant to ensure the reliability of continued operation. An Asset Management Plan for the plant, which rates the condition of existing assets, was recently completed. It concluded that numerous assets at the plant need immediate replacement or refurbishment largely due to hydraulic limitations and aging equipment. The most critical needs are addressed in this Plan. These problems are prioritized according to Fiscal Years. The UV Disinfection Report completed by CH2M (Jacobs) in 2017 can also be noted in Appendix D.

Without the design, construction, and implementation of these projects, the water quality of the Boardman River, Boardman Lake, and Grand Traverse Bay will eventually degrade because the plant will not be able to continue to provide adequate treatment as mandated by its NPDES permit.

3 Alternative Analysis

3.1 Alternatives Considered

Each project was assessed to follow one of the following alternate classifications. Each upgrade or rehabilitative method was chosen on a technical basis and cost comparisons are presented for each alternative analysis, where applicable.

3.2 No Action

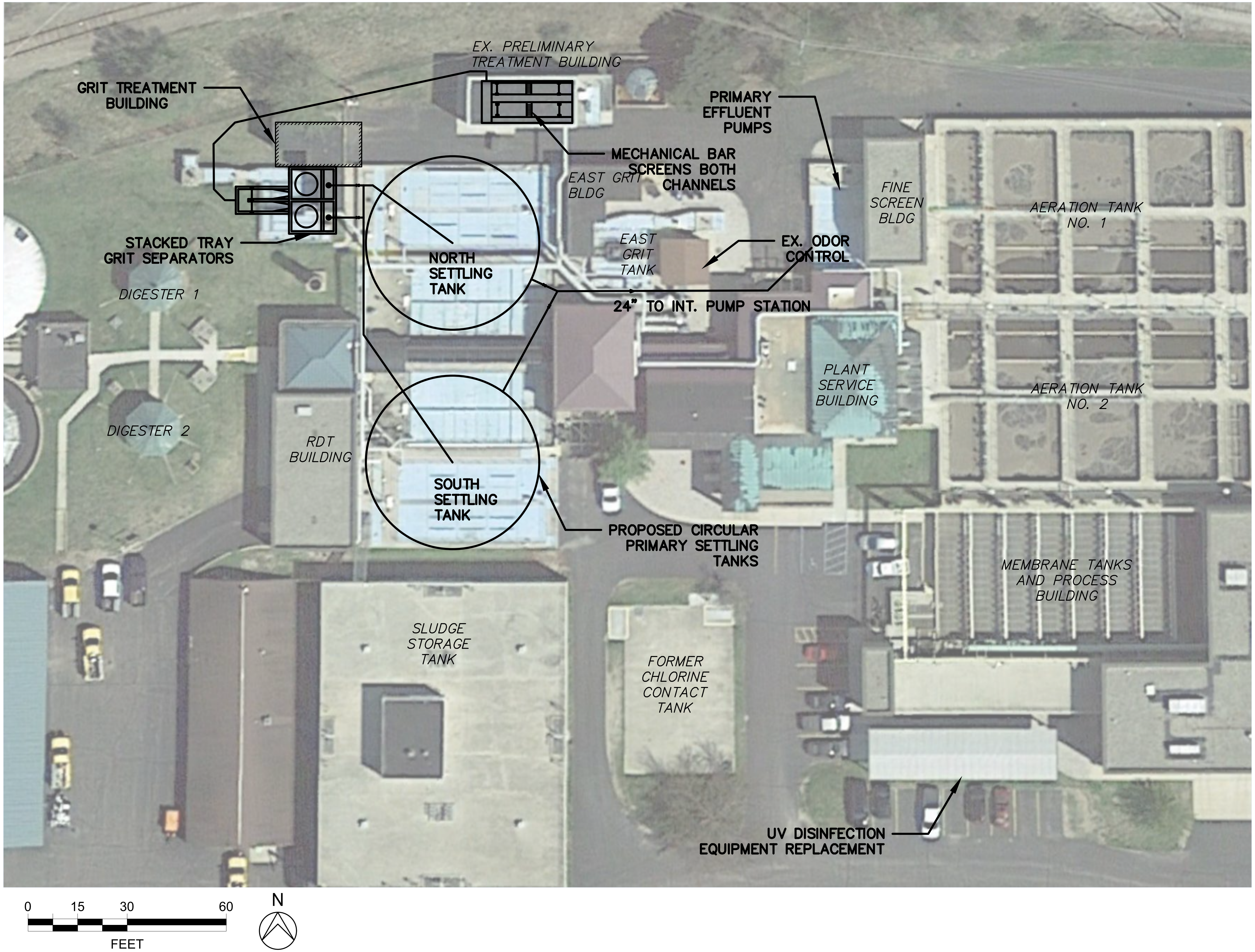
As previously indicated, if no action is taken, the existing plant equipment and structures will continue to degrade to the point that they will not be able to treat wastewater to a degree which complies with NPDES permit requirements or adequately protects public health and the environment. Besides, there are several projects which will mitigate or eliminate the potential for harm to employees and inhabited environs. All projects listed as part of this plan are of absolute necessity and should be implemented as soon as possible to avoid harm to workers, nearby residents, unnecessary upsets at the plant, and failures to the facility.

3.3 Headworks and Primary Treatment Improvements

Improvements to the Headworks and Primary Treatment are necessary to improve the reliability of treatment and address the system deficiencies. Figure 3-1 shows the overall locations of these projects located at the wastewater treatment plant. The Headworks and Primary Treatment Options Study is provided in Appendix E.

The Primary Influent Distribution Piping is in severely distressed condition and requires corrective action as it is reportedly on the verge of failure and has already exhibited leaks that have been arrested but almost caused disastrous flooding of the lower level of the TCRWWTP. Another issue is the manual bar screen used in the bypass channel for flow that is more than the rotary screen's capacity. Since it is a manually cleaned screen, it can become blinded rather quickly and result in problematic overflows of both channels or bypassing around the rotary screen since the rotary screen has points of overflow that are below the top of the channel walls. Within the grit removal process, the existing gates from each grit tank are nearly inoperable and the TCRWWTP is unable to isolate flows downstream of each grit chamber. This poor grit removal has led to grit settling in the primary sludge and accumulating in the anaerobic digesters.

Several alternatives were evaluated to address the headworks and primary treatment which are described below.



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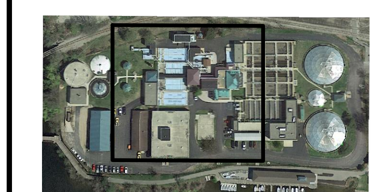


CITY OF TRAVERSE CITY
REGIONAL WWTP

CWSRF
PROJECT PLAN

PRELIMINARY AND
PRIMARY TREATMENT
IMPROVEMENTS

HRC JOB NO.	FIGURE NO.
20210140	3.1
APRIL 2021	

3.3.1 Preliminary Screening

3.3.1.1 Mechanically Raked Bar Screen in Bypass Channel, Band Screen in Primary Channel

This alternative would include the installation of a mechanically raked bar screen on a fixed bar rack in the current bypass channel and the installation of motorized gate actuators to regulate the flow to the grit removal processes downstream similar to Alternative S1 and the installation of a mechanical traveling band screen in the current primary channel.

There would likely be minimal changes in Operation Cost since the additional periodic operation of the bypass channel screen would likely be offset by fewer problems resulting from bypassing of excess flows with lower levels of screenings as well as the cost of labor of tending to the manual screen bypass. This alternative would address the need for mechanical screening of all flows. The overall screen capacity during high plant flows would also be increased since the band screen has a higher capacity than the Rotamat.

3.3.1.2 Mechanically Raked Bar Screen in both Bypass Channel and Primary Channels

This alternative would include the installation of a 3/8" mechanically raked bar screen on a fixed bar rack in the current bypass channel similar to Alternative S1. In addition, the existing Rotamat screen would be replaced with a fixed bar rack mechanically cleaned screen.

There would likely be minimal changes in operating costs since the additional periodic operation of the bypass channel screen would likely be offset by fewer problems resulting from bypassing of excess flows with lower levels of screenings as well as the cost of labor of tending to the manual screen bypass. This alternative would address the need for mechanical screening of all flows. The overall screen capacity during high plant flows would also be increased since the mechanically cleaned bar screen has a higher capacity than the Rotamat.

3.3.2 Grit Removal

3.3.2.1 Rehabilitate the Existing Grit Removal Treatment Process (Detritors)

This alternative assumes the two existing Detritor grit removal tanks continued to be used. The existing tanks would be rehabilitated, and new covers would be installed. The mechanisms and grit classifiers would be replaced to match the existing ones. The two existing flumes are also old and should be replaced or modified to ensure their accuracy. A concern has been expressed on this alternative over the lack of adequate flow control to the Grit removal since there is currently no means to limit flow to one grit tank versus the other. A motor actuator on the channel gates downstream of the primary screen channel could be placed. If the actuator were set to limit the flow to one of the grit systems, the other channel could be used for the excess flow. Specific programming would be required to control the actuator.

3.3.2.2 Replace the Existing Grit Removal Using Stacked Tray System

This alternative assumes the grit system would be replaced with two stacked tray grit removal units (Hydro HeadCell). For this evaluation, two 9-foot diameter stacked tray systems would be installed in grit removal tanks. A grit classifier/washer would be installed in a new building adjacent to the tanks for final grit disposal to achieve greater than 95% grit removal with less and 5% volatile solids. The building would be equipped with foul air odor control and connected to the existing odor control system. Flow splitting to each grit tank would be achieved using a splitter box and flow metering using Parshall flumes.

3.3.3 Primary Settling

3.3.3.1 New Circular Primary Settling Tanks

The first alternative includes two new circular settling tanks that would be installed to provide a similar capacity as the existing rectangular units. Circular settling tank mechanisms are easier to maintain, and this is consistent with industry practices. With only two tanks there would only be two mechanisms versus the current four collector mechanisms and significantly fewer moving parts since there would be no chains and flights. Settling rates using two 70 feet diameter units would be approximately the same as the existing 8 rectangular tanks, existing as the settling area is 7,702 SF and the proposed settling area would be 7,693 SF. For this alternative, the circular primary treatment tanks could be paired with one either the east or west grit tanks (either the existing or new ones) with flow control occurring upstream of these tanks. Doing so would equally distribute the hydraulic capacity between the two primary settling tanks. Covering the circular tanks for odor containment would be more challenging but still feasible. Odor control treatment of the foul air would also still be required like existing practices.

3.3.3.2 Upgrade Existing Primary Settling Tanks and Influent Piping

Alternative 2 includes the complete replacement of the four dual chain and flight primary settling tanks including drive mechanisms, chains, flights scrapers, and scum trough actuators, replacement of critical primary influent distribution piping – mainly in the primary pipe gallery and just beyond the wall to facilitate removal of all parallel pipe paths and the installation of all twelve 12-inch influent valves, three redundant 24-inch knife gate valves (all except the path from West Grit to North Primary since it is so short), cleaning of 24-inch piping between the East Grit Tank and the South Primary Settling Tanks and the installation of slide gates at the location of four of the inoperable sluice gates downstream of both grit tanks (the fifth one – 18-inch from West Grit Tank would be removed and this pipe abandoned). Odor control would still be required similar to existing practices.

3.3.4 Primary Effluent Pumping

3.3.4.1 Primary Effluent Pumping Using Submersible Pumps

Primary effluent currently flows through one of two existing fin mesh opening band screens and then into one of four screw pumps for pumping to the secondary treatment process. These screw pump bays could be reconfigured to accept a submersible pump that can operate at low levels. This alternative would include a screw centrifugal pump with a pre-rotation basin installed in each bay along with a discharge pipe that would extend up to the level of the existing screw pumps and would fit nicely into the existing screw pump bays with a slight alteration of the floor in each bay.

3.3.4.2 Primary Effluent Pumping Using Existing Screw Pumps

This alternative includes the replacement of the existing screw pumps in kind. In addition, replacement of some of the concrete on the discharge channels with sulfide-resistant concrete is recommended due to the extensive corrosion which has been experienced in this area due to the sulfide release and eventual acid deposition on the wall, which has seriously degraded the existing concrete.

3.3.5 Evaluation of Headworks and Primary Treatment Alternatives

To get a reasonable comparison of alternatives for Preliminary and Primary Treatment, the improvement alternatives suggested for both Preliminary and Primary Treatment were compared between each equivalent alternative so that a complete Capital and Operating Cost impact could be determined and compared.

The Opinion of Probable Project Cost for the lowest PW alternatives is shown in Table 3-1 below along with a proportional amount of Annual Operation & Maintenance (O&M) cost for each. This comparison included various differential components such as an allowance for the HV costs based on the relative volumes of the additional building volumes that would need to be ventilated and heated on an annual basis, the cost of dealing with grit carryover from the existing grit removal process as opposed to improved grit removal from a more efficient process, the relative cost of screenings removal versus improved screenings equipment, as well as the relative cost of operation of rectangular settling equipment versus circular clarifier equipment. A Present Worth factor was applied to the relative Annual O&M cost (3.5% at 20 years) in each case to determine a 20-year Present Worth of the O&M costs to develop an Equivalent Present Worth Cost for each of the alternatives being considered. This provides a baseline economic comparison upon which each of these alternative combinations was compared. The table below summarizes the results of this economic comparison.

Table 3-1. Comparison of Headworks and Primary Treatment Alternatives

DESCRIPTION	PROJECT AMOUNT	ANNUAL O&M [4]	20 YEAR PW OF O&M [1.]	TOTAL PW
Preliminary Screening				
Mech. Fine Bar Screen in Bypass Ch, Band Screen in Exist Ch.	$1,739,000	$202,368	$2,876,137	$4,615,137
Mech. Fine Bar Screen in Both Channels	$1,662,000	$202,368	$2,876,137	**$4,538,137**
Grit Removal				
Ex. Grit Removal [2]	$900,000	$270,471[3]	$6,094,039	$6,994,039
New Grit Removal – Stacked Tray	$4,820,000	$42,909	$609,838	**$5,429,838**
Primary Settling				
Primary Settling and Influent Piping/Valves Replacements[3]	$3,550,000	$63,932	$3,408,631	$6,958,631
Two new 70' diam circular Primary Settling Tanks	$6,340,000	$12,416	$176,463	**$6,516,463**
Primary Effluent Pumping				
New Submersible Primary Effluent Pumps	$1,533,000	$49,724	$706,698	**$2,239,698**
Rehab Exist Primary Effluent Screw Pumps	$2,420,000	$180,843	$2,570,207	$4,990,207

1. Assumes 3.5% Interest Rate over 20 years.
2. Annual O&M includes future tank replacements – West Grit Tank in 20 years and East Grit Tank in 40 years*
3. Annual O&M includes the future tank replacements as a percentage of the future cost.
4. A portion of the total O&M Cost most relevant to each alternative and utilized for comparison of the alternatives.

The most cost-effective alternative for preliminary screening is for two new mechanical fine bar screens. Improved flow splitting before the grit removal is also recommended to equally distribute the flow to each grit removal unit. The rehabilitation of the existing grit tanks would also require their eventual complete replacement. New, more efficient, stacked tray grit removal would provide significantly less wear on downstream equipment.

Re-using the existing primary settling tanks represents the lowest capital cost and based on the structural analysis, the existing primary sludge tanks are in sound condition if concrete repairs are completed. However, given their age, the tanks would likely need to be replaced in the next 40 to 60 years. Replacement of the existing primary settling tanks with circular tanks provides a lower 20-year present worth mainly due to the lower estimated O&M costs and the anticipated replacement cost of the existing tanks (one pair in 40 years and one pair in 60 years). The O&M and

potential safety risks of continuing to work in the crowded primary piping gallery (both very difficult to quantify) also contribute to recommending replacement of the primary tanks at this time.

Preliminary Effluent Pumping Alternative using new submersible pumps in the existing screw pump bays represents the most cost-effective alternative versus continued reliance on the screw pumps.

3.4 UV Disinfection Upgrades

In September 2016, surge flow events damaged the electronics in the ultraviolet (UV) modules. Instrumentation and controls, spare UV modules, and operation procedures have been implemented to minimize the potential for flow surges and to minimize interruption of UV disinfection should surges or peak wet-weather flows occur. Hydraulic limitations and aging equipment also led to the need for an updated disinfection system.

3.4.1 UV System Modification

In accordance with the Administrative Consent Order (ACO) issued by EGLE to the City on July 3rd, 2019, all UV system modifications required were completed by the deadline of no later than one year after the Part 41 Permit was issued. These modifications included the following:

- Raising the UV system electrical equipment out of the wastewater flow channel and sealing the electrical components. Non-watertight electrical equipment will be raised at least 12 inches above the top of the UV channel concrete. The electrical equipment for at least six UV modules or lamp banks will be raised.
- Raising the electrical conduits associated with the raised UV modules at least 12 inches above the top of the UV channel concrete.
- Relocating the weir plates in the UV channel (that function to maintain upstream levels and prime on the membrane bioreactor back pulse pumps) to the permeate discharge structure.
- Raising the permeate discharge structure rim or top of concrete (TOC) at least 1.1 feet above its current elevation.

3.4.2 UV System Replacement

In accordance with the ACO issued, the new UV system must be constructed/installed and fuller operational no later than July 1st, 2026. Additionally, the existing UV equipment has reached the end of its useful life, and new UV equipment along with a raised UV channel hydraulic grade level, a raised UV channel invert, and a replacement modulating weir gate is recommended. The new UV equipment will be designed not to be damaged at 100-year flood levels and provide full disinfection at 25-year flood levels.

3.4.2.1 Evaluation of UV System Replacement Alternatives

Two alternatives were evaluated for the replacement UV technology: open-channel UV systems (both horizontal and vertically oriented) and in-vessel systems. The existing UV technology employed at the Traverse City Regional WWTP is low-pressure, low output. WWTPs typically replace these systems with low-pressure, high-output systems when they have reached the ends of their useful lives. The high-output systems require significantly fewer lamps than the low-output systems. They also offer modulation of lamp output in addition to the ability to turn banks or modules on and off. This will provide significant energy savings due to flow and water quality variability typical of WWTPs. And most relevant to the flooding events that occurred at the TCRWWTP, the electronics in this next generation of UV equipment are better protected from flooding.

