50 | WESSLER ENGINEERING

More than a Project™

VILLAGE OF YELLOW SPRINGS, OHIO

Wastewater System Evaluation

August 17, 2026

Ryan Brauen, P.E.// Vice President

WESSLER PRESENTERS

Ryan Brauen, P.E.
Vice President & Project Manager

- B.S. in Civil Engineering, Ohio Northern University (2005)
- 21+ years of professional experience in water engineering

Bluffton, OH

Vini de Souza, E.I.
Project Engineer

- B.S. in Civil Engineering, Ohio Northern University (2023)
- 3+ years of professional experience in water engineering

Dublin, OH

ABOUT WESSLER

Working with our clients to provide better quality of life by **improving** and **preserving** water resources

- Founded in 1975 (50+ years)
- Headquartered in Indianapolis
- Two offices in Ohio (Bluffton, Dublin)
- Six offices in Indiana
- Specialists in water engineering
- 129 employees (~47 engineers)
- Employee owned

There is no water problem we can't solve **together**

WHY ARE WE ALL HERE?

Present and discuss Wessler's findings from the Yellow Springs Wastewater Preliminary Engineering Report

Photo by Alissa O'Donnell

What Wessler Was Asked to Do

- Evaluate the existing wastewater treatment plant and collection system conditions and identify capacity and performance limitations
- Develop and evaluate feasible improvement alternatives, including rehabilitation, replacement, and regional treatment options
- Recommend improvements, estimate costs, and outline potential funding sources and potential user rate impacts

Your Voice Matters

- Your voice matters to the Village Council
- This is your Wastewater Treatment System
- This potentially impacts your Monthly Sewer Bill/ Sewer Rates

Deciding What's Next for Your Water

- With input from the public, the Village Council must decide how to move forward with the community's wastewater infrastructure
- **Will have lasting impacts for at least the next 20 years, if not longer**

WHAT PROMPTED THE EVALUATION

Operating Constraints

The wastewater treatment plant was built in 1964 and expanded in 2009 to increase capacity and meet new nutrient removal requirements

Last expanded in 2009, when "Avatar" was the biggest movie in theaters and "Parks and Recreation" first aired

Aging Infrastructure

The lift station force main was built in 1964 and carries most village wastewater to the WWTP

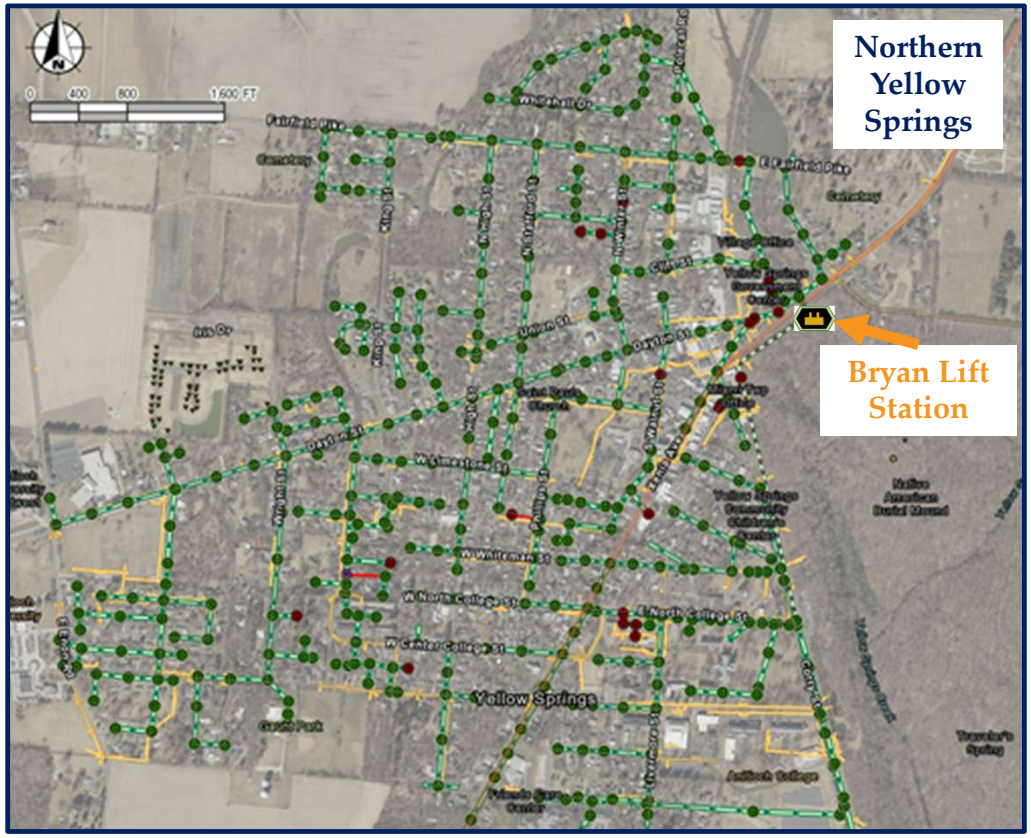
Was installed when Beatlemania swept the U.S. and the Ford introduced the Mustang at New York World's Fair

