

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF KENTUCKY-)	
AMERICAN WATER COMPANY FOR A)	CASE NO. 2023-00248
CERTIFICATE OF PUBLIC)	
CONVENIENCE AND NECESSITY)	
AUTHORIZING THE CONSTRUCTION OF)	
A WATER TRANSMISSION MAIN TO THE)	
CITY OF MILLERSBURG)	

**DIRECT TESTIMONY OF JOHN MAGNER, ENGINEERING PROJECT MANAGER
FOR KENTUCKY-AMERICAN WATER COMPANY, INC.**

Filed: July 26, 2023

1 I. INTRODUCTION

2 Q. Please state your name, position, and business address.

3 A. My name is John Magner. I am an Engineering Project Manager for Kentucky-American
4 Water Company, Inc. (“KAW” or “the Company”). My business address is 2300
5 Richmond Road, Lexington, Kentucky 40502.

6 Q. Have you previously filed testimony at the Kentucky Public Service Commission
7 (“Commission”)?

8 A. No, I have not previously filed testimony to the Kentucky Public Service Commission.

9 Q. Please state your educational and professional background.

10 A. I received a Bachelor of Science in Civil Engineering from the University of Kentucky in
11 2015 and a Master of Business Administration from the University of Kentucky in 2016. I
12 am a registered Professional Engineer in the Commonwealth of Kentucky, State of
13 Tennessee, and State of Georgia.

14 I have been employed as an Engineering Project Manager at KAW since 2022. In
15 this position, I am responsible for managing capital projects within KAW’s system. Prior
16 to joining KAW, I worked for Stantec Consulting Service Inc. for six years as a Water
17 Resources Engineer where I both designed and managed municipal water, wastewater, and
18 stormwater projects. I am an active member of the Clean Water Professionals of Kentucky
19 and Tennessee organization.

20 Q. What is the purpose of your direct testimony?

21 A. The purpose of my testimony is to describe the need for the construction of a new water
22 transmission main connecting KAW’s existing distribution system to Millersburg,
23 Kentucky (“Project”), the scope of the Project, the planning that has occurred, and the

1 impacts the Project will have on KAW's customers and operations, as well as other utilities
2 and communities within the region.

3 **Q. Please describe KAW's Central Division.**

4 **A.** KAW treats, distributes, and sells water to residential, commercial, industrial, and
5 governmental users in the Central Division, which includes service territory within
6 Bourbon, Clark, Fayette, Harrison, Jessamine, Nicholas, Scott and Woodford counties.
7 KAW has approximately 139,000 customers within the Central Division. Source water is
8 obtained from Pool 9 of the Kentucky River and treated at two different water treatment
9 plants. KAW has a third water treatment plant in KAW's Northern Division and the source
10 water for that plant is Pool 3 of the Kentucky River. Water is distributed to customers
11 using a network of mains, storage tanks, and booster stations. The Central Division
12 includes KAW's Millersburg system located in Bourbon County.

13 **Q. Does KAW supply its own water to the Millersburg system?**

14 **A.** No, the Millersburg system is isolated from the rest of KAW's Central Division meaning
15 that KAW cannot currently supply Millersburg with water treated at one of its own water
16 treatment facilities.

17 **Q. How does KAW supply water to the Millersburg system?**

18 **A.** KAW purchases all water for Millersburg from Paris Water Works. Paris Water Works
19 supplies this water through a single 6" main and connection located south of Millersburg.
20 KAW's agreement with Paris Water Works specifies that KAW has the right to purchase
21 water up to a daily average of 200,000 gallons per calendar month.

22 **Q. Does KAW sell water to other utilities surrounding Millersburg?**

1 A. Yes, KAW sells water to Nicholas County Water District, Harrison County Water
2 Association, and Judy Water Association. Nicholas County Water District and Harrison
3 County Water Association have direct connections to the Millersburg system, while Judy
4 Water Association purchases water via connections to KAW's greater Central Division
5 system in Bourbon County.

