DRAFT

Milton Township
Sanitary Sewer Collection

FEASIBLITY STUDY

DRAFT

May 2024

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APPENDICES

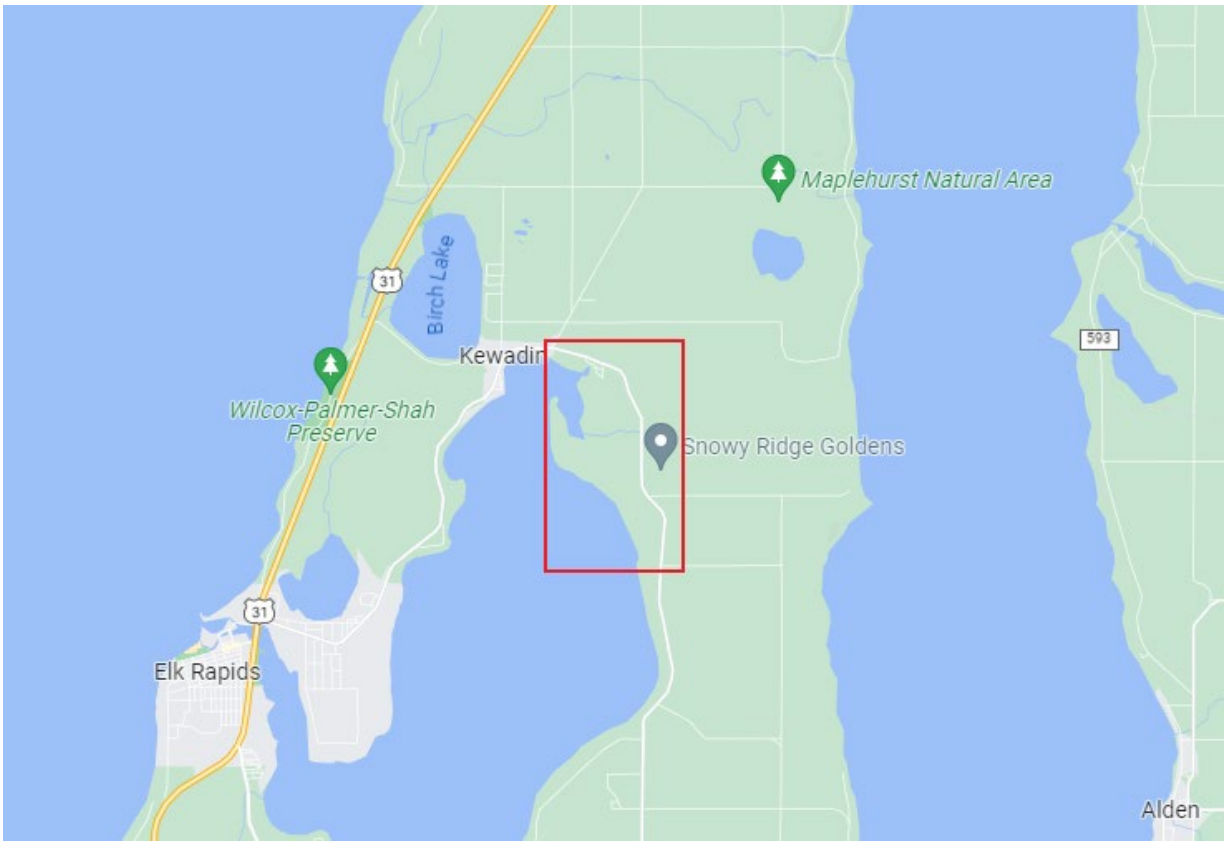
1.0 INTRODUCTION & PROJECT BACKGROUND

Milton Township in Antrim County, Michigan, has an interest in providing sanitary sewer collection to the residential and commercial properties adjacent to the Cherry Avenue corridor from Easley Road north to Cairn Highway collecting residential homes and subdivisions along this route. The project area is bounded by Elk Lake on the west side and parcels adjacent to Cherry Avenue on the east. The parcels immediately adjacent to the route are mainly residential with some commercial at the north end.

1.1 Study and Service Area

This Feasibility Study consisted of the areas within the Township of Milton along the Cherry Avenue corridor from Easley Road north to Cairn Highway, and along the West shore of Elk Lake. These areas were selected for investigation by the Task Force as areas where there appeared to be interest in pursuing sewer or areas known to be challenging for typical septic systems to function properly. **Figure 1-1** below presents a Vicinity Map of all areas reviewed for sewer feasibility.

Figure 1-1: Vicinity Map



1.2 Population

Information provided by the United States Census is presented in **Table 1-1** below. According to the U.S. Census Bureau, the population increased by 13.6% from 2000 to 2020.

Using population projection data from the Population Projections by County Through 2045 report issued by the State of Michigan Department of Technology, Management and Budget in September 2019, the projected population for Milton Township is presented in **Table 1-2**, below. Based on the data, minimal growth is anticipated through 2045.

Table 1-1: Milton Township POPULATION

Municipality	2000 Census	2010 Census	2020 Census	Percent Increase 2000 - 2020
Milton Township	2072	2204	2355	13.6%

Table 1-2: Milton Township POPULATION PROJECTION

Municipality	2020	2030	2035	2040	2045	Percent Increase 2020 - 2045
Milton Township	2355	2430	2438	2421	2374	0.8%
Growth Rate		3.2%	0.3%	-0.7%	-1.9%	

Since the study area is primarily along Elk Lake, the population is not expected to decrease as this is a desirable location and any vacancies are easily replaced, and development is likely to occur.

1.3 Existing Environment Evaluation

Information was gathered by desk top review to identify potential impacts to the project. At this stage a cultural and archaeological review has not been completed. These reviews may be required if State or Federal loans or grants are applied for. It's anticipated any review would conclude no significant impact due to the proposed project scope.

1.3.1 Wetlands

The Michigan Environmental Great Lakes and Energy (EGLE) wetland viewer was used to identify areas in the National Wetlands Inventory and Michigan Resource Inventory System. A map is in **Appendix A**. These may not be the only wetlands in the area. Further investigation may be needed in design phases.

Much of the project area is within or directly adjacent to wetlands or wetlands soils a map of the soil conditions is in **Appendix B**. Soils conducive to wetlands limit the effectiveness of drain field absorption as a means of wastewater treatment.

1.3.2 Existing Contamination

The EGLE Environmental Viewer was used to identify sources and areas of know contamination. A map of the project area is located in **Appendix C**. Sources of contamination are identified for project construction consideration as hazardous waste disposal can impact construction costs.

2.0 EXISTING SYSTEM

2.1 Existing Community Systems.

The Township of Milton has an existing 3" sanitary force main that runs along Cairn Hwy from the intersection with Cherry Ave west around Elk Lake to the township border south of Birch Lake Road. The force main connects to Township of Elk Rapids existing 4" sanitary force main then connects to the Village of Elk Rapids wastewater treatment plant. An existing community septic system services the subdivision located off Cherry Avenue, and consists of residences along Huckleberry Lane, Blueberry Lane, Eagle Way Lane, and Harlan Drive.

2.2 Existing Residential Systems.

Residential septic systems exist through the service area. Mounded drain field were observed and noted at residences in low lying areas along the Elk Lake shoreline. The wet land area to the east of Elk Tip Drive has limited development and resulted in residents utilizing holding tanks to pump and haul wastewater due to the proximity to wetlands.

3.0 NEED FOR PROJECT

The transition from lake side cabins to large vacation and year-round homes create conditions where residential drain fields are unable to properly treat wastewater due to the lack of natural filtration between drain field and the water table. This has created lingering concerns regarding the current and future water quality of Elk Lake. Improper collection and treatment of wastewater can pose a severe health and safety risk to the users of the public water body, and over time can be detrimental to the health of the water body itself. This project would serve to ensure high water quality of Elk Lake, protect the economic and recreation opportunities the lake offers, and allow for further development without a concern for proper wastewater treatment.

4.0 ALTERNATIVES CONSIDERED

A multitude of alternatives for wastewater collection and treatment are available to most projects. The designer needs to consider many different aspects of a project when making a selection. Items such as construction cost, operation and maintenance (O&M) costs, and product availability are certainly factors. However, other factors such as geology, topography, groundwater elevation, and

current surface improvements all play a big role in the selection of the wastewater systems. The specific alternatives investigated are evaluated below. A standard gravity system was not evaluated due to the relatively flat to undulating topography of the subject area.

4.1 Collection Alternatives

1. Low pressure grinder pump collection system.
2. Low pressure septic tank effluent pump (STEP) collection system.

4.1.1 Option #1-Low-Pressure Grinder Pump Collection System

Description

This alternative would collect the wastewater using small-diameter PVC or HDPE force mains and individual grinder pumps for each connection. This approach is widely used in situations where gravity flow is challenging due to a very flat ground surface and high groundwater.

This method allows for the installation of the force main to be done by horizontal directional drilling, which saves cost by removing the need to open-cut a trench that disturbs a large area of surface and requires, in most instances, dewatering of the open-cut trench. It is anticipated that each parcel and/or home would have its own grinder pump that would pump waste from the pump station to the force main out in the road. Due to the use of positive-displacement pumps, the need for an intermediate sewage lift station is only anticipated when flows or head exceed the capabilities of the individual residential pumps.

The funding for this alternate requires that the new grinder pump chambers, pumps, and force mains be owned and maintained by Milton Township

Once the waste is collected from the properties within the service district, it would then be transported to a wastewater treatment facility for treatment and disposal. Transmission from the collection system would be done using a duplex sewage pump station and force main, transporting the sewage to the treatment facility.

