Eveleth Wastewater Facilities Plan

City of Eveleth

Public Hearing

February 24, 2025

City of Eveleth WWT Facility Plan Public Hearing

- Background
- Purpose and Scope
- Recommended Project & Path Forward
- Project Funding and Impact on Sewer Rates

Background

- **August 2019 MPCA Effluent Limits Letter**
  - Elbow Lake impaired water quality
  - Lower Total Phosphorus and Mercury Limit
- **Several Meetings with MPCA**
  - Discussed: MPCA Data, Elbow Lake water quality, changing discharge location
- **March 2022 City Received New NPDES Permit**
  - New low limits and compliance schedule
  - Must meet new Total Phosphorus limit by March 31, 2029

Purpose and Scope

- **Determine most cost-effective way to meet MPCA proposed limits & Eveleth's WW Treatment needs thru 2045**
- **Qualify for state funding**
- **Scope**
  - 20-year planning document
  - Evaluate Existing Conditions
  - Project Future Conditions & WW Needs
  - Develop Alternatives to Meet Wastewater Treatment Needs
  - Evaluation of Alternatives and Present Worth Costs
  - Recommended Alternative
  - Project Funding & Estimated Impact on Residential Sewer Rates

Planning Area

Existing Conditions

- **3,543 Population Served (Eveleth & Leonidas)**
- **Flow and Loading Evaluation**
  - Avg Daily Flow = 0.583 MGD
  - Permitted Capacity = 0.900 MGD
  - Inflow & Infiltration (I/I) – Excessive per EPA Criteria
  - BOD, TSS Loading below capacity
  - Existing TP Limit of 1.0 mg/l
- **WWTF Equipment and Process Evaluation**
  - Influent Screen - aged, poor condition, no compactor
  - Influent flow control & metering – not working properly
  - Flow Equalization – pond liner and piping, insufficient volume

Existing Conditions

- **WWTF Equipment and Process Evaluation**
  - Package Style Plant – Activated Sludge
  - Clarifier – only one unit
  - RAS and WAS Pumps – air lift pumps, no flow metering
  - Filter PS and Filters – pumps aged, filter limitations
  - Digester/Sludge Storage – insufficient volume
  - Overall WWTF provides good treatment performance

Joint WWTF Existing Bar Screen

Projected Conditions

- **Population decline through 2045**
- **Projected flow (1.071 mgd) greater than design capacity**
- **Projected BOD Loading = 842 lbs/d (1,532 lbs/d capacity)**
- **New Total Phosphorus Limit = 0.124 mg/l**
- **New Mercury Limit = 1.8 ng/l**
- **Current WWTF cannot consistently meet TP Limit**
  - Filtration is key process

Alternatives to Meet WW Needs

- **No Action**
- **Regional Treatment**
- **Upgrade Existing WWTF**
- **Change Discharge Location**
- **Demolish WWTF & Construct New Facility**

Initial Alternative Evaluation

- **No Action**
  - No capital cost
  - Permit Violations
  - Fines, penalties, sewer extension moratorium
- **Regional Treatment**
  - Pump Station and Forcemain to Virginia
  - Upgrade/Expand EQ Pond
  - Demo Existing Plant
  - Pay Virginia for Treatment (very low TP limit)

Initial Alternative Evaluation

- **Upgrade Existing WWTF**
  - WWTF provides good treatment
  - City investment in existing infrastructure
  - Upgrade equipment to provide reliable treatment
  - Improve filtration to meet TP limit

Initial Alternative Evaluation

- **Change Discharge Location**
  - Asked MPCA for limits
  - Discharge downstream of Elbow Lake (TP limit = 0.34 mg/l)
    - Pump Station and 6 miles of forcemain
    - WWTF Improvements still needed
  - Discharge to St. Louis River (TP Limit = 1.0 mg/l)
    - Pump station and 8 miles of forcemain
    - Some WWTF improvements still needed

Initial Alternative Evaluation

- **Demolish WWTF & Construct New Facility**
  - City investment in existing WWTF
  - Treatment performance of existing WWTF is good
  - Space constraints (relocate PW building)
  - High cost for new WWTF (>$30 million)

Detailed Alternative Evaluation

- **Two Alternatives:**
  - Upgrade Existing WWTF
  - Change Discharge Location to St. Louis River
- **Present Worth Cost Evaluation**
- **Non-monetary Factors**

Detailed Alternative Evaluation

- **Alternative #1 - Upgrade Existing WWTF**
  - Improve existing WWTF to reliably meet limits
  - Replace aged equipment
  - Flow control and equalization improvements
  - Treatment process improvements (aeration and clarifier)
  - Filtration is key to meeting proposed low TP Limit