6 **Q. Please describe the challenges KAW's Millersburg system experiences related to water**
7 **supply capacity.**

8 A. Paris Water Works is only obligated to supply KAW with a daily average of 200,000
9 gallons per calendar month of water and the demand of KAW's existing customers can
10 exceed this supply at times. In 2022, KAW's average daily volume purchased from Paris
11 Water Works exceeded 200,000 gallons in six of the twelve months based on KAW's
12 monthly operating reports. In January 2023, the average daily volume purchased exceeded
13 200,000 gallons by approximately 29%. Events within KAW's Millersburg distribution
14 system and the Paris Water Works system, such as main breaks, can result in service
15 interruptions for customers since the supply is not sufficient to overcome these
16 occurrences. KAW recently had to issue precautionary boil advisories to Millersburg
17 customers due to a main break within the Paris Water Works system and water supply
18 shortages related to winter weather in July 2022 and December 2022, respectively.

19 Millersburg has limited fire protection. A fire on June 22, 2022 destroyed historic
20 buildings in downtown Millersburg, including the post office and multiple apartments. The
21 flow available in Millersburg's fire hydrants was not sufficient to adequately contain the
22 fire. KAW also had to issue a precautionary boil advisory to Millersburg customers due to
23 this event.

1 Additionally, there is not sufficient supply to support material new development
2 within Millersburg and the surrounding area in Bourbon, Nicholas, and Harrison Counties.
3 KAW has received numerous inquiries regarding additional water capacity in the region,
4 including for a potential new industrial park that could bring several hundred jobs to the
5 region. Without investment in bringing new capacity to the area, economic growth will be
6 limited. KAW's current available capacity may not be able to meet these demands and
7 KAW has had to so inform prospective customers.

8 **Q. Are other surrounding water utilities able to provide additional supply capacity?**

9 A. No. Based on discussions with utilities surrounding Millersburg, including Nicholas
10 County Water District, Harrison County Water Association, and Paris Water Works, they
11 are not able to provide additional supply to KAW's Millersburg system. Nicholas County
12 Water District and Harrison County Water Association, as well as Sharpsburg Water
13 District and Judy Water Association, have indicated a need for additional water supply.

14 **Q. Has KAW experienced challenges related to the quality of the water being supplied to
15 Millersburg?**

16 A. The Stage 1 and Stage 2 Disinfection Byproduct Rules were established by the United
17 States Environmental Protection Agency ("EPA") to reduce drinking water exposure to
18 disinfection byproducts ("DBP"). These rules established maximum contaminant levels
19 ("MCL") for total trihalomethanes ("TTHM") and total haloacetic acids ("HAA5"). KAW
20 has measured elevated levels of TTHM and HAA5 in the water supplied by Paris Water
21 Works. In 2022, water quality monitoring at KAW's master meter with Paris Water Works
22 indicated HAA5 levels in the supplied water above the regulatory MCL in nine of the
23 twelve months and TTHM levels above the MCL in one month. To reduce the potential for

1 DBP formation, KAW filters the supplied water through granular activated carbon filters
2 prior to distribution to Millersburg.

3 The “Optimal Corrosion Control Treatment Evaluation Technical
4 Recommendations for Primacy Agencies and Public Water Systems” document published
5 by the EPA in 2016 provides recommendations for treatment methodologies to control lead
6 and copper in potable water and comply with regulatory requirements of the Lead and
7 Copper Rule. This document states that treating water with corrosion inhibitors controls
8 lead release and lists orthophosphate-based inhibitors as an effective corrosion control
9 treatment method, noting that “phosphate-based based corrosion inhibitors have been
10 widely used to control lead and copper release.” In accordance with the EPA guidance,
11 KAW treats water with an orthophosphate-based corrosion inhibitor to prevent leaching of
12 lead from piping in private plumbing systems and to remain in compliance with applicable
13 regulations. The water currently supplied to Millersburg from Paris Water Works does not
14 receive a corrosion inhibitor during treatment.