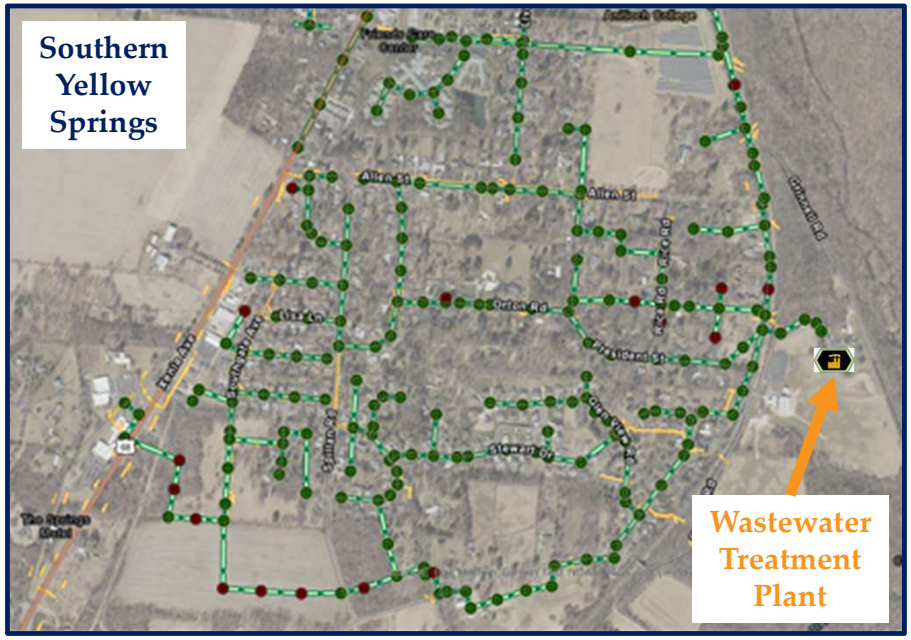
Increased Demand

The Village expects future growth in areas for housing, businesses, public and open spaces, and areas shifting from light industrial use to housing

Future growth over the next 20 years will increase demand on the system, which is experiencing reliability issues

SANITARY SEWER COLLECTION SYSTEM





BRYAN LIFT STATION & FORCE MAIN

Main collection site where flows are measured and recorded before passing through a grinder pump to break down solids

Pumps then move wastewater under pressure through a force main toward the treatment plant

BRYAN LS & FM CURRENT PERFORMANCE

System Configuration

- Lift station includes 3 pumps with total capacity of 2,600 gpm (3.74 MGD)
- Flow is discharged through a 16-inch force main approximately 2,900 ft long

Hydraulic (How Much) Overview

- Averages 0.315 MGD (Jan 2022 – Oct 2025)
- Max observed at 3.358 MGD (April 2025)

