WESSLER ENGINEERING

More than a Project™

BASICS OF PFAS IN DRINKING WATER

AUGUST 2024

PRESENTER

Kurt Wanninger

Wessler Engineering
Senior Project Manager

Kurt serves in Wessler's Drinking Water group and has more than 30 years of professional experience in the water, wastewater and stormwater utility industry as well as more than 16 years in municipal government. He assists community leaders with developing successful plans to help manage their utility systems.

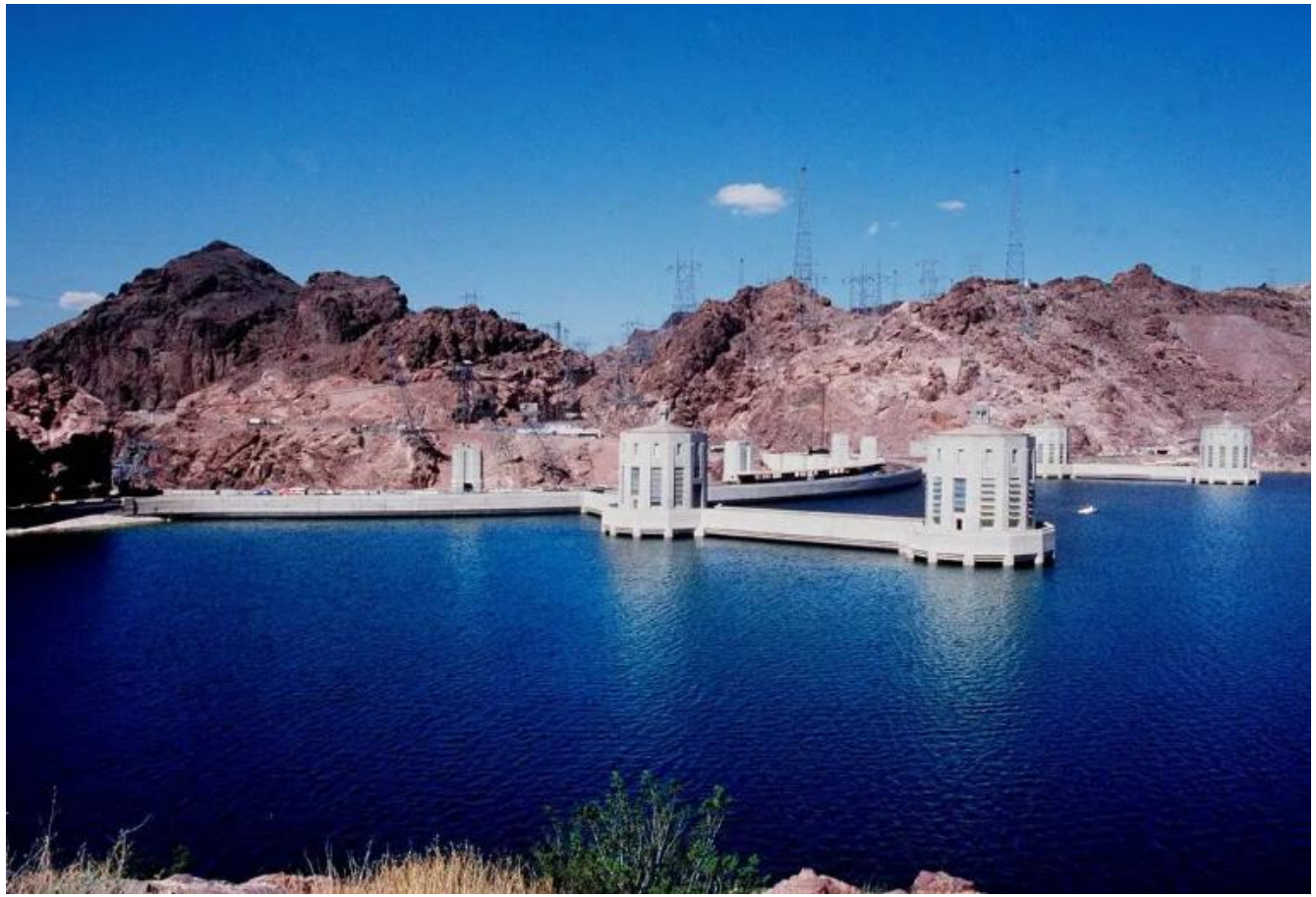
ABOUT WESSLER ENGINEERING

- Civil and Environmental Engineering Consulting Firm
- Specialists in water engineering: Drinking Water, Wastewater, & Stormwater
- Founded in 1975 (49 years)
- Headquartered in Indianapolis
- Six offices in Indiana
- Two offices in Ohio
- 115 employees (~45 engineers)
- Employee owned

WATER REGIONALIZATION?

Definitions:

- The process of integrating or coordinating water projects across multiple jurisdictions or communities.
- It involves pooling resources, generating efficiencies, and optimizing the quality of water supply and wastewater management services.
- The process of coordinating water projects across jurisdictions or communities
- Question: Is an interconnection with an adjacent utility considered regionalization?