15 **Q. Please describe the scope of the Project.**

16 A. The Project will include the construction of approximately 33,000 linear feet of 16” ductile
17 iron water main and approximately 31,000 linear feet of 12” ductile iron water main from
18 KAW’s system in southwest Bourbon County to the Millersburg system. The main will
19 start at the existing 12-inch KAW main located along US-68 southwest of the city of Paris,
20 route around the north side of Paris along US-68, and continue north along US-68 between
21 Paris and Millersburg. The main will connect to the existing 6” KAW main south of
22 Millersburg. The size of the transmission main will transition from 16” to 12” on the north

1 side of Paris. Overview maps of the proposed main alignment are provided in Exhibit 1.
2 KAW anticipates that the main will primarily be constructed within state right-of-way.

3 **Q. How was the pipe sizing for the transmission main determined?**

4 A. The transmission main was sized to meet the requirements of 807 KAR 5:066, Section
5 10(3) which states “Transmission pipe lines from sources of supply shall be designed to
6 deliver in combination with related storage facilities and to the limits of the capacity of
7 those sources of supply the maximum requirements of that portion of the system which is
8 dependent upon such transmission pipe lines.”

9 KAW’s engineering consultant for the project, Stantec Consulting Services Inc.
10 (“Stantec”), developed demand projections and performed hydraulic modeling as described
11 in the memorandum provided in Exhibit 2. Stantec’s analyses considered the supply
12 capacity required to satisfy the following criteria:

- 13 • Provide adequate pressures and fire protection to KAW’s existing customers in
14 Millersburg;
- 15 • Support new development in Millersburg;
- 16 • Satisfy the demand of KAW’s existing wholesale customers;
- 17 • Provide regional water supply resiliency; and
- 18 • Provide opportunities for KAW to sell water to other regional utilities to defray the cost
19 of the project and foster regional economic development.

20 Based on Stantec’s analysis, a 16” main provides sufficient capacity to satisfy these
21 criteria. In order to reduce project costs, KAW will transition the size of the transmission
22 main from 16” to 12” for the portion of the main between northern Paris and Millersburg.
23 Constructing a 16” main around Paris will increase available capacity for potential water

1 sales to Paris Water Works. A 12” main from Paris to Millersburg still provides adequate
2 capacity to serve the current and anticipated future needs of Millersburg and the
3 surrounding area.

4 **Q. Were other alternatives for supplying water to Millersburg evaluated?**

5 A. Yes, multiple alternatives were evaluated, which are described below. Alternative
6 transmission main alignments that were evaluated by KAW are presented in Exhibit 3.

- 7 • Purchase additional water from other utilities: As discussed previously, other utilities
8 surrounding Millersburg are unable to provide sufficient additional supply. Several
9 surrounding utilities have indicated they also need additional supply.
- 10 • Construct a main through downtown Paris: KAW evaluated constructing a main
11 beginning and ending at the same points as the proposed alignment, but following Main
12 Street through Paris instead of routing north of Paris along US-68. While this alignment
13 would reduce the total length of pipe to be installed, the estimated project cost was not
14 significantly reduced due to increased expenses associated with constructability and
15 pavement restoration in the developed areas of Paris. Additionally, this alignment would
16 result in increased disturbance to residents in Paris.
- 17 • Construct a main through rural areas south of Paris: KAW evaluated building a main
18 from an existing 8” KAW main located along Bethlehem Road south of Paris to
19 Millersburg. This main would route through rural areas south of Paris to reduce costs
20 associated with pavement restoration. However, tying into KAW’s existing 8” main
21 would not provide adequate hydraulic capacity and would adversely affect pressures in
22 other areas of KAW’s system. Additionally, this alternative would require significant
23 private easement acquisition.

- 1 • Construct a main from North Middletown: KAW owns and operates the water
2 distribution system in North Middletown, KY, which is located approximately 9 miles
3 southeast of Paris. KAW supplies water to North Middletown via 4-inch to 8-inch
4 transmission mains from Fayette County. KAW evaluated constructing a transmission
5 main from North Middletown to Millersburg. In order for this alternative to provide
6 adequate supply to Millersburg, KAW would have to upsize the existing transmission
7 main to North Middletown in addition to building a new transmission main between
8 North Middletown and Millersburg, which approximately doubled the estimated project
9 cost when compared to the proposed project alignment.