Design Criteria

1. Proposed system will include 141 residential service connections and, with a total number of 141 parcels being assessed within the service district.
2. Every service connection is assumed to require 100 feet of service line and a septic system abandoned.
3. Low pressure sewers and force mains sized to provide a minimum of two feet per second flow velocity at average daily flow rates.
4. Directional drilling of service lines, as well as low pressure force main and transmission force mains will be utilized, reducing the restoration costs to service connection locations, and

points of additional infrastructure or access are required such as intermediate lift stations, air relief valves, and cleanouts.

5. This system may not be suitable for all areas within the service district due to the seasonal nature of the lake front areas. Long periods of low use could result in solids settling in the pipe and potential clogging of low-pressure force mains when flow is insufficient to keep solids suspended.

Environmental Impacts.

This alternative would utilize directional drilling for main and service placement, reducing construction impact to localized points throughout the service areas as opposed to a trench installation where every foot of infrastructure impacts the surface environment. A preliminary Environmental Review has been completed and no adverse effects are anticipated.

Land Requirements.

The low pressure and force main route are within existing road rights-of-way, and the individual service connections up to and including the individual grinder pump station will be within easements. Land or easements may need to be acquired for intermediate lift stations and for the transmission main pumping stations.

No easements or land purchase agreements have been made at this time. Upstream of the grinder pump station would be owned and maintained by the parcel owner.

Potential Construction Problems.

There are many miles of proposed low-pressure sewer and force main proposed so areas of poor soils, high groundwater, and conflicts with other utility infrastructure are likely to be encountered. However, since the installed sewer will be a pressure sewer, it is easy to adjust the location and/or depth to work around existing features and utilities.

Sustainability Considerations

1. This alternative requires electric power for each service connection and intermediate lift stations. No septic tank pumping is required, reducing trucking and separate disposal of sewage solids.
2. Chemical addition at the main and intermediate lift stations is anticipated to reduce odors and maintain sewage quality for the time required to move the sewage from the individual service connection to the treatment facility.

Cost Estimates

1. The Preliminary Engineer's Estimate for this project can be reviewed in **Appendix D**.
2. Total Project Capital Cost: $11,500,000

4.1.2 Option #2-Low-Pressure STEP Pump Collection System

Description

This alternative would collect the wastewater using small diameter PVC or HDPE force mains, individual septic tanks, and effluent pumps for each service connection. This approach is widely used in situations where gravity flow is challenging due to a very flat ground surface and high groundwater. This method allows for the installation of the force main to be done by horizontal directional drilling, which saves cost by removing the need to open-cut a trench that disturbs a large area of surface and requires, in most instances, dewatering of the open-cut trench. It is anticipated that each parcel and/or home would have an adequate septic tank and a new effluent pump would pump waste from the septic tank to the force main out in the road. The existing drain field would be abandoned.

Due to the use of positive-displacement pumps, the need for an intermediate sewage lift station is only anticipated when flows or head exceed the capabilities of the individual residential pumps.

This alternate may require that the new septic tanks be installed by the owner if they are not adequately sized or in a condition suitable for use. Each septic tank would need to be evaluated on a case-by-case basis. Septic tank maintenance costs for pumping each septic tank at regular intervals and maintenance of the pump with be the responsibility of the owner. We have assumed a five-year pump out interval, but the actual time will vary due to individual use. For low use residences, a ten-year pump-out may be adequate while high use facilities may need to be pumped every one to two years. We have assumed a cost to have tanks serviced by a local septic hauler.

Once the liquid waste is collected from the properties within the service district, it would then be transported to a wastewater treatment facility for treatment and disposal.

Design Criteria

1. Proposed system will include 141 residential service connections with a total number of 141 parcels being assessed within the service district.
2. Every service connection is assumed to require 100 feet of service line, and a septic system is assumed to exist at each initial connection.
3. All the initial connections are assumed to have adequate new septic tanks.
4. Low pressure sewers and force mains sized to provide a minimum of two feet per second flow velocity at average daily flow rates.
5. Directional drilling of service lines, low-pressure force main and transmission force mains will be utilized, reducing the restoration costs to service connection locations, and points of additional infrastructure or access are required such as intermediate lift stations, air relief valves, and cleanouts.

Environmental Impacts.

This alternative would utilize directional drilling for main and service placement, reducing construction impact to localized points throughout the service areas as opposed to a trench installation where every foot of infrastructure impacts the surface environment. A preliminary Environmental Review has been completed and no adverse effects are anticipated.

Land Requirements.

The low-pressure sewer and force main route are within existing road rights-of-way, and the individual service connections from the road up to the individual effluent pump station will be within construction easements. Land or easements may need to be acquired for intermediate lift stations and for the transmission main pumping stations. No easements or land purchase agreements have been made at this time. Upstream of the effluent pump, including the septic tank, would be owned and maintained by the parcel owner.

Potential Construction Problems.

There are approximately five miles of proposed low-pressure sewer and force main proposed so areas of poor soils, high groundwater, and conflicts with other utility infrastructure are likely to be encountered. However, since the installed sewer will be a pressure sewer, it is easy to adjust the location and/or depth to work around existing features and utilities.

Sustainability Considerations

1. This alternative requires electric power for each service connection and intermediate lift station. The power requirements for the effluent pumps are slightly less than those for a grinder pump due to the solids being removed in a septic tank.
2. Each connection will have a septic tank that requires periodic pumping, trucking, and separate disposal of sewage solids.
3. Chemical addition is anticipated to reduce odors and maintain sewage quality for the time required to move the sewage from the individual service connection to the treatment facility.

Cost Estimates

1. The Preliminary Engineer's Estimate for this project can be reviewed in **Appendix D**.
2. Total Project Capital Cost: $10,100,000

4.2 Wastewater Treatment Alternatives

1. Connect to existing Milton Township System/Elk Rapids Treatment Facility
2. Township Owned and Operated Wastewater Treatment Facility

4.2.1 Option #1-Village of Elk Rapids Wastewater Treatment Facility

Description

Once the waste is collected from the properties around Elk Lake, it would then be transported to the Elk Rapids WWTF for treatment and disposal. The proposed route for this force main is along Cherry Avenue and connects to the existing Township force main in Kewadin. Transmission from the collection system would be done using existing infrastructure transporting the sewage to the treatment facility, which is located approximately 2.5 miles southwest of Kewadin.

Currently, the Elk Rapids Village states that the WWTF is operating well under its treatment capacity and has 50 additional REU's of capacity available for connection. With minimal improvements required the WWTF can accommodate the flows from the proposed expansion of Milton Townships system. The available capacity is an existing lagoon system that is currently capable of accepting the additional flow beyond the 50 REU's with operational improvements currently in the planning phase. Correspondence from the Elk Rapids Plant operator states they would be willing to agree to expand as needed to meet future flows from the Milton Township.

Environmental Impacts.

Any impacts for this option would be minimal and localized at the site of the existing Elk Rapids treatment facility. Impacts from the installation of the delivery sewer (from collection to the treatment site) may arise. This route may need to be adjusted in the event a full Environmental Review is needed. An Environmental Review of this option was not performed.

Land Requirements.

The force main route is within existing road rights-of-way, and all treatment will be at the existing Elk Rapids facility.

Construction Problems.

No known construction problems are identified. The Elk Rapids Treatment Facility will provide the design and construction of any needed improvements at the treatment facility.

Sustainability Considerations

This alternative utilizes an existing treatment facility with available planned capacity, making the required improvements minimal.

Cost Estimate

This alternative utilizes an existing treatment facility. Improvements are limited to plant headworks upgrades as the lagoon system has adequate capacity to accept the additional flows. Estimated costs for the Milton Twp additional flows are $500,000.

4.2.2 Option#2-Township Owned and Operated Wastewater Treatment Facility

Description

Treatment of wastewater by a Milton Township-owned lagoon system would be logistically feasible but cost-wise substantially more than utilizing the existing Elk Rapids system. Wastewater would be treated in multiple cells, stored during the non-discharge months, and then disposed of through spray irrigation on crop fields as close as possible to the lagoon site.

A preliminary design of this alternative would place a large assumption that property can be secured to build new treatment and storage lagoons and the spray irrigation areas. Additionally, the Township would be required to hire additional staff to operate the facility. The proposed 141 REU's are assumed to produce 34,000 gallons per day at 235 gallons per day per REU. The Elk Rapids Wastewater Treatment facility provided the current calculated gallons per day per REU. This would equate to $2,600,000 to construct the treatment facility, acquire property and install additional force main to convey wastewater to the treatment site. This amount does not account for short term assets and operation and maintenance costs.

Environmental Impacts.

Impacts for this option include the construction of a new treatment facility on multiple acquired properties. Impacts from the installation of the delivery sewer (from collection to the treatment site) may arise. A route and treatment facility site(s) have not been reviewed as part of this study.

Land Requirements.

There are no land requirements for this option.

Sustainability Considerations

Site locations and feasibility assessments will need to be made. Consideration to future system expansions and location to populations will need to be considered.

Cost Estimate

1. The Preliminary Engineer's Estimate for this project can be reviewed in **Appendix E**
2. Total Project Capital Cost: $2,600,000

5.0 COMPARISON OF ALTERNATIVES

5.1 Present Worth (life cycle) Cost Analysis

A user impact cost analysis has been performed for two collection alternatives and two treatment alternatives that were considered. The analysis entailed completing the annual costs shown in Attachment x. A summary matrix rating system is provided below.

5.2 Matrix Rating System of Present Worth Cost Analysis

Following are two matrixes showing the results of the user impact cost analysis. The first matrix shows the results of the collection alternatives analysis. The second matrix shows the results of the treatment alternatives analysis.