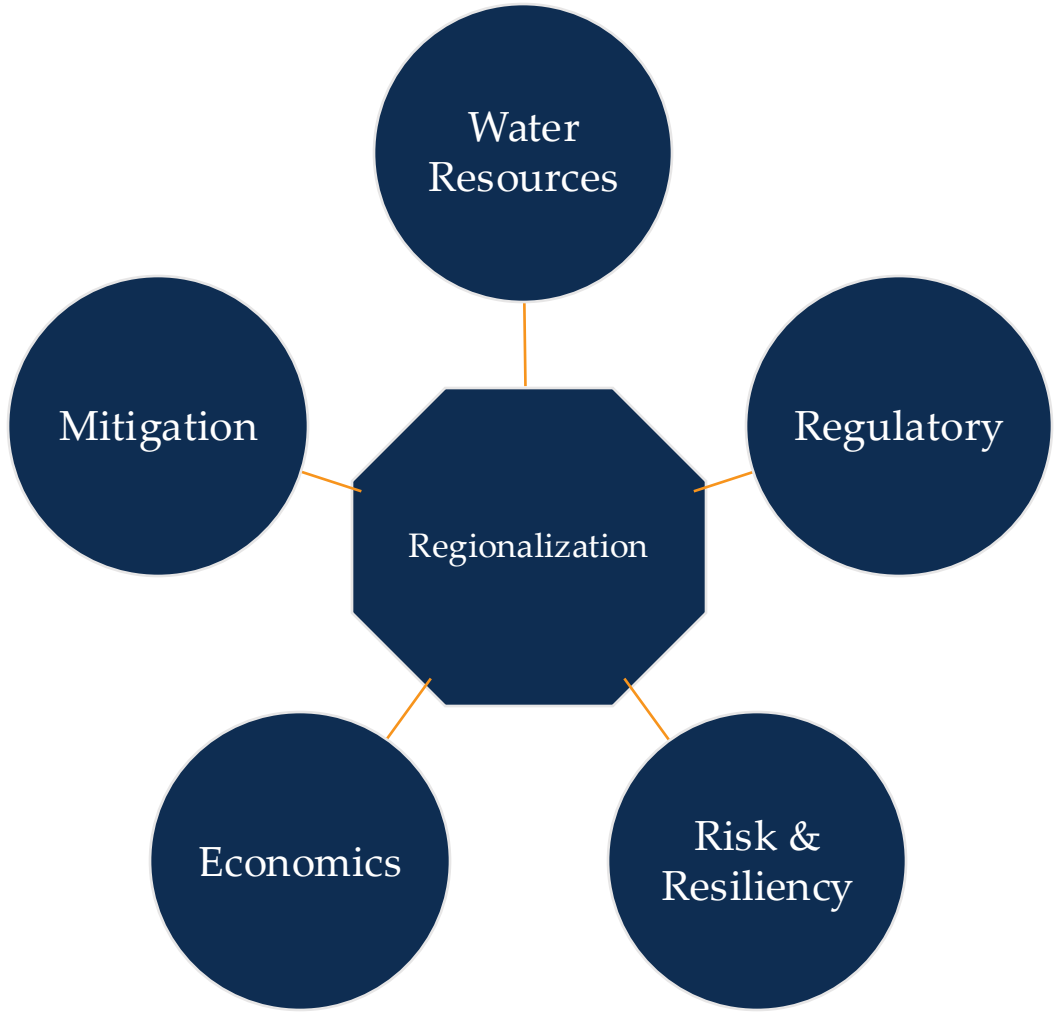
WATER REGIONALIZATION?

Management:
» Pool of water resources

Compliance:
» To meet federal drinking water standards or as a step for mitigation from a contamination source

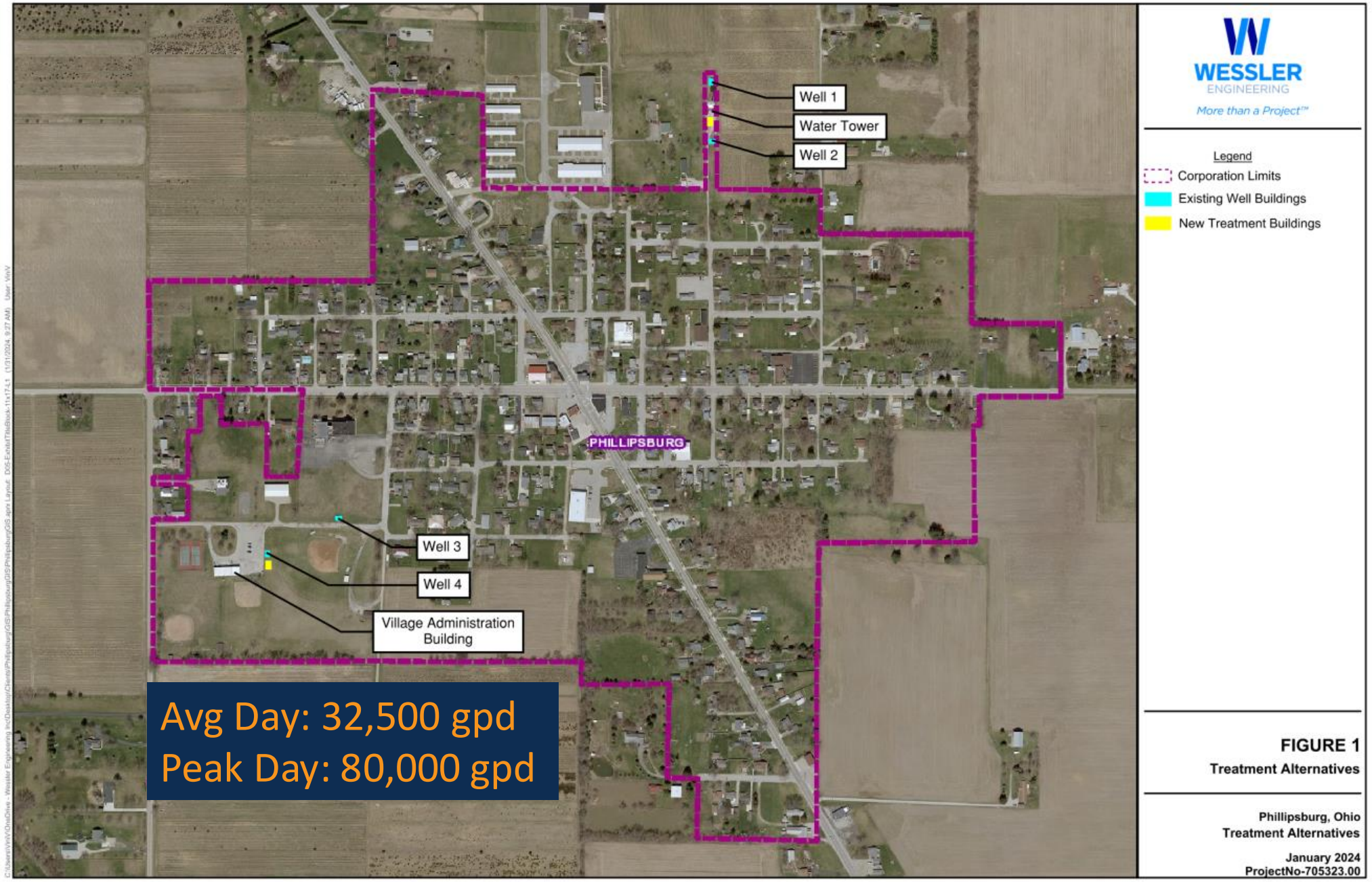
Sustainability:
» Opportunity to reduce risk and provide resiliency for a drinking water system