10 **Q. What benefits does the proposed Project provide when compared to the evaluated**
11 **alternatives?**

12 A. The proposed project provides sufficient supply to meet existing and anticipated future
13 demands in Millersburg and the surrounding region. Additionally, the proposed
14 transmission main alignment along US-68 will allow the main to be constructed primarily
15 in state right-of-way. This reduces costs associated with pavement restoration since KAW
16 anticipates much of the main will be installed within grass-covered areas. Constructing in
17 state right-of-way also reduces disturbance to citizens and the need for property and
18 easement acquisition.

19 **Q. What is the estimated cost of the project?**

20 A. An engineer's opinion of probable cost was developed in March 2023. The total estimated
21 cost of the project is \$12,800,000. A detailed cost estimate is provided in Exhibit 4. The
22 actual project cost may vary from the engineer's opinion of estimated project cost based
23 on local labor market conditions and material prices at the time of bidding.

1 **Q. Will the construction of the transmission main increase or decrease operating costs?**

2 A. Operating costs will decrease. In 2022, KAW purchased approximately 76.3 million
3 gallons (MG) from Paris Water Works at a total cost of approximately \$187,000. Based on
4 a variable incremental production cost of approximately \$0.60 per 1,000 gallons for KAW
5 to supply the same volume of water, KAW's cost would be approximately \$46,000.

6 **Q. What is the Project's schedule?**

7 A. The project is currently in the preliminary design phase. Anticipated project milestone
8 dates are provided below but are dependent on factors such as regulatory approvals, supply
9 chain impacts to material deliveries, and potential project phasing needs due to local
10 construction labor availability.

- 11 • Design Complete: November 2023
- 12 • Bid Advertisement: November 2023
- 13 • Bids Received: December 2023
- 14 • Construction Start: January 2024
- 15 • Main In-Service: December 2024

16 **Q. Is there regional support for the project?**

17 A. Yes. Letters of support are provided in Exhibit 5.

18 **Q. What permits will be required for the project?**

19 A. KAW anticipates that the following permits will be required for the project:

- 20 • Water Quality (401) Certification, Kentucky Division of Water
- 21 • Individual or Nationwide 404 Permit, United States Army Corps of Engineers
- 22 • Encroachment Permit, Kentucky Transportation Cabinet
- 23 • Utility Crossing Permit, CSX Railroad

- 1 • Construction Application for Drinking Water Distribution (DW-1), Kentucky Division
2 of Water
- 3 • KYR10 Kentucky Pollutant Discharge Elimination System General Permit for
4 Stormwater Discharges associated with Construction Activities, Kentucky Division of
5 Water
- 6 • Local land disturbance, traffic, and street cut permits, as applicable

7 KAW and Stantec will coordinate with the respective permitting agencies early in
8 the Project to reduce the risk of permitting delays or the need for multiple permit submittal
9 iterations.

10 **II. CONCLUSION**

11 **Q. Would you recommend that the Commission approve this Certificate?**

12 A. Yes, I recommend that the Commission approve the Certificate of Public Convenience and
13 Necessity for a new transmission main to Millersburg. The new main will improve both
14 the water supply and water quality to KAW’s retail and wholesale customers in
15 Millersburg, as well as provide regional water supply resiliency.

16 **Q. Does this conclude your testimony?**

17 A. Yes, this concludes my testimony.

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) **SS:**
COUNTY OF FAYETTE)

The undersigned, John P. Manger, being duly sworn, deposes and says that he is the Engineering Project Manager for Kentucky-American Water Company, that he has personal knowledge of the matters set forth in the foregoing testimony and that the answers contained therein are true and correct to the best of his information, knowledge, and belief.