Why Improvements Are Recommended

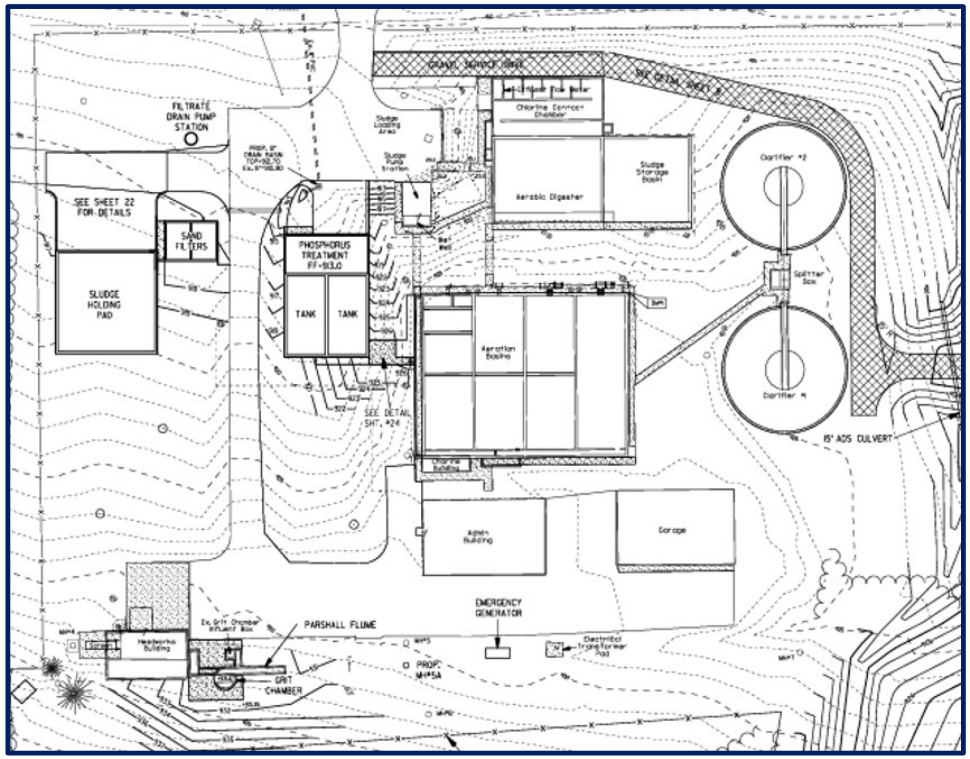
- Limited wet well storage provides ~1 minute of response time during high-flow conditions
- The 16-inch force main is unable to be inspected, cleaned, or rehabilitated due to critical nature

Pressurized flow from the force main discharges into the main gravity sewer carrying wastewater to the treatment plant

BRYAN LS & FM EVALUATION FINDINGS

Finding	Category	Why It Matters	Improvement Approach
Future peak flows may exceed lift station capacity	👷 Operations	Reliable wastewater conveyance is needed during wet-weather events	Pump replacement alternatives
Critical lift station equipment is approaching its limits	⚙️ Reliability	Equipment reliability becomes more important as flows increase	Grinder capacity upgrade
Flow monitoring equipment has limitations during peak events	✅ Compliance	Accurate flow data supports regulatory reporting and planning	Influent flow metering capacity upgrade
Limited emergency response time during equipment failures	👷 Operations	Operators have little time to respond before an overflow occurs	Wet well capacity upgrade
Emergency bypass discharges to Yellow Springs Creek	🛡️ Safety	Accurate flow data helps identify and report overflows	Bypass flow metering upgrade
Condition of the force main is unknown	⚙️ Reliability	Critical infrastructure has not been inspected in 60+ years	Rehabilitation and replacement alternatives

WASTEWATER TREATMENT PLANT



2009 Wastewater Treatment Plant Improvements

Google Earth Satellite View

WASTEWATER TREATMENT PLANT

Screens remove large debris before further treatment

Air supports bacteria to break down waste and remove nutrients

WASTEWATER TREATMENT PLANT

Clarifiers settle solids by gravity; weirs direct clean water out

Outgoing flows are disinfected and measured before release

WWTP CURRENT PERFORMANCE

Hydraulic (How Much) Overview

- **Average Design Flow (ADF):**
  - » ADF capacity of 0.6 MGD
  - » Averages 0.445 MGD (Jan 2022 – Oct 2025)