Economics:
» Enable water systems to operate at appropriate economies of scale, potential cost savings



Pros and Cons of Regionalization

- Growth
  - Pro - Opportunity and flexibility to grow
  - Con- Could restrict a community's growth
- Environmental
  - Pro - Emergent Chemicals
  - Con- One source of supply
- Water sheds
  - Pro – Resilience
  - Con – Shifting resources
- Managerial
  - Pro – Economies of scale
  - Con – One water source


Well 1
Water Tower
Well 2
PHILLIPSBURG
Well 3
Well 4
Village Administration Building
Avg Day: 32,500 gpd
Peak Day: 80,000 gpd
WESSLER ENGINEERING
More than a Project™
Legend
Corporation Limits
Existing Well Buildings
New Treatment Buildings
FIGURE 1
Treatment Alternatives
Phillipsburg, Ohio
Treatment Alternatives
January 2024
ProjectNo-705323.00

WHY?

Water – Quality Issues

- PFAS testing conducted by OEPA (2021) and Pace Analytical Services (2023)
- Detectable levels of PFAS found in each well

Regulatory – OEPA Proposed Limits for PFAS

- Village currently in compliance with OEPA Limits (PFAS levels < 70 ppt)
- PFAS levels are currently higher than proposed Federal EPA limit (4 ppt)
- New Federal EPA limits are expected to be released early this year

Age – Past Useful Service Life

- Wells ≈ 70 years old
- Water Tower ≈ 75 years old

WHAT IS PFAS?

Per- and Polyfluorinated Substances (PFAS):

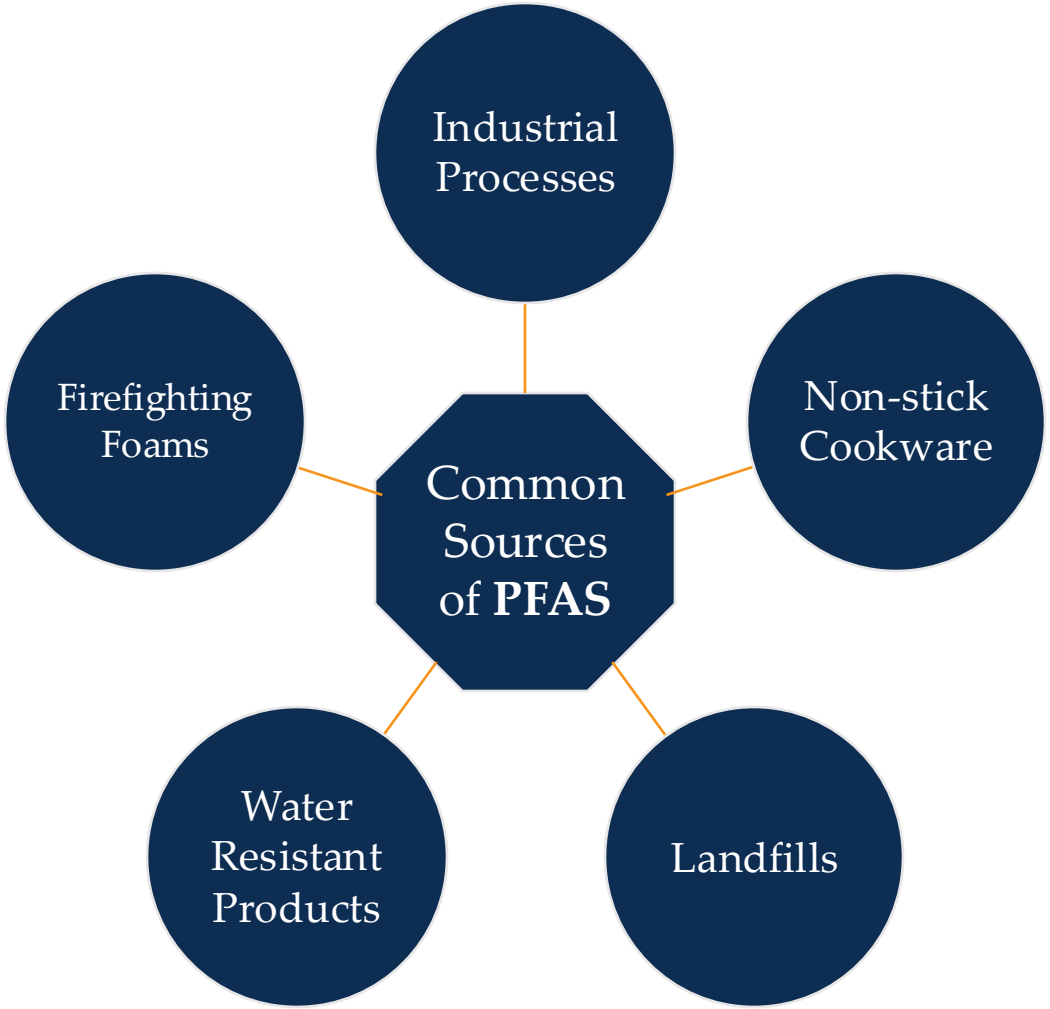
» Man-made chemicals used in many products