The alternative of horizontally oriented lamps has the best benefit-to-cost ratio and is recommended. Retrofitting existing channels with vertically oriented lamps was ranked second. This alternative offered modest savings but less protection from damage at high water levels, and the cost savings versus the lowest budgetary estimate of the horizontally oriented lamps were small. The in-vessel alternatives provide a robust solution to address flooding and would eliminate the need for additional hydraulic improvements provided the permeate pumps are not impacted by the head loss through the in-vessel equipment. However, due to the high cost of constructing a new building, this technology had the lowest benefit-to-cost ratios, was ranked third in the evaluation, and therefore not recommended.

As UV equipment offerings continue to change, a similar review and evaluation of alternatives may be required. The 25-year flood elevation at the WWTP discharge may be reduced below the FEMA elevation noted herein as a result of the planned Union Street Dam replacement. Therefore, the 25-year flood elevation should be determined after the dam replacement at the time of UV replacement and the new UV channel HGL set accordingly.

3.5 Lower Boardman River Sanitary Sewer Replacement

The existing 24-inch sanitary sewer main along the frontage of the Lower Boardman River in the 100 and 200 blocks of Front Street is supported by a concrete retaining wall. The sewer and retaining walls were built in the 1930s. This wall is a cantilevered retaining wall, itself supported by a series of timber piles. In recent years it has become apparent that the river was scouring out the soil underneath the wall footing risking failure of the 24-inch gravity sewer.

The loss of soils is problematic to the community and the river as the support for the sanitary sewer and service leads is lost and/or weakened, potentially contributing to the release of raw sewage into the river. In addition, the impact to the sewer system pipes and connections encourages ground water infiltration into the sewer pipes which increases the community costs to treat sewage on typical days and contributes to the failure of the sanitary sewer on larger storm event days.

Several improvements to the sanitary sewer were assessed as the best and most feasible approaches for the restoration and management of the shoreline of the river. With these projects, potentially 50 gallons per minute of infiltration from wet laterals will be removed as a result of this project. Figure 3-2 shows the overall locations of this project as well as other projects located in the collections system.

In the 100 blocks, replacement of the sewer and addressing the risk of undermining the sewer is recommended. During the sewer replacement, the existing retaining wall would be replaced to allow for a natural shoreline and restoration of habitat along the riverfront. The existing stem and footing of the wall would be removed with the existing piles to remain. Riprap would be placed along the river bottom and up the shoreline to protect the shoreline from erosion and scouring while creating habitat for fish and other aquatic and riparian wildlife. Planting, trees, grasses, and other landscape items will be added to protect the new bank from erosion and promote habitat. Other landscaping would include the construction of a rain garden for stormwater management. It is recommended to remove only the vertical stem of the existing concrete wall, leaving the horizontal footing of the old wall in place as a sheltered habitat for fish. Methods of creating a stable, scour-resistant toe of the slope near the wall foundation will require further consideration during the final design.

The existing 24-inch sanitary sewer line behind the wall would be rerouted further south within the alley. This section of sanitary sewer has many sanitary leads that need to be replaced and this rerouting would provide the opportunity to fix and stabilize the leads, which will reduce the infiltration of ground water into the sewer system.

Elmwood

Peninsula

Lake Michigan

Garfield

Traverse City

Boardman Lake

I/I Alternative 1
Sewer Rehabilitation

Bay Street
Lift Station

RG-01

I/I Alternative 3
Retention Basin

Lower Boardman River
Wall Sanitary Sewer

East Front Street
Sewer Improvements

MDOT
Sewer Replacement

Front Steet
Lift Station

SSM-1387

I/I Alternative 2
New Lift Station
and Force Main

SSM-1414

SSM-334

SSM-479

I/I Alternative 1
Sewer Rehabilitation

I/I Alternative 2
New Force Main

WWTP

4
9
3
2

CITY of TRAVERSE CITY MICHIGAN

HRC
HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

1925 BRETON ROAD SE SUITE 100
GRAND RAPIDS, MI 49506

PHONE: (616) 454-4286

WEBSITE: http//www.hrcengr.com

LEGEND

- Lift Station
- Pump Station
- Sanitary Sewer Manholes

Sewer Gravity Mains
Diameter (in.)
- Unknown
- 4" - 8"
- 9" - 15"
- 16" - 36"

Sewer Force Mains
- Traverse City Owned
- Maintained by Others
- Roads
- City of Traverse City
- Townships
- Hydrology
- 2020 Flow Meter

N W E S

0 500 1,000 2,000 Feet

DRAWN: DIU CHECKED: DIU

CWSRF PROJECT PLAN

CITY OF TRAVERSE CITY COLLECTION SYSTEM IMPROVEMENTS

HRC JOB NO: 20210140	SCALE: AS SHOWN
MAY 2021	**FIGURE 3-2**

Date: 4/14/2021 Document Path: Y:\2021\01\20210140\03_Studies\Working\GIS\Sewer_Alternatives.mxd

For the sewer replacement in the 200-block alley, the installation of a sheet pile wall on the river side of the wall is recommended to prevent the loss of sewer support. A sheet pile wall would be driven into the earth on the river side of the retaining wall. The top of the sheet pile would coincide with the top of the wall footing. Once the sheet pile is driven into the river bottom, concrete would be pumped between the sheet pile and the existing retaining wall and fill under the existing footer as well to fill the gap. The sheet pile would protect the wall from further scour. Rip rap could be placed into the river to provide some fisheries habitat benefit.

The sanitary leads in this block were replaced about 10 years ago. As a precaution, removing the asphalt behind the concrete wall to locate any signs of soil subsidence and backfill with compacted aggregate material, as well as excavating and repairing any storm or sanitary sewer service leads that appear compromised is recommended. This option may be constructed with a temporary dam in the river and dewatering between the dam and the existing retaining wall.

3.6 Infiltration and Inflow Removal

Several alternatives for removing infiltration and inflow (I/) were considered to be completed together with long-term sewer rehabilitation in West Front Sewer System and are presented as follows.

3.6.1 Sanitary Sewer Evaluation Study and Hydraulic Modeling

Flow monitoring completed in 2015 and 2020 demonstrated the need for further investigation of two-meter districts, M03 and M09 which indicated high wet infiltration and inflow. This investigation would be a sanitary sewer evaluation study (SSES) and include field investigations for infiltration and inflow. This may include additional manhole inspections, CCTV inspections, smoke testing, and/or dye testing. Specifically, for Meter District M09 this would involve cleaning and CCTV inspection of the 24-inch sewer from the Front Street Lift Station to the Boardman River siphon (excluding the 100 and 200 block sewers). This inspection will also help identify the quantity and severity of the lateral connections adjacent to the Boardman River as sources of infiltration.

Meter district M04 represents a large collection area with increased dry weather flows. Based on the flow monitoring results, subdividing and re-metering this district would allow the City to capture more rainfall events and prepare the necessary unit hydrographs for the hydraulic modeling of these sewers and best target the areas for sewer rehabilitation and I/I removal.

3.6.2 Rehabilitation or Sewer Main Replacement (I/I Alternative 1)

Completion of sewer rehabilitation to address sources of infiltration and inflow is typically the most sustainable and lowest maintenance alternatives. The rehabilitation includes sewer, manhole, and lateral rehabilitation to address infiltration and inflow as well as the removal of footing drains, roof leads, sump pumps, and other sources of inflow. Overflows can be removed by reducing wet weather flows. Effective infiltration and inflow removal programs can take years to develop and implement and the evaluation of the other alternatives may be required considering this schedule.

In the development of the wastewater AMP, sanitary sewers and manholes were inspected per the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP) and Manhole Assessment Certification Program (MACP) grading systems. Rehabilitation will address sewer segments and manholes with at least one PACP or MACP defect rating of 4 or 5 will be addressed.

3.6.3 Interceptor Lift Station and FM (I/I Alternative 2)

To address the hydraulic limitations in the West Front street sewer, an interceptor pump station was evaluated at Fifth Street and Wadsworth at the western end of Hannah Park. This option would capture the flows from meter districts

M02 and M03 and reduce the peak wet weather flows limited by the hydraulic capacity of the sewer downstream of the Boardman River siphon. This alternative would include a new lift station, approximately 4,500 LF of 8-inch force main, and 1,000 LF of gravity sewer to separate these district flows from the Front Street Lift Station. Results from this project would potentially eliminate overflows downstream by diverting flow from the East Front Street lift station. The proposed force main would be located along City streets and cross the Boardman River under the 8th Street Bridge or by trenchless technology.

The pump station would have approximately 3.0 mgd capacity to convey the average and peak flows contributing to this meter district and constructed either below grade or in an above-grade structure. As this pump station would be located at the western portion of Hannah Park, the pump station would be designed to ensure above-grade structures provide both aesthetic architectural features and ensure all pedestrian traffic is not impacted.

3.6.4 Retention Basin (I/I Alternative 3)

The alternative for the construction of a retention basin in the location of the City's Lot X was also considered. This basin would be assumed to be 500,000 gallons and collect wet weather flows in excess of the hydraulic capacity of the sewer downstream of the Boardman River siphon and prevent sewer overflows downstream. The equalized wastewater would be pumped back to the gravity sewer following the wet weather event using a pump station. The equalization basin would be constructed with adequate level controls gates, flushing devices, and sloped floors to minimize the maintenance and cleaning associated with the tank. This tank would be installed to maintain above-grade parking.

3.6.5 Evaluation of Alternatives

The Front Street Lift Station has sufficient capacity to convey the peak flows and the Boardman River siphon can convey peak flows greater than 25-year, 24-hour wet weather events, this alternative is recommended to be completed after completion and evaluation of the I/I removal through sewer rehabilitation. I/I removal is more cost-effective over a 40-year life due to the reduced maintenance requirements, electrical energy usage, and treatment costs associated with removing these flows. However, due to the frequency of the events that occurred in 2020 and variable levels of Lake Michigan, sewer rehabilitation and targeted I/I removal may require additional measures to prevent SSOs. I/I alternatives 2 or 3 should be considered using a hydraulic model simulation to determine the required pump station capacity or retention basin equalization volume to effectively prevent downstream SSOs.

3.7 East Front Sewer Improvements

Most of the 24-inch and 18-inch sewer in Front Street both east and west of the Front Street Lift Station has been CIPP lined or replaced to address infiltration and inflow issues as well as structural defects. However, two sections of 24-inch concrete sewer constructed in the 1940s should be rehabilitated. Additionally, old leaking sewer laterals continue to contribute to high dry weather flows as a result of the increased groundwater levels and high-water levels of Grand Traverse Bay (Lake Michigan).

The Front Street Lift Station discharges to a 16-inch cast-iron force main. This pipe is more than 65 years old and is incurring high friction losses due to age and condition. This alternative includes 500 feet of force main replacement with the 20-inch pipe as well as 720 feet of 24-inch sewer lining, and 40 lateral replacement subject to high infiltration and inflow in East Front Street. Infiltration from the leaking laterals will be removed as a result of this project. This project would be completed in concurrence with the Front Street Streetscape project.

3.8 US-31 Reconstruction – Utility Replacement

The Michigan Department of Transportation (MDOT) has designed the reconstruction of US-31 from Murchie Bridge East to Garfield Avenue in Grand Traverse County approximately 4,560 feet long. Portions of the City of Traverse City's MDOT project will occur in the road rights-of-way under the jurisdiction of the MDOT. The City of Traverse City is working with the MDOT to incorporate the removal of approximately 3,200 LF of 8-inch sewer, transferring 38 sewer leads by extending to the southern 24-inch sanitary sewer, and the replacement of 350-feet of the 8-inch sewer during the reconstruction. These sewers are clay and concrete constructed in the 1950s and structural defects and infiltration were identified during the wastewater AMP No rehab of the 24" san is planned with this project, but it could be lined at a later date if needed. When construction plans are prepared, the necessary MDOT permit for working in the rights-of-way will be applied for.

3.9 Cost of Alternatives

The costs of the improvements detailed previously are shown in Table 3-2 by Fiscal Year.

3.10 Impacts of Alternatives

The improvements listed in the above projects are a mixture of work at the Wastewater Treatment Plant (WWTP) and Collection System. The long and short-term impacts of the alternatives are described in Section 5.

Table 3-2. Summary of SRF Projects (by Fiscal Year)

	Projects	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	Lower Boardman River Wall Sanitary Sewer	$2,853,000				
2	SSES		$200,000			
3	Sanitary Sewer Rehabilitation		$430,000	$430,000	$430,000	$430,000
4	Primary Treatment Improvements		$14,544,000			
5	US-31 Reconstruction - Utility Replacement			$416,000		
6	East Front Sewer Improvements			$860,000		
7	UV Disinfection Upgrades				$2,699,000	
8	Wet Weather Equalization/Diversion					$4,200,000
	Total FY Project Cost	**$2,853,000**	**$15,174,000**	**$1,706,000**	**$3,129,000**	**$4,630,000**
	Total SRF Projects Cost	**$27,492,000**				

4 Selected Alternatives

4.1 Proposed Facilities

The following projects noted in Table 4-1 are proposed under this SRF Project Plan.

Table 4-1. Fiscal Year of SRF Projects

Project	Fiscal Year
Lower Boardman River Wall Sanitary Sewer	2022
SSES	2023
Sanitary Sewer Rehabilitation	2023
Headworks and Primary Treatment Improvements	2023
UV Disinfection Update	2024
US-31 Reconstruction – Utility Replacement	2024
East Front Sewer Improvements	2024
Lift Station and Force Main	2025

The projects proposed in this Project Plan will begin construction within the next year starting the 2022 fiscal year. It is anticipated that these projects will encompass the needed capital improvements over the next 20-year period. Project locations, including the extents of disturbance, for all projects, have been included in Figure 3.1 for a WWTP projects overview and Figure 3.2 for a collection system projects overview. Detailed cost estimates for each project have been included in Appendix F.

4.2 Proposed Schedule

Table 4-2 below shows the completed SRF Project Plan submittal task dates.

Table 4-2. SRF Project Plan Task Schedule

Project Plan Task	Scheduled Date
Public Hearing Notice	April 15, 2021
Place Draft Project Plan on Public Records	April 15, 2021
Formal Public Hearing	May 17, 2021
City Commission Resolution of Project Plan Adoption	May 17, 2021
Submit Final Project Plan to EGLE	June 1, 2021

4.3 Cost Estimate

The estimated total project cost for the proposed project is $27,436,000. A cost summary for the wastewater collection system improvements and a detailed opinion of probable project cost for the WWTP improvements are both shown in Appendix F.

4.4 User Costs and Cost Sharing

The estimated costs for all proposed projects and fiscal years are presented below. Table 4-3 presents a summary of the estimated user costs by Fiscal year. The total estimated cost for the project is $13.18 per residential connection.

Table 4-3. Estimated User Cost Summary by Phase

Descriptions	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Total Phase Project Cost	$2,853,000	$15,174,000	$1,706,000	$3,129,000	$4,630,000
Interest Rate	2.0%	2.0%	2.0%	2.0%	2.0%
Term (years)	20	20	20	20	20
No. of Residential Connections	9,570	9,570	9,570	9,570	9,570
Total Annual Debt Repayment	$174,500	$928,000	$104,400	$191,400	$283,200
Total Annual Debt Repayment per Residential Connection	$157,050	$835,200	$93,960	$172,260	$254,880
Total Monthly Cost for Project per Residential Connection	$1.37	$7.27	$0.82	$1.50	$2.22
Total Cost of Loan	$3,490,000	$18,560,000	$2,088,000	$3,828,000	$5,664,000
Interest Paid	$637,000	$3,386,000	$382,000	$699,000	$1,034,000

Notes:

1.Assumes interest rate of 2.0%
2.Assumes 90% residential contribution to fund
3.As of April 2021, 5,870 residential connections in Traverse City and an estimated 3,700 residential connections from Townships

4.5 Authority to Implement Selected Alternative

Implementation of the proposed project assumes that the project will be financed by a low-interest loan from the SRF program. The City of Traverse City has the necessary legal, institutional, financial, and managerial resources available to ensure the construction, operation, and maintenance of the proposed facilities.

5 Fiscal Sustainability Plan

A fiscal sustainability plan will be developed for those facilities which are installed, replaced, or rehabilitated under this project. This will be done by building on the Plant's existing asset management plan. The City's asset inventory is a key part of its asset management plan and is provided in Appendix G.

The existing asset registry will be updated with information on facilities impacted by the project. Data for existing equipment will be updated with new model numbers and rehabilitation dates. The new equipment will be added to the inventory. At the conclusion of the projects, the inventory will be fully updated to accurately reflect the equipment that is currently installed at the site.

Condition and performance data will be updated as well. New pumps and blowers will have their duty points recorded during startup. This will provide a benchmark to judge future performance by. Other critical mechanical equipment will have data such as full load amp draws recorded for this purpose as well. Condition information for existing items will be updated to reflect any rehabilitation work that was completed.

Useful life estimates will be updated for rehabilitated assets and solicited from manufacturers of newly installed assets. These estimates will be used to plan for future service and replacement costs. Operations and Maintenance manuals will be provided for all new equipment, along with onsite training. This will ensure that Plant staff has the knowledge necessary to perform maintenance and repairs. Water and energy conservation efforts will be implemented as a part of the fiscal sustainability plan as well.

6 Environmental Impacts

6.1 General

The anticipated environmental impacts resulting from the construction of the selected plan include beneficial & adverse, short-term & long-term, and irreversible impacts. The following is a discussion of the environmental impacts of the selected plan.

6.1.1 Beneficial and Adverse Impacts

The Traverse City Regional Wastewater Treatment Plant (TCRWWTP) is the City of Traverse City's municipal wastewater treatment facility. The TCRWWTP provides treatment to all industrial, commercial, and domestic (residential) wastewater. Wastewater from homes, businesses, and industries is pumped from two pump stations and nine lift stations to the head of the TCRWWTP for treatment in accordance with its NPDES permit with subsequent discharge to the Boardman River. Without the diligent work of TCRWWTP employees to operate and maintain the facilities, the polluted water (sewage) would be discharged into the Boardman River, Boardman Lake, Kids Creek, and the Grand Traverse Bay.