Detailed Alternative Evaluation

- **5 Filtration Alternatives**
  - Change media in existing sand filters
    - Mfr requires deeper media bed, physically won't fit in existing space
  - New upflow sand filters
    - Height of filters will not fit into existing space
  - Reactive filters
    - Higher capital and annual cost
  - Disc Filters
    - Small footprint, pilot tested at Eveleth WWTF
  - Cloth Media Filters (two brands)
    - Similar to disc filter, pilot tested at Eveleth WWTF

Detailed Alternative Evaluation

- **Alternative #2 - Change Discharge Location**
  - Downstream of Elbow Lake – Not cost effective
    - TP Limit = 0.34 mg/l
    - WWTF Improvements required
    - Effluent PS and 6 miles of forcemain
  - St. Louis River
    - TP Limit = 1.0 mg/l (existing limit)
    - Some WWTF Improvements needed
    - Filters – minor upgrades
    - Effluent PS and 8 miles of forcemain

Cost Analysis

Alternative	Capital Cost	O&M*	Salvage Value	Total Present Worth
#1 Upgrade Existing WWTF	$12,600,000	$69,300	$400,000	$13,400,000
#2 Discharge to St. Louis River	$29,250,000	$27,850	$4,300,000	$25,600,000

*Estimated increase in annual O&M cost

Non-monetary Factors

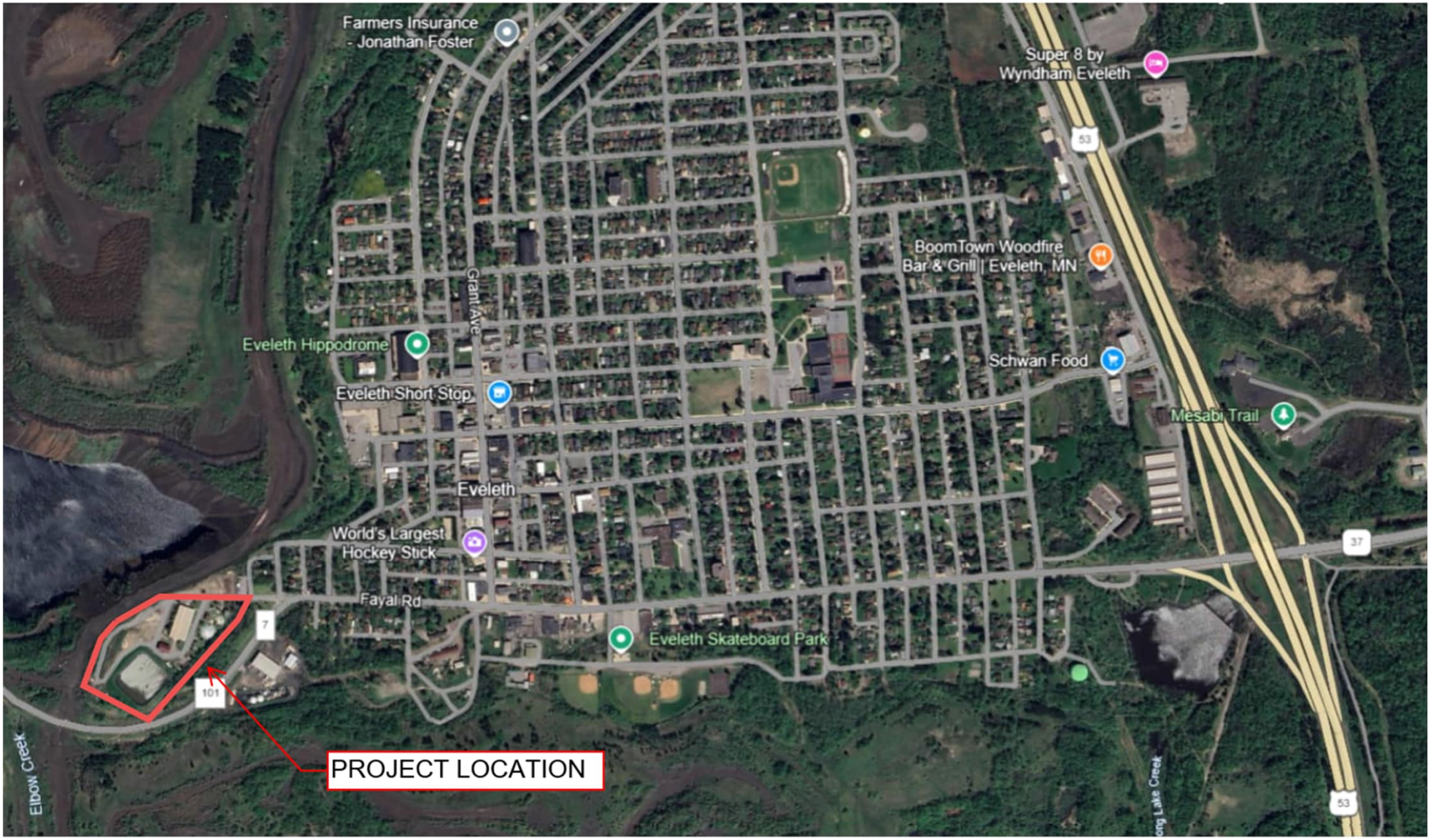
Parameters	Alternative #1 - Upgrade Exist WWTF	Alternative #2 - Change Discharge Location
Ease of Operation	4	3
Treatment Performance	4	4
Mechanical Reliability	4	3
Ease of Construction	3	1
Ease of Expansion	3	3
Total	**18**	**14**