Concerns:

» According to the Federal EPA, studies indicate the potential for both short- and long-term adverse health effects when levels are above the proposed maximum contaminant level (MCL) for periods of time.
» The proposed federal Maximum Contaminant Level for PFAS: 4 parts per trillion (ppt)

Personal Options:

» Home treatment, such as activated carbon or reverse osmosis, may be helpful in reducing levels (Environmental Protection Agency's website epa.gov)
» Health effects (Centers for Disease Control and Prevention website cdc.gov)



WELL TESTING RESULTS

Well Number	PFAS Compound	OEPA Testing Results (2021)	Pace Analytical Testing Results (2023)	Proposed Federal EPA Limit	Hazard Index
Well 1	PFOS	6.53 ppt	ND	4 ppt	-
Well 2	PFOS	22.6 ppt	6.4 ppt	4 ppt	-
	PFHxS	24.7 ppt	ND	10 ppt; HI: 1	HI: 2.74
Well 3	PFOS	-	23.0 ppt	4 ppt	-
Well 4	PFOS	-	13.0 ppt	4 ppt	-
	PFBS	-	17.0 ppt	10ppt; HI: 1	HI: 3.12
	PFHxS	-	28.0 ppt		

Note: "ND" is defined as "not detected", meaning that no traceable amount was found in the test results. The above results only show those compounds and levels that are identified in, and are in exceedance of, the proposed federal limits.

ALTERNATIVES

1. Do Nothing

2. Local Treatment

- Granular Activated Carbon (GAC)
- Ion Exchange (IEX)
- Reverse Osmosis (RO)

3. Regional Water Supply

- City of Union
- Montgomery County
- City of Brookville

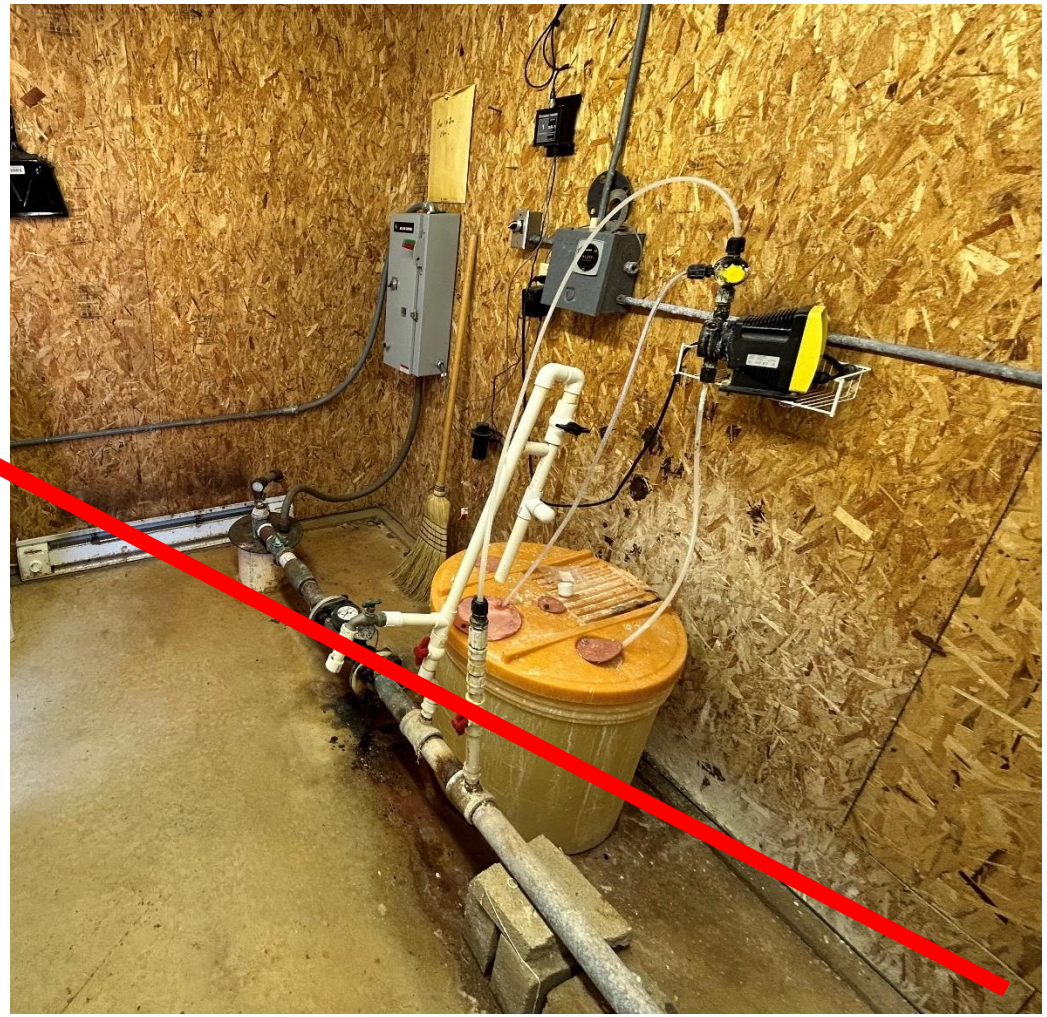
1. DO NOTHING

PROS

- "No" additional cost

CONS

- Does not address PFAS contamination issues
- Existing equipment, wells, and water tower will continue to deteriorate