Construction activities associated with the proposed improvements will take place on the existing facilities. Construction and equipment manufacturing-related jobs would be generated, and local contractors would have an equal opportunity to bid on the construction contracts.

Implementation of the Project Plan would create temporary disruption due to required construction. This includes noise & dust generated by the work and possible erosion of spoils from open excavation. The assessment of alternate solutions and sites for the proposed project included identification of any important resources of either historic or environmental value which are protected by law and should be avoided. No registered contamination sites were found within the project area using the EGLE site contamination online mapper tool. Documentation of the research and results can be found in Appendix A.

6.1.2 Short-Term and Long-Term Impacts

The short-term adverse impacts associated with construction activities would be minimal, and mitigatable, in comparison to the resulting long-term beneficial impacts. Short-term impacts include traffic disruption, dust, noise, and temporary partial enclosures. No long-term negative impacts are anticipated.

The long-term positive impacts include improved efficiency at the plant, increased treating capacity, decreased complaints of odor, and the ability to continue providing adequate treatment to protect water quality. These impacts also include improved processing at the plant and reduced wear on the plant equipment.

6.1.3 Irreversible Impacts

The investment in non-recoverable resources committed to the Project Plan would be traded off for the improved performance of the facilities during the life of the system. The commitment of resources includes public capital, energy, labor, and unsalvageable materials. These non-recoverable resources would be foregone for the provision of the proposed improvements.

Construction accidents associated with this project may cause irreversible bodily injuries or death. Accidents may also cause damage to or destruction of equipment and other resources.

6.2 Analysis of Impacts

6.2.1 Direct Impacts

Local Air Quality

There will be minimal direct impacts on local air quality during the construction phases of these projects. Any effects on air quality will be due to dust and emissions from construction equipment and minimal possible styrene emissions from the CIPP curing material.

Archeological, Historical, or Cultural Resources

There are no impacts on archaeological, tribal, historical, or cultural resources due to this project.

Impacts Upon the Existing or Future Quality of Local Groundwater and Surface Waters

Construction will occur on the WWTP site, which is on the north shoreline of Boardman Lake and adjacent to the Boardman River. Additionally, work will take place within the connections systems through Grand Traverse County, the City of Traverse City, and the associated Township: Bair, Acme, East Bay, Elmwood, Garfield, and Peninsula. No impact will be made to the River, but appropriate measures will be taken during construction to avoid impact to these neighboring bodies of water. All necessary permits will be obtained before the proposed activities. There are no impacts anticipated to the local groundwater.

A detailed topographical survey will be conducted before construction to determine if the floodplain will be impacted by the project where construction of the oxidation tank will take place. All other construction and improvements will be made within existing facilities

Impacts Upon Sensitive Features

Since the work is expected to take place within the existing wastewater collection system facilities, the construction will take place outside of the designated floodplain, wetland areas, or other sensitive areas. Any work that takes place within floodplain limits, proper mitigation measures, and permits will be obtained before the proposed activities.

Impacts Upon People and The Local Economy

Short-term impacts on people will occur during the construction phase. Increased construction traffic will occur in the localized project areas of the connection system. All sanitary sewer users will experience beneficial long-term impacts due to the level of service to which they expect to be maintained by these improvements. The local economy will be stimulated for contractors and suppliers of the materials, labor, and equipment necessary to construct the project.

Operational Impacts

The proposed project will improve the operational efficiency of the WWTP and lower future operation and maintenance (O&M) costs for the wastewater collection system.

6.2.1 Indirect Impacts

Changes in Rate, Density, Or Type of Residential, Commercial, or Industrial Development and the Associated Transportation Changes

No changes are anticipated to the above.

Changes in Land Use

No changes are anticipated to the above. All improvements to the WWTP and the wastewater collection system will be completed on the existing WWTP site and to existing system structures.

Changes in Air or Water Quality Due to Facilitated Development

There will be no changes to air quality due to development. The proposed work will decrease the amount of total suspended solids discharged to the Boardman River during wet weather events, improving the water quality of the effluent to the river.

Changes to The Natural Setting or Sensitive Features Resulting from Secondary Growth

There should be no changes to the natural setting or sensitive features resulting from secondary growth.

Impacts on Cultural, Human, Social and Economic Resources

No changes are anticipated to the above.

Impacts of Area Aesthetics

All the proposed WWTP work will be completed on the existing sites which are largely isolated from public view.

Resource Consumption Over the Useful Life of the Treatment Works, Especially the Generation of Solid Wastes

No changes are anticipated to the above.

6.2.1 Cumulative Impacts

Siltation

Siltation may occur during the construction phase of the project. Proper soil erosion and sedimentation control practices will be followed to reduce the impacts of siltation on surrounding areas.

Water Quality Impacts from Direct Discharges and Non-Point Sources

The proposed work will decrease the amount of total suspended solids and biological solids discharged to the Boardman River during SSOs caused by wet weather events, improving the water quality of the effluent to the river.

Indirect Impacts from Development

There should no impacts on development as a result of this project.

The Impacts from Multiple Public Works Projects Occurring in the Same Vicinity

There will only be short-term traffic impacts during the construction phase of this project and proper traffic control measures will be followed.

7 Mitigation

7.1 Short-Term, Construction Related Mitigation

Environmental disruption will occur during construction. Guidelines will be established for cover vegetation removal, dust control, traffic control, and accident prevention. Once construction is completed those short-term effects will stop and the area will be returned to the original conditions.

The soil erosion impact would be mitigated through the contractor's required compliance with a program for control of soil erosion and sedimentation as specified in Part 91 of Michigan Act 451, P.A. of 1994. The use of soil erosion and sedimentation controls (i.e., straw bales, sedimentation basins, catch basin inserts, silt fencing, etc.) will protect the Boardman River, Boardman Lake, Kids Creek, and the Grand Traverse Bay.

Careful considerations will be taken during the construction planning process to ensure that the plant remains in service while the improvements are underway. Construction equipment will be maintained in good condition to decrease noise. All access roads will be swept as necessary to avoid tracking sediment onto public roads.

7.2 Mitigation of Long-Term Impacts

General construction activities will prohibit the disposal of soils in wetlands, floodplains, or other sensitive areas. Catch basins will be protected where earthwork activities will take place.

7.3 Mitigation of Indirect Impacts

The current trend in Grand Traverse County and the City of Traverse City is that the land use is largely dominated by residential properties. According to the City of Traverse City's master planning for land use, this will not change. Considering that a vast majority of the residents within the City limits are connected to the wastewater system, a substantial increase in flow is not expected from within the City limits.

The City of Traverse City's Master Plan and ordinances can also be found on their websites.

8 Public Participation

8.1 General

The Project Plan will be advertised in the local newspaper April 15, 2021 (refer to Appendix H for all public participation documentation.) A copy of the Project Plan will be placed at the following location for review:

- City Hall
- Online at the City of Traverse City's Website

A formal public hearing will be held on May 17, 2021, to review the work associated with the proposed Project Plan. The hearing will review the information presented in the Project Plan, including estimated user costs, and receive comments and views of interested persons. Copies of correspondence related to agency notifications, as well as other relevant correspondence, will also be included in Appendix H.

8.2 Public Hearing

Appendix H will include a transcribed copy of the public hearing, commission members attendance list, the Project Plan resolution, comments received and answered, and a photocopy of the slides presented at the hearing.

8.3 Resolution

The City Commission will make a formal resolution regarding this Plan at a Commission meeting following the public hearing scheduled for May 17, 2021. The resolution is included in Appendix I.

APPENDIX A: AGENCY CORRESPONDANCE

APPENDIX B: WEB SOILS SURVEY RESULTS

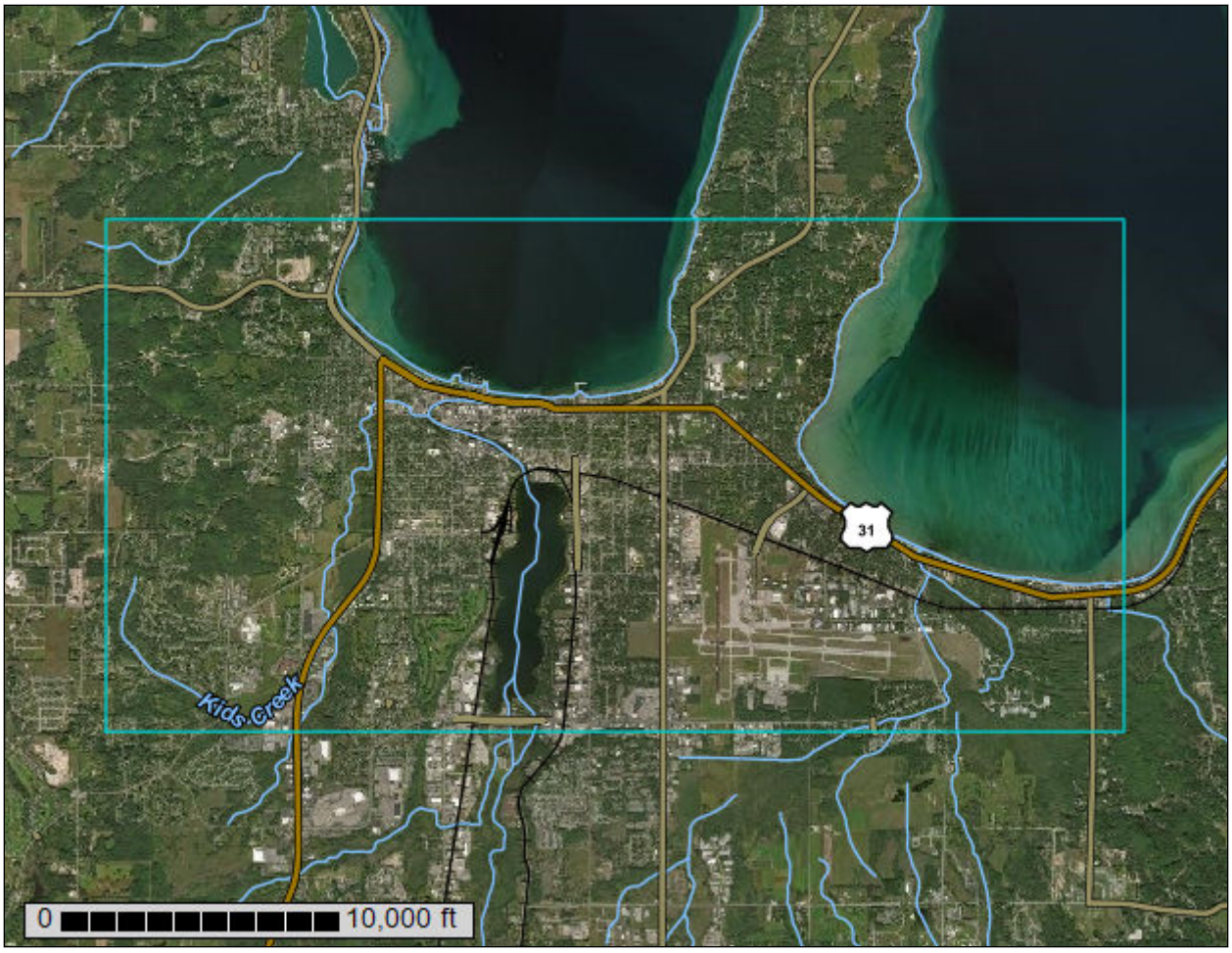
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Grand Traverse County, Michigan, and Leelanau County, Michigan



March 31, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

APPENDIX C: CITY OF TRAVERSE CITY CURRENT NPDES PERMIT

PERMIT NO. MI0027481

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the federal Clean Water Act (federal Water Pollution Control Act, 33 U.S.C., Section 1251 *et seq*., as amended); Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); Part 41, Sewerage Systems, of the NREPA; and Michigan Executive Order 2019-06,

City of Traverse City
400 Boardman
PO Box 592
Traverse City, MI 49686

is authorized to discharge from the **Traverse City Regional Wastewater Treatment Plant** located at

606 Hannah Avenue
Traverse City, MI 49686

designated as **Traverse City WWTP**

to the receiving water named the Boardman River in accordance with effluent limitations, monitoring requirements, and other conditions set forth in this permit.

This permit is based on a complete application submitted on March 21, 2019.

This permit takes effect on November 1, 2020. The provisions of this permit are severable. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term in accordance with applicable laws and rules. On its effective date, this permit shall supersede National Pollutant Discharge Elimination System (NPDES) Permit No. MI0027481 (expiring October 1, 2019).

This permit and the authorization to discharge shall expire at midnight on **October 1, 2024**. In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit an application that contains such information, forms, and fees as are required by the Michigan Department of Environment, Great Lakes, and Energy (Department) by **April 4, 2024**.

Issued: September 28, 2020.

Original signed by Christine Alexander
Christine Alexander, Manager
Permits Section
Water Resources Division

PERMIT FEE REQUIREMENTS

In accordance with Section 324.3120 of the NREPA, the permittee shall make payment of an annual permit fee to the Department for each October 1 the permit is in effect regardless of occurrence of discharge. The permittee shall submit the fee in response to the Department's annual notice. Payment may be made electronically via the Department's MiWaters system. The MiWaters website is located at https://miwaters.deq.state.mi.us. Payment shall be submitted or postmarked by January 15 for notices mailed by December 1. Payment shall be submitted or postmarked no later than 45 days after receiving the notice for notices mailed after December 1.

Annual Permit Fee Classification: Municipal Major, less than 10 MGD (Individual Permit)

In accordance with Section 324.3132 of the NREPA, the permittee shall make payment of an annual biosolids land application fee to the Department if the permittee land applies biosolids. The permittee shall submit the fee in response to the Department's annual notice. Payment may be made electronically via the Department's MiWaters system. The MiWaters website is located at https://miwaters.deq.state.mi.us. Payment shall be submitted or postmarked no later than January 31 of each year for notices mailed by December 15. Payment shall be submitted or postmarked no later than 45 days after receiving the notice for notices mailed after December 15.

CONTACT INFORMATION

Unless specified otherwise, all contact with the Department required by this permit shall be made to the Cadillac District Office of the Water Resources Division. The Cadillac District Office is located at 120 West Chapin Street, Cadillac, MI 49601-2158, Telephone: 231-775-3960, Fax: 231-775-1511.

CONTESTED CASE INFORMATION

Any person who is aggrieved by this permit may file a sworn petition with the Michigan Administrative Hearing System within the Michigan Department of Licensing and Regulatory Affairs, c/o the Michigan Department of Environment, Great Lakes, and Energy, setting forth the conditions of the permit which are being challenged and specifying the grounds for the challenge. The Department of Licensing and Regulatory Affairs may reject any petition filed more than 60 days after issuance as being untimely.

PART I

Section A. Limitations and Monitoring Requirements

1. Final Effluent Limitations, Monitoring Point 001A

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge treated municipal wastewater from Monitoring Point 001A through Outfall 001. Outfall 001 discharges to the Boardman River at Latitude 44.75744, Longitude -85.62429. Such discharge shall be limited and monitored by the permittee as specified below.

	Maximum Limits for Quantity or Loading				Maximum Limits for Quality or Concentration				Monitoring	Sample
Parameter	**Monthly**	**7-Day**	**Daily**	**Units**	**Monthly**	**7-Day**	**Daily**	**Units**	**Frequency**	**Type**
Flow	(report)	---	(report)	MGD	---		---	---	Daily	Report Total Daily Flow
Carbonaceous Biochemical Oxygen Demand (CBOD5)	1800	2800	(report)	lbs/day	25	40	(report)	mg/l	3xWeekly	24-Hr Composite
Total Suspended Solids (TSS)	2100	3200	(report)	lbs/day	30	45	(report)	mg/l	3xWeekly	24-Hr Composite
Ammonia Nitrogen (as N)										
May – September	780	---	(report)	lbs/day	11	---	(report)	mg/l	3xWeekly	24-Hr Composite
Total Phosphorus (as P)	35	---	(report)	lbs/day	0.5	---	(report)	mg/l	3x Weekly	24-Hr Composite
Fecal Coliform Bacteria	---	---	---	---	200	400	(report)	cts/100 ml	3xWeekly	Grab
Total Copper	5.0	---	(report)	lbs/day	70	---	(report)	ug/l	Monthly	24-Hr Composite
Total Mercury										
Corrected	(report)	---	(report)	lbs/day	(report)	---	(report)	ng/l	Quarterly	Calculation
Uncorrected	---	---	---	---	---	---	(report)	ng/l	Quarterly	Grab
Field Duplicate	---	---	---	---	---	---	(report)	ng/l	Quarterly	Grab
Field Blank	---	---	---	---	---	---	(report)	ng/l	Quarterly	Preparation
Laboratory Method Blank	---	---	---	---	---	---	(report)	ng/l	Quarterly	Preparation
					Minimum % Monthly		**Minimum % Daily**			
CBOD5 Minimum % Removal	---	---	---	---	85	---	(report)	%	Monthly	Calculation
TSS Minimum % Removal	---	---	---	---	85	---	(report)	%	Monthly	Calculation
					Minimum Daily		**Maximum Daily**			
pH	---		---	---	6.5	---	9.0	S.U.	3XWeekly	Grab
Dissolved Oxygen										
June – August	--	---	---	---	6.0	---	---	mg/l	3xWeekly	Grab
September – May	--	---	---	---	4.0	---	---	mg/l	3xWeekly	Grab

PART I

Section A. Limitations and Monitoring Requirements

The following design flow was used in determining the above limitations, but is not to be considered a limitation or actual capacity: 8.5 MGD

a. Narrative Standard
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.

b. Sampling Locations
Samples for CBOD5, Total Suspended Solids, Ammonia Nitrogen, Total Phosphorus, Total Mercury, and Total Copper shall be taken prior to disinfection. Samples for Dissolved Oxygen, Fecal Coliform Bacteria, and pH shall be taken after disinfection. The Department may approve alternate sampling locations that are demonstrated by the permittee to be representative of the effluent.

c. Quarterly Monitoring
Quarterly samples shall be taken during the months of January, April, July, and October. If the facility does not discharge during these months, the permittee shall sample the next discharge occurring during the period in question. If the facility does not discharge during the period in question, a sample is not required for that period. For any month in which a sample is not taken, the permittee shall enter "*G" on the Discharge Monitoring Report (DMR). (For purposes of reporting on the Daily tab of the DMR, the permittee shall enter “*G” on the first day of the month only).

d. Ultraviolet Disinfection
It is understood that ultraviolet light will be used to achieve compliance with the fecal coliform limitations. If disinfection other than ultraviolet light will be used, the permittee shall notify the Department in accordance with Part II.C.12. of this permit.

e. Percent Removal Requirements
Monthly percent removal shall be calculated based on the monthly average CBOD5 and TSS concentrations and the monthly average influent concentrations for approximately the same period. Daily percent removal shall be calculated based on the daily effluent CBOD5 and TSS concentrations and the daily influent concentrations for the same day. Reporting of Daily percent removal is only required on days on which an influent sample is obtained.

f. Monitoring Frequency Reduction for Total Copper
After the submittal of 24 months of data, the permittee may request, in writing, Department approval for a reduction in monitoring frequency for Total Copper. This request shall contain an explanation as to why the reduced monitoring is appropriate. Upon receipt of written approval and consistent with such approval, the permittee may reduce the monitoring frequency indicated in Part I.A.1. of this permit. The monitoring frequency for Total Copper shall not be reduced to less than annually. The Department may revoke the approval for reduced monitoring at any time upon notification to the permittee.

g. Total Mercury Testing and Additional Reporting Requirements
The analytical protocol for total mercury shall be in accordance with EPA Method 1631, Revision E, "Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry," EPA-821-R-02-019, August 2002. The quantification level for total mercury shall be 0.5 ng/l, unless a higher level is appropriate because of sample matrix interference. Justification for higher quantification levels shall be submitted to the Department within 30 days of such determination.