John P. Manger

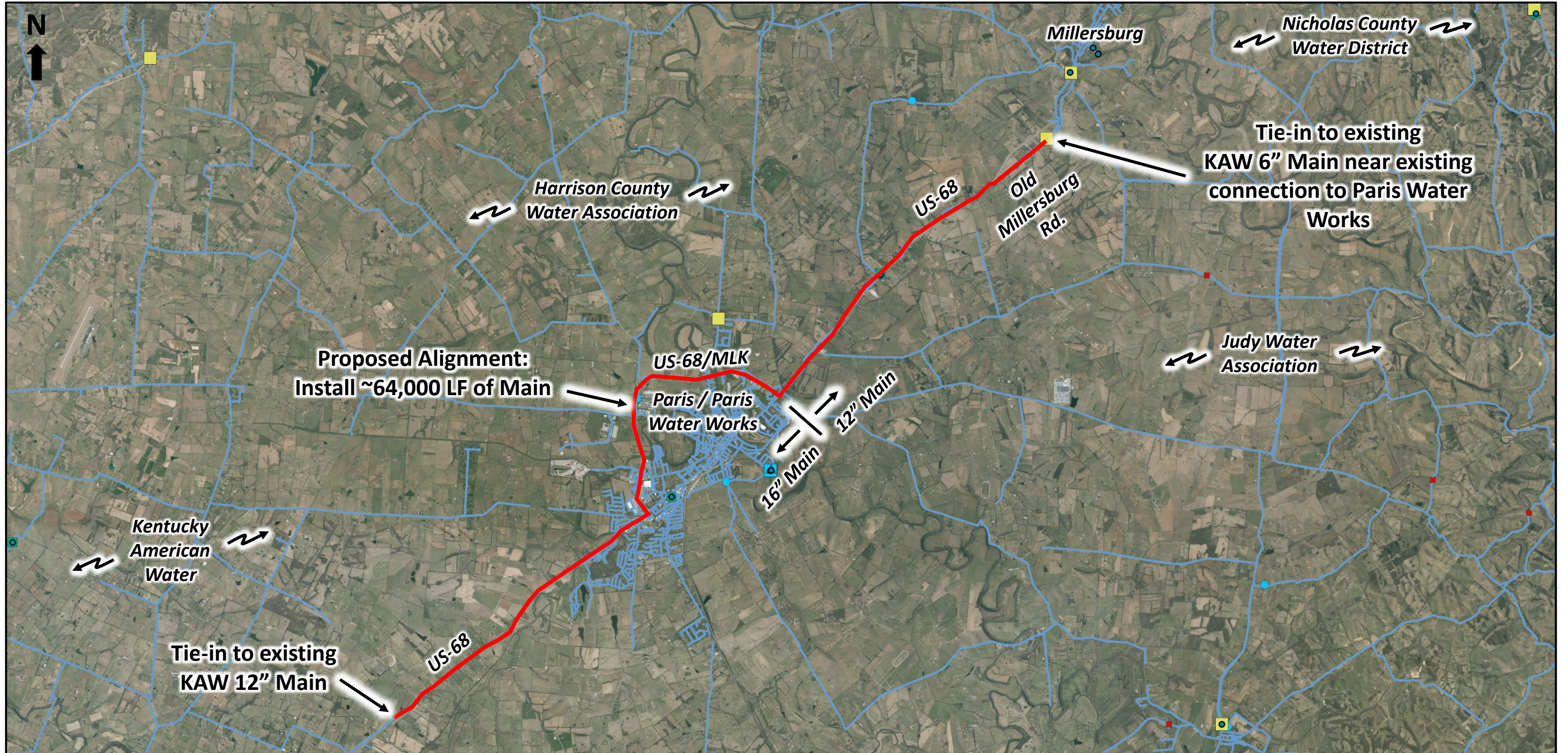
Subscribed and sworn to before me, a Notary Public in and before said County and State,
this 25th day of July, 2023.



Notary Public

My Commission Expires:
July 31, 2025
Notary ID: KYNP26988

Figure 1:
Kentucky American Water Millersburg Transmission Main - Alignment Overview