Table 5-1: Matrix of Collection System Costs

	Option No. 1: Low-Pressure System with Grinder Pumps	Option No. 2: STEP Collection
Initial Capital Costs	$11,500,000	$10,100,000
30-yr Scheduled Annual Payment with interest at 3.85%	$652,988	$573,493
Annual O&M Amount	$159,000	$159,000
Annual Short Term Asset Amount	$44,000	$22,208
Total Annual Amount	$834,196	$757,701
Monthly User Impact	$506	$446

Table 5-2: Matrix of Treatment Alternatives Cost

	Alternative No. 1: Connection to Elk Rapids WWTF	Alternative No. 2: Connection to New Milton Twp WWTP
Initial Capital Costs	$500,000	$2,600,000
30-yr Scheduled Annual Payment with interest at 3.85%	$28,391	$147,631
Annual O&M Amount	-	$274,000
Annual Short Term Asset Amount	-	$12,000
Annual Milton Twp/Elk Rapids Service Agreement Total per user	$448	
Total Annual Amount	$36,021	$433,631
Monthly User Impact	$54	$256

5.3 Results of Present Worth Cost Analysis

The Present worth Cost Analysis for the collection system alternatives resulted in relatively close life-cycle costs for the two systems investigated. The current Present Worth Cost Analysis calculation puts the life cycle cost of the STEP system lower than the grinder pump system. However, it does not account for the potential need to replace septic tank that are inadequate for accepting STEP system pumps. This could potentially bring the two systems to equal cost. There is a concern of low flow

periods in portions of the system due to seasonal homes where a low-pressure grinder pump system may allow solids to settle in the force mains causing backups and flow issues.

A review of the current treatment Present Worth Cost Analysis shows that the treatment option of utilizing the existing Elk Rapids system is the lowest life cycle cost.

There are more initial capital costs and risks for increased costs involved with Milton Township having its own lagoon WWTP. Procuring land, easements, and treatment and discharge permits could result in additional costs that are difficult to predict on a project that may not be completed for several years. The anticipated lower cost of annual O&M makes this option almost as cost-effective.

However, the reduced responsibility comes with less control over operational items and how they will impact customer costs over time. The treatment cost will be set by a separate entity and passed through to the users.

6.0 RECOMMENDED ALTERNATIVE

6.1 Collection System

The cost of construction for both a STEP or Grinder pump system is relatively close and does not affect the initial investment need for construction. However, it does not account for the much higher cost of short-lived assets due to the more expensive grinder pumps typically needing replacement more often than STEP pumps. There is also a concern of low flow periods in portions of the system due to seasonal homes where a low-pressure grinder pump system may allow solids to settle in the force mains causing backups and flow issues.

Given the area's seasonal occupancy tendencies a STEP system is recommended as it reduces the probability of solids settling and causing backups. A preliminary system layout is located in **Appendix F**.

6.2 Treatment System

The Village of Elk Rapids wastewater treatment plant currently has capacity to handle 50 additional REU's. This excess capacity would not be enough to serve the proposed sewer district expansion of 141 REU's. The available capacity would be enough to serve residences along the lake shore portion of the Elk Tip Dr, where the greatest concentration of mounded drain fields is located. Given the planned additional capacity at the Elk Rapids treatment plant, accommodating the entire study area is possible for less cost and impact. Due to the estimated lower cost to the Township utilizing the Elk Rapids System is recommended.

Appendix A.
Streets Wetland Map

Wetlands Map Viewer

October 2, 2023

Part 303 Final Wetlands Inventory

- Wetlands as identified on NWI and MIRIS maps
- Soil areas which include wetland soils
- Wetlands as identified on NWI and MIRIS maps and soil areas which include wetland soils

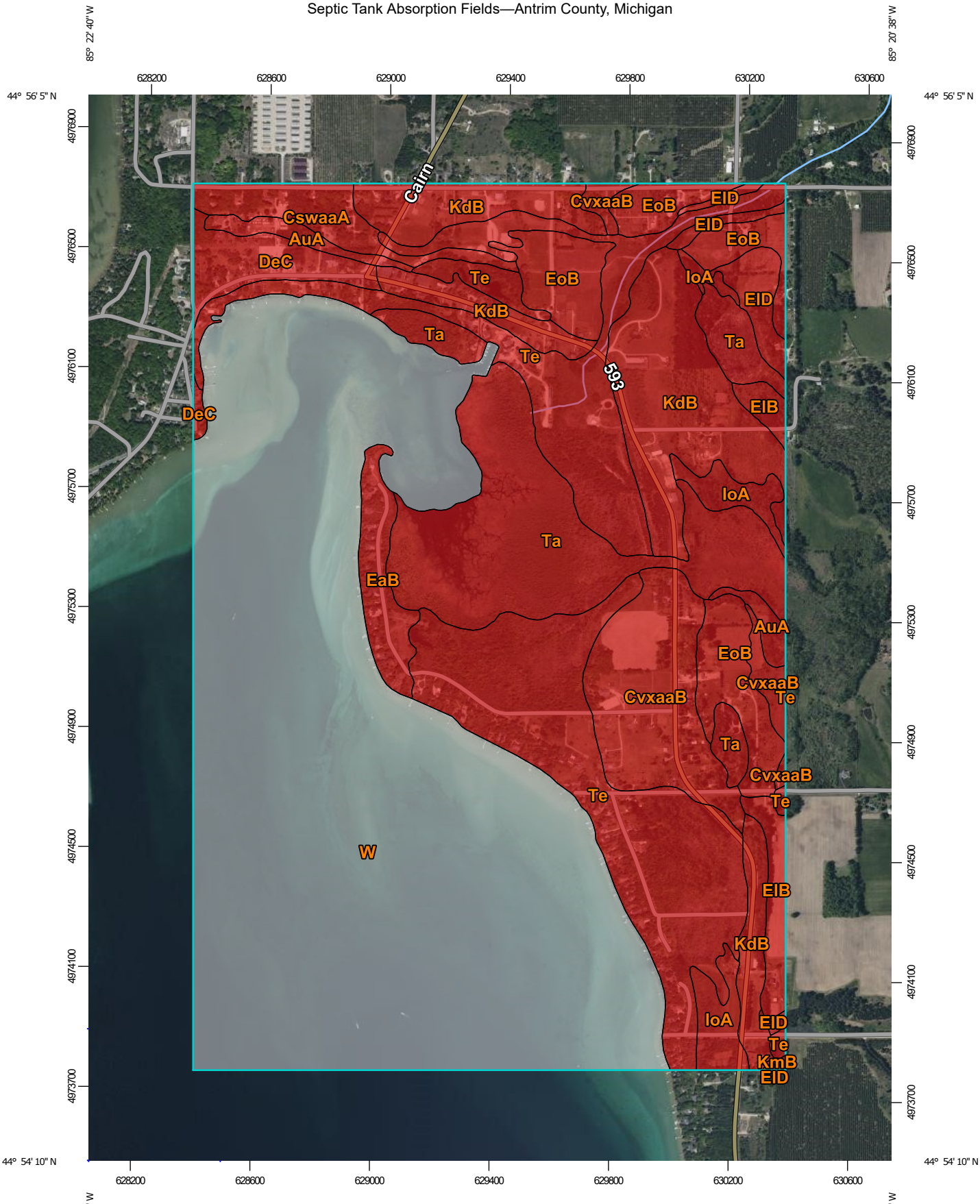
1:35,489

0 0.3 0.6 1.2 mi

0 0.5 1 2 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Appendix B.
Septic Tank Absorption Fields


85° 22' 40" W
85° 20' 38" W
44° 56' 5" N
44° 54' 10" N
628200
628600
629000
629400
629800
630200
630600
4976900
4976500
4976100
4975700
4975300
4974900
4974500
4974100
4973700
Cairn
593
CswaaA
AuA
DeC
KdB
CvxaaB
EoB
EID
Te
IoA
Ta
EaB
W
EIB
KmB
Map Scale: 1:17,300 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 250 500 1000 1500
Feet
0 500 1000 2000 3000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Lines

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Points

Very limited

Somewhat limited

Not limited

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Antrim County, Michigan
Survey Area Data: Version 19, Aug 24, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 27, 2023—May 28, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Septic Tank Absorption Fields