The use of clean technique sampling procedures is required unless the permittee can demonstrate to the Department that an alternate sampling procedure is representative of the discharge. Guidance for clean technique sampling is contained in EPA Method 1669, “Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels (Sampling Guidance),” EPA-821-R96-001, July 1996. Information

PART I

Section A. Limitations and Monitoring Requirements

and data documenting the permittee's sampling and analytical protocols and data acceptability shall be submitted to the Department upon request.

In order to demonstrate compliance with EPA Method 1631E and EPA Method 1669, the permittee shall report, on the daily sheet, the analytical results of all field blanks and field duplicates collected in conjunction with each sampling event, as well as laboratory method blanks when used for blank correction. The permittee shall collect at least one (1) field blank and at least one (1) field duplicate per sampling event. If more than ten (10) samples are collected during a sampling event, the permittee shall collect at least one (1) additional field blank AND field duplicate for every ten (10) samples collected. Only field blanks or laboratory method blanks may be used to calculate a concentration lower than the actual sample analytical results (i.e., a blank correction). Only one (1) blank (field OR laboratory method) may be used for blank correction of a given sample result, and only if the blank meets the quality control acceptance criteria. If blank correction is not performed on a given sample analytical result, the permittee shall report under "Total Mercury – Corrected" the same value reported under "Total Mercury – Uncorrected." The field duplicate is for quality control purposes only; its analytical result shall not be averaged with the sample result.

The Department will review the mercury monitoring data using the reasonable potential process described in R 323.1211 of the Michigan Administrative Code to determine if there is a reasonable potential for the Water Quality Standard of 1.3 ng/l of total mercury to be exceeded in the effluent. If it is determined that the effluent has a reasonable potential to exceed 1.3 ng/l of total mercury, upon written notification by the Department, the permittee shall commence development and implementation of the Pollutant Minimization Program for Total Mercury contained in Part I.A.4. of this permit. If, at any time during the life of the permit, the final effluent concentration exceeds 5 ng/l, the permittee shall notify the Department at the time of its next regular monthly monitoring report and shall commence development and implementation of the Pollutant Minimization Program for Total Mercury contained in Part I.A.4. of this permit.

PART I

Section A. Limitations and Monitoring Requirements

2. Quantification Levels and Analytical Methods for Selected Parameters

Maximum acceptable quantification levels (QLs) are specified for selected parameters in the table below. These QLs shall be considered the maximum acceptable unless a higher QL is appropriate because of sample matrix interference. Justification for higher QLs shall be submitted to the Department within 30 days of such determination. Where necessary to help ensure that the QLs specified can be achieved, analytical methods may also be specified in the table below. The sampling procedures, preservation and handling, and analytical protocol for all monitoring conducted in compliance with this permit, including monitoring conducted to meet the requirements of the application for permit reissuance, shall be in accordance with the methods specified in the table below, or in accordance with Part II.B.2. of this permit if no method is specified in the table below, unless an alternate method is approved by the Department. **Not all QLs are expressed in the same units in the table below**. The table is continued on the following page:

Parameter	QL	Units	Analytical Method
1,2-Diphenylhydrazine (as Azobenzene)	3.0	ug/l	
2,4,6-Trichlorophenol	5.0	ug/l	
2,4-Dinitrophenol	19	ug/l	
3,3'-Dichlorobenzidine	1.5	ug/l	EPA Method 605
4-Chloro-3-Methylphenol	7.0	ug/l	
4,4'-DDD	0.01	ug/l	EPA Method 608
4,4'-DDE	0.01	ug/l	EPA Method 608
4,4'-DDT	0.01	ug/l	EPA Method 608
Acrylonitrile	1.0	ug/l	
Aldrin	0.01	ug/l	EPA Method 608
Alpha-Endosulfan	0.01	ug/l	EPA Method 608
Alpha-Hexachlorocyclohexane	0.01	ug/l	EPA Method 608
Antimony, Total	1	ug/l	
Arsenic, Total	1	ug/l	
Barium, Total	5	ug/l	
Benzidine	0.1	ug/l	EPA Method 605
Beryllium, Total	1	ug/l	
Beta-Endosulfan	0.01	ug/l	EPA Method 608
Beta-Hexachlorocyclohexane	0.01	ug/l	EPA Method 608
Bis (2-Chloroethyl) Ether	1.0	ug/l	
Bis (2-Ethylhexyl) Phthalate	5.0	ug/l	
Boron, Total	20	ug/l	
Cadmium, Total	0.2	ug/l	
Chlordane	0.01	ug/l	EPA Method 608
Chloride	1.0	mg/l	
Chromium, Hexavalent	5	ug/l	
Chromium, Total	10	ug/l	
Copper, Total	1	ug/l	
Cyanide, Available	2	ug/l	EPA Method OIA 1677
Cyanide, Total	5	ug/l	
Delta-Hexachlorocyclohexane	0.01	ug/l	EPA Method 608

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Section A. Limitations and Monitoring Requirements

Parameter	QL	Units	Analytical Method
Dieldrin	0.01	ug/l	EPA Method 608
Di-N-Butyl Phthalate	9.0	ug/l	
Endosulfan Sulfate	0.01	ug/l	EPA Method 608
Endrin	0.01	ug/l	EPA Method 608
Endrin Aldehyde	0.01	ug/l	EPA Method 608
Fluoranthene	1.0	ug/l	
Heptachlor	0.01	ug/l	EPA Method 608
Heptachlor Epoxide	0.01	ug/l	EPA Method 608
Hexachlorobenzene	0.01	ug/l	EPA Method 612
Hexachlorobutadiene	0.01	ug/l	EPA Method 612
Hexachlorocyclopentadiene	0.01	ug/l	EPA Method 612
Hexachloroethane	5.0	ug/l	
Lead, Total	1	ug/l	
Lindane	0.01	ug/l	EPA Method 608
Lithium, Total	10	ug/l	
Mercury, Total	0.5	ng/l	EPA Method 1631E
Nickel, Total	5	ug/l	
PCB-1016	0.1	ug/l	EPA Method 608
PCB-1221	0.1	ug/l	EPA Method 608
PCB-1232	0.1	ug/l	EPA Method 608
PCB-1242	0.1	ug/l	EPA Method 608
PCB-1248	0.1	ug/l	EPA Method 608
PCB-1254	0.1	ug/l	EPA Method 608
PCB-1260	0.1	ug/l	EPA Method 608
Pentachlorophenol	1.8	ug/l	
Perfluorooctane sulfonate (PFOS)	2.0	ng/l	ASTM D7979 or an isotope dilution method (sometimes referred to as Method 537 modified)
Perfluorooctanoic acid (PFOA)	0.002	ug/l	ASTM D7979 or an isotope dilution method (sometimes referred to as Method 537 modified)
Phenanthrene	1.0	ug/l	
Selenium, Total	1.0	ug/l	
Silver, Total	0.5	ug/l	
Strontium, Total	1000	ug/l	
Sulfate	2.0	mg/l	
Sulfides, Dissolved	20	ug/l	
Thallium, Total	1	ug/l	
Toxaphene	0.1	ug/l	EPA Method 608
Vinyl Chloride	1.0	ug/l	
Zinc, Total	10	ug/l	

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Section A. Limitations and Monitoring Requirements

3. Additional Monitoring Requirements

As a condition of this permit, the permittee shall monitor the discharge from monitoring point 001 for the constituents listed below. This monitoring is an application requirement of 40 CFR 122.21(j), effective December 2, 1999. Testing shall be conducted in August 2021, May 2022, March 2023, and October 2023. Grab samples shall be collected for available cyanide, total phenols, and the Perfluoroalkyl and Polyfluoroalkyl Substances and Volatile Organic Compounds identified below. For all other parameters, 24-hour composite samples shall be collected.

Test species for whole effluent toxicity monitoring shall include fathead minnow **and** *Ceriodaphnia dubia,* for a total of four (4) tests on each species. Testing and reporting procedures shall follow procedures contained in EPA-821-R-02-013, "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" (Fourth Edition). When the effluent ammonia nitrogen (as N) concentration is greater than 3 mg/l, the pH of the toxicity test shall be maintained at a pH of 8 Standard Units. Acute and chronic toxicity data shall be included in the reporting for the toxicity test results. Toxicity test data acceptability is contingent upon the validation of the test method by the testing laboratory. Such validation shall be submitted to the Department upon request. The permittee shall report to the Department any whole effluent toxicity test results greater than 1.0 TU_A or 1.0 TU_C within five (5) days of becoming aware of the result.

The results of such additional monitoring shall be submitted with the application for reissuance (see the cover page of this permit for the application due date). The permittee shall notify the Department within 14 days of completing the monitoring for each month specified above in accordance with Part II.C.5. Additional reporting requirements are specified in Part II.C.11. If, upon review of the analysis, it is determined that additional requirements are needed to protect the receiving waters in accordance with applicable water quality standards, the permit may then be modified by the Department in accordance with applicable laws and rules.

Whole Effluent Toxicity

acute toxicity	chronic toxicity

Hardness

calcium carbonate

Perfluoroalkyl and Polyfluoroalkyl Substances

Perfluorooctane Sulfonate (PFOS)	Perfluorooctanoic Acid (PFOA)

Metals (Total Recoverable), Cyanide and Total Phenols

antimony	arsenic	available cyanide	zinc
beryllium	cadmium	chromium	
lead	thallium	nickel	
selenium	silver	total phenolic compounds	

Volatile Organic Compounds

acrolein	acrylonitrile	benzene	bromoform
carbon tetrachloride	chlorobenzene	chlorodibromomethane	chloroethane
2-chloroethylvinyl ether	chloroform	dichlorobromomethane	1,1-dichloroethane
1,2-dichloroethane	trans-1,2-dichloroethylene	1,1-dichloroethylene	1,2-dichloropropane
1,3-dichloropropylene	ethylbenzene	methyl bromide	methyl chloride
methylene chloride	1,1,2,2-tetrachloroethane	tetrachloroethylene	toluene
1,1,1-trichloroethane	1,1,2-trichloroethane	trichloroethylene	vinyl chloride

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Acid-Extractable Compounds

4-chloro-3-methylphenol	2-chlorophenol	2,4-dichlorophenol	2,4-dimethylphenol
4,6-dinitro-o-cresol	2,4-dinitrophenol	2-nitrophenol	4-nitrophenol
Pentachlorophenol	phenol	2,4,6-trichlorophenol	

Base/Neutral Compounds

acenaphthene	acenaphthylene	anthracene	benzidine
benzo(a)anthracene	benzo(a)pyrene	3,4-benzofluoranthene	benzo(ghi)perylene
benzo(k)fluoranthene	bis(2-chloroethoxy)methane	bis(2-chloroethyl)ether	bis(2-chloroisopropyl)ether
bis(2-ethylhexyl)phthalate	4-bromophenyl phenyl ether	butyl benzyl phthalate	2-chloronaphthalene
4-chlorophenyl phenyl ether	chrysene	di-n-butyl phthalate	di-n-octyl phthalate
dibenzo(a,h)anthracene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene
3,3'-dichlorobenzidine	diethyl phthalate	dimethyl phthalate	2,4-dinitrotoluene
2,6-dinitrotoluene	1,2-diphenylhydrazine	fluoranthene	fluorene
Hexachlorobenzene	hexachlorobutadiene	hexachlorocyclo-pentadiene	hexachloroethane
indeno(1,2,3-cd)pyrene	isophorone	naphthalene	nitrobenzene
n-nitrosodi-n-propylamine	n-nitrosodimethylamine	n-nitrosodiphenylamine	phenanthrene
pyrene	1,2,4-trichlorobenzene		

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Section A. Limitations and Monitoring Requirements

4. Pollutant Minimization Program for Total Mercury

This condition is required, upon written notification by the Department or if the permittee notifies the Department that the final effluent concentration of total mercury has exceeded 5 ng/l, as specified in Part I.A.1. The goal of the Pollutant Minimization Program is to maintain the effluent concentration of total mercury at or below 1.3 ng/l. Within 180 days of written notification by the Department or after the permittee notifies the Department that the final effluent concentration of total mercury has exceeded 5 ng/l, the permittee shall submit to the Department an approvable Pollutant Minimization Program for mercury designed to proceed toward the goal.

The Pollutant Minimization Program shall include the following:

a. an annual review and semi-annual monitoring of potential sources of mercury entering the wastewater collection system;

b. a program for quarterly monitoring of influent and periodic monitoring of sludge for mercury; and

c. implementation of reasonable, cost-effective control measures when sources of mercury are discovered. Factors to be considered include significance of sources, economic considerations, and technical and treatability considerations.

On or before March 31 of each year following approval of the Pollutant Minimization Program, the permittee shall submit a status report for the previous calendar year to the Department that includes 1) the monitoring results for the previous year, 2) an updated list of potential mercury sources, and 3) a summary of all actions taken to reduce or eliminate identified sources of mercury.

Any information generated as a result of the Pollutant Minimization Program set forth in this permit may be used to support a request to modify the approved program or to demonstrate that the Pollutant Minimization Program requirement has been completed satisfactorily.

A request for modification of the approved program and supporting documentation shall be submitted in writing to the Department for review and approval. The Department may approve modifications to the approved program (approval of a program modification does not require a permit modification), including a reduction in the frequency of the requirements under items a. and b. above.

This permit may be modified in accordance with applicable laws and rules to include additional mercury conditions and/or limitations as necessary.

PART I

Section A. Limitations and Monitoring Requirements

5. Untreated or Partially Treated Sewage Discharge Reporting and Testing Requirements

In accordance with Section 324.3112a of the NREPA, if untreated or partially treated sewage is directly or indirectly discharged from a sewer system onto land or into the waters of the state, the permittee shall immediately, but not more than 24 hours after the discharge begins, notify local health departments, a daily newspaper of general circulation in the county in which the permittee is located, and a daily newspaper of general circulation in the county or counties in which the municipalities whose waters may be affected by the discharge are located, that the discharge is occurring. The permittee shall also notify the Department via its MiWaters system on the form entitled "Report of Discharge (CSO\SSO\RTB)." The MiWaters website is located at https://miwaters.deq.state.mi.us. At the conclusion of the discharge, the permittee shall make all such notifications specified in, and in accordance with, Section 324.3112a of the NREPA, and shall notify the Department via its MiWaters system on the form entitled "Report of Discharge (CSO\SSO\RTB)."

The permittee shall also annually contact municipalities, including the superintendent of a public drinking water supply with potentially affected intakes, whose waters may be affected by the permittee's discharge of untreated or partially treated sewage, and if those municipalities wish to be notified in the same manner as specified above, the permittee shall provide such notification.

Additionally, in accordance with Section 324.3112a of the NREPA, each time a discharge of untreated or partially treated sewage occurs, the permittee shall test the affected waters for *Escherichia coli* to assess the risk to the public health as a result of the discharge and shall provide the test results to the affected local county health departments and to the Department. The results of this testing shall be submitted to the Department via MiWaters as part of the notification specified above, or, if the results are not yet available, submitted as soon as they become available. This testing is not required if it has been waived by the local health department, or if the discharge(s) did not affect surface waters. The testing shall be done at locations specified by each affected local county health department but shall not exceed 10 tests for each separate discharge event. The affected local county health department may waive this testing requirement if it determines that such testing is not needed to assess the risk to the public health as a result of the discharge event.

Permittees accepting sanitary or municipal sewage from other sewage collection systems are encouraged to notify the owners of those systems of the above reporting and testing requirements.

6. Facility Contact

The "Facility Contact" was specified in the application. The permittee may replace the facility contact at any time and shall notify the Department in writing within 10 days after replacement (including the name, address and telephone number of the new facility contact).

a. The facility contact shall be (or a duly authorized representative of this person):
   - for a corporation, a principal executive officer of at least the level of vice president; or a designated representative if the representative is responsible for the overall operation of the facility from which the discharge originates, as described in the permit application or other NPDES form,
   - for a partnership, a general partner,
   - for a sole proprietorship, the proprietor, or
   - for a municipal, state, or other public facility, either a principal executive officer, the mayor, village president, city or village manager or other duly authorized employee.

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b. A person is a duly authorized representative only if:
- the authorization is made in writing to the Department by a person described in paragraph a. of this section; and
- the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the facility (a duly authorized representative may thus be either a named individual or any individual occupying a named position).

Nothing in this section releases the permittee from properly submitting reports and forms as required by law.