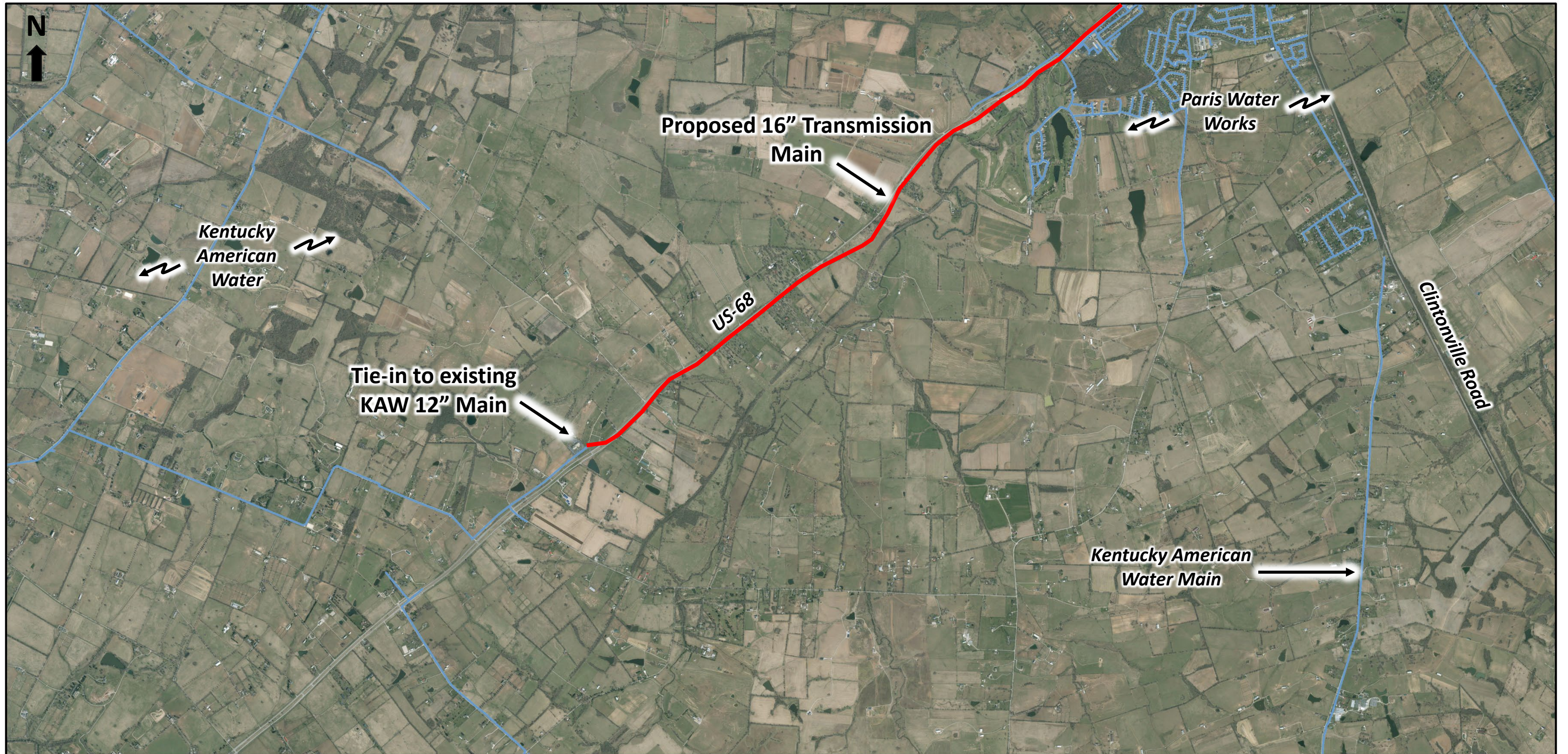
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|------------------------|----------------------------|----------------------|
| Water Lines | Pump Stations | Water Pumps |
| Well Sources | Water Meters | Non-Community Points |
| Water Treatment Plants | Surface and Spring Sources | |
| Water Tanks | Purchase Sources | |











Note:
 Map generated using Kentucky Infrastructure Authority WRIS portal. Additional annotations provided added by Kentucky American Water.