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
AuA	Au Gres-Finch sands, 0 to 4 percent slopes	Very limited	Au Gres (50%)	Depth to saturated zone (1.00)	12.8	0.9%
				Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
			Finch (30%)	Depth to cemented pan (1.00)		
				Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
			Kalkaska (15%)	Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
			Roscommon (5%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
CswaaA	Croswell sand, 0 to 6 percent slopes	Very limited	Croswell (85%)	Depth to saturated zone (1.00)	24.3	1.7%
				Filtering capacity (1.00)		
				Seepage, bottom layer (1.00)		
			Rubicon (8%)	Filtering capacity (1.00)		
				Seepage, bottom layer (1.00)		
			Au Gres (6%)	Depth to saturated zone (1.00)		
				Filtering capacity (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Seepage, bottom layer (1.00)		
			Deford (1%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Filtering capacity (1.00)		
				Seepage, bottom layer (1.00)		
CvxaaB	Charlevoix sandy loam, 0 to 4 percent slopes	Very limited	Charlevoix (90%)	Depth to saturated zone (1.00)	74.5	5.1%
				Slow water movement (0.95)		
			Ensley (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Slow water movement (0.32)		
			Onaway (2%)	Slow water movement (1.00)		
			Blue Lake (2%)	Filtering capacity (1.00)		
				Seepage, bottom layer (1.00)		
DeC	Deer Park sand, 2 to 20 percent slopes	Very limited	Deer Park (85%)	Seepage, bottom layer (1.00)	24.9	1.7%
				Filtering capacity (1.00)		
				Slope (0.37)		
			Au Gres (5%)	Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
			Finch (3%)	Depth to cemented pan (1.00)		
				Depth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Seepage, bottom layer (1.00)		
			Roscommon (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
			Tawas (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Subsidence (1.00)		
				Seepage, bottom layer (1.00)		
			Croswell (2%)	Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
EaB	East Lake gravelly loamy sand, 0 to 6 percent slopes	Very limited	East Lake (90%)	Seepage, bottom layer (1.00)	22.1	1.5%
				Filtering capacity (1.00)		
			Rubicon (5%)	Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
			Kalkaska (5%)	Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
ElB	Emmet-Montcalm complex, lake moderated, 3 to 12 percent slopes	Very limited	Emmet (41%)	Seepage, bottom layer (1.00)	18.3	1.3%
				Slow water movement (0.50)		
			Montcalm (39%)	Seepage, bottom layer (1.00)		
			Ensley (5%)	Ponding (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
				Slow water movement (0.50)		
			Kalkaska (5%)	Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
			Rubicon (3%)	Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
			Charlevoix (2%)	Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
EID	Emmet-Montcalm complex, lake moderated, 12 to 40 percent slopes	Very limited	Emmet (41%)	Slope (1.00)	18.1	1.2%
				Seepage, bottom layer (1.00)		
				Slow water movement (0.50)		
			Montcalm (39%)	Slope (1.00)		
				Seepage, bottom layer (1.00)		
			Kalkaska (5%)	Seepage, bottom layer (1.00)		
				Slope (1.00)		
				Filtering capacity (1.00)		
			Ensley (5%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
				Slow water movement (0.50)		
			Rubicon (3%)	Seepage, bottom layer (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Filtering capacity (1.00)		
			Charlevoix (2%)	Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
EoB	Emmet-Onaway sandy loams, 3 to 12 percent slopes	Very limited	Emmet (50%)	Seepage, bottom layer (1.00)	69.7	4.8%
				Slow water movement (0.50)		
			Kalkaska (5%)	Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
			Charlevoix (5%)	Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
			Ensley (5%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
				Slow water movement (0.50)		
			Montcalm (5%)	Seepage, bottom layer (1.00)		
IoA	Iosco sand, 0 to 4 percent slopes	Very limited	Iosco (95%)	Depth to saturated zone (1.00)	24.8	1.7%
				Slow water movement (1.00)		
			Kawkawlin (5%)	Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
KdB	Kalkaska-East Lake complex, lake moderated, 0	Very limited	Kalkaska (55%)	Seepage, bottom layer (1.00)	134.4	9.2%
				Filtering capacity (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
	to 6 percent slopes		East Lake (35%)	Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
			Karlin (10%)	Seepage, bottom layer (1.00)		
KmB	Kalkaska-Montcalm complex, 0 to 12 percent slopes	Very limited	Kalkaska (45%)	Seepage, bottom layer (1.00)	0.4	0.0%
				Filtering capacity (1.00)		
			Montcalm (35%)	Seepage, bottom layer (1.00)		
			Emmet (10%)	Seepage, bottom layer (1.00)		
				Slow water movement (0.50)		
			East Lake (10%)	Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
Ta	Tawas muck	Very limited	Tawas (85%)	Ponding (1.00)	146.9	10.1%
				Depth to saturated zone (1.00)		
				Subsidence (1.00)		
				Seepage, bottom layer (1.00)		
			Au Gres (5%)	Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
			Roscommon (5%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
			Finch (5%)	Depth to cemented pan (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
Te	Tawas-Ensley complex	Very limited	Ensley (50%)	Ponding (1.00)	234.6	16.1%
				Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
				Slow water movement (0.50)		
			Tawas (40%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Subsidence (1.00)		
				Seepage, bottom layer (1.00)		
			Roscommon (10%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
W	Water	Not rated	Water (100%)		647.9	44.6%
Totals for Area of Interest					**1,453.6**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	805.7	55.4%
Null or Not Rated	647.9	44.6%
Totals for Area of Interest	**1,453.6**	**100.0%**

Description

ENG - Engineering

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to

validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

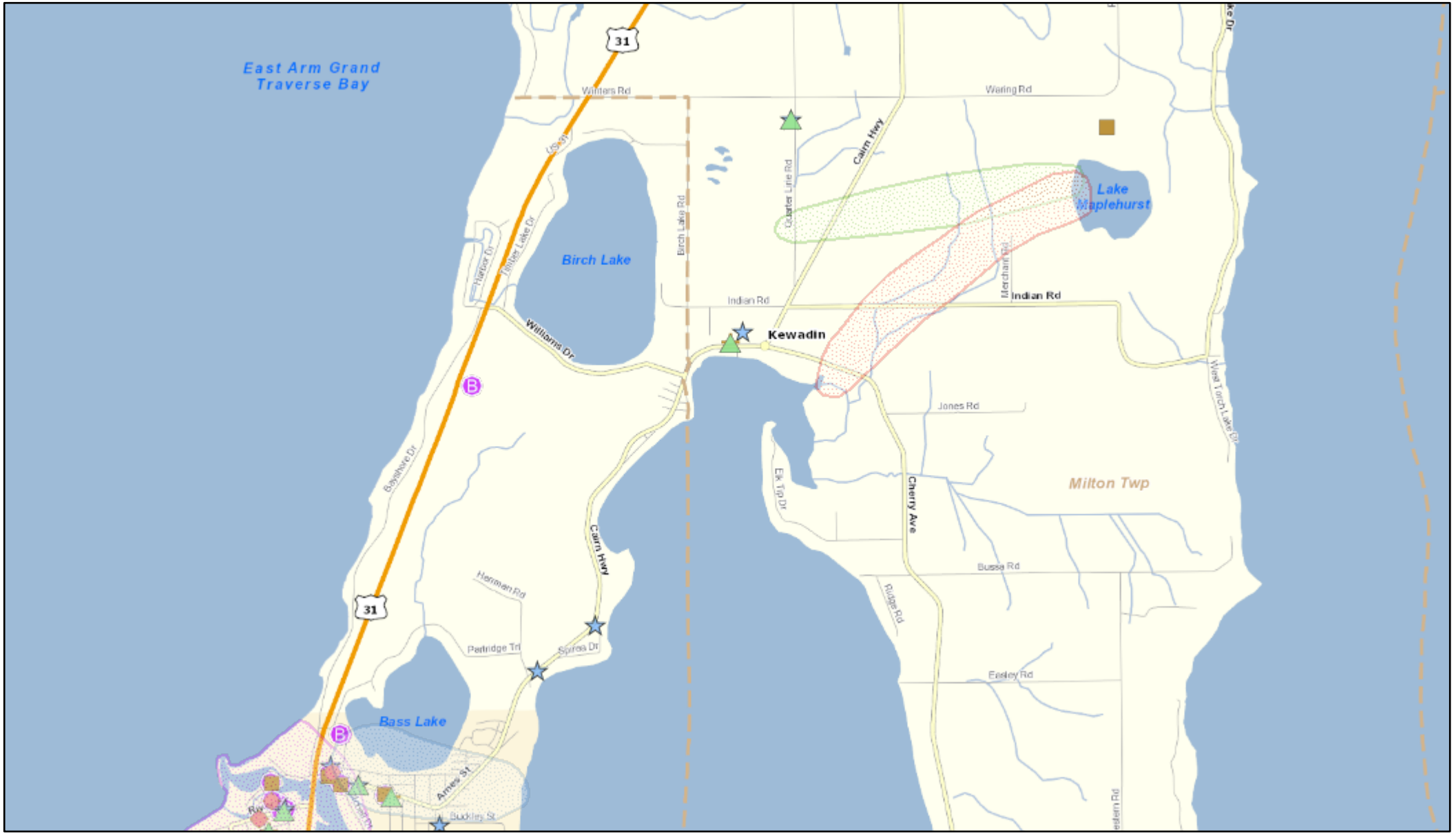
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix C.
Environmental Map

Environmental Mapper



October 2, 2023

- Low Vulnerability WHPA
- Type 2 Provisional WHPA
- Type 1 Provisional WHPA
- Type 1 Traditional WHPA
- Michigan Deptartment of Transportation - Point
- Notice of Approved Env. Remediation - Point
- SFC
- WRG
- TIF - Act 381
- Assessments
- Brownfield Loan
- Brownfield Grant

1:39,034

0 0.33 0.65 1.3 mi

0 0.5 1 2 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Map by: State of Michigan - CSS

Appendix D.
Collection System EOPPC

Preliminary Engineer's Estimate
Milton Township Sewer Extension
STEP Collection System
Antrim County, Michigan
May 2024

The project estimate is Wade Trim's pre-design opinion of probable cost based upon the available information. Assumes one pump station per connection, 1.25" service from pump station to main in road.