7. Monthly Operating Reports

Part 41 of Act 451 of 1994 as amended, specifically Section 324.4106 and associated R 299.2953, requires that the permittee file with the Department, on forms prescribed by the Department, operating reports showing the effectiveness of the treatment facility operation and the quantity and quality of liquid wastes discharged into waters of the state.

Within 30 days of the effective date of this permit, the permittee shall submit to the Department a revised treatment facility monitoring program to address monitoring requirement changes reflected in this permit, or submit justification explaining why monitoring requirement changes reflected in this permit do not necessitate revisions to the treatment facility monitoring program. The permittee shall implement the revised treatment facility monitoring program upon approval from the Department. Applicable forms and guidance are available on the Department's web site at https://www.michigan.gov/egle/0,9429,7-135-3313_71618_44117---,00.html. The permittee may use alternate forms if they are consistent with the approved treatment facility monitoring program. Unless the Department provides written notification to the permittee that monthly submittal of operating reports is required, operating reports that result from implementation of the approved treatment facility monitoring program shall be maintained on site for a minimum of three (3) years and shall be made available to the Department for review upon request.

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Section A. Limitations and Monitoring Requirements

8. Asset Management

The permittee shall at all times properly operate and maintain all facilities (i.e., the sewer system and treatment works as defined in Part 41 of the NREPA), and control systems installed or used by the permittee to operate the sewer system and treatment works and achieve and maintain compliance with the conditions of this permit (also see Part II.D.3 of this permit). The requirements of an Asset Management Program function to achieve the goals of effective performance, adequate funding, and adequate operator staffing and training. Asset management is a planning process for ensuring that optimum value is gained for each asset and that financial resources are available to rehabilitate and replace those assets when necessary. Asset management is centered on a framework of five (5) core elements: the current state of the assets; the required sustainable level of service; the assets critical to sustained performance; the minimum life-cycle costs; and the best long-term funding strategy.

a. Asset Management Program Requirements

The permittee shall continue to implement the Asset Management Plan approved on February 8, 2019, and approved modifications thereto. The Asset Management Plan contains a schedule for the development and implementation of an Asset Management Program that meets the requirements outlined below in 1) – 4):

1) *Maintenance Staff.* The permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit. The level of staffing needed shall be determined by taking into account the work involved in operating the sewer system and treatment works, planning for and conducting maintenance, and complying with this permit.

2) *Collection System Map.* The permittee shall complete a map of the sewer collection system it owns and operates. The map shall be of sufficient detail and at a scale to allow easy interpretation. The collection system information shown on the map shall be based on current conditions and shall be kept up-to-date and available for review by the Department. **Note: Items below referencing combined sewer systems are not applicable to separate sewer systems.** Such map(s) shall include but not be limited to the following:

a) all sanitary sewer lines and related manholes;

b) all combined sewer lines, related manholes, catch basins and CSO regulators;

c) all known or suspected connections between the sanitary sewer or combined sewer and storm drain systems;

d) all outfalls, including the treatment plant outfall(s), combined sewer treatment facility outfalls, untreated CSOs, and any known SSOs;

e) all pump stations and force mains;

f) the wastewater treatment facility(ies), including all treatment processes;

g) all surface waters (labeled);

h) other major appurtenances such as inverted siphons and air release valves;

i) a numbering system which uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;

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Section A. Limitations and Monitoring Requirements

j) the scale and a north arrow;

k) the pipe diameter, date of installation, type of material, distance between manholes, and the direction of flow; and

l) the manhole interior material, rim elevation (optional), and invert elevations.

3) *Inventory and assessment of fixed assets.* The permittee shall complete an inventory and assessment of operations-related fixed assets including portions of the collection system owned and operated by the permittee. Fixed assets are assets that are normally stationary (e.g., pumps, blowers, buildings, manholes, and sewer lines). The inventory and assessment shall be based on current conditions and shall be kept up-to-date and available for review by the Department.

a) The fixed asset inventory shall include the following:

(1) a brief description of the fixed asset, its design capacity (e.g., pump: 120 gallons per minute), its level of redundancy, and its tag number if applicable;

(2) the location of the fixed asset;

(3) the year the fixed asset was installed;

(4) the present condition of the fixed asset (e.g., excellent, good, fair, poor); and

(5) the current fixed asset (replacement) cost in dollars for year specified in accordance with approved schedules;

b) The fixed asset assessment shall include a "Business Risk Evaluation" that combines the probability of failure of the fixed asset and the criticality of the fixed asset, as follows:

(1) Rate the probability of failure of the fixed asset on a scale of 1-5 (low to high) using criteria such as maintenance history, failure history, and remaining percentage of useful life (or years remaining);

(2) Rate the criticality of the fixed asset on a scale of 1-5 (low to high) based on the consequence of failure versus the desired level of service for the facility; and

(3) Compute the Business Risk Factor of the fixed asset by multiplying the failure rating from (1) by the criticality rating from (2).

4) *Operation, Maintenance & Replacement (OM&R) Budget and Rate Sufficiency for the Sewer System and Treatment Works.* The permittee shall complete an assessment of its user rates and replacement fund, including the following:

a) beginning and end dates of fiscal year;

b) name of the department, committee, board, or other organization that sets rates for the operation of the sewer system and treatment works;

c) amount in the permittee's replacement fund in dollars for year specified in accordance with approved schedules;

d) replacement fund strategy of all assets with a useful life of 20 years or less;

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e) expenditures for maintenance, corrective action and capital improvement taken during the fiscal year;

f) OM&R budget for the fiscal year; and

g) rate calculation demonstrating sufficient revenues to cover OM&R expenses. If the rate calculation shows there are insufficient revenues to cover OM&R expenses, the permittee shall document, within three (3) fiscal years after submittal of the Asset Management Plan, that there is at least one rate adjustment that reduces the revenue gap by at least 10 percent. The permittee may prepare and submit an alternate plan, subject to Department approval, for addressing the revenue gap. The ultimate goal of the Asset Management Program is to ensure sufficient revenues to cover OM&R expenses.

b. Annual Reporting

The permittee shall develop a written report that summarizes asset management activities completed during the previous year and planned for the upcoming year. The written report shall be submitted to the Department on or before July 30th of each year. The written report shall include:

1) a description of the staffing levels maintained during the year;

2) a description of inspections and maintenance activities conducted and corrective actions taken during the previous year;

3) expenditures for collection system maintenance activities, treatment works maintenance activities, corrective actions, and capital improvement during the previous year;

4) a summary of assets/areas identified for inspection/action (including capital improvement) in the upcoming year based on the five (5) core elements and the Business Risk Factors computed in accordance with condition a.3)b)(3) above;

5) a maintenance budget and capital improvement budget for the upcoming year that take into account implementation of an effective Asset Management Program that meets the five (5) core elements;

6) an updated asset inventory based on the original submission; and

7) an updated OM&R budget with an updated rate schedule that includes the amount of insufficient revenues, if any.

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Section A. Limitations and Monitoring Requirements

9. Discharge Monitoring Report – Quality Assurance Study Program

The permittee shall participate in the Discharge Monitoring Report – Quality Assurance (DMR-QA) Study Program. The purpose of the DMR-QA Study Program is to annually evaluate the proficiency of all in-house and/or contract laboratory(ies) that perform, on behalf of the facility authorized to discharge under this permit, the analytical testing required under this permit. In accordance with Section 308 of the Clean Water Act (33 U.S.C. § 1318); and R 323.2138 and R 323.2154 of Part 21, Wastewater Discharge Permits, promulgated under Part 31 of the NREPA, participation in the DMR-QA Study Program is required for all major facilities, and for minor facilities selected for participation by the Department.

Annually and in accordance with DMR-QA Study Program requirements and submittal due dates, the permittee shall submit to the Michigan DMR-QA Study Program state coordinator all documentation required by the DMR-QA Study. DMR-QA Study Program participation is required only for the analytes required under this permit and only when those analytes are also identified in the DMR-QA Study.

If the permitted facility's status as a major facility should change, participation in the DMR-QA Study Program may be reevaluated. Questions concerning participation in the DMR-QA Study Program should be directed to the Michigan DMR-QA Study Program state coordinator.

All forms and instructions required for participation in the DMR-QA Study Program, including submittal due dates and state coordinator contact information, can be found at http://www.epa.gov/compliance/discharge-monitoring-report-quality-assurance-study-program.

10. Continuous Monitoring

If continuous monitoring equipment is used and becomes temporarily inoperable, the permittee shall manually obtain a minimum of three (3) equally spaced grab samples/readings within each 24-hour period for the affected parameter(s). On such days, in the comment field on the Daily tab of the DMR, the permittee shall indicate "continuous monitoring system inoperable," the date on which the system is expected to become operable again, and the number of samples/readings obtained during each 24-hour period.

Section B. Storm Water Pollution Prevention

Section B. Storm Water Pollution Prevention is not required for this permit.

PART I

Section C. Industrial Waste Pretreatment Program

1. Federal Industrial Pretreatment Program

a. The permittee shall implement the Federal Industrial Pretreatment Program (FIPP) approved on July 23, 1985, and any subsequent modifications approved up to the issuance of this permit. Approval of substantial program modifications after the issuance of this permit shall be incorporated into this permit by minor modification in accordance with 40 CFR 122.63.

b. The permittee shall comply with R 323.2301 through R 323.2317 of the Michigan Administrative Code (Part 23 Rules), the General Pretreatment Regulations for Existing and New Sources of Pollution (40 CFR Part 403), and the approved FIPP.

c. The permittee shall have the legal authority and necessary interjurisdictional agreements that provide the basis for the implementation and enforcement of the approved FIPP throughout the service area. The legal authority and necessary interjurisdictional agreements shall include, at a minimum, the authority to carry out the activities specified in R 323.2306(a).

d. The permittee shall develop procedures which describe, in sufficient detail, program commitments which enable implementation of the approved FIPP, 40 CFR Part 403, and the Part 23 Rules in accordance with R 323.2306(c).

e. The permittee shall establish an interjurisdictional agreement (or comparable document) with all tributary governmental jurisdictions. Each interjurisdictional agreement shall contain, at a minimum, the following:

1) identification of the agency responsible for the implementation and enforcement of the approved FIPP within the tributary governmental jurisdiction's boundaries; and

2) the provision of the legal authority which provides the basis for the implementation and enforcement of the approved FIPP within the tributary governmental jurisdiction's boundaries.

f. The permittee shall prohibit discharges that:

1) cause, in whole or in part, the permittee's failure to comply with any condition of this permit or the NREPA;

2) restrict, in whole or in part, the permittee's management of biosolids;

3) cause, in whole or in part, operational problems at the treatment facility or in its collection system;

4) violate any of the general or specific prohibitions identified in R 323.2303(1) and (2);

5) violate categorical standards identified in R 323.2311; and

6) violate local limits established in accordance with R 323.2303(4).

g. The permittee shall maintain a list of its nondomestic users that meet the criteria of a significant industrial user as identified in R 323.2302(cc).

h. The permittee shall develop an enforcement response plan which describes, in sufficient detail, program commitments which will enable the enforcement of the approved FIPP, 40 CFR Part 403, and the Part 23 Rules in accordance with R 323.2306(g).

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Section C. Industrial Waste Pretreatment Program

i. The Department may require modifications to the approved FIPP which are necessary to ensure compliance with 40 CFR Part 403 and the Part 23 Rules in accordance with R 323.2309.

j. The permittee shall not implement changes or modifications to the approved FIPP without notification to the Department. Any substantial modification shall be subject to Department public noticing and approval in accordance with R 323.2309.

k. The permittee shall maintain an adequate revenue structure and staffing level for effective implementation of the approved FIPP.

l. The permittee shall develop and maintain, for a minimum of three (3) years, all records and information necessary to determine nondomestic user compliance with 40 CFR Part 403, Part 23 Rules and the approved FIPP. This period of retention shall be extended during the course of any unresolved enforcement action or litigation regarding a nondomestic user or when requested by the Department or the United States Environmental Protection Agency. All of the aforementioned records and information shall be made available upon request for inspection and copying by the Department and the United States Environmental Protection Agency.

m. The permittee shall evaluate the approved FIPP for compliance with the 40 CFR Part 403, Part 23 Rules and the prohibitions stated in item f. above. Based upon this evaluation, the permittee shall propose to the Department all necessary changes or modifications to the approved FIPP no later than the next Industrial Pretreatment Program Annual Report due date (see item p. below).

n. The permittee shall develop and enforce local limits to implement the prohibitions listed in item f above. Local limits shall be based upon data representative of actual conditions demonstrated in a maximum allowable headworks loading analysis. An evaluation of whether the existing local limits need to be revised shall be submitted to the Department by September 1, 2021. The submittal shall provide a technical evaluation of the basis upon which this determination was made which includes information regarding the maximum allowable headworks loading, collection system protection criteria, and worker health and safety, based upon data collected since the last local limits review.

The following pollutants shall be evaluated:

1) Arsenic, Cadmium, Chromium, Copper, Cyanide, Lead, Mercury, Nickel, Silver, and Zinc;

2) Pollutants that are subject to limits or monitoring in this permit;

3) Pollutants that have an existing local limit; and,

4) Other pollutants of concern which would reasonably be expected to be discharged or transported by truck or rail or otherwise introduced into the POTW.

PART I

Section C. Industrial Waste Pretreatment Program

o. The permittee is required under this permit and R 323.2303(4) of the Michigan Administrative Code to review and update their local limits when:

1) new pollutants are introduced;

2) new pollutants that were previously unevaluated are identified;

3) new water quality or biosolids standards are established or additional information becomes available about the nature of pollutants, such as removal rates and accumulation in biosolids; or

4) substantial increases of pollutants are proposed as required in the notification of new or increased uses in accordance with the provisions of 40 CFR 122.42.

p. On or before April 1 of each year, the permittee shall submit to the Department, as required by R 323.2310(8), an Industrial Pretreatment Program Annual Report on the status of program implementation and enforcement activities. The reporting period shall begin on January 1 and end on December 31. At a minimum, the Industrial Pretreatment Program Annual Report shall include:

1) the Pretreatment Program Reports data identified in Appendix A to 40 CFR Part 127 – NPDES Electronic Reporting;

2) a summary of changes to the approved FIPP that have not been previously reported to the Department;

3) a summary of results of all the sampling and analyses performed of the wastewater treatment plant's influent, effluent, and biosolids conducted in accordance with approved methods during the reporting period. The summary shall include the monthly average, daily maximum, quantification level, and number of samples analyzed for each pollutant. At a minimum, the results of analyses for all locally limited parameters for at least one monitoring event that tests influent, effluent and biosolids during the reporting period shall be submitted with each report, unless otherwise required by the Department. Sample collection shall be at intervals sufficient to provide pollutant removal rates, unless the pollutant is not measurable; and

4) any other relevant information requested by the Department.

PART I

Section D. Residuals Management Program

1. Residuals Management Program for Land Application of Biosolids

The permittee is authorized to land-apply bulk biosolids or prepare bulk biosolids for land application in accordance with the permittee's approved Residuals Management Program (RMP) approved on June 18, 2001, and approved modifications thereto, and the requirements established in R 323.2401 through R 323.2418 of the Michigan Administrative Code (Part 24 Rules). The approved RMP, and any approved modifications thereto, are enforceable requirements of this permit. Incineration, landfilling and other residual disposal activities shall be conducted in accordance with Part II.D.7. of this permit. The Part 24 Rules can be obtained via the internet (http://www.michigan.gov/egle/ and near the top of the screen click on Water, then towards the bottom right of the screen click on Permits, Wastewater, Biosolids, then click on Biosolids Laws and Rules Information which is under the Laws & Rules banner in the center of the screen).

a. Annual Report

On or before October 30 of each year, the permittee shall submit an annual report to the Department for the previous fiscal year of October 1 through September 30. The report shall be submitted electronically via the Department's MiWaters system at https://miwaters.deq.state.mi.us. At a minimum, the report shall contain:

1) a certification that current residuals management practices are in accordance with the approved RMP, or a proposal for modification to the approved RMP; and

2) a completed Annual Report Form for Reporting Biosolids, available at https://miwaters.deq.state.mi.us.

b. Modifications to the Approved RMP

Prior to implementation of modifications to the RMP, the permittee shall submit proposed modifications to the Department for approval. The approved modification shall become effective upon the date of approval. Upon written notification, the Department may impose additional requirements and/or limitations to the approved RMP as necessary to protect public health and the environment from any adverse effect of a pollutant in the biosolids.

c. Record Keeping

Records required by the Part 24 Rules shall be kept for a minimum of five (5) years. However, the records documenting cumulative loading for sites subject to cumulative pollutant loading rates shall be kept as long as the site receives biosolids.

d. Contact Information

RMP-related submittals shall be made to the Department.

PART II

Part II may include terms and /or conditions not applicable to discharges covered under this permit.

Section A. Definitions

Acute toxic unit (TU_A) means $100/LC_{50}$ where the LC_{50} is determined from a whole effluent toxicity (WET) test which produces a result that is statistically or graphically estimated to be lethal to 50% of the test organisms.

Annual monitoring frequency refers to a calendar year beginning on January 1 and ending on December 31. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Authorized public agency means a state, local, or county agency that is designated pursuant to the provisions of Section 9110 of Part 91, Soil and Sedimentation Control, of the NREPA, to implement soil erosion and sedimentation control requirements with regard to construction activities undertaken by that agency.

Best management practices (BMPs) means structural devices or nonstructural practices that are designed to prevent pollutants from entering into storm water, to direct the flow of storm water, or to treat polluted storm water.

Bioaccumulative chemical of concern (BCC) means a chemical which, upon entering the surface waters, by itself or as its toxic transformation product, accumulates in aquatic organisms by a human health bioaccumulation factor of more than 1000 after considering metabolism and other physiochemical properties that might enhance or inhibit bioaccumulation. The human health bioaccumulation factor shall be derived according to R 323.1057(5). Chemicals with half-lives of less than 8 weeks in the water column, sediment, and biota are not BCCs. The minimum bioaccumulation concentration factor (BAF) information needed to define an organic chemical as a BCC is either a field-measured BAF or a BAF derived using the biota-sediment accumulation factor (BSAF) methodology. The minimum BAF information needed to define an inorganic chemical as a BCC, including an organometal, is either a field-measured BAF or a laboratory-measured bioconcentration factor (BCF). The BCCs to which these rules apply are identified in Table 5 of R 323.1057 of the Water Quality Standards.