- **Peak Design Flow (PDF):**
  - » PDF capacity of 3.93 MGD
  - » Max observed at 2.903 MGD (April 2024)

Loadings (How Strong) Overview

- **Conventional Pollutant Loadings ($cBOD_5$ & TSS):**
  - » $cBOD_5$ & TSS loadings near design capacity
  - » Removal efficiency of 95% ($cBOD_5$) and 98% (TSS)

- **Nutrient Loadings (NH_3-N & Total P):**
  - » NH_3-N & Total P remain below design capacity
  - » Removal efficiency of 99% (NH_3-N) and 85% (Total P)

Treatment Capacity Assessment

- » Biological treatment capacity exceeds projected ADF from future growth
- » Clarification and equalization capacity exceed projected PDF from future growth

Why Improvements Are Recommended

- » Past permit exceedances were linked to aeration control, DO management, and equipment reliability challenges
- » Operational limitations, code compliance issues, and aging equipment

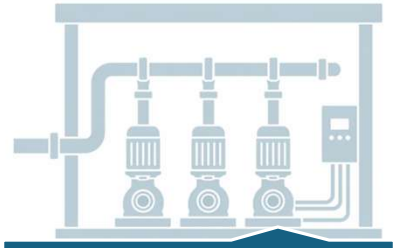
WWTP EVALUATION FINDINGS

Finding	Category	Why It Matters	Improvement Approach
Headworks electrical equipment does not meet current code	🛡️ Safety	Safety and regulatory compliance concerns	Electrical room modifications and equipment relocation
Aeration equipment and process controls require upgrades	⚙️ Reliability	Biological treatment performance depends on reliable aeration	Increase blower, diffuser, & mixer capacities and add DO probes
Existing controls limit operational flexibility	👷 Operations	Operators have fewer tools to optimize treatment performance	Additional automation, actuators, and SCADA improvements
Temporary phosphorus removal system remains in use	✅ Compliance	Current configuration was not permitted as a long-term solution	Permanent chemical feed facilities
Chlorine gas disinfection remains in use	🛡️ Safety	Safety and emergency response considerations	UV disinfection conversion
Existing sludge handling limits winter operations	👷 Operations	Seasonal operating constraints increase operational effort	Building enclosure, permanent piping, and equipment upgrades

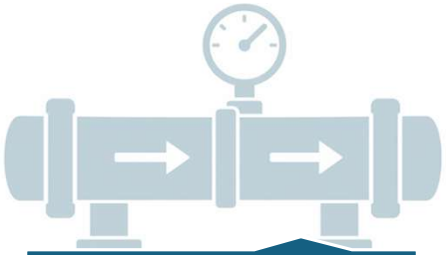
EVALUATED ALTERNATIVES

No Action

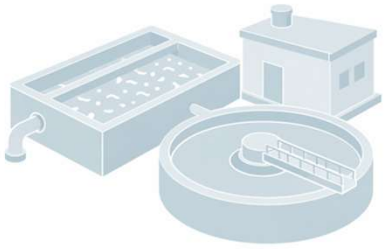
Regionalization with Neighboring Facilities



Lift Station Improvements



Force Main Improvements



Wastewater Treatment Plant Improvements

NO ACTION

PROS

- Limits immediate capital cost increases
- Currently meets permitting requirements