	Description	Quantity	Unit	Unit Price	Amount
1	Mobilization (5%)	1	LS	$350,730.00	$350,730
2	Traffic Maintenance and Control	1	LS	$250,000.00	$250,000
3	Temporary Soil Erosion and Sedimentation Control	1	LS	$150,000.00	$150,000
4	Dewatering	1	LS	$100,000.00	$100,000
5	1.25" Dia, HDPE (San Service)	14,100	LF	$30.00	$423,000
6	2" Dia, HDPE	2,000	LF	$40.00	$80,000
7	3" Dia, HDPE	24,350	LF	$50.00	$1,217,500
8	Air Release Structure	15	EA	$7,500.00	$112,500
9	Cleanout Structure	30	EA	$2,000.00	$60,000
10	Residential Pump Station, Orenco BPP PF10	141	EA	$15,000.00	$2,115,000
11	Intermediate Submersible Pump Station, Duplex	3	EA	$175,000.00	$525,000
12	Property Acquisition	3	EA	$20,000.00	$60,000
13	Sanitary Service Connection	141	EA	$5,000.00	$705,000
14	HMA Leveling Course 220Lb/Syd	200	Ton	$300.00	$60,000
15	Aggregate Shoulder	200	Ton	$30.00	$6,000
16	Portable Generator	1	EA	$90,000.00	$90,000
17	Pump Existing Septic Tanks	141	EA	$1,000.00	$141,000
18	Electric service connection	141	EA	$2,500.00	$352,500
19	Permanent Stand By Generator	3	EA	$90,000.00	$270,000
20	Protective Lining in Wet Well	3	EA	$18,000.00	$54,000
21	Activated Carbon Odor Control System	3	EA	$21,000.00	$63,000
22	Electricity to Sites	3	EA	$10,000.00	$30,000
23	Chemical injection @ Pump Station	1	LS	$100,000.00	$100,000
24	Restoration	1	LS	$100,000.00	$50,000
				Estimated Construction Cost:	**$7,365,230**
				Contingencies (10%)	**$736,500**
				Survey, Engineering, Construction Svcs. (25%)	**$2,025,400**
				Total Engineer's Estimate	**$10,100,000**

Preliminary Engineer's Estimate
Milton Township
Low-Pressure Grinder Collection System
Antrim, Michigan
May 2024

The project estimate is Wade Trim's pre-design opinion of probable cost based upon the available information. Assumes one grinder pump station per connection, 1.25" service from grinder station to main in road.

	Description	Quantity	Unit	Unit Price	Amount
1	Mobilization (5%)	1	LS	$757,850	$757,850
2	Traffic Maintenance and Control	1	LS	$250,000.00	$250,000
3	Temporary Soil Erosion and Sedimentation Control	1	LS	$150,000.00	$150,000
4	Dewatering	1	LS	$100,000.00	$100,000
5	1.25" Dia, HDPE (San Service)	14,100	LF	$30.00	$423,000
6	2" Dia, HDPE	2,000	LF	$40.00	$80,000
7	3" Dia, HDPE	24,350	LF	$50.00	$1,217,500
8	Air Release Structure	15	EA	$7,500.00	$112,500
9	Cleanout Structure	30	EA	$2,000.00	$60,000
10	Residential Ginder Pump Station, Simplex (DH071-93)	141	EA	$18,000.00	$2,538,000
11	Intermediate Submersible Pump Station, Duplex	3	EA	$175,000.00	$525,000
12	Property Acquisition	3	EA	$20,000.00	$60,000
13	Sanitary Service Connection	141	EA	$5,000.00	$705,000
14	HMA Leveling Course 220Lb/Syd	200	Ton	$300.00	$60,000
15	Aggregate Shoulder	200	Ton	$30.00	$6,000
16	Portable Generator	1	EA	$90,000.00	$90,000
16	Pump Existing Septic Tanks	141	EA	$1,000.00	$141,000
17	Electric service connection	141	EA	$2,500.00	$352,500
18	Abandon Existing Septic Tank	141	EA	$1,000.00	$141,000
19	Permanent Stand By Generator	3	EA	$90,000.00	$270,000
20	Protective Lining in Wet Well	3	EA	$18,000.00	$54,000
21	Activated Carbon Odor Control System	3	EA	$21,000.00	$63,000
22	Electricity to Sites	3	EA	$10,000.00	$30,000
23	Chemical injection @ Pump Station	1	LS	$100,000.00	$100,000
24	Restoration	1	LS	$100,000.00	$50,000

Estimated Construction Cost:	**$8,336,350**
Contingencies (10%)	**$833,600**
Survey, Engineering, Construction Svcs. (25%)	**$2,292,500**
Total Engineer's Estimate	**$11,500,000**

Short Term Assets
Milton Township
Low-Pressure STEP Collection System
Antrim County, Michigan
May 2024

	Description	life expectancy	# of units	Replacement Cost	Annual Amount
STEP Collection					
1	Residential Pump (assume 10% need replaced)	15	14	$2,000.00	$1,867
2	Pump Controls	15	14	$1,000.00	$933
3	Pump Vault Filter pack	10	141	$500.00	$7,050
4	LS pumps	15	5	$15,000.00	$5,000
5	LS Controls	15	5	$8,571.43	$2,857
6	Vehicles	10	1	$45,000.00	$4,500
				Total Annual Amount	**$22,208**

Short Term Assets
Milton Township
Low-Pressure Grinder Collection System
Antrim County, Michigan
May 2024

	Description	life expectancy	# of units	Replacement Cost	Annual Amount
STEP Collection					
1	Residential Pump	15	141	$2,300.00	$21,620
2	Pump Controls	15	141	$1,000.00	$9,400
3	LS pumps	15	5	$15,000.00	$5,000
4	LS Controls	15	5	$9,000.00	$3,000
5	Vehicles	10	1	$45,000.00	$4,500
				Total Annual Amount	**$44,000**

Operation & Maintenance
Milton Township Sewer Extension
Low-Pressure STEP Collection System
Antrim, Michigan
May 2024

	Description	Annual Amount
1	Utilities	$8,000
2	Contract Waste Disposal	$0
3	Salaries/Benefits	$100,000
4	Contract Services Other-Lab/Testing	$0
5	Other-Vehicles	$9,300
6	Administrative/Office	$25,000
7	Supplies	$5,000
8	Other-Chemicals	$5,000
9	Legal	$6,700
	Total	**$159,000**

Operation & Maintenance
Milton Township Sewer Extension
Low-Pressure Grinder Collection System
Antrim, Michigan
May 2024

	Description	Annual Amount
1	Utilities	$8,000
2	Contract Waste Disposal	$0
3	Salaries/Benefits	$100,000
4	Contract Services Other-Lab/Testing	$0
5	Other-Vehicles	$9,300
6	Administrative/Office	$25,000
7	Supplies	$5,000
8	Other-Chemicals	$5,000
9	Legal	$6,700
	Total	**$159,000**

Appendix E.
Treatment System EOPPC

Preliminary Engineer's Estimate
Milton Township
Township Owned Lagoon WWTP
Antrim County, Michigan
May, 2024

The project estimate is Wade Trim's pre-design opinion of probable cost based upon the available information. Assumes a suitable treatment and land application site is found between the two collection areas.

	Description	Quantity	Unit	Unit Price	Amount
	Lagoon Site				
1	Land Acquisition, Purchase and Survey	5	Acre	$3,450.00	$16,560
2	Hydrogeological Investigation	1	LSUM	$25,000.00	$25,000
3	Clear and Grub	5	Acre	$2,300.00	$11,500
4	High Rate Lagoons earthwork	2,130	CY	$4.60	$9,798
5	High Rate Lagoons lining, 60 mil hdpe	21600	SF	$2.01	$43,470
6	Storage Lagoons earthwork	11,328	CY	$4.60	$52,109
7	Storage Lagoons aerators	2	EA	$17,250.00	$34,500
8	install power/cabling	2	EA	$28,750.00	$57,500
9	lining, storage lagoon, 60 mil hdpe	108,000	SF	$2.01	$217,350
10	Electrical Utility	1	LSUM	$28,750.00	$28,750
11	Electrical Sw Gr, MCC, Standby Receptacle	1	LSUM	$86,250.00	$86,250
12	Flow Control Manholes, 4' diameter	2	EA	$5,750.00	$11,500
13	6inch PVC SDR 35 sewer(inc trench $18/LF)	120	LF	$48.61	$5,833
14	6 inch gate valves	6	EA	$8,395.00	$50,370
15	Pumps 500 gpm, Installed	1	EA	$86,250.00	$86,250
16	Storage Building	1	LSUM	$28,750.00	$28,750
17	**Irrigation Site**				
18	Land Acquisition, Purchase and Survey	14	Acre	$3,450.00	$49,680
19	Clear and Grub	14	Acre	$1,150.00	$16,560
20	Land Leveling	14	Acre	$1,150.00	$16,560
21	Irrigation Pond earthwork	3,000	CY	$4.60	$13,800
22	Irrigation Pond lining	14,700	SF	$2.01	$29,584
23	Pump Station, Manhole wetwell, 8 feet	0	EA	$13,800.00	$1,656
24	Valve Vault	0	EA	$23,000.00	$2,760
25	6 inch gate valves	1	EA	$2,300.00	$2,208
26	6inch check valves	3	EA	$2,300.00	$6,900
27	6 inch DIP fittings in valve vault	1	LSUM	$6,900.00	$6,900
28	Centerpivot irrigator	3	EA	$51,750.00	$155,250
29	8 inch HDPE, Directionally Drilled	180	LF	$52.90	$9,522
30	FM, Magnetic, 6 inch	1	EA	$11,500.00	$11,500
31	electrical	1	LSUM	$11,500.00	$11,500
				Estimated Construction Cost:	**$1,100,000**
				Contingencies (10%):	**$110,000**
				Engineering, Legal, & Construction Services (20%):	**$242,000**
				Lagoon WWTP Engineer's Estimate:	**$1,452,000**