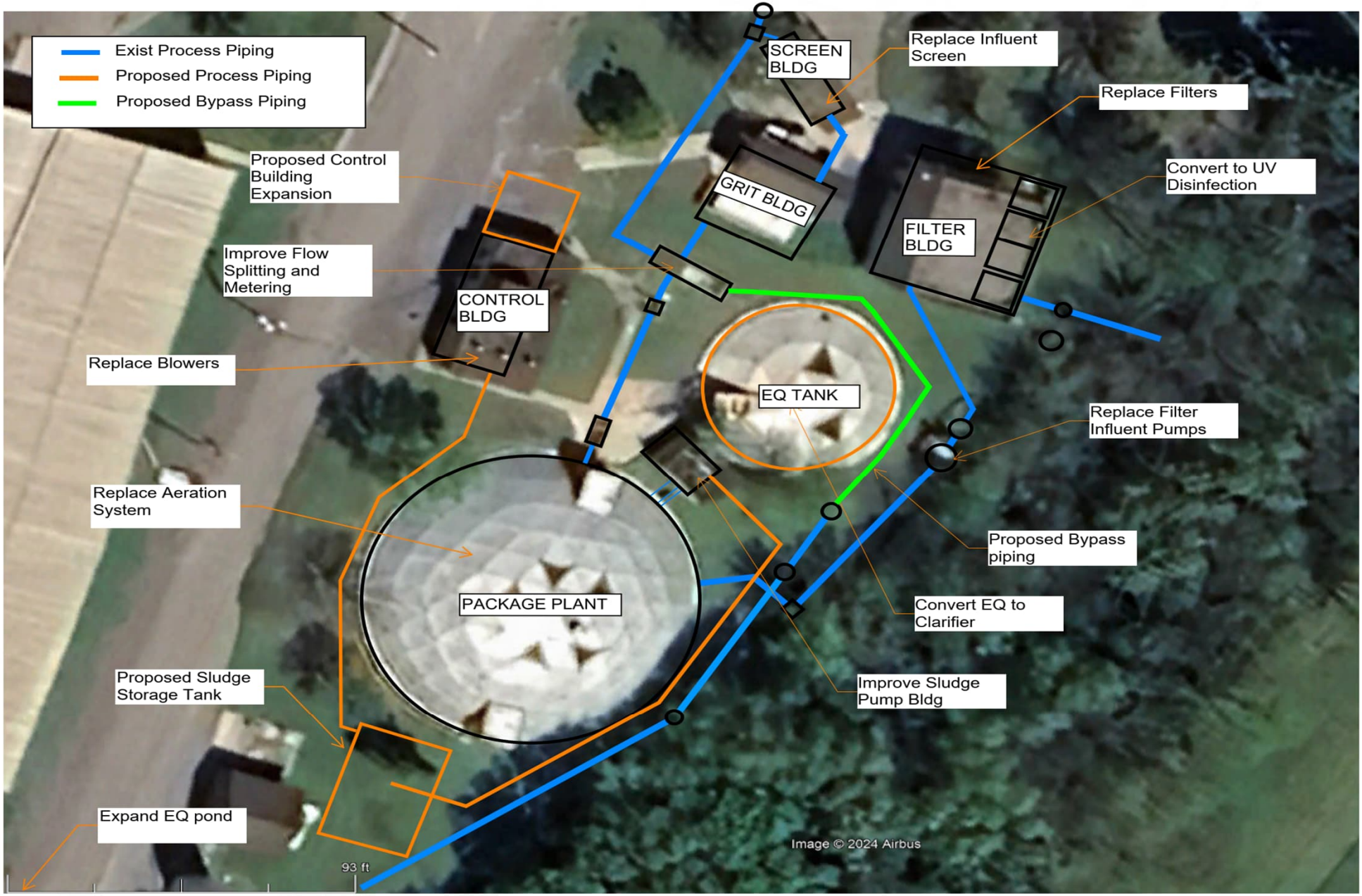
Recommended Alternative

- **Alternative #1 – Upgrade Existing WWTF**
  - Improve existing WWTF to reliably meet limits
  - Replace influent screen
  - Improve flow control and increase EQ volume
  - Replace aeration system for activated sludge process
  - Improve sludge handling for activated sludge process