Biosolids are the solid, semisolid, or liquid residues generated during the treatment of sanitary sewage or domestic sewage in a treatment works. This includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes and a derivative of the removed scum or solids.

Bulk biosolids means biosolids that are not sold or given away in a bag or other container for application to a lawn or home garden.

Certificate of Coverage (COC) is a document, issued by the Department, which authorizes a discharge under a general permit.

Chronic toxic unit (TU_C) means $100/MATC$ or $100/IC_{25}$, where the maximum acceptable toxicant concentration (MATC) and IC_{25} are expressed as a percent effluent in the test medium.

Class B biosolids refers to material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with the Part 24 Rules, Land Application of Biosolids, promulgated under Part 31 of the NREPA. Processes include aerobic digestion, composting, anaerobic digestion, lime stabilization and air drying.

Combined sewer system is a sewer system in which storm water runoff is combined with sanitary wastes.

Continuous monitoring refers to sampling/readings that occur at regular and consistent intervals throughout a 24-hour period and at a frequency sufficient to capture data that are representative of the discharge. The maximum acceptable interval between samples/readings shall be one (1) hour.

PART II

Section A. Definitions

Daily concentration
FOR PARAMETERS OTHER THAN pH, DISSOLVED OXYGEN, TEMPERATURE, AND CONDUCTIVITY – Daily concentration is the sum of the concentrations of the individual samples of a parameter taken within a calendar day divided by the number of samples taken within that calendar day. The daily concentration will be used to determine compliance with any maximum and minimum daily concentration limitations. For guidance and examples showing how to perform calculations using results below quantification levels, see the document entitled "Reporting Results Below Quantification," available at https://www.michigan.gov/documents/deq/wrd-npdes-results-quantification_620791_7.pdf.

FOR pH, DISSOLVED OXYGEN, TEMPERATURE, AND CONDUCTIVITY – The daily concentration used to determine compliance with maximum daily pH, temperature, and conductivity limitations is the highest pH, temperature, and conductivity readings obtained within a calendar day. The daily concentration used to determine compliance with minimum daily pH and dissolved oxygen limitations is the lowest pH and dissolved oxygen readings obtained within a calendar day.

Daily loading is the total discharge by weight of a parameter discharged during any calendar day. This value is calculated by multiplying the daily concentration by the total daily flow and by the appropriate conversion factor. The daily loading will be used to determine compliance with any maximum daily loading limitations. When required by the permit, report the maximum calculated daily loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMRs.

Daily monitoring frequency refers to a 24-hour day. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Department means the Michigan Department of Environment, Great Lakes, and Energy.

Detection level means the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability.

Discharge means the addition of any waste, waste effluent, wastewater, pollutant, or any combination thereof to any surface water of the state.

EC_{50} means a statistically or graphically estimated concentration that is expected to cause 1 or more specified effects in 50% of a group of organisms under specified conditions.

Fecal coliform bacteria monthly
FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – Fecal coliform bacteria monthly is the geometric mean of all daily concentrations determined during a discharge event. Days on which no daily concentration is determined shall not be used to determine the calculated monthly value. The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMR. If the period in which the discharge event occurred was partially in each of two months, the calculated monthly value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – Fecal coliform bacteria monthly is the geometric mean of all daily concentrations determined during a reporting month. Days on which no daily concentration is determined shall not be used to determine the calculated monthly value. The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMR.

PART II

Section A. Definitions

Fecal coliform bacteria 7-day
FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – Fecal coliform bacteria 7-day is the geometric mean of the daily concentrations determined during any 7 consecutive days of discharge during a discharge event. If the number of daily concentrations determined during the discharge event is less than 7 days, the number of actual daily concentrations determined shall be used for the calculation. Days on which no daily concentration is determined shall not be used to determine the value. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day geometric mean value for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. If the 7-day period was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – Fecal coliform bacteria 7-day is the geometric mean of the daily concentrations determined during any 7 consecutive days in a reporting month. If the number of daily concentrations determined is less than 7, the actual number of daily concentrations determined shall be used for the calculation. Days on which no daily concentration is determined shall not be used to determine the value. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day geometric mean for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. The first calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

Flow-proportioned sample is a composite sample with the sample volume proportional to the effluent flow.

General permit means an NPDES permit issued authorizing a category of similar discharges.

Geometric mean is the average of the logarithmic values of a base 10 data set, converted back to a base 10 number.

Grab sample is a single sample taken at neither a set time nor flow.

IC_{25} means the toxicant concentration that would cause a 25% reduction in a nonquantal biological measurement for the test population.

Illicit connection means a physical connection to a municipal separate storm sewer system that primarily conveys non-storm water discharges other than uncontaminated groundwater into the storm sewer; or a physical connection not authorized or permitted by the local authority, where a local authority requires authorization or a permit for physical connections.

Illicit discharge means any discharge to, or seepage into, a municipal separate storm sewer system that is not composed entirely of storm water or uncontaminated groundwater. Illicit discharges include non-storm water discharges through pipes or other physical connections; dumping of motor vehicle fluids, household hazardous wastes, domestic animal wastes, or litter; collection and intentional dumping of grass clippings or leaf litter; or unauthorized discharges of sewage, industrial waste, restaurant wastes, or any other non-storm water waste directly into a separate storm sewer.

Individual permit means a site-specific NPDES permit.

Inlet means a catch basin, roof drain, conduit, drain tile, retention pond riser pipe, sump pump, or other point where storm water or wastewater enters into a closed conveyance system prior to discharge off site or into waters of the state.

PART II

Section A. Definitions

Interference is a discharge which, alone or in conjunction with a discharge or discharges from other sources, both: 1) inhibits or disrupts a POTW, its treatment processes or operations, or its sludge processes, use or disposal; and 2) therefore, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or, of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act. [This definition does not apply to sample matrix interference].

Land application means spraying or spreading biosolids or a biosolids derivative onto the land surface, injecting below the land surface, or incorporating into the soil so that the biosolids or biosolids derivative can either condition the soil or fertilize crops or vegetation grown in the soil.

LC_{50} means a statistically or graphically estimated concentration that is expected to be lethal to 50% of a group of organisms under specified conditions.

Maximum acceptable toxicant concentration (MATC) means the concentration obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test. A lower chronic limit is the highest tested concentration that did not cause the occurrence of a specific adverse effect. An upper chronic limit is the lowest tested concentration which did cause the occurrence of a specific adverse effect and above which all tested concentrations caused such an occurrence.

Maximum extent practicable means implementation of best management practices by a public body to comply with an approved storm water management program as required by a national permit for a municipal separate storm sewer system, in a manner that is environmentally beneficial, technically feasible, and within the public body's legal authority.

MBTU/hr means million British Thermal Units per hour.

MGD means million gallons per day.

Monthly concentration is the sum of the daily concentrations determined during a reporting period divided by the number of daily concentrations determined. The calculated monthly concentration will be used to determine compliance with any maximum monthly concentration limitations. Days with no discharge shall not be used to determine the value. When required by the permit, report the calculated monthly concentration in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMR.

For minimum percent removal requirements, the monthly influent concentration and the monthly effluent concentration shall be determined. The calculated monthly percent removal, which is equal to 100 times the quantity [1 minus the quantity (monthly effluent concentration divided by the monthly influent concentration)], shall be reported in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Monthly loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined during a reporting period. The calculated monthly loading will be used to determine compliance with any maximum monthly loading limitations. Days with no discharge shall not be used to determine the value. When required by the permit, report the calculated monthly loading in the "AVERAGE" column under "QUANTITY OR LOADING" on the DMR.

Monthly monitoring frequency refers to a calendar month. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

PART II

Section A. Definitions

Municipal separate storm sewer means a conveyance or system of conveyances designed or used for collecting or conveying storm water which is not a combined sewer and which is not part of a POTW as defined in the Code of Federal Regulations at 40 CFR 122.2.
Municipal separate storm sewer system (MS4) means all separate storm sewers that are owned or operated by the United States, a state, city, village, township, county, district, association, or other public body created by or pursuant to state law, having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under state law, such as a sewer district, flood control district, or drainage district, or similar entity, or a designated or approved management agency under Section 208 of the Clean Water Act that discharges to the waters of the state. This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

National Pretreatment Standards are the regulations promulgated by or to be promulgated by the Federal Environmental Protection Agency pursuant to Section 307(b) and (c) of the Clean Water Act. The standards establish nationwide limits for specific industrial categories for discharge to a POTW.

No observed adverse effect level (NOAEL) means the highest tested dose or concentration of a substance which results in no observed adverse effect in exposed test organisms where higher doses or concentrations result in an adverse effect.

Noncontact cooling water is water used for cooling which does not come into direct contact with any raw material, intermediate product, by-product, waste product or finished product.

Nondomestic user is any discharger to a POTW that discharges wastes other than or in addition to water-carried wastes from toilet, kitchen, laundry, bathing or other facilities used for household purposes.

Nonstructural controls are practices or procedures implemented by employees at a facility to manage storm water or to prevent contamination of storm water.

NPDES means National Pollutant Discharge Elimination System.

Outfall is the location at which a point source discharge first enters a surface water of the state.

Part 91 agency means an agency that is designated by a county board of commissioners pursuant to the provisions of Section 9105 of Part 91 of the NREPA; an agency that is designated by a city, village, or township in accordance with the provisions of Section 9106 of Part 91 of the NREPA; or the Department for soil erosion and sedimentation control activities under Part 615, Supervisor of Wells; Part 631, Reclamation of Mining Lands; or Part 632, Nonferrous Metallic Mineral Mining, of the NREPA, pursuant to the provisions of Section 9115 of Part 91 of the NREPA.

Part 91 permit means a soil erosion and sedimentation control permit issued by a Part 91 agency pursuant to the provisions of Part 91 of the NREPA.

Partially treated sewage is any sewage, sewage and storm water, or sewage and wastewater, from domestic or industrial sources that is treated to a level less than that required by the permittee's NPDES permit, or that is not treated to national secondary treatment standards for wastewater, including discharges to surface waters from retention treatment facilities.

Point of discharge is the location of a point source discharge where storm water is discharged directly into a separate storm sewer system.

PART II

Section A. Definitions

Point source discharge means a discharge from any discernible, confined, discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, or rolling stock. Changing the surface of land or establishing grading patterns on land will result in a point source discharge where the runoff from the site is ultimately discharged to waters of the state.

Polluting material means any material, in solid or liquid form, identified as a polluting material under the Part 5 Rules, Spillage of Oil and Polluting Materials, promulgated under Part 31 of the NREPA (R 324.2001 through R 324.2009 of the Michigan Administrative Code).

POTW is a publicly owned treatment work.

Predevelopment is the last land use prior to the planned new development or redevelopment.

Pretreatment is reducing the amount of pollutants, eliminating pollutants, or altering the nature of pollutant properties to a less harmful state prior to discharge into a public sewer. The reduction or alteration can be by physical, chemical, or biological processes, process changes, or by other means. Dilution is not considered pretreatment unless expressly authorized by an applicable National Pretreatment Standard for a particular industrial category.

Public (as used in the MS4 individual permit) means all persons who potentially could affect the authorized storm water discharges, including, but not limited to, residents, visitors to the area, public employees, businesses, industries, and construction contractors and developers.

Public body means the United States; the state of Michigan; a city, village, township, county, school district, public college or university, or single-purpose governmental agency; or any other body which is created by federal or state statute or law.

Qualified Personnel means an individual who meets qualifications acceptable to the Department and who is authorized by an Industrial Storm Water Certified Operator to collect the storm water sample.

Qualifying storm event means a storm event causing greater than 0.1 inch of rainfall and occurring at least 72 hours after the previous measurable storm event that also caused greater than 0.1 inch of rainfall. Upon request, the Department may approve an alternate definition meeting the condition of a qualifying storm event.

Quantification level means the measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calculated at a specified concentration above the detection level. It is considered the lowest concentration at which a particular contaminant can be quantitatively measured using a specified laboratory procedure for monitoring of the contaminant.

Quarterly monitoring frequency refers to a three month period, defined as January through March, April through June, July through September, and October through December. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Regional Administrator is the Region 5 Administrator, U.S. EPA, located at R-19J, 77 W. Jackson Blvd., Chicago, Illinois 60604.

Regulated area means the permittee's urbanized area, where urbanized area is defined as a place and its adjacent densely-populated territory that together have a minimum population of 50,000 people as defined by the United States Bureau of the Census and as determined by the latest available decennial census.

PART II

Section A. Definitions

Secondary containment structure means a unit, other than the primary container, in which significant materials are packaged or held, which is required by state or federal law to prevent the escape of significant materials by gravity into sewers, drains, or otherwise directly or indirectly into any sewer system or to the surface waters or groundwaters of the state.

Separate storm sewer system means a system of drainage, including, but not limited to, roads, catch basins, curbs, gutters, parking lots, ditches, conduits, pumping devices, or man-made channels, which is not a combined sewer where storm water mixes with sanitary wastes, and is not part of a POTW.

Significant industrial user is a nondomestic user that: 1) is subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; or 2) discharges an average of 25,000 gallons per day or more of process wastewater to a POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process waste stream which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the permittee as defined in 40 CFR 403.12(a) on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's treatment plant operation or violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Significant materials means any material which could degrade or impair water quality, including but not limited to: raw materials; fuels; solvents, detergents, and plastic pellets; finished materials such as metallic products; hazardous substances designated under Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (see 40 CFR 372.65); any chemical the facility is required to report pursuant to Section 313 of Emergency Planning and Community Right-to-Know Act (EPCRA); polluting materials as identified under the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code); Hazardous Wastes as defined in Part 111, Hazardous Waste Management, of the NREPA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Significant spills and significant leaks means any release of a polluting material reportable under the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code).

Special-use area means storm water discharges for which the Department has determined that additional monitoring is needed from: secondary containment structures required by state or federal law; lands on Michigan's List of Sites of Environmental Contamination pursuant to Part 201, Environmental Remediation, of the NREPA; and/or areas with other activities that may contribute pollutants to the storm water.

Stoichiometric means the quantity of a reagent calculated to be necessary and sufficient for a given chemical reaction.

Storm water means storm water runoff, snow melt runoff, surface runoff and drainage, and non-storm water included under the conditions of this permit.

Storm water discharge point is the location where the point source discharge of storm water is directed to surface waters of the state or to a separate storm sewer. It includes the location of all point source discharges where storm water exits the facility, including *outfalls* which discharge directly to surface waters of the state, and *points of discharge* which discharge directly into separate storm sewer systems.

Structural controls are physical features or structures used at a facility to manage or treat storm water.

SWPPP means the Storm Water Pollution Prevention Plan prepared in accordance with this permit.

PART II

Section A. Definitions

Tier I value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier I toxicity database.

Tier II value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier II toxicity database.

Total maximum daily loads (TMDLs) are required by the Clean Water Act for waterbodies that do not meet water quality standards. TMDLs represent the maximum daily load of a pollutant that a waterbody can assimilate and meet water quality standards, and an allocation of that load among point sources, nonpoint sources, and a margin of safety.

Toxicity reduction evaluation (TRE) means a site-specific study conducted in a stepwise process designed to identify the causative agents of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.

Water Quality Standards means the Part 4 Water Quality Standards promulgated pursuant to Part 31 of the NREPA, being R 323.1041 through R 323.1117 of the Michigan Administrative Code.

Weekly monitoring frequency refers to a calendar week which begins on Sunday and ends on Saturday. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

WWSL is a wastewater stabilization lagoon.

WWSL discharge event is a discrete occurrence during which effluent is discharged to the surface water up to 10 days of a consecutive 14 day period.

3-portion composite sample is a sample consisting of three equal-volume grab samples collected at equal intervals over an 8-hour period.

7-day concentration
FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – The 7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days of discharge during a WWSL discharge event divided by the number of daily concentrations determined. If the number of daily concentrations determined during the WWSL discharge event is less than 7 days, the number of actual daily concentrations determined shall be used for the calculation. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations. When required by the permit, report the maximum calculated 7-day concentration for the WWSL discharge event in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMR. If the WWSL discharge event was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – The 7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days in a reporting month divided by the number of daily concentrations determined. If the number of daily concentrations determined is less than 7, the actual number of daily concentrations determined shall be used for the calculation. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations in the reporting month. When required by the permit, report the maximum calculated 7-day concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMR. The first 7-day calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

PART II

Section A. Definitions

7-day loading
FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – The 7-day loading is the sum of the daily loadings determined during any 7 consecutive days of discharge during a WWSL discharge event divided by the number of daily loadings determined. If the number of daily loadings determined during the WWSL discharge event is less than 7 days, the number of actual daily loadings determined shall be used for the calculation. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations. When required by the permit, report the maximum calculated 7-day loading for the WWSL discharge event in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMR. If the WWSL discharge event was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – The 7-day loading is the sum of the daily loadings determined during any 7 consecutive days in a reporting month divided by the number of daily loadings determined. If the number of daily loadings determined is less than 7, the actual number of daily loadings determined shall be used for the calculation. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations in the reporting month. When required by the permit, report the maximum calculated 7-day loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMR. The first 7-day calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

24-hour composite sample is a flow-proportioned composite sample consisting of hourly or more frequent portions that are taken over a 24-hour period. A time-proportioned composite sample may be used upon approval of the Department if the permittee demonstrates it is representative of the discharge.

PART II

Section B. Monitoring Procedures

1. Representative Samples

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations promulgated pursuant to Section 304(h) of the Clean Water Act (40 CFR Part 136 – Guidelines Establishing Test Procedures for the Analysis of Pollutants), unless specified otherwise in this permit. **Test procedures used shall be sufficiently sensitive to determine compliance with applicable effluent limitations**. Requests to use test procedures not promulgated under 40 CFR Part 136 for pollutant monitoring required by this permit shall be made in accordance with the Alternate Test Procedures regulations specified in 40 CFR 136.4. These requests shall be submitted to the Manager of the Permits Section, Water Resources Division, Michigan Department of Environment, Great Lakes, and Energy, P.O. Box 30458, Lansing, Michigan, 48909-7958. The permittee may use such procedures upon approval.