Transmission Force Main to WWTF

1	Mobilization (5%)	1	LS	$41,000.00	$41,000
2	Traffic Maintenance and Control	1	LS	$20,000.00	$20,000
3	Temporary Soil Erosion and Sedimentation Control	1	LS	$5,000.00	$5,000
4	Dewatering	1	LS	$5,000.00	$5,000
5	3" Dia, HDPE	5,280	LF	$50.00	$264,000
6	Pump Station, Self Priming	1	EA	$175,000.00	$175,000
7	Permanent Stand By Generator	1	EA	$90,000.00	$90,000
8	Protective Lining in Wet Well	1	EA	$18,000.00	$18,000
9	Activated Carbon Odor Control System	1	EA	$21,000.00	$21,000
10	Property Acquisition	1	EA	$11,500.00	$11,500
11	Electricity to Sites	1	EA	$10,000.00	$10,000
12	Air Release Structure	7	EA	$7,500.00	$52,500
13	Cleanout Structure	7	EA	$2,000.00	$14,000
14	Asphalt	100	SY	$28.75	$2,875
15	Aggregate Shoulder	100	SY	$4.60	$460
16	Chemical injection @ Pump Station	1	LS	$100,000.00	$100,000
17	Restoration	1	LS	$15,000.00	$15,000

Estimated Construction Cost:	**$845,335**
Contingencies (10%):	**$84,500**
Engineering, Legal, & Construction Services (20%):	**$186,000**
Transmission Sanitary Sewer Engineer's Estimate:	**$1,116,000**
Total Construction Cost:	**$1,946,000**
Total non-Construction Cost:	**$622,500**
Total Project Engineer's Estimate:	**$2,600,000**

Short Term Assets
Milton Township
Township Owned Lagoon WWTP
Antrim County, Michigan
May, 2024

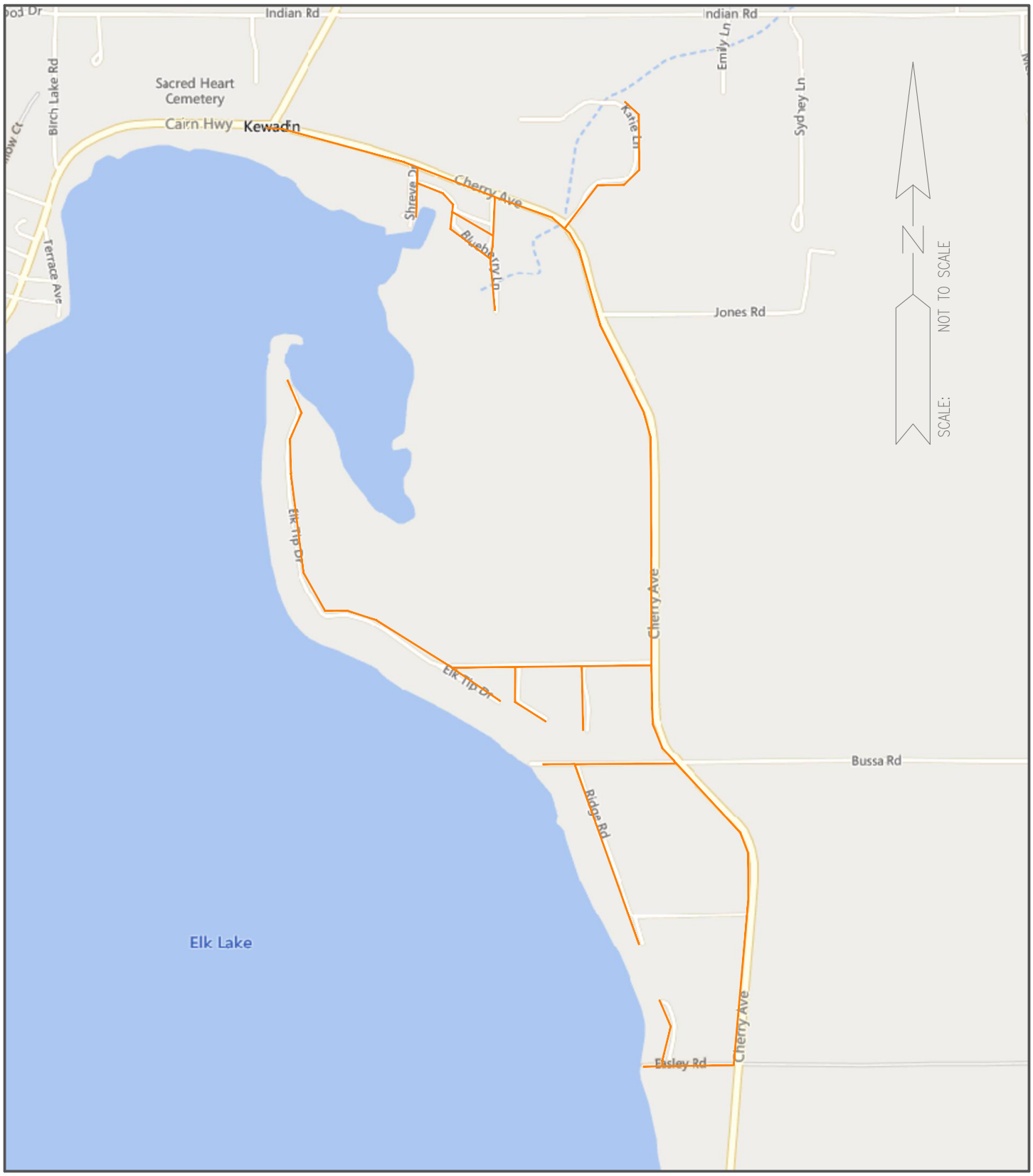
	Description	life expectancy	# of units	Replacement Cost	Annual Amount
Lagoon WWTP					
1	Aerator	15	1	$17,250.00	$1,150
2	Effluent Pump	15	1	$86,250.00	$5,750
3	Irrigation Pump	15	1	$17,250.00	$1,150
4	Flow Meter	15	1	$11,500.00	$767
5	Misc Monitoring and Equipment	5	1	$5,750.00	$1,150
6	LS Pump Controls	15	1	$5,750.00	$383
7	LS Pumps	15	1	$23,000.00	$1,533
8	Air Release Valve	15	7	$575.00	$268
				Estimated Annual RR&I Cost:	**$12,000**

Operation & Maintenance
Milton Township
Township Owned Lagoon WWTP
Antrim County, Michigan
May, 2024

Assumes 1 FT operator & 50% of admin costs

	Description	Annual Amount
Lagoon WWTP		
1	Personnel	$115,000
2	Administrative	$57,500
3	Energy	$37,950
4	Chemicals	$11,500
5	Monitoring and Testing	$5,750
6	Professional Services	$5,750
7	Residuals Disposal	$34,500
8	Misc	$5,750
	Total	**$274,000**

Appendix F.
System Map



MILTON TOWNSHIP
ANTRIM COUNTY
MICHIGAN

2024 SEWER
FEASIBILITY STUDY

WADE TRIM
10850 East Traverse Highway, Suite 2260
Traverse City, MI 49684
231.947.7400
www.wadetrim.com

SEC. – , – , –	
BOOK #: –	PAGE #: –
DR BY: JHS	COMP BY: –
CK BY: –	SRVY BY: –
JOB #:	MOT2001-01C
SHEET: 1 OF 1	

Appendix G.
Loan Summary

LP STEP System

Enter values

Loan amount	$10,100,000.00
Annual interest rate	3.85%
Loan period in years	30
Number of payments per year	1
Start date of loan	5/9/2024
Optional extra payments	$0.00

Loan summary

Scheduled payment	$573,493.16
Scheduled number of payments	30
Actual number of payments	1
Total early payments	$0.00
Total interest	$7,104,794.65