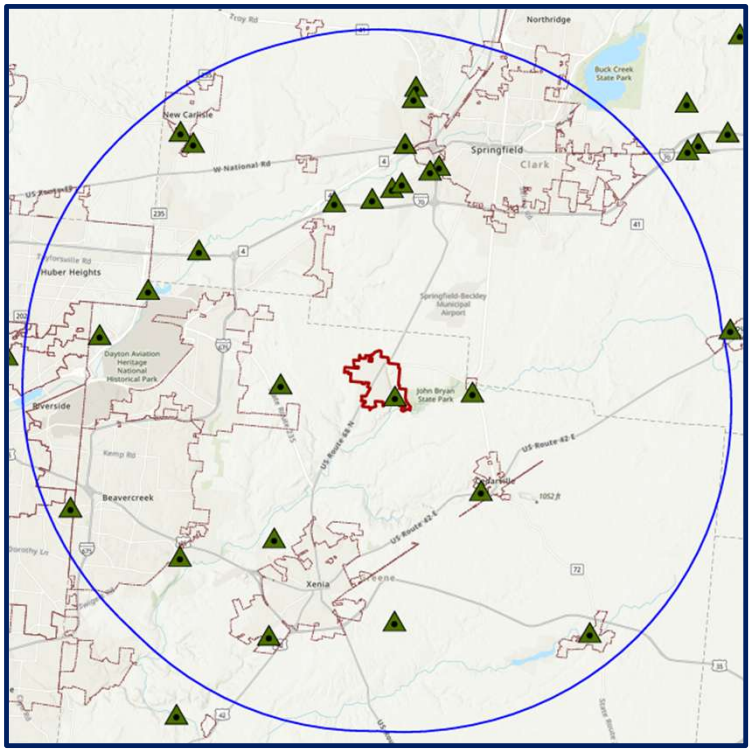
CONS

- All equipment will continue to deteriorate
- Passing the burden to the next generation

X Not Recommended

REGIONALIZATION

Wastewater from Yellow Springs would be pumped to another facility for treatment



PROS

- Modern facilities can meet future standards
- Reduces local operation and maintenance costs

CONS

- Requires costly new infrastructure investments
- Limited local control over decisions

EVALUATION

- Most don't have treatment capacity to handle
- Two facilities however met capacity criteria

REGIONALIZATION

WWTP Name	Plant Size (MGD)	Distance To (mi)	Worst Month (%)
~~New Carlisle~~	~~1.0~~	~~12.9~~	~~203.9%~~
~~Xenia Ford Road~~	~~3.6~~	~~7.0~~	~~154.7%~~
Southwest Regional	**4.0**	**9.2**	**88.9%**
~~Xenia Glady Run~~	~~4.0~~	~~10.0~~	~~117.3%~~
~~Fairborn~~	~~6.0~~	~~10.0~~	~~133.5%~~
~~Beavercreek~~	~~10.6~~	~~10.0~~	~~140.6%~~
~~Eastern Regional~~	~~13.0~~	~~12.7~~	~~105.7%~~
Springfield	**25.0**	**9.0**	**94.8%**

Worst Month Percentages Including Yellow Springs' Peak Month Flows

SOUTHWEST REGIONAL

- Near outer extent of the evaluation radius and requires routing across I-675 and I-70

SPRINGFIELD

- Near outer extent of the evaluation radius and requires routing along I-68 and across I-70

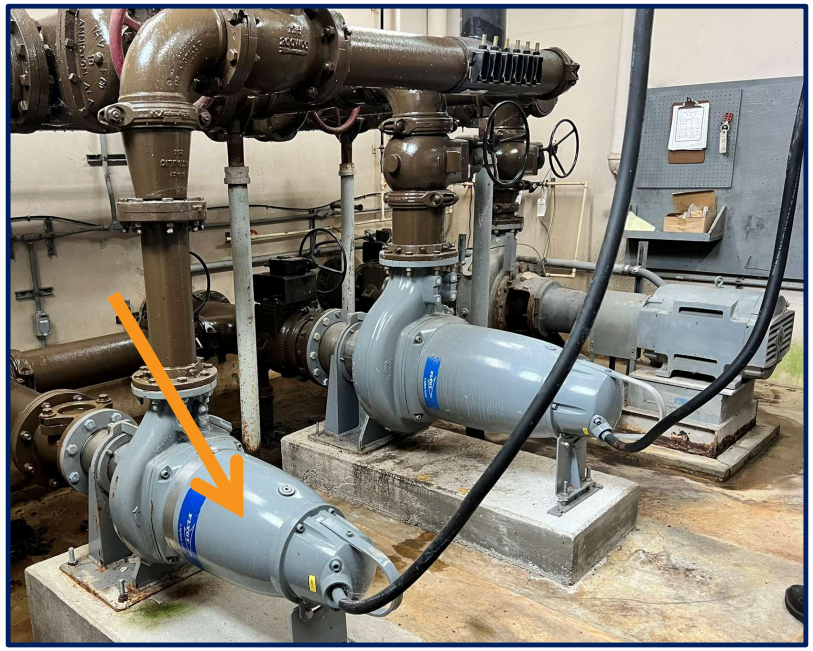
CONCLUSION

- Significant cost to construct and maintain long-distance conveyance infrastructure
- Reduced local control over future treatment costs, capacity, and operations