The permittee shall periodically calibrate and perform maintenance procedures on all analytical instrumentation at intervals to ensure accuracy of measurements. The calibration and maintenance shall be performed as part of the permittee's laboratory Quality Assurance/Quality Control program.

3. Instrumentation

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring instrumentation at intervals to ensure accuracy of measurements.

4. Recording Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information: 1) the exact place, date, and time of measurement or sampling; 2) the person(s) who performed the measurement or sample collection; 3) the dates the analyses were performed; 4) the person(s) who performed the analyses; 5) the analytical techniques or methods used; 6) the date of and person responsible for equipment calibration; and 7) the results of all required analyses.

5. Records Retention

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the Department.

PART II

Section C. Reporting Requirements

1. Start-Up Notification

If the permittee will not discharge during the first 60 days following the effective date of this permit, the permittee shall notify the Department within 14 days following the effective date of this permit, and then 60 days prior to the commencement of the discharge.

2. Submittal Requirements for Self-Monitoring Data

Part 31 of the NREPA (specifically Section 324.3110(7)); and R 323.2155(2) of Part 21, Wastewater Discharge Permits, promulgated under Part 31 of the NREPA, allow the Department to specify the forms to be utilized for reporting the required self-monitoring data. Unless instructed on the effluent limitations page to conduct "Retained Self-Monitoring," the permittee shall submit self-monitoring data via the Department's MiWaters system.

The permittee shall utilize the information provided on the MiWaters website, located at https://miwaters.deq.state.mi.us, to access and submit the electronic forms. Both monthly summary and daily data shall be submitted to the Department no later than the 20th day of the month following each month of the authorized discharge period(s). The permittee may be allowed to submit the electronic forms after this date if the Department has granted an extension to the submittal date.

3. Retained Self-Monitoring Requirements

If instructed on the effluent limits page (or otherwise authorized by the Department in accordance with the provisions of this permit) to conduct retained self-monitoring, the permittee shall maintain a year-to-date log of retained self-monitoring results and, upon request, provide such log for inspection to the staff of the Department. Retained self-monitoring results are public information and shall be promptly provided to the public upon request.

The permittee shall certify, in writing, to the Department, on or before January 10th (April 1st for animal feeding operation facilities) of each year, that: 1) all retained self-monitoring requirements have been complied with and a year-to-date log has been maintained; and 2) the application on which this permit is based still accurately describes the discharge. With this annual certification, the permittee shall submit a summary of the previous year's monitoring data. The summary shall include maximum values for samples to be reported as daily maximums and/or monthly maximums and minimum values for any daily minimum samples.

Retained self-monitoring may be denied to a permittee by notification in writing from the Department. In such cases, the permittee shall submit self-monitoring data in accordance with Part II.C.2., above. Such a denial may be rescinded by the Department upon written notification to the permittee. Reissuance or modification of this permit or reissuance or modification of an individual permittee's authorization to discharge shall not affect previous approval or denial for retained self-monitoring unless the Department provides notification in writing to the permittee.

4. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report. Such increased frequency shall also be indicated.

PART II

Section C. Reporting Requirements

Monitoring required pursuant to Part 41 of the NREPA or Rule 35 of the Mobile Home Park Commission Act, 1987 PA 96, as amended, for assurance of proper facility operation, shall be submitted as required by the Department.

5. Compliance Dates Notification

Within 14 days of every compliance date specified in this permit, the permittee shall submit a *written* notification to the Department indicating whether or not the particular requirement was accomplished. If the requirement was not accomplished, the notification shall include an explanation of the failure to accomplish the requirement, actions taken or planned by the permittee to correct the situation, and an estimate of when the requirement will be accomplished. If a written report is required to be submitted by a specified date and the permittee accomplishes this, a separate written notification is not required.

6. Noncompliance Notification

Compliance with all applicable requirements set forth in the Clean Water Act, Parts 31 and 41 of the NREPA, and related regulations and rules is required. All instances of noncompliance shall be reported as follows:

a. 24-Hour Reporting
Any noncompliance which may endanger health or the environment (including maximum and/or minimum daily concentration discharge limitation exceedances) shall be reported, verbally, within 24 hours from the time the permittee becomes aware of the noncompliance. A written submission shall also be provided within five (5) days.

b. Other Reporting
The permittee shall report, in writing, all other instances of noncompliance not described in a. above at the time monitoring reports are submitted; or, in the case of retained self-monitoring, within five (5) days from the time the permittee becomes aware of the noncompliance.

Written reporting shall include: 1) a description of the discharge and cause of noncompliance; and 2) the period of noncompliance, including exact dates and times, or, if not yet corrected, the anticipated time the noncompliance is expected to continue, and the steps taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

7. Spill Notification

The permittee shall immediately report any release of any polluting material which occurs to the surface waters or groundwaters of the state, unless the permittee has determined that the release is not in excess of the threshold reporting quantities specified in the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code), by calling the Department at the number indicated on the second page of this permit (or, if this is a general permit, on the COC); or, if the notice is provided after regular working hours, call the Department's 24-hour Pollution Emergency Alerting System telephone number, 1-800-292-4706 (calls from **out-of-state** call 1-517-373-7660).

Within ten (10) days of the release, the permittee shall submit to the Department a full written explanation as to the cause of the release, the discovery of the release, response (clean-up and/or recovery) measures taken, and preventive measures taken or a schedule for completion of measures to be taken to prevent reoccurrence of similar releases.

PART II

Section C. Reporting Requirements

8. Upset Noncompliance Notification

If a process "upset" (defined as an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee) has occurred, the permittee who wishes to establish the affirmative defense of upset shall notify the Department by telephone within 24 hours of becoming aware of such conditions; and within five (5) days, provide in writing, the following information:

a. that an upset occurred and that the permittee can identify the specific cause(s) of the upset;

b. that the permitted wastewater treatment facility was, at the time, being properly operated and maintained (note that an upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation); and

c. that the permittee has specified and taken action on all responsible steps to minimize or correct any adverse impact in the environment resulting from noncompliance with this permit.

No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

In any enforcement proceedings, the permittee, seeking to establish the occurrence of an upset, has the burden of proof.

9. Bypass Prohibition and Notification

a. Bypass Prohibition
Bypass is prohibited, and the Department may take an enforcement action, unless:

1) bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

2) there were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass; and

3) the permittee submitted notices as required under 9.b. or 9.c. below.

b. Notice of Anticipated Bypass
If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Department, if possible at least ten (10) days before the date of the bypass, and provide information about the anticipated bypass as required by the Department. The Department may approve an anticipated bypass, after considering its adverse effects, if it will meet the three (3) conditions listed in 9.a. above.

c. Notice of Unanticipated Bypass
The permittee shall submit notice to the Department of an unanticipated bypass by calling the Department at the number indicated on the second page of this permit (if the notice is provided after regular working hours, call: 1-800-292-4706) as soon as possible, but no later than 24 hours from the time the permittee becomes aware of the circumstances.

PART II

Section C. Reporting Requirements

d. Written Report of Bypass
A written submission shall be provided within five (5) working days of commencing any bypass to the Department, and at additional times as directed by the Department. The written submission shall contain a description of the bypass and its cause; the period of bypass, including exact dates and times, and if the bypass has not been corrected, the anticipated time it is expected to continue; steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass; and other information as required by the Department.

e. Bypass Not Exceeding Limitations
The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to ensure efficient operation. These bypasses are not subject to the provisions of 9.a., 9.b., 9.c., and 9.d., above. This provision does not relieve the permittee of any notification responsibilities under Part II.C.11. of this permit.

f. Definitions

1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

10. Bioaccumulative Chemicals of Concern (BCC)

Consistent with the requirements of R 323.1098 and R 323.1215 of the Michigan Administrative Code, the permittee is prohibited from undertaking any action that would result in a lowering of water quality from an increased loading of a BCC unless an increased use request and antidegradation demonstration have been submitted and approved by the Department.

11. Notification of Changes in Discharge

The permittee shall notify the Department, in writing, as soon as possible but no later than 10 days of knowing, or having reason to believe, that any activity or change has occurred or will occur which would result in the discharge of: 1) detectable levels of chemicals on the current Michigan Critical Materials Register, priority pollutants or hazardous substances set forth in 40 CFR 122.21, Appendix D, or the Pollutants of Initial Focus in the Great Lakes Water Quality Initiative specified in 40 CFR 132.6, Table 6, which were not acknowledged in the application or listed in the application at less than detectable levels; 2) detectable levels of any other chemical not listed in the application or listed at less than detection, for which the application specifically requested information; or 3) any chemical at levels greater than five times the average level reported in the complete application (see the first page of this permit, for the date(s) the complete application was submitted). Any other monitoring results obtained as a requirement of this permit shall be reported in accordance with the compliance schedules.

PART II

Section C. Reporting Requirements

12. Changes in Facility Operations

Any anticipated action or activity, including but not limited to facility expansion, production increases, or process modification, which will result in new or increased loadings of pollutants to the receiving waters must be reported to the Department by a) submission of an increased use request (application) and all information required under R 323.1098 (Antidegradation) of the Water Quality Standards or b) by notice if the following conditions are met: 1) the action or activity will not result in a change in the types of wastewater discharged or result in a greater quantity of wastewater than currently authorized by this permit; 2) the action or activity will not result in violations of the effluent limitations specified in this permit; 3) the action or activity is not prohibited by the requirements of Part II.C.10.; and 4) the action or activity will not require notification pursuant to Part II.C.11. Following such notice, the permit or, if applicable, the facility's COC may be modified according to applicable laws and rules to specify and limit any pollutant not previously limited.

13. Transfer of Ownership or Control

In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the permittee shall submit to the Department 30 days prior to the actual transfer of ownership or control a written agreement between the current permittee and the new permittee containing: 1) the legal name and address of the new owner; 2) a specific date for the effective transfer of permit responsibility, coverage and liability; and 3) a certification of the continuity of or any changes in operations, wastewater discharge, or wastewater treatment.

If the new permittee is proposing changes in operations, wastewater discharge, or wastewater treatment, the Department may propose modification of this permit in accordance with applicable laws and rules.

14. Operations and Maintenance Manual

For wastewater treatment facilities that serve the public (and are thus subject to Part 41 of the NREPA), Section 4104 of Part 41 and associated Rule 2957 of the Michigan Administrative Code allow the Department to require an Operations and Maintenance (O&M) Manual from the facility. An up-to-date copy of the O&M Manual shall be kept at the facility and shall be provided to the Department upon request. The Department may review the O&M Manual in whole or in part at its discretion and require modifications to it if portions are determined to be inadequate.

At a minimum, the O&M Manual shall include the following information: permit standards; descriptions and operation information for all equipment; staffing information; laboratory requirements; record keeping requirements; a maintenance plan for equipment; an emergency operating plan; safety program information; and copies of all pertinent forms, as-built plans, and manufacturer's manuals.

Certification of the existence and accuracy of the O&M Manual shall be submitted to the Department at least sixty days prior to start-up of a new wastewater treatment facility. Recertification shall be submitted sixty days prior to start-up of any substantial improvements or modifications made to an existing wastewater treatment facility.

PART II

Section C. Reporting Requirements

15. Signatory Requirements

All applications, reports, or information submitted to the Department in accordance with the conditions of this permit and that require a signature shall be signed and certified as described in the Clean Water Act and the NREPA.

The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

The NREPA (Section 3115(2)) provides that a person who at the time of the violation knew or should have known that he or she discharged a substance contrary to this part, or contrary to a permit, COC, or order issued or rule promulgated under this part, or who intentionally makes a false statement, representation, or certification in an application for or form pertaining to a permit or COC or in a notice or report required by the terms and conditions of an issued permit or COC, or who intentionally renders inaccurate a monitoring device or record required to be maintained by the Department, is guilty of a felony and shall be fined not less than $2,500.00 or more than $25,000.00 for each violation. The court may impose an additional fine of not more than $25,000.00 for each day during which the unlawful discharge occurred. If the conviction is for a violation committed after a first conviction of the person under this subsection, the court shall impose a fine of not less than $25,000.00 per day and not more than $50,000.00 per day of violation. Upon conviction, in addition to a fine, the court in its discretion may sentence the defendant to imprisonment for not more than 2 years or impose probation upon a person for a violation of this part. With the exception of the issuance of criminal complaints, issuance of warrants, and the holding of an arraignment, the circuit court for the county in which the violation occurred has exclusive jurisdiction. However, the person shall not be subject to the penalties of this subsection if the discharge of the effluent is in conformance with and obedient to a rule, order, permit, or COC of the Department. In addition to a fine, the attorney general may file a civil suit in a court of competent jurisdiction to recover the full value of the injuries done to the natural resources of the state and the costs of surveillance and enforcement by the state resulting from the violation.

16. Electronic Reporting

Upon notice by the Department that electronic reporting tools are available for specific reports or notifications, the permittee shall submit electronically all such reports or notifications as required by this permit, on forms provided by the Department.

PART II

Section D. Management Responsibilities

1. Duty to Comply

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit, more frequently than, or at a level in excess of, that authorized, shall constitute a violation of the permit.

It is the duty of the permittee to comply with all the terms and conditions of this permit. Any noncompliance with the Effluent Limitations, Special Conditions, or terms of this permit constitutes a violation of the NREPA and/or the Clean Water Act and constitutes grounds for enforcement action; for permit or Certificate of Coverage (COC) termination, revocation and reissuance, or modification; or denial of an application for permit or COC renewal.

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2. Operator Certification

The permittee shall have the waste treatment facilities under direct supervision of an operator certified at the appropriate level for the facility certification by the Department, as required by Sections 3110 and 4104 of the NREPA. Permittees authorized to discharge storm water shall have the storm water treatment and/or control measures under direct supervision of a storm water operator certified by the Department, as required by Section 3110 of the NREPA.

3. Facilities Operation

The permittee shall, at all times, properly operate and maintain all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes adequate laboratory controls and appropriate quality assurance procedures.

4. Power Failures

In order to maintain compliance with the effluent limitations of this permit and prevent unauthorized discharges, the permittee shall either:

a. provide an alternative power source sufficient to operate facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit; or

b. upon the reduction, loss, or failure of one or more of the primary sources of power to facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit, the permittee shall halt, reduce or otherwise control production and/or all discharge in order to maintain compliance with the effluent limitations and conditions of this permit.

5. Adverse Impact

The permittee shall take all reasonable steps to minimize or prevent any adverse impact to the surface waters or groundwaters of the state resulting from noncompliance with any effluent limitation specified in this permit including, but not limited to, such accelerated or additional monitoring as necessary to determine the nature and impact of the discharge in noncompliance.

PART II

Section D. Management Responsibilities

6. Containment Facilities

The permittee shall provide facilities for containment of any accidental losses of polluting materials in accordance with the requirements of the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code). For a POTW, these facilities shall be approved under Part 41 of the NREPA.

7. Waste Treatment Residues

Residuals (i.e. solids, sludges, biosolids, filter backwash, scrubber water, ash, grit, or other pollutants or wastes) removed from or resulting from treatment or control of wastewaters, including those that are generated during treatment or left over after treatment or control has ceased, shall be disposed of in an environmentally compatible manner and according to applicable laws and rules. These laws may include, but are not limited to, the NREPA, Part 31 for protection of water resources, Part 55 for air pollution control, Part 111 for hazardous waste management, Part 115 for solid waste management, Part 121 for liquid industrial wastes, Part 301 for protection of inland lakes and streams, and Part 303 for wetlands protection. Such disposal shall not result in any unlawful pollution of the air, surface waters or groundwaters of the state.

8. Right of Entry

The permittee shall allow the Department, any agent appointed by the Department, or the Regional Administrator, upon the presentation of credentials and, for animal feeding operation facilities, following appropriate biosecurity protocols:

a. to enter upon the permittee's premises where an effluent source is located or any place in which records are required to be kept under the terms and conditions of this permit; and

b. at reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect process facilities, treatment works, monitoring methods and equipment regulated or required under this permit; and to sample any discharge of pollutants.

9. Availability of Reports

Except for data determined to be confidential under Section 308 of the Clean Water Act and Rule 2128 (R 323.2128 of the Michigan Administrative Code), all reports prepared in accordance with the terms of this permit, shall be available for public inspection at the offices of the Department and the Regional Administrator. As required by the Clean Water Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Clean Water Act and Sections 3112, 3115, 4106 and 4110 of the NREPA.

10. Duty to Provide Information

The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or the facility's COC, or to determine compliance with this permit. The permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

PART II

Section D. Management Responsibilities

PART II

Section E. Activities Not Authorized by This Permit

1. Discharge to the Groundwaters

This permit does not authorize any discharge to the groundwaters. Such discharge may be authorized by a groundwater discharge permit issued pursuant to the NREPA.

2. POTW Construction

This permit does not authorize or approve the construction or modification of any physical structures or facilities at a POTW. Approval for the construction or modification of any physical structures or facilities at a POTW shall be by permit issued under Part 41 of the NREPA.

3. Civil and Criminal Liability

Except as provided in permit conditions on "Bypass" (Part II.C.9. pursuant to 40 CFR 122.41(m)), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond the permittee's control, such as accidents, equipment breakdowns, or labor disputes.

4. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee may be subject under Section 311 of the Clean Water Act except as are exempted by federal regulations.

5. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Clean Water Act.

6. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Department of Environment, Great Lakes, and Energy permits, or approvals from other units of government as may be required by law.

APPENDIX D: UV DISINFECTION EVALUATION (DATED SEPTEMBER 2017)

APPENDIX E: HEADWORKS AND PRIMARY TREATMENT OPTIONS REPORT (DATED DECEMBER 2020)

APPENDIX F: COST ESTIMATES

HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

Engineering. Environment. Excellence.