Payment number	Payment date	Beginning balance	Scheduled payment	Extra payment	Total payment	Principal	Interest	Ending balance	Cumulative interest
1	5/9/2024	$10,100,000.00	$573,493.16	$0.00	$573,493.16	$184,643.16	$388,850.00	$9,915,356.84	$388,850.00
2	6/9/2024	$9,915,356.84	$573,493.16	$0.00	$573,493.16	$191,751.92	$381,741.24	$9,723,604.93	$770,591.24
3	7/9/2024	$9,723,604.93	$573,493.16	$0.00	$573,493.16	$199,134.37	$374,358.79	$9,524,470.56	$1,144,950.03
4	8/9/2024	$9,524,470.56	$573,493.16	$0.00	$573,493.16	$206,801.04	$366,692.12	$9,317,669.52	$1,511,642.14
5	9/9/2024	$9,317,669.52	$573,493.16	$0.00	$573,493.16	$214,762.88	$358,730.28	$9,102,906.65	$1,870,372.42
6	10/9/2024	$9,102,906.65	$573,493.16	$0.00	$573,493.16	$223,031.25	$350,461.91	$8,879,875.40	$2,220,834.33
7	11/9/2024	$8,879,875.40	$573,493.16	$0.00	$573,493.16	$231,617.95	$341,875.20	$8,648,257.44	$2,562,709.53
8	12/9/2024	$8,648,257.44	$573,493.16	$0.00	$573,493.16	$240,535.24	$332,957.91	$8,407,722.20	$2,895,667.44
9	1/9/2025	$8,407,722.20	$573,493.16	$0.00	$573,493.16	$249,795.85	$323,697.30	$8,157,926.35	$3,219,364.75
10	2/9/2025	$8,157,926.35	$573,493.16	$0.00	$573,493.16	$259,412.99	$314,080.16	$7,898,513.36	$3,533,444.91
11	3/9/2025	$7,898,513.36	$573,493.16	$0.00	$573,493.16	$269,400.39	$304,092.76	$7,629,112.97	$3,837,537.68
12	4/9/2025	$7,629,112.97	$573,493.16	$0.00	$573,493.16	$279,772.31	$293,720.85	$7,349,340.66	$4,131,258.52
13	5/9/2025	$7,349,340.66	$573,493.16	$0.00	$573,493.16	$290,543.54	$282,949.62	$7,058,797.12	$4,414,208.14
14	6/9/2025	$7,058,797.12	$573,493.16	$0.00	$573,493.16	$301,729.47	$271,763.69	$6,757,067.66	$4,685,971.83
15	7/9/2025	$6,757,067.66	$573,493.16	$0.00	$573,493.16	$313,346.05	$260,147.10	$6,443,721.61	$4,946,118.93
16	8/9/2025	$6,443,721.61	$573,493.16	$0.00	$573,493.16	$325,409.87	$248,083.28	$6,118,311.73	$5,194,202.22
17	9/9/2025	$6,118,311.73	$573,493.16	$0.00	$573,493.16	$337,938.15	$235,555.00	$5,780,373.58	$5,429,757.22
18	10/9/2025	$5,780,373.58	$573,493.16	$0.00	$573,493.16	$350,948.77	$222,544.38	$5,429,424.81	$5,652,301.60
19	11/9/2025	$5,429,424.81	$573,493.16	$0.00	$573,493.16	$364,460.30	$209,032.86	$5,064,964.51	$5,861,334.46
20	12/9/2025	$5,064,964.51	$573,493.16	$0.00	$573,493.16	$378,492.02	$195,001.13	$4,686,472.49	$6,056,335.59
21	1/9/2026	$4,686,472.49	$573,493.16	$0.00	$573,493.16	$393,063.96	$180,429.19	$4,293,408.52	$6,236,764.78
22	2/9/2026	$4,293,408.52	$573,493.16	$0.00	$573,493.16	$408,196.93	$165,296.23	$3,885,211.60	$6,402,061.01
23	3/9/2026	$3,885,211.60	$573,493.16	$0.00	$573,493.16	$423,912.51	$149,580.65	$3,461,299.09	$6,551,641.65
24	4/9/2026	$3,461,299.09	$573,493.16	$0.00	$573,493.16	$440,233.14	$133,260.01	$3,021,065.95	$6,684,901.67
25	5/9/2026	$3,021,065.95	$573,493.16	$0.00	$573,493.16	$457,182.12	$116,311.04	$2,563,883.83	$6,801,212.71
26	6/9/2026	$2,563,883.83	$573,493.16	$0.00	$573,493.16	$474,783.63	$98,709.53	$2,089,100.20	$6,899,922.24
27	7/9/2026	$2,089,100.20	$573,493.16	$0.00	$573,493.16	$493,062.80	$80,430.36	$1,596,037.40	$6,980,352.59
28	8/9/2026	$1,596,037.40	$573,493.16	$0.00	$573,493.16	$512,045.72	$61,447.44	$1,083,991.69	$7,041,800.03
29	9/9/2026	$1,083,991.69	$573,493.16	$0.00	$573,493.16	$531,759.48	$41,733.68	$552,232.21	$7,083,533.71
30	10/9/2026	$552,232.21	$573,493.16	$0.00	$552,232.21	$530,971.27	$21,260.94	$0.00	$7,104,794.65

LP Grinder Pump System

Enter values

Loan amount	$11,500,000.00
Annual interest rate	3.85%
Loan period in years	30
Number of payments per year	1
Start date of loan	5/9/2024
Optional extra payments	$0.00

Loan summary

Scheduled payment	$652,987.26
Scheduled number of payments	30
Actual number of payments	1
Total early payments	$0.00
Total interest	$8,089,617.68

Payment number	Payment date	Beginning balance	Scheduled payment	Extra payment	Total payment	Principal	Interest	Ending balance	Cumulative interest
1	5/9/2024	$11,500,000.00	$652,987.26	$0.00	$652,987.26	$210,237.26	$442,750.00	$11,289,762.74	$442,750.00
2	6/9/2024	$11,289,762.74	$652,987.26	$0.00	$652,987.26	$218,331.39	$434,655.87	$11,071,431.35	$877,405.87
3	7/9/2024	$11,071,431.35	$652,987.26	$0.00	$652,987.26	$226,737.15	$426,250.11	$10,844,694.21	$1,303,655.97
4	8/9/2024	$10,844,694.21	$652,987.26	$0.00	$652,987.26	$235,466.53	$417,520.73	$10,609,227.68	$1,721,176.70
5	9/9/2024	$10,609,227.68	$652,987.26	$0.00	$652,987.26	$244,531.99	$408,455.27	$10,364,695.69	$2,129,631.97
6	10/9/2024	$10,364,695.69	$652,987.26	$0.00	$652,987.26	$253,946.47	$399,040.78	$10,110,749.21	$2,528,672.75
7	11/9/2024	$10,110,749.21	$652,987.26	$0.00	$652,987.26	$263,723.41	$389,263.84	$9,847,025.80	$2,917,936.59
8	12/9/2024	$9,847,025.80	$652,987.26	$0.00	$652,987.26	$273,876.76	$379,110.49	$9,573,149.04	$3,297,047.09
9	1/9/2025	$9,573,149.04	$652,987.26	$0.00	$652,987.26	$284,421.02	$368,566.24	$9,288,728.02	$3,665,613.33
10	2/9/2025	$9,288,728.02	$652,987.26	$0.00	$652,987.26	$295,371.23	$357,616.03	$8,993,356.80	$4,023,229.35
11	3/9/2025	$8,993,356.80	$652,987.26	$0.00	$652,987.26	$306,743.02	$346,244.24	$8,686,613.78	$4,369,473.59
12	4/9/2025	$8,686,613.78	$652,987.26	$0.00	$652,987.26	$318,552.63	$334,434.63	$8,368,061.15	$4,703,908.22
13	5/9/2025	$8,368,061.15	$652,987.26	$0.00	$652,987.26	$330,816.90	$322,170.35	$8,037,244.25	$5,026,078.58
14	6/9/2025	$8,037,244.25	$652,987.26	$0.00	$652,987.26	$343,553.35	$309,433.90	$7,693,690.90	$5,335,512.48
15	7/9/2025	$7,693,690.90	$652,987.26	$0.00	$652,987.26	$356,780.16	$296,207.10	$7,336,910.74	$5,631,719.58
16	8/9/2025	$7,336,910.74	$652,987.26	$0.00	$652,987.26	$370,516.19	$282,471.06	$6,966,394.55	$5,914,190.64
17	9/9/2025	$6,966,394.55	$652,987.26	$0.00	$652,987.26	$384,781.07	$268,206.19	$6,581,613.48	$6,182,396.83
18	10/9/2025	$6,581,613.48	$652,987.26	$0.00	$652,987.26	$399,595.14	$253,392.12	$6,182,018.35	$6,435,788.95
19	11/9/2025	$6,182,018.35	$652,987.26	$0.00	$652,987.26	$414,979.55	$238,007.71	$5,767,038.80	$6,673,796.66
20	12/9/2025	$5,767,038.80	$652,987.26	$0.00	$652,987.26	$430,956.26	$222,030.99	$5,336,082.53	$6,895,827.65
21	1/9/2026	$5,336,082.53	$652,987.26	$0.00	$652,987.26	$447,548.08	$205,439.18	$4,888,534.46	$7,101,266.83
22	2/9/2026	$4,888,534.46	$652,987.26	$0.00	$652,987.26	$464,778.68	$188,208.58	$4,423,755.78	$7,289,475.41
23	3/9/2026	$4,423,755.78	$652,987.26	$0.00	$652,987.26	$482,672.66	$170,314.60	$3,941,083.12	$7,459,790.00
24	4/9/2026	$3,941,083.12	$652,987.26	$0.00	$652,987.26	$501,255.56	$151,731.70	$3,439,827.56	$7,611,521.70
25	5/9/2026	$3,439,827.56	$652,987.26	$0.00	$652,987.26	$520,553.89	$132,433.36	$2,919,273.67	$7,743,955.06
26	6/9/2026	$2,919,273.67	$652,987.26	$0.00	$652,987.26	$540,595.22	$112,392.04	$2,378,678.45	$7,856,347.10
27	7/9/2026	$2,378,678.45	$652,987.26	$0.00	$652,987.26	$561,408.14	$91,579.12	$1,817,270.31	$7,947,926.22
28	8/9/2026	$1,817,270.31	$652,987.26	$0.00	$652,987.26	$583,022.35	$69,964.91	$1,234,247.96	$8,017,891.13
29	9/9/2026	$1,234,247.96	$652,987.26	$0.00	$652,987.26	$605,468.71	$47,518.55	$628,779.25	$8,065,409.67
30	10/9/2026	$628,779.25	$652,987.26	$0.00	$628,779.25	$604,571.25	$24,208.00	$0.00	$8,089,617.68

Elk Rapids WWTP Improvements

Enter values

Loan amount	$500,000.00
Annual interest rate	3.85%
Loan period in years	30
Number of payments per year	1
Start date of loan	5/9/2024
Optional extra payments	$0.00

Loan summary

Scheduled payment	$28,390.75
Scheduled number of payments	30
Actual number of payments	1
Total early payments	$0.00
Total interest	$351,722.51