X Not Recommended

LIFT STATION IMPROVEMENTS

Alternative A: Small Pump Capacity Increase



PROS

- Increase capacity of two pumps to provide buffer for uncertainty in peak flow measurements
- Minimal changes to existing infrastructure, with a straightforward implementation

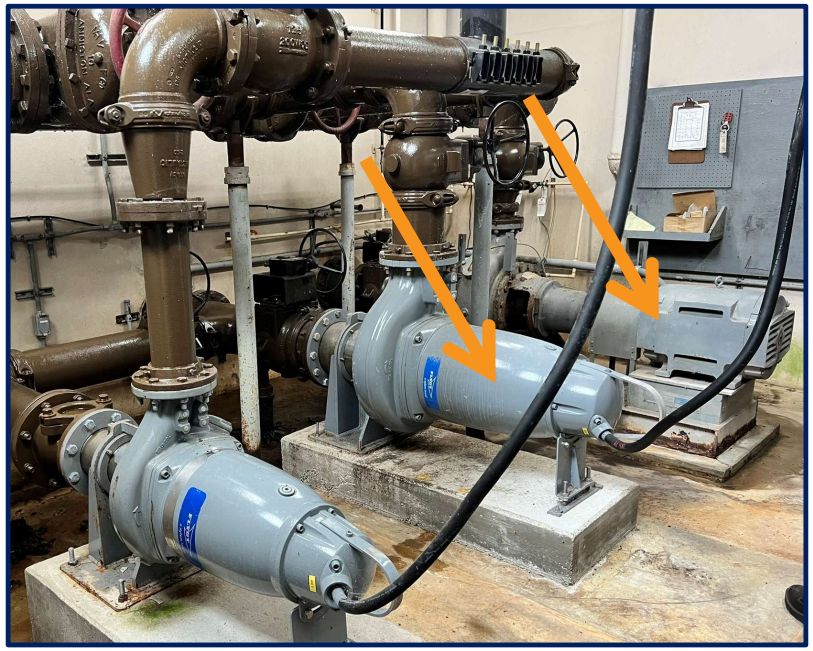
CONS

- New pump is even more oversized than needed for typical day-to-day operation
- Does not operate efficiently and can increase energy use and long-term equipment wear

X Not Recommended

LIFT STATION IMPROVEMENTS

Alternative B: Large Pumps Capacity Increase



PROS

- Increase capacity of two pumps to provide buffer for uncertainty in peak flow measurements
- Provides additional capacity buffer to account for uncertainty in peak flow measurements

CONS

- Higher upfront cost with infrastructure that operates infrequently under normal conditions
- Does not improve efficiency during typical and low-flow conditions

X Not Recommended

LIFT STATION IMPROVEMENTS

Alternative C: Large Pump Replacement

PROS

- Current pump capacity meets demand with the largest pump out of service
- Replace oldest large pump to modernize pumping assets and improve resiliency

CONS

- Does not provide capacity buffer to account for uncertainty in peak flow measurements
- Does not improve efficiency during typical and low-flow conditions

✓ **Recommended**

FORCE MAIN IMPROVEMENTS

Alternative 4A: Force Main Rehabilitation

A resin-soaked flexible liner is inserted into the existing pipe, then cured in place (CIPP) to form a new, jointless pipe inside the old one

Example of pipe before and after CIPP via NuFlow Technologies

PROS

- Minimizes surface disturbances because excavation is limited to access points
- Shorter construction duration with reduced impact to traffic and utilities