Recommended Alternative

- **Alternative #1 – Upgrade Existing WWTF**
  - Convert EQ tank into second clarifier
  - Replace filter lift station pumps
  - Replace filters with cloth media filters
  - Convert to UV disinfection
  - Add sludge storage tank
  - Improve electrical and SCADA systems
  - Improve operator space


Farmers Insurance - Jonathan Foster
Super 8 by Wyndham Eveleth
BoomTown Woodfire Bar & Grill | Eveleth, MN
Grant Ave
Eveleth Hippodrome
Eveleth Short Stop
Schwan Food
Mesabi Trail
Eveleth
World's Largest Hockey Stick
Fayal Rd
Eveleth Skateboard Park
PROJECT LOCATION
Elbow Creek
53
37
7
101


Exist Process Piping
Proposed Process Piping
Proposed Bypass Piping
SCREEN BLDG
Replace Influent Screen
Replace Filters
Proposed Control Building Expansion
GRIT BLDG
Convert to UV Disinfection
FILTER BLDG
Improve Flow Splitting and Metering
CONTROL BLDG
Replace Blowers
EQ TANK
Replace Filter Influent Pumps
Replace Aeration System
Proposed Bypass piping
PACKAGE PLANT
Convert EQ to Clarifier
Proposed Sludge Storage Tank
Improve Sludge Pump Bldg
Expand EQ pond
Image © 2024 Airbus
93 ft

Funding Criteria

- **PFA and USDA (RD) use Median Household Income (MHI)**
  - PFA Affordability: Annual Residential Sewer Cost >1.4%
  - USDA Affordability: Annual Residential Sewer Cost >1.5%

Median Household Income (MHI)	Current Monthly Sewer Charge	Sewer Cost as % of MHI
$47,721	$56.40	1.42%

  - USDA Grant Affordability: MHI <80% of SNMHI
    - Eveleth MHI is 65%

How are we going to pay for this?

- **Minnesota PFA's Clean Water Fund Loan**
  - 20-Year Loan – current base interest rate is 3.0%
  - Discounts on base rate – determined by PFA
  - Debt service on loan repaid through sewer rates
- **Point Source Implementation Grant (PSIG)**
  - Potential grant funds up to 80% of capital cost – max grant $7,000,000
  - Majority of project qualifies for grant
  - Availability of funds based on ranking among projects on Project Priority List (PPL)
- **Water Infrastructure Fund (WIF) Grant**
  - PFA affordability criteria: residential sewer cost>1.4% of MHI
  - Eveleth qualifies

How are we going to pay for this?

- **Principal Forgiveness**
  - PFA affordability criteria: residential sewer cost >1.4% of MHI
  - Eveleth qualifies
- **IRRRB Grant**
  - Infrastructure grants for iron range communities
  - Usual grant amount $250,000
  - Eveleth qualifies
- **USDA Rural Development**
  - 40-year loans (3.25%), grants for communities <10,000 population
  - Eveleth qualifies for grant funds based on MHI
  - Up to 75% grant to resolve documented health & sanitary violation
  - No documented violations, Eveleth would qualify for 10% grant

Projected Sewer Rate Impacts

Scenario	Loan Amount	Rate Impacts*	Sewer Cost as % of MHI
No Grant Funds	$12,600,000	$48.72/month	2.64%
50% Grant	$6,300,000	$26.21/month	2.08%
80% Grant	$2,520,000	$12.69/month	1.74%

*Includes estimated increase of $69,300 in annual O&M cost

- Grant availability dependent on project ranking on PPL
- PFA will evaluate current sewer account to determine exact grant

Anticipated Project Schedule

Item	Approximate Date
Submit Wastewater Treatment Facility Plan to MPCA	February 28, 2025
Submit Application for PPL	February 28, 2025
Proceed with Design	January 2026
Apply for PSIG Funding (deadline)	July 31, 2026
Submit Plans & Specs to MPCA	August 2026
Plans and Spec Deadline	January 26, 2027*
Begin Construction	Spring 2027
Complete Construction	Fall 2028
Comply with MPCA Total Phosphorus Limit	March 31, 2029*

*NPDES Permit Requirement