Payment number	Payment date	Beginning balance	Scheduled payment	Extra payment	Total payment	Principal	Interest	Ending balance	Cumulative interest
1	5/9/2024	$500,000.00	$28,390.75	$0.00	$28,390.75	$9,140.75	$19,250.00	$490,859.25	$19,250.00
2	6/9/2024	$490,859.25	$28,390.75	$0.00	$28,390.75	$9,492.67	$18,898.08	$481,366.58	$38,148.08
3	7/9/2024	$481,366.58	$28,390.75	$0.00	$28,390.75	$9,858.14	$18,532.61	$471,508.44	$56,680.69
4	8/9/2024	$471,508.44	$28,390.75	$0.00	$28,390.75	$10,237.68	$18,153.08	$461,270.77	$74,833.77
5	9/9/2024	$461,270.77	$28,390.75	$0.00	$28,390.75	$10,631.83	$17,758.92	$450,638.94	$92,592.69
6	10/9/2024	$450,638.94	$28,390.75	$0.00	$28,390.75	$11,041.15	$17,349.60	$439,597.79	$109,942.29
7	11/9/2024	$439,597.79	$28,390.75	$0.00	$28,390.75	$11,466.24	$16,924.51	$428,131.56	$126,866.81
8	12/9/2024	$428,131.56	$28,390.75	$0.00	$28,390.75	$11,907.69	$16,483.06	$416,223.87	$143,349.87
9	1/9/2025	$416,223.87	$28,390.75	$0.00	$28,390.75	$12,366.13	$16,024.62	$403,857.74	$159,374.49
10	2/9/2025	$403,857.74	$28,390.75	$0.00	$28,390.75	$12,842.23	$15,548.52	$391,015.51	$174,923.02
11	3/9/2025	$391,015.51	$28,390.75	$0.00	$28,390.75	$13,336.65	$15,054.10	$377,678.86	$189,977.11
12	4/9/2025	$377,678.86	$28,390.75	$0.00	$28,390.75	$13,850.11	$14,540.64	$363,828.75	$204,517.75
13	5/9/2025	$363,828.75	$28,390.75	$0.00	$28,390.75	$14,383.34	$14,007.41	$349,445.40	$218,525.16
14	6/9/2025	$349,445.40	$28,390.75	$0.00	$28,390.75	$14,937.10	$13,453.65	$334,508.30	$231,978.80
15	7/9/2025	$334,508.30	$28,390.75	$0.00	$28,390.75	$15,512.18	$12,878.57	$318,996.12	$244,857.37
16	8/9/2025	$318,996.12	$28,390.75	$0.00	$28,390.75	$16,109.40	$12,281.35	$302,886.72	$257,138.72
17	9/9/2025	$302,886.72	$28,390.75	$0.00	$28,390.75	$16,729.61	$11,661.14	$286,157.11	$268,799.86
18	10/9/2025	$286,157.11	$28,390.75	$0.00	$28,390.75	$17,373.70	$11,017.05	$268,783.41	$279,816.91
19	11/9/2025	$268,783.41	$28,390.75	$0.00	$28,390.75	$18,042.59	$10,348.16	$250,740.82	$290,165.07
20	12/9/2025	$250,740.82	$28,390.75	$0.00	$28,390.75	$18,737.23	$9,653.52	$232,003.59	$299,818.59
21	1/9/2026	$232,003.59	$28,390.75	$0.00	$28,390.75	$19,458.61	$8,932.14	$212,544.98	$308,750.73
22	2/9/2026	$212,544.98	$28,390.75	$0.00	$28,390.75	$20,207.77	$8,182.98	$192,337.21	$316,933.71
23	3/9/2026	$192,337.21	$28,390.75	$0.00	$28,390.75	$20,985.77	$7,404.98	$171,351.44	$324,338.70
24	4/9/2026	$171,351.44	$28,390.75	$0.00	$28,390.75	$21,793.72	$6,597.03	$149,557.72	$330,935.73
25	5/9/2026	$149,557.72	$28,390.75	$0.00	$28,390.75	$22,632.78	$5,757.97	$126,924.94	$336,693.70
26	6/9/2026	$126,924.94	$28,390.75	$0.00	$28,390.75	$23,504.14	$4,886.61	$103,420.80	$341,580.31
27	7/9/2026	$103,420.80	$28,390.75	$0.00	$28,390.75	$24,409.05	$3,981.70	$79,011.75	$345,562.01
28	8/9/2026	$79,011.75	$28,390.75	$0.00	$28,390.75	$25,348.80	$3,041.95	$53,662.95	$348,603.96
29	9/9/2026	$53,662.95	$28,390.75	$0.00	$28,390.75	$26,324.73	$2,066.02	$27,338.23	$350,669.99
30	10/9/2026	$27,338.23	$28,390.75	$0.00	$27,338.23	$26,285.71	$1,052.52	$0.00	$351,722.51

TWP Owned WWTP

Enter values

Loan amount	$2,600,000.00
Annual interest rate	3.85%
Loan period in years	30
Number of payments per year	1
Start date of loan	5/9/2024
Optional extra payments	$0.00

Loan summary

Scheduled payment	$147,631.90
Scheduled number of payments	30
Actual number of payments	1
Total early payments	$0.00
Total interest	$1,828,957.04

Payment number	Payment date	Beginning balance	Scheduled payment	Extra payment	Total payment	Principal	Interest	Ending balance	Cumulative interest
1	5/9/2024	$2,600,000.00	$147,631.90	$0.00	$147,631.90	$47,531.90	$100,100.00	$2,552,468.10	$100,100.00
2	6/9/2024	$2,552,468.10	$147,631.90	$0.00	$147,631.90	$49,361.88	$98,270.02	$2,503,106.22	$198,370.02
3	7/9/2024	$2,503,106.22	$147,631.90	$0.00	$147,631.90	$51,262.31	$96,369.59	$2,451,843.91	$294,739.61
4	8/9/2024	$2,451,843.91	$147,631.90	$0.00	$147,631.90	$53,235.91	$94,395.99	$2,398,608.00	$389,135.60
5	9/9/2024	$2,398,608.00	$147,631.90	$0.00	$147,631.90	$55,285.49	$92,346.41	$2,343,322.50	$481,482.01
6	10/9/2024	$2,343,322.50	$147,631.90	$0.00	$147,631.90	$57,413.98	$90,217.92	$2,285,908.52	$571,699.93
7	11/9/2024	$2,285,908.52	$147,631.90	$0.00	$147,631.90	$59,624.42	$88,007.48	$2,226,284.09	$659,707.40
8	12/9/2024	$2,226,284.09	$147,631.90	$0.00	$147,631.90	$61,919.96	$85,711.94	$2,164,364.13	$745,419.34
9	1/9/2025	$2,164,364.13	$147,631.90	$0.00	$147,631.90	$64,303.88	$83,328.02	$2,100,060.25	$828,747.36
10	2/9/2025	$2,100,060.25	$147,631.90	$0.00	$147,631.90	$66,779.58	$80,852.32	$2,033,280.67	$909,599.68
11	3/9/2025	$2,033,280.67	$147,631.90	$0.00	$147,631.90	$69,350.60	$78,281.31	$1,963,930.07	$987,880.99
12	4/9/2025	$1,963,930.07	$147,631.90	$0.00	$147,631.90	$72,020.59	$75,611.31	$1,891,909.48	$1,063,492.29
13	5/9/2025	$1,891,909.48	$147,631.90	$0.00	$147,631.90	$74,793.39	$72,838.51	$1,817,116.09	$1,136,330.81
14	6/9/2025	$1,817,116.09	$147,631.90	$0.00	$147,631.90	$77,672.93	$69,958.97	$1,739,443.16	$1,206,289.78
15	7/9/2025	$1,739,443.16	$147,631.90	$0.00	$147,631.90	$80,663.34	$66,968.56	$1,658,779.82	$1,273,258.34
16	8/9/2025	$1,658,779.82	$147,631.90	$0.00	$147,631.90	$83,768.88	$63,863.02	$1,575,010.94	$1,337,121.36
17	9/9/2025	$1,575,010.94	$147,631.90	$0.00	$147,631.90	$86,993.98	$60,637.92	$1,488,016.96	$1,397,759.28
18	10/9/2025	$1,488,016.96	$147,631.90	$0.00	$147,631.90	$90,343.25	$57,288.65	$1,397,673.71	$1,455,047.94
19	11/9/2025	$1,397,673.71	$147,631.90	$0.00	$147,631.90	$93,821.46	$53,810.44	$1,303,852.25	$1,508,858.37
20	12/9/2025	$1,303,852.25	$147,631.90	$0.00	$147,631.90	$97,433.59	$50,198.31	$1,206,418.66	$1,559,056.69
21	1/9/2026	$1,206,418.66	$147,631.90	$0.00	$147,631.90	$101,184.78	$46,447.12	$1,105,233.88	$1,605,503.80
22	2/9/2026	$1,105,233.88	$147,631.90	$0.00	$147,631.90	$105,080.40	$42,551.50	$1,000,153.48	$1,648,055.31
23	3/9/2026	$1,000,153.48	$147,631.90	$0.00	$147,631.90	$109,125.99	$38,505.91	$891,027.49	$1,686,561.22
24	4/9/2026	$891,027.49	$147,631.90	$0.00	$147,631.90	$113,327.34	$34,304.56	$777,700.14	$1,720,865.78
25	5/9/2026	$777,700.14	$147,631.90	$0.00	$147,631.90	$117,690.45	$29,941.46	$660,009.70	$1,750,807.23
26	6/9/2026	$660,009.70	$147,631.90	$0.00	$147,631.90	$122,221.53	$25,410.37	$537,788.17	$1,776,217.61
27	7/9/2026	$537,788.17	$147,631.90	$0.00	$147,631.90	$126,927.06	$20,704.84	$410,861.11	$1,796,922.45
28	8/9/2026	$410,861.11	$147,631.90	$0.00	$147,631.90	$131,813.75	$15,818.15	$279,047.37	$1,812,740.60
29	9/9/2026	$279,047.37	$147,631.90	$0.00	$147,631.90	$136,888.58	$10,743.32	$142,158.79	$1,823,483.93
30	10/9/2026	$142,158.79	$147,631.90	$0.00	$142,158.79	$136,685.67	$5,473.11	$0.00	$1,828,957.04