2. LOCAL TREATMENT

PROS

- Addresses PFAS contamination
- Village controls water rates

CONS

- High cost to construct/purchase/operate
- New treatment process for Village
- Increased operational costs – labor, equipment, electric, and maintenance
- New wellfield ~10 years

GAC vs IEX

Project Summary:

- Two vessels at each wellsite
- New buildings to house vessels and chlorine
- New water tower (100,000-gallon)

Method	Space Reqm't	Backwash Req'd	Media	Head loss
GAC	70 ft²	Yes	Reuse	7 psi
IEX	20-30 ft²	No	Replace	22 psi

REVERSE OSMOSIS (RO)

Project Summary:

- One RO system at each wellsite
- New buildings to house RO systems and chlorine
- Potential requirement for additional treatment
- New water tower (100,000-gallon)

4. REGIONAL WATER SUPPLY

PROS

- Lower operational costs than local water treatment
- Improved grant funding opportunities
  - Private wells along route could tie in (not required)

CONS

- Increased water age
- Lose local control water supply
- Long-term investment (50+ years)
- Reliant on supplier water supply and future regulatory requirements
- Potential for transmission main failure

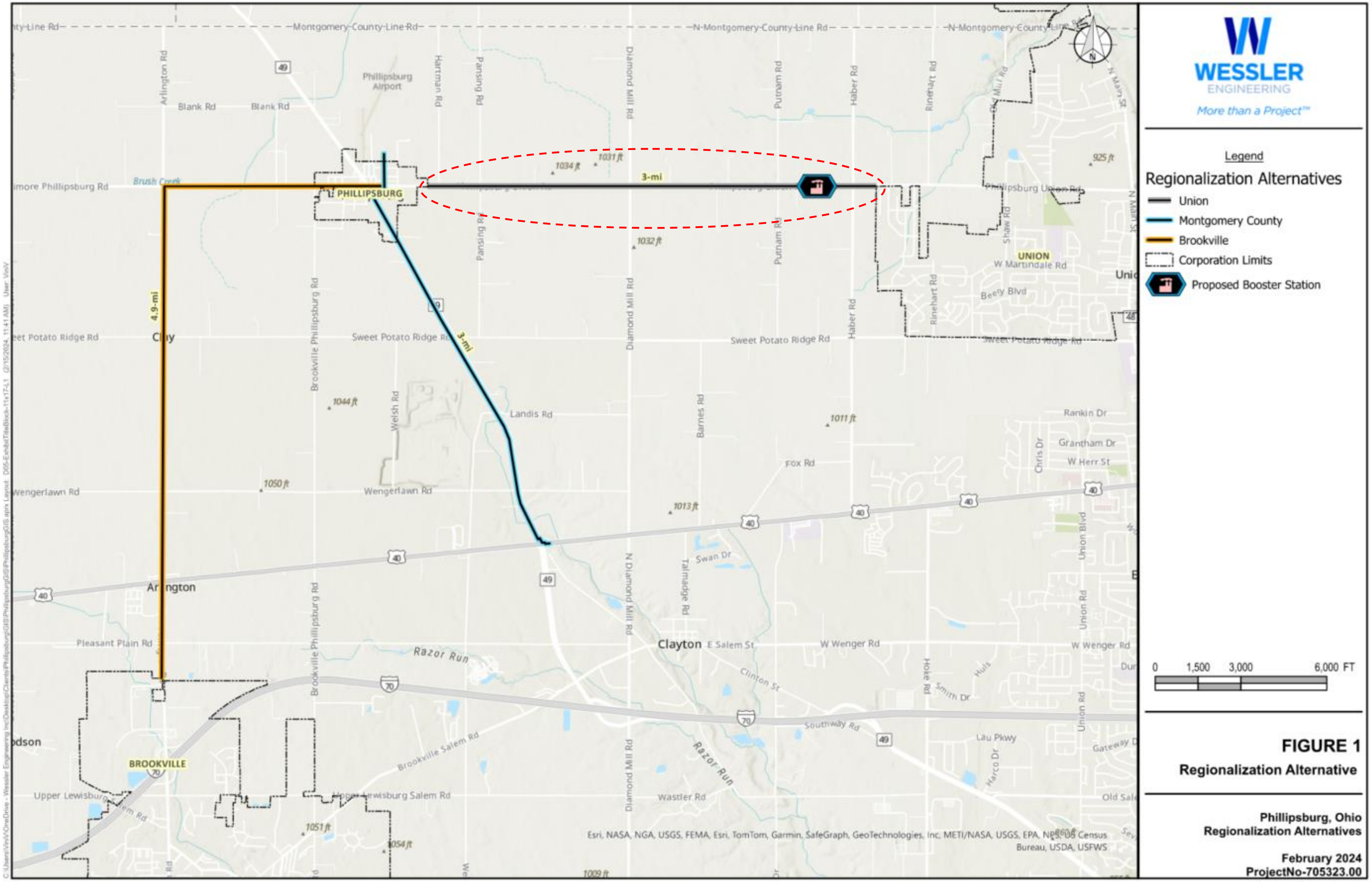


FIGURE 1
Regionalization Alternative

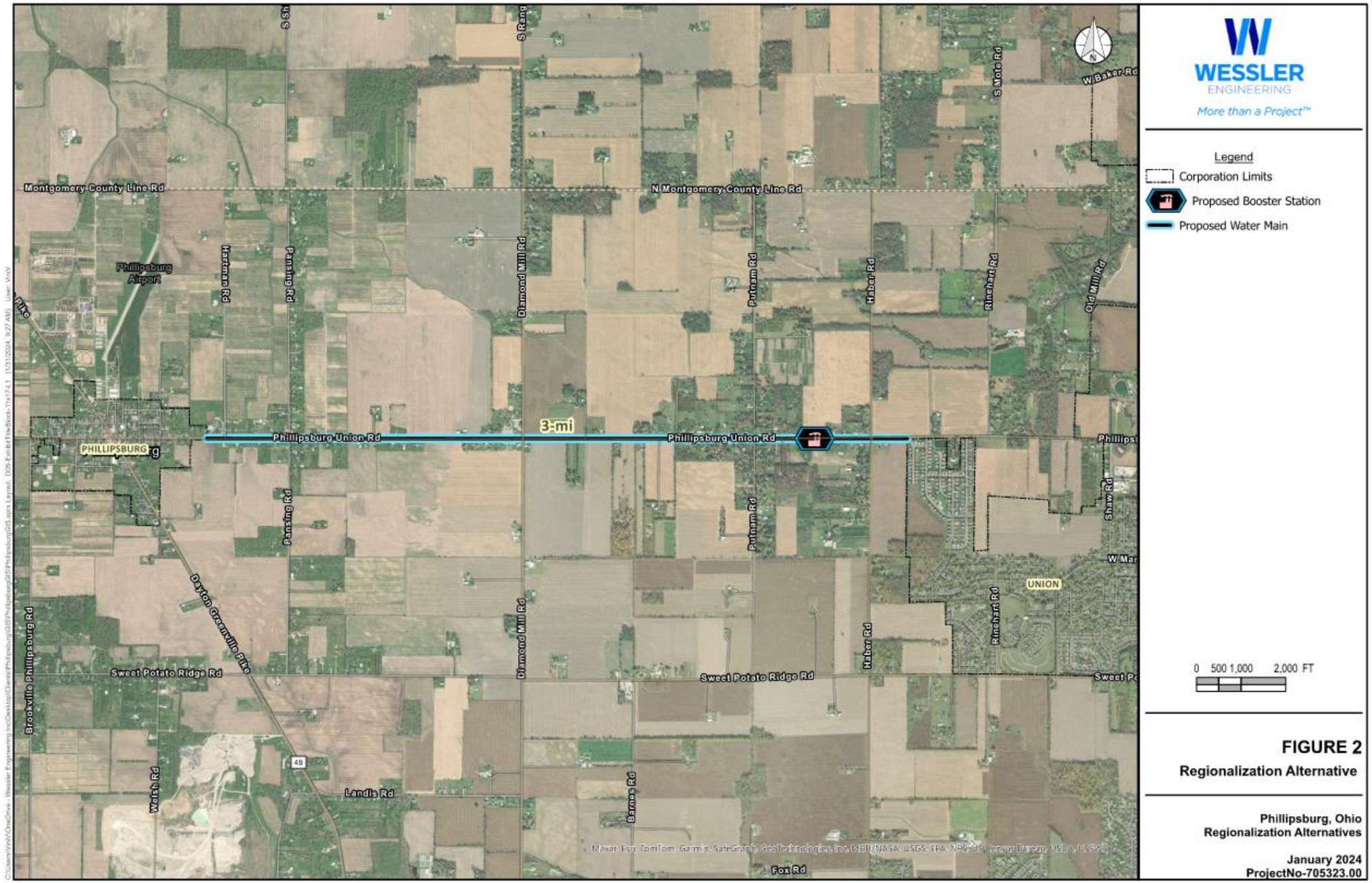
Phillipsburg, Ohio
Regionalization Alternatives

February 2024
ProjectNo-705323.00

REGIONAL: CITY OF UNION

Project Summary:

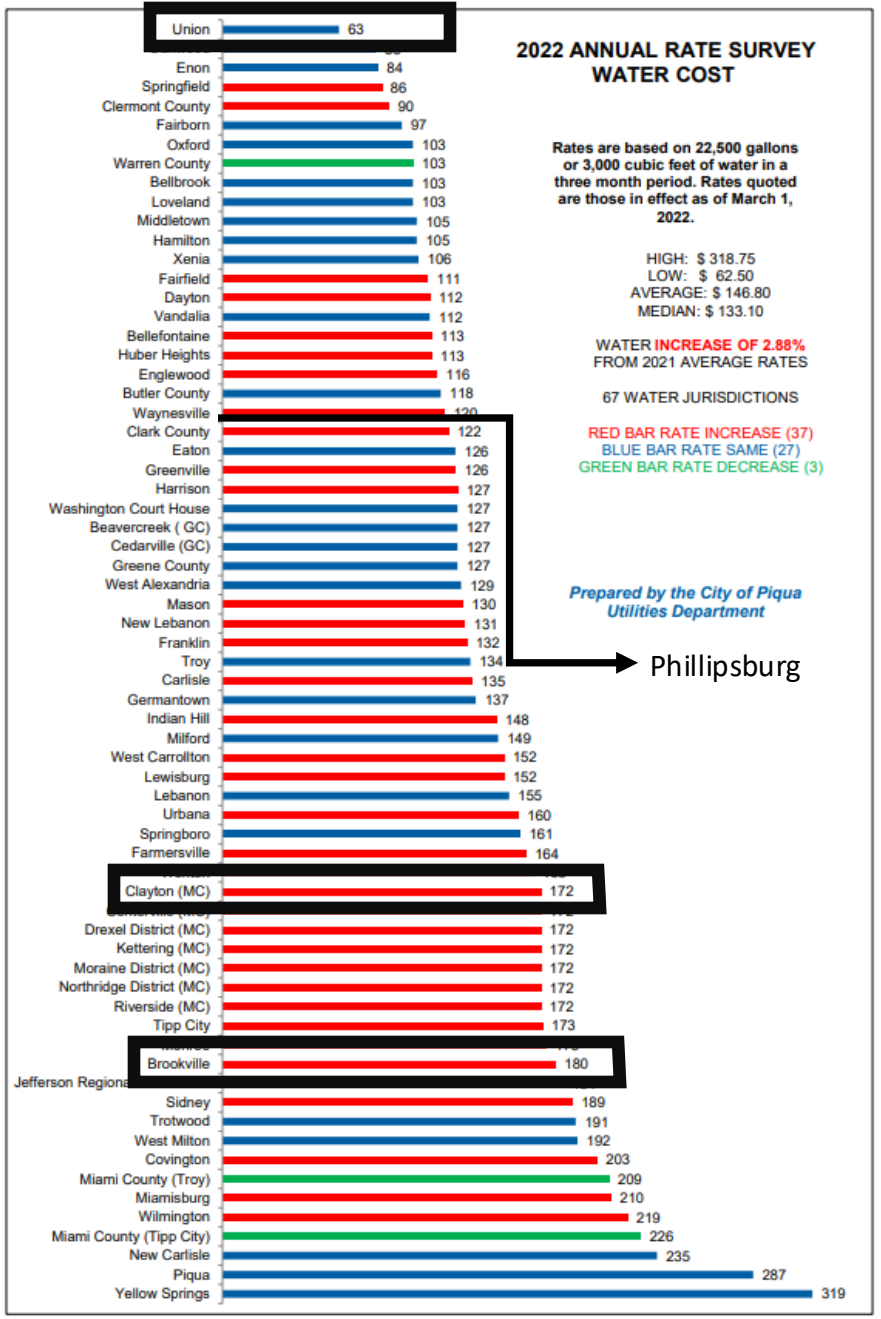
- Abandonment of existing groundwater wells
- ~ 3 miles of 8-inch transmission line
- Water Source: Groundwater (Great Miami River Buried Valley Aquifer)
- 1 Booster Station
- Water Tower (100,000 gallons) Replacement
- New master meter and vault
- New automated controls
- New chemical feed equipment
- Water Hardness
  - Phillipsburg 380 mg/L as CaCO3
  - Union 320 mg/L as CaCO3


WESSLER
ENGINEERING
More than a Project™
Legend
Corporation Limits
Proposed Booster Station
Proposed Water Main
0 500 1,000 2,000 FT
FIGURE 2
Regionalization Alternative
Phillipsburg, Ohio
Regionalization Alternatives
January 2024
ProjectNo-705323.00
Montgomery County Line Rd
N Montgomery County Line Rd
Phillipsburg Union Rd
3-mi
PHILLIPSBURG
UNION
Phillipsburg Airport
Diamond Mill Rd
Putnam Rd
Haber Rd
Rinehart Rd
Old Mill Rd
Shaw Rd
Pansing Rd
Hartman Rd
Dayton Greenville Pike
Brookville Phillipsburg Rd
Sweet Potato Ridge Rd
Welsh Rd
Landis Rd
Barnes Rd
Fox Rd
W Baker Rd
S Mote Rd

REGIONAL WATER SUMMARY

Utility	*Est. Net Present Cost over 20-Years*	*Est. Capital Costs*	*Est. Yearly Wholesale Water Costs*	*Est. Water Main Distance (miles)*	*Water Source*
City of Union	$11,800,000	$8,650,000	$25,000	3.0	Union (Groundwater)
Montgomery County	Not Evaluated	Not Evaluated	Not Evaluated	3.0	Dayton (Groundwater)
Brookville	Not Evaluated	Not Evaluated	Not Evaluated	4.9	Dayton (Groundwater)

*Montgomery County is not interested in supplying water to Phillipsburg.



COSTS

These costs are not included in the "Project Costs"

PROJECT COSTS

- Construction
- Non-Construction
  - Survey, Engineering, Permitting, Land Acquisition, Legal, Financial

MAINTENANCE

- Equipment repairs/service
- Building repairs/service
- Filters/media (cleaning/rotation)

OPERATIONS

- Labor
- Chemicals
- Utilities (electric, etc.)
- Supplies

REPLACEMENT

- Equipment
- Piping/valves
- Electrical/controls
- Filters/media (new)

ESTIMATED TOTAL PROJECT COSTS

	ESTIMATED CONSTRUCTION COST	ESTIMATED NON-CONSTRUCTION COST	**TOTAL ESTIMATED PROJECT COST**
Regional Water (Union)	$ 6,850,000	$ 1,800,000	**$ 8,650,000**
Granular Activated Carbon (GAC)	$ 4,000,000	$ 1,400,000	**$ 5,400,000**
Ion Exchange (IEX)	$ 4,250,000	$ 1,400,000	**$ 5,650,000**
Reverse Osmosis (RO)	$ 4,750,000	$ 1,600,000	**$ 6,350,000**

NET PRESENT COST (20-50 YEARS)