1925 Breton Road SE, Suite 100; Grand Rapids, MI 49506 Telephone: (616) 454-4286

PROJECT: **Traverse City CWSRF** DATE: **3/25/2021**

LOCATION: **Traverse City, Michigan** PROJECT NO. **20210140**

ESTIMATOR: **ARH**

WORK: **Lower Boardman River Wall Sanitary Sewer** CHECKED BY: **DIU**

100 & 200 Block CURRENT ENR:

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
	GENERAL				
1	Mobilization	1	LS	$96,247	$96,247
	SITE PREPARATION, EROSION CONTROL, AND DEMOLITION				
2	Tree Removal	4	Ea	$500	$2,000
3	Sidewalk Removal	8600	SF	$2	$17,200
4	Asphalt Removal	36075	SF	$2	$54,113
5	Lanscape Removal	3500	SF	$1	$3,500
6	Curb Removal	835	LF	$4	$3,340
7	Old Wall Removal	480	LF	$75	$36,000
8	Storm and Sanitary Removal/Abandonment	1545	LF	$25	$38,625
9	Manhole/Catch Basin Removal	7	Ea	$500	$3,500
10	Miscellaneous Demo and Removal	2	LS	$15,000	$30,000
	UTILITY SYSTEMS				
11	Existing Utility Structure Elevation Adjustment	24	Ea	$250	$6,000
12	Storm Manholes and Catch Basins	10	Ea	$3,000	$30,000
13	Storm Piping	500	LF	$90	$45,000
14	Storm Lead Excavation and Installation	160	LF	$50	$8,000
15	Swirl Chambers/Infiltration Beds	2	EA	$20,000	$40,000
16	Sanitary Manholes	3	EA	$4,000	$12,000
17	Sanitary By-pass and Trench Dewatering	1	LS	$80,000	$80,000
18	Sanitary Sewer Pipe	465	LF	$250	$116,250
19	Sanitary Lead Excavation and Installation	300	LF	$65	$19,500
	EARTHWORK AND WALL REHAB				
20	Soil Erosion Control Measures	2	LS	$15,000	$30,000
21	Cut and Haul Soil	3,600	CY	$20	$72,000
22	Aggregate Backfill	495	CY	$50	$24,750
23	New Sheet Pile Wall	545	LF	$1,200	$654,000
24	Tremied Concrete	545	CY	$200	$109,000
25	Rip Rap at Wall Base	525	CY	$75	$39,375

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ESTIMATOR: **ARH**

WORK: **Lower Boardman River Wall Sanitary Sewer** CHECKED BY: **DIU**

100 & 200 Block CURRENT ENR:

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
	HARDSCAPE IMPROVEMENTS				
26	Sidewalk, Conc, 6 inch	10,750	Sft	$8	$80,625
27	Heavy duty concrete, 10 inch	600	Sft	$10	$5,700
28	Concrete Road Curb	755	LF	$25	$18,875
29	Finish Grading	51,965	SF	$1	$38,974
30	HMA Pavement	24,765	SF	$3	$74,295
	LIGHTING AND ELECTRICAL SYSTEMS				
31	Replacement Pedestrian Scaled Lighting	7	EA	$4,000	$28,000
32	Relocate Conduit and Wire	960	LF	$50	$48,000
	SIGNAGE AND PAVEMENT MARKINGS				
33	Traffic Management	2	LS	$5,000	$10,000
34	Street Marking and Signage	2	LS	$5,000	$10,000
	LANDSCAPING				
35	Landscape habitat area/rain garden	16,450	SF	$8	$123,375
36	Trees	26	Ea	$600	$15,600
37	Demarcation Layer and Erosion Control Fabric	16,450	SF	$1	$12,338
	Construction Subtotal				**$2,037,000**
	Contingencies	20	%		$408,000
	Engineering, Legal, and Administrative	20	%		$408,000
	TOTAL PROJECT COST				**$2,853,000**

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PROJECT: **Traverse City CWSRF**
LOCATION: **Traverse City, Michigan**
WORK: **Headworks and Primary Treatment Improvements**

DATE: **3/25/2021**
PROJECT NO. **20210140**
ESTIMATOR: **ARH**
CHECKED BY: **DIU**
CURRENT ENR:

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
	HEADWORKS				
1	42-inch wide Mechanically Raked Fine Bar screen and wash/compact	1	EA	$427,500	$427,500
2	Demo Exist Manual Screen	1	LS	$12,000	$12,000
3	Conveyance Duct to Dumpster	10	LF	$800	$8,000
4	Grating Modifications	24	SF	$125	$3,000
5	Handrail Additions	12	LF	$120	$1,440
6	Concrete Rehab Allowance	20	SF	$100	$2,000
7	72-inch wide Channel - Mech Fine Bar screen and washer/compactor	1	EA	$465,500	$465,500
8	Demo Exist Rotamat Screen	1	LS	$20,000	$20,000
9	Conveyance Duct to Dumpster	8	LF	$800	$6,400
10	Slide Gate Actuators for Grit Flow Control	2	EA	$18,500	$37,000
11	Controls Modifications and Programming	1	LS	$20,000	$20,000
12	Misc Metal	1%	%	$1,002,840	$11,000
13	Misc Mechanical	1%	%	$1,002,840	$11,000
14	Misc Painting	1%	%	$1,002,840	$11,000
15	Electrical Allowance	15%	%	$1,002,840	$151,000

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CURRENT ENR:

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
	GRIT REMOVAL				
17	Demo Old West Detritor	1	LS	$35,000	$35,000
18	Concrete Floors and Footings on Grade	126	CY	$800	$101,096
19	Concrete Walls	243	CY	$1,000	$242,667
20	Concrete Oper Floor & Struts	99	LS	$1,200	$118,933
21	Superstructure	2,172	SF	$250	$543,000
22	Grit Weirs/Baffles	24	LF	$100	$2,400
23	Isolation Slide Gates	7	EA	$32,000	$224,000
24	Tank Covers	1,008	SF	$80	$80,640
25	Soil or Flowable Fill Below and Around Channels	506	CY	$75	$37,949
26	FRP Foul Air Ductwork (just in this building)	102	LF	$200	$20,400
27	FRP Foul Air Registers and Grilles	1	LS	$20,000	$20,000
28	Site Improvements (Minor)	1	LS	$50,000	$50,000
29	Excavation and Backfill	400	CY	$200	$80,000
30	Influent 24 Valves	6	EA	$12,000	$72,000
31	24" RS Extension/Revisions	200	LF	$250	$50,000
32	Influent Meters (s)	2	EA	$36,000	$72,000
33	Influent Sampler and piping	1	EA	$20,000	$20,000
34	Grit Tank Equipment Package	1	LS	$967,500	$967,500
35	Handrails	46	LF	$150	$6,900
36	Stairs	25	VLF	$1,500	$36,750
37	Misc Metal	2%	%	$2,781,235	$56,000
38	Misc Mechanical (Pl HVAC)	5%	%	$2,781,235	$140,000
39	Painting	2%	%	$2,781,235	$56,000
40	Electrical	15%	%	$2,781,235	$418,000

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CURRENT ENR:

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
	PRIMARY TREATMENT				
41	Floor Fill	2,133	CY	$100	$213,333
42	Concrete Floor	372	CY	$800	$297,719
43	Concrete Walls	228	CY	$1,000	$227,941
44	Concrete Weirs Struts	98	LS	$1,200	$117,227
45	12-inch Knife Gate Valves	4	EA	$21,400	$85,600
46	Weirs/Baffles	440	LF	$100	$43,960
47	Concrete Wall Demo (Partial)	344	CY	$400	$137,600
48	Covers	7,693	SF	$80	$615,440
49	Collection Mechanisms	2	EA	$288,000	$576,000
50	30-inch Influent / Effluent Piping	400	LF	$350	$140,000
51	Handrails	879	LF	$150	$131,880
52	Stairs	40	VLF	$1,500	$60,000
53	Relocating PE Screens and Channels	1	LS	$1,000,000	$1,000,000
54	Misc Metal	2%	%	$3,646,699	$73,000
55	Misc Mechanical	5%	%	$3,646,699	$183,000
56	Misc Painting	2%	%	$3,646,699	$73,000
57	Electrical	15%	%	$3,646,699	$548,000

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CHECKED BY: **DIU**

CURRENT ENR:

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
	PRIMARY EFFLUENT PUMPING				
58	Submersible Pump Package with Prerostal Basin	3	EA	$222,400	$667,200
59	Concrete Core for Basin Install	3	EA	$4,000	$12,000
60	Concrete Grout around Basin and Base Elbow Install	33	CY	$2,000	$66,667
61	Discharge Piping 24-inch	48	LF	$300	$14,400
62	Pump VFDs	3	EA	$60,000	$180,000
63	Control Panel and Programming	1	LS	$70,000	$70,000
64	Misc Metal	3%	%	$1,010,267	$31,000
65	Misc Mechanical	2%	%	$1,010,267	$21,000
66	Misc Painting	1%	%	$1,010,267	$11,000
67	Misc. Electrical	15%	%	$1,010,267	$152,000
	Construction Subtotal				**$10,388,000**
	Contingencies	20	%		$2,078,000
	Engineering, Legal, and Administrative	20	%		$2,078,000
	TOTAL PROJECT COST				**$14,544,000**

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Telephone: (616) 454-4286

PROJECT: **Traverse City CWSRF**

LOCATION: **Traverse City, Michigan**

WORK: **Sewer Rehabilitation (I/I Alternative 1)**

DATE: **3/25/2021**

PROJECT NO. **20210140**

ESTIMATOR: **ARH**

CHECKED BY: **DIU**

CURRENT ENR:

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
1	18-inch CIPP	2000	LF	$150	$300,000
2	24-inch CIPP	1500	LF	$160	$240,000
3	8-inch to 12-inch CIPP	4000	LF	$125	$500,000
4	Manhole Rehabilitation	75	EA	$2,500	$187,500
	Construction Subtotal				**$1,228,000**
	Contingencies	20	%		$246,000
	Engineering, Legal, and Administrative	20	%		$246,000
	TOTAL PROJECT COST				**$1,720,000**

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PROJECT: **Traverse City CWSRF**

LOCATION: **Traverse City, Michigan**

WORK: **Flow Diversion (I/I Alternative 2)**
Lift Station and FM

DATE: **3/25/2021**

PROJECT NO. **20210140**

ESTIMATOR: **ARH**

CHECKED BY: **DIU**

CURRENT ENR:

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
1	8-inch FM	5000	LF	$200	$1,000,000
2	New Lift Station to Intercept High Flow Area	1	LS	$2,000,000	$2,000,000
	Construction Subtotal				**$3,000,000**
	Contingencies	20	%		$600,000
	Engineering, Legal, and Administrative	20	%		$600,000
	TOTAL PROJECT COST				**$4,200,000**

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PROJECT: **Traverse City CWSRF** DATE: **3/25/2021**

LOCATION: **Traverse City, Michigan** PROJECT NO. **20210140**

ESTIMATOR: **ARH**

WORK: **Wet Weather Equalization (I/I Alternative 3)** CHECKED BY: **DIU**

Retention Basin CURRENT ENR:

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
1	8-inch FM	1	LS	$100,000	$100,000
2	500,000 gallon Retention Basin	1	LS	$2,500,000	$2,500,000
3	Pump Station	1	LS	$250,000	$250,000
4	Miscelaneous Equipment	1	LS	$100,000	$100,000
5	Electrical Allowance	20	%	$250,000	$50,000
	Construction Subtotal				**$3,000,000**
	Contingencies	20	%		$600,000
	Engineering, Legal, and Administrative	20	%		$600,000
	TOTAL PROJECT COST				**$4,200,000**

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PROJECT: **Traverse City CWSRF**

LOCATION: **Traverse City, Michigan**

WORK: **UV Disinfection Update**

Trojan UV3000PLUS*

*Based on a 5 year inflation rate

DATE: **3/25/2021**

PROJECT NO. **20210140**

ESTIMATOR: **ARH**

CHECKED BY: **DIU**

CURRENT ENR:

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
1	Equipment Installation and Construction	1	LS	$1,426,472	$1,426,472
2	Other Improvements / Hydraulic Improvements	1	LS	$500,000	$500,000
	Construction Subtotal				**$1,927,000**
	Contingencies	20	%		$386,000
	Engineering, Legal, and Administrative	20	%		$386,000
	TOTAL PROJECT COST				**$2,699,000**

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PROJE **Traverse City CWSRF**

LOCAT **Traverse City, Michigan**

WORK: **US-31 Reconstruction - Utility Replacement**

DATE: **3/25/2021**

PROJECT NO. **20210140**

ESTIMATOR: **ARH**

CHECKED BY: **DIU**

CURRENT ENR:

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
1	Garfield Ave to Hope St - Sewer Lead Transfer from north to south sewer	38	Ea	$5,000	$190,000
2	Remove existing 8-inch sanitary sewer after transfer are complete	3300	Ft	$16	$52,800
3	Hall St to 350' West - 8-inch Sewer Open Cut	350	Ft	$150	$52,500
	Construction Subtotal				**$296,000**
	Contingencies	20	%		$60,000
	Engineering, Legal, and Administrative	20	%		$60,000
	TOTAL PROJECT COST				**$416,000**

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PROJECT: **Traverse City CWSRF**
LOCATION: **Traverse City, Michigan**
WORK: **East Front Sewer Improvements**

DATE: **3/25/2021**
PROJECT NO. **20210140**
ESTIMATOR: **ARH**
CHECKED BY: **DIU**
CURRENT ENR:

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
1	Mobilization	1	LS	$25,000	$25,000
2	Traffic Control	1	LS	$20,000	$20,000
3	Bypass Pumping	1	LS	$75,000	$75,000
4	Sewer Cleaning (Pre-lining), 24-inch Pipe	720	LF	$7.00	$5,040
5	Abandon 24-inch Sewer (Southern Sewer on East Front)	527	LF	$20	$10,540
6	CCTV Inspection (Pre-&-Post Lining) incl. Sewer to Abandon	1,250	LF	$5.0	$6,250
7	24-inch Cured-In-Place Pipe Lining	720	LF	$120	$86,400
8	Replace Sewer Leads on East Front	20	EA	$10,000	$200,000
9	New Manholes	1	EA	$20,000	$20,000
10	Connect to Existing Manhole	2	EA	$10,000	$20,000
11	24-inch Sewer	100	LF	$400	$40,000
12	20-inch Force Main (East Front LS)	300	LF	$350	$105,000
	Construction Subtotal				**$614,000**
	Contingencies	20	%		$123,000
	Engineering, Legal, and Administrative	20	%		$123,000
	TOTAL PROJECT COST				**$860,000**

APPENDIX G: WASTEWATER ASSET MANAGEMENT PLAN

The City of Traverse City Wastewater Asset Management Plan can be found at the following link: https://www.traversecitymi.gov/downloads/final_tc_ww_amp_report.pdf.

APPENDIX H: PUBLIC HEARING DOCUMENTATION

City of Traverse City
Public Hearing Notice Regarding
the Application to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) for funding assistance through the Clean Water State Revolving Fund

The City of Traverse City will hold a public hearing on the application to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) for funding assistance through the Clean Water State Revolving Fund, better known as the State Revolving Fund (SRF) Program for the proposed Wastewater System Improvements project. The public hearing is being held for the purpose of receiving comments from interested persons.

The hearing will be held at 7:00 p.m. on Monday, May 17, 2021 during the City Commission Regular Meeting, conducted as a Remote Participation Meeting. The meeting will be conducted over the Zoom Platform, and any individual may give public comment during the meeting by calling (312) 626-6799; meeting ID is 827-1362-9783. Alternatively, you may give public comment by joining the meeting using the following link: https://us02web.zoom.us/u/keIhrecwy9

The proposed Wastewater System Improvements project descriptions and details are organized into a comprehensive 20-year Project Plan. If the SRF application is successful, the City will have the ability to employ the grant program to fund the proposed project. The project construction will include improvements to the influent pumping and screening equipment, grit removal equipment, settling tanks, primary effluent pumps, and the UV system. In addition, the project will include reconstruction of the lower Boardman River Wall sanitary sewer replacement, sewer rehabilitation, East Front Street sewer improvements, and US-31 sewer improvements. Work will occur at the existing wastewater treatment plant site, located at 606 Hannah Avenue as well as other existing locations within the collection system.

Impacts of the proposed project may include:

> **Noise:** Noise due to construction activities such as construction equipment, machinery, generators, compressors, etc. will be kept to a minimum, as practicable. The work hours will be maintained in accordance with local ordinances.
>
> **Traffic Disturbance:** Traffic control devices and temporary lane closures will be necessary during construction in the collection system. This may impact vehicular and pedestrian traffic flow patterns. Construction activities will be coordinated by location to mitigate any cumulative impacts.

The total cost of the improvements is estimated to be $27.5 million. The repayment of the SRF loan, if approved, will be apportioned to City sewer customers at a monthly rate of approximately $13 per residential service. The estimated user costs to finance the proposed project have been determined assuming SRF financing with a 2.0% interest rate (current SRF interest rate) and a 20-year debt retirement. The apportionment costs

are based on an annual average over a 20-year period to provide an estimate of the average charge per residential service.

Copies of the Wastewater System Draft Project Plan detailing the proposed project is available for review beginning on Thursday, April 15, 2020 at:

- City of Traverse City - City Hall, 400 Boardman Avenue, Traverse City, Michigan, 49684 and at the City's website www.traversecitymi.gov.

Written comments received before the hearing record is closed on May 17, 2020 will receive responses in the Final Project Plan. Written questions should be sent to:

Benjamin Marentette, City Clerk, City Hall, 400 Boardman Avenue, Traverse City, Michigan, 49684 *Or* tcclerk@traversecitymi.gov

IF YOU ARE PLANNING TO ATTEND THE PUBLIC MEETING AND YOU HAVE A DISABILITY REQUIRING ANY SPECIAL ASSISTANCE, PLEASE NOTIFY THE ADA COORDINATOR AT 992-4440 OR TDD #922-4412 AS SOON AS POSSIBLE.

The City of Traverse City does not discriminate on the basis of disability in the admission or access to, or treatment or employment in, its programs or activities. Penny Hill, Assistant City Manager has been designated to coordinate compliance with the non-discrimination requirements contained within Section 35.107 of the Department of Justice regulations. Information concerning the provisions of the Americans with Disabilities Act, and the rights provided thereunder, are available from the ADA Coordinator.

Published on April 15, 2021 in the Traverse City Record-Eagle

Benjamin Marentette, MMC, City Cerk

APPENDIX I: RESOLUTION