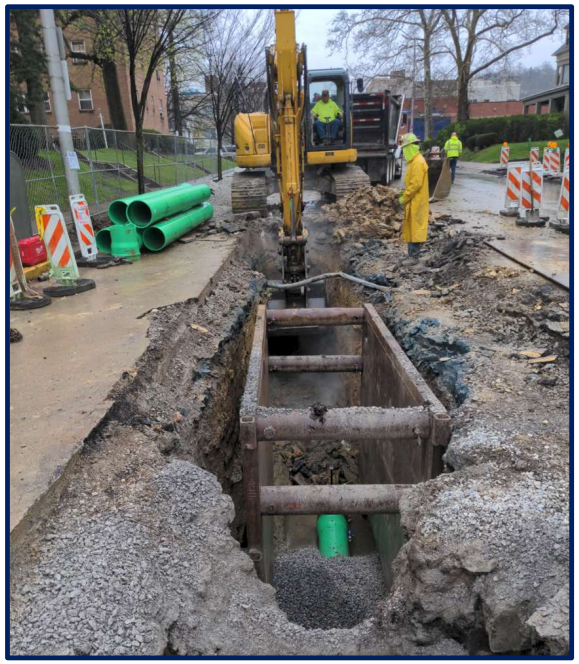
CONS

- Performance depends on installation quality and existing pipe condition
- Reduces pipe diameter, which can slightly limit flow capacity depending on pipe roughness

X Not Recommended

FORCE MAIN IMPROVEMENTS

Alternative 4B: Force Main Replacement



Example of installing a new sewer main pipe via Pittsburgh Water

PROS

- Provides new pipe with full structural integrity and design service life
- Improves corrosion resistance compared to the existing cast iron pipe

CONS

- Greater surface disruption from full excavation and restoration
- Increased construction complexity due to utility conflicts and traffic control

✓ **Recommended**

WWTP IMPROVEMENTS

Upgrades to the existing treatment plant to improve reliability and support long-term operations

PROS

- Maximizes the value of existing infrastructure while resolving reliability, safety, and compliance
- Provides a more reliable and resilient treatment process for long-term community needs

CONS

- Impacts to sewer rates
- Upgrades must be carefully implemented to maintain treatment throughout construction

✓ **Recommended**

ESTIMATED PROJECT COSTS

Alt.	Main Component	Cost	Status
#1	No Action	$0	Not recommended
#2	Regionalization	Unknown	Not recommended
#3A	LS: Small Pump	$900,000	Not recommended
#3B	LS: Large Pumps	$1,750,000	Not recommended
#3C	LS: Large Pump	$1,200,000	**Recommended**
#4A	FM: Rehab	$2,650,000	Not recommended
#4B	FM: Replace	$2,000,000	**Recommended**
#5	WWTP Improvements	$5,450,000	**Recommended**