	Regionalization	Local Treatment		
	Village of Union	GAC	IEX	RO
NET PRESENT VALUE - 20 Yr.	$ 11,800,000	$ 12,500,000	$ 13,300,000	$ 13,700,000
NET PRESENT VALUE - 25 Yr.	$ 12,600,000	$ 14,400,000	$ 15,400,000	$ 15,600,000
NET PRESENT VALUE - 50 Yr.	$ 20,500,000	$ 31,600,000	$ 34,300,000	$ 32,700,000
Total Est. Project Costs (Const. & Non-Const.)	$ 8,650,000	$ 5,400,000	$ 5,650,000	$ 6,350,000
Est. Yearly Wholesale Water Costs	$ 25,000	N/A	N/A	N/A
Est. Yearly Operations & Maintenance Costs	$ 80,000	$ 215,000	$ 235,000	$ 210,000
Est. Replacement Costs (20 years)	$ 760,000	$ 1,270,000	$ 1,250,000	$ 1,580,000
Est. Replacement Costs (50 years)	$ 3,020,000	$ 4,590,000	$ 5,040,000	$ 5,160,000

PRELIMINARY TIMELINE

- General Plan Submittal: March 8, 2024
- OEPA Funding Nomination: March 8, 2024
- General Plan Approval: ~May 2024
- Design: May 2024 – April 2025
- Permitting/Bidding: April 2025 – September 2025
- Construction: October 2025 – April 2027

Central Indiana

Water isn't only a Western problem. Here's why some Hoosiers are worried about running out

LEAP pipeline plans become flashpoint for water issues in Indiana (indystar.com)

LEAP District Water Supply

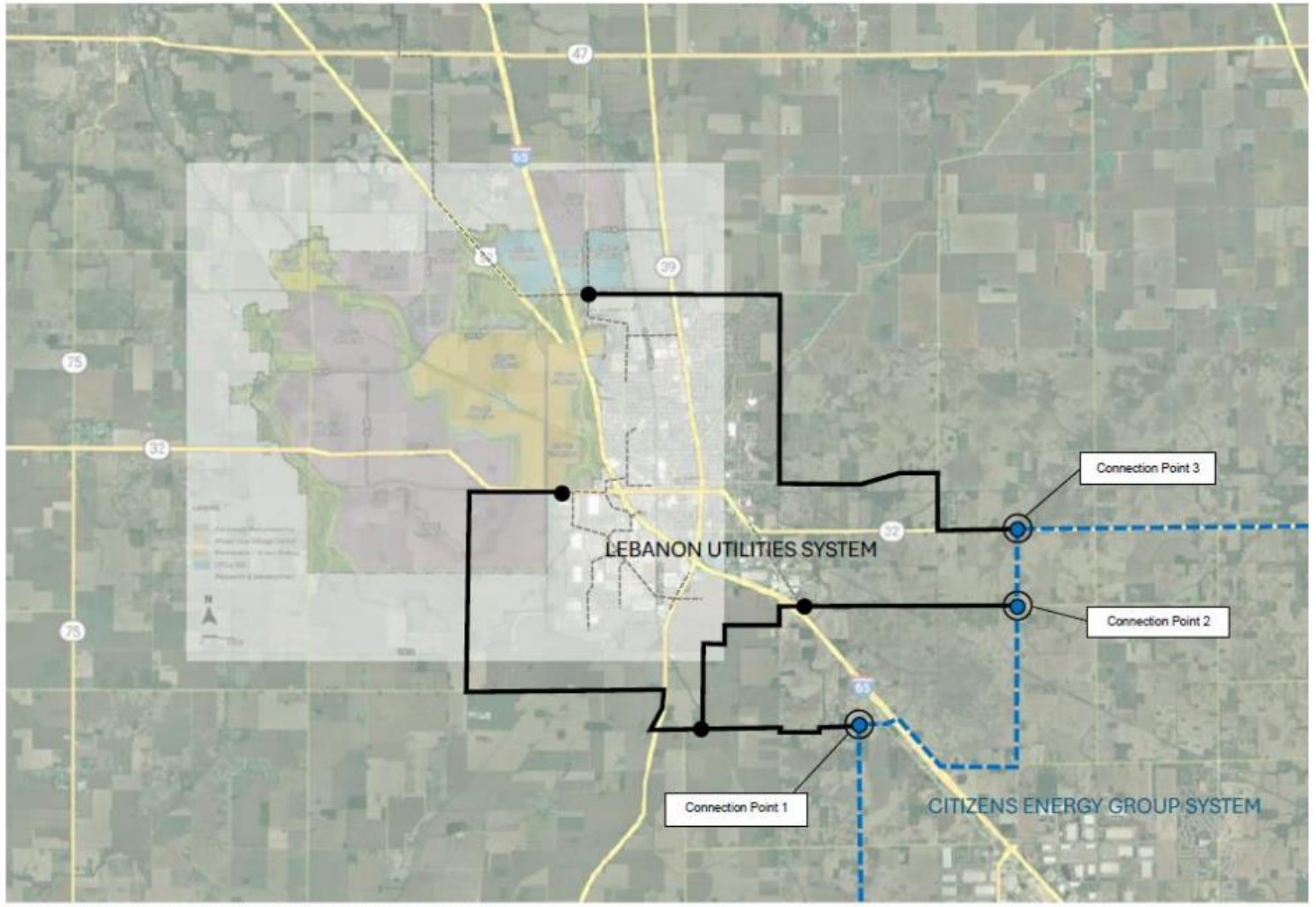


EXHIBIT "A" – WATER SUPPLY AGREEMENT – CEG-LU

https://lebanon.in.gov/wp-content/uploads/2024/01/LU-CEG-WATER-SUPPLY-AND-INTERLOCAL-COOPERATION-AGREEMENT-9.17.23-final.pdf

QUESTIONS?

Kurt J. Wanninger
Senior Project Manager
Wessler Engineering
317-538-1891
KurtW@wesslerengineering.com

WESSLER ENGINEERING

www.wesslerengineering.com