Recommended Project Components

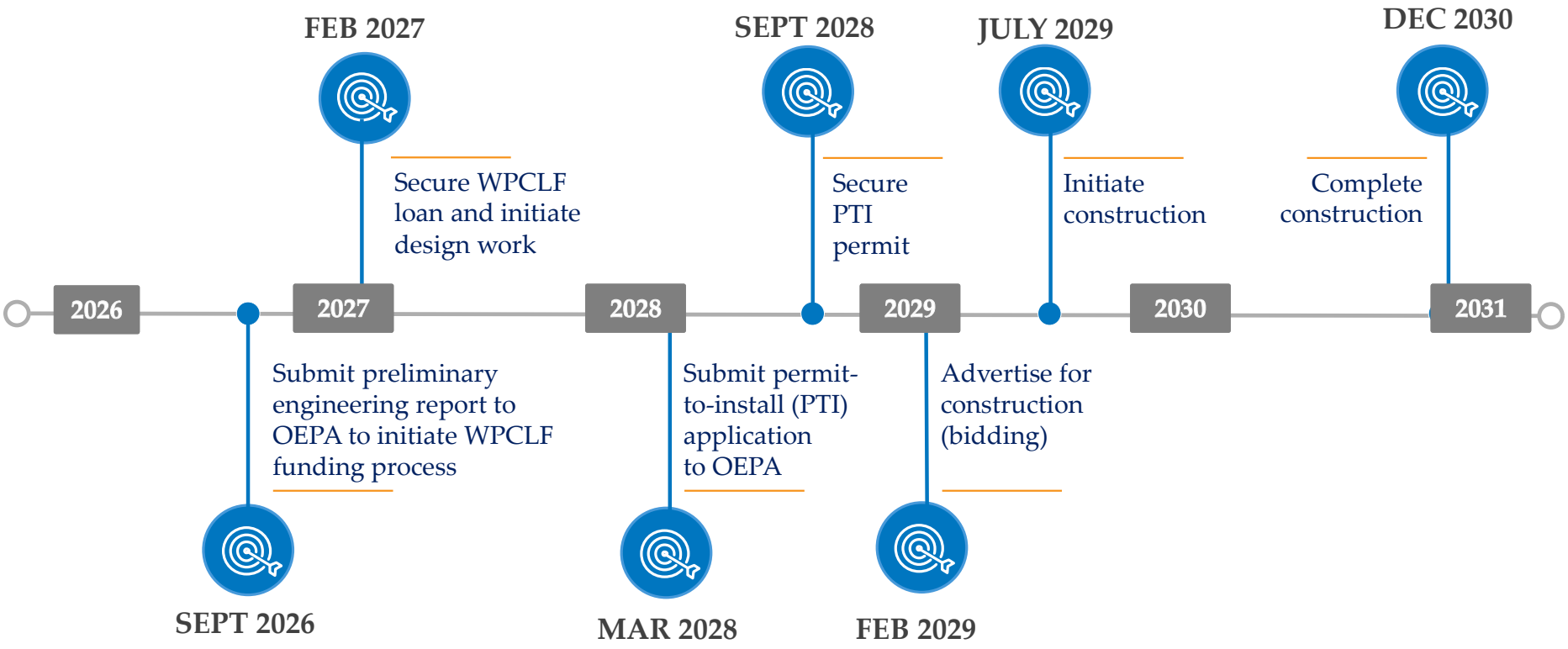
- Lift Station Pump Replacement (Alt. #3C): $1,200,000
- Force Main Replacement (Alt. #4B): $2,000,000
- WWTP Improvements (Alt. #5): $5,450,000

Total Recommended Project Cost: $8.65 Million

PRELIMINARY FUNDING SCENARIOS

SCENARIO			#1	#2	#3	#4	#5
TOTAL PROJECT COST			**$ 8,650,000**	**$ 8,650,000**	**$ 8,650,000**	**$ 8,650,000**	**$ 8,650,000**
FINANCING							
Ohio EPA Loan	25	2.99%	$ 8,650,000	$ 8,150,000	$ 7,700,000	$ -	$ 2,200,000
OWDA Loan	20	4.36%	$ -	$ -	$ -	$ 8,650,000	$ -
OPWC Loan	30	0.00%	$ -	$ -	$ -	$ -	$ 5,000,000
OPWC Grant			$ -	$ 500,000	$ -	$ -	$ 500,000
U.S. Army Corps Grant 594			$ -	$ -	$ 950,000	$ -	$ 950,000
Local Funds			$ -	$ -	$ -	$ -	$ -
Total Financing			**$ 8,650,000**	**$ 8,650,000**	**$ 8,650,000**	**$ 8,650,000**	**$ 8,650,000**
ANNUAL COSTS							
Ohio EPA Loan Payment			$ 496,198	$ 467,516	$ 441,702	$ -	$ 126,201
OWDA Loan Payment			$ -	$ -	$ -	$ 656,936	$ -
OPWC Loan Payment			$ -	$ -	$ -	$ -	$ 166,667
Total Annual Costs			**$ 496,198**	**$ 467,516**	**$ 441,702**	**$ 656,936**	**$ 292,867**
NUMBERS OF CUSTOMERS OR EDUS			**1,893**	**1,893**	**1,893**	**1,893**	**1,893**
AVERAGE INCREASE PER CUSTOMER OR EDU			**$ 21.84**	**$ 20.58**	**$ 19.44**	**$ 28.92**	**$ 12.89**

PRELIMINARY TIMELINE



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QUESTIONS?

(Please State Your Name)

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