Kentucky Infrastructure Authority (KIA), Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS

Figure 2:
Kentucky American Water Millersburg Transmission Main – South Detail View



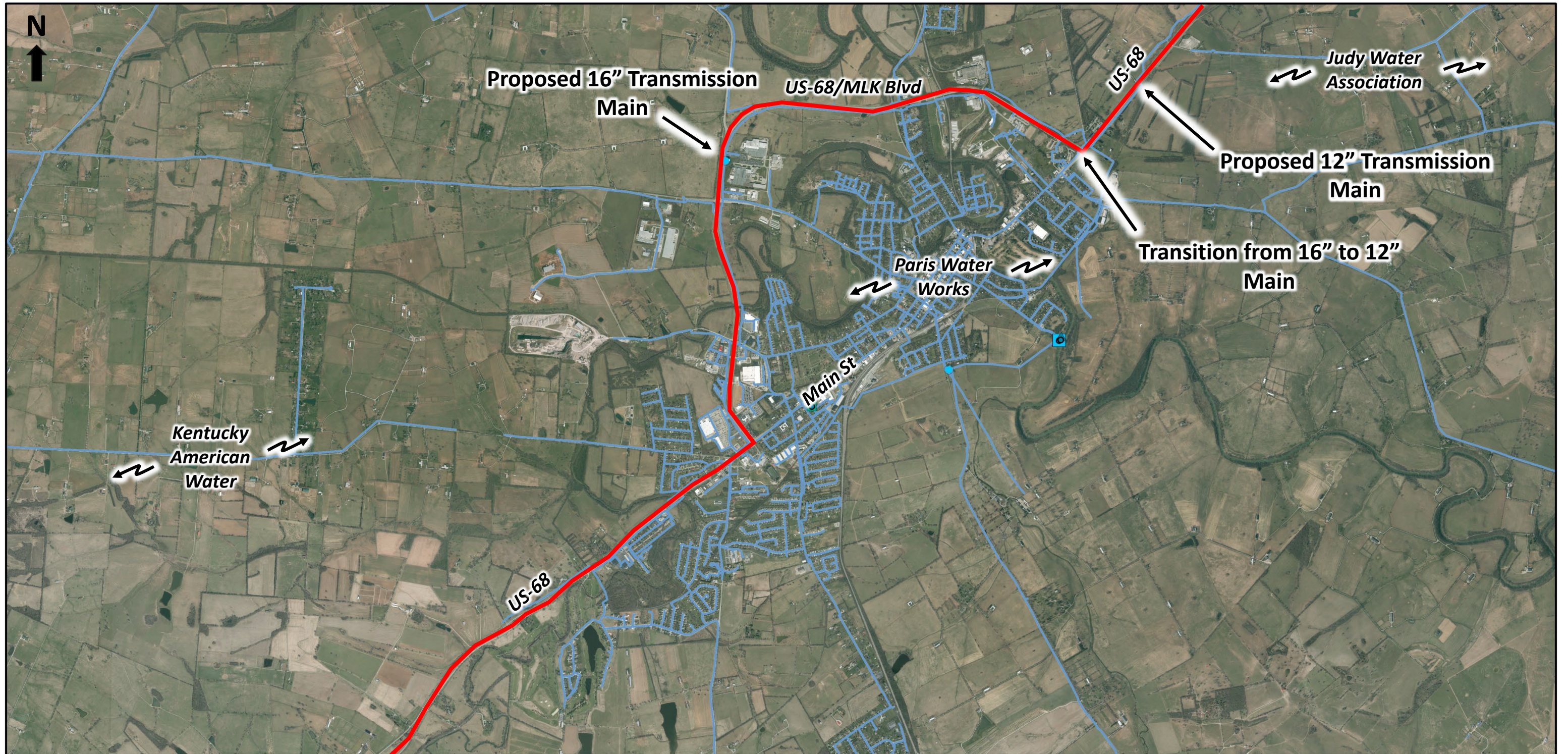
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|--|--|--|
|  Water Lines |  Pump Stations |  Water Pumps |
|  Well Sources |  Water Meters |  Non-Community Points |
|  Water Treatment Plants |  Surface and Spring Sources | |
|  Water Tanks |  Purchase Sources | |

Note:
 Map generated using Kentucky Infrastructure Authority WRIS portal. Additional annotations provided added by Kentucky American Water.

Kentucky Infrastructure Authority (KIA), Lexington-Fayette Urban Cnty Gov, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS

Figure 3:
Kentucky American Water Millersburg Transmission Main – Central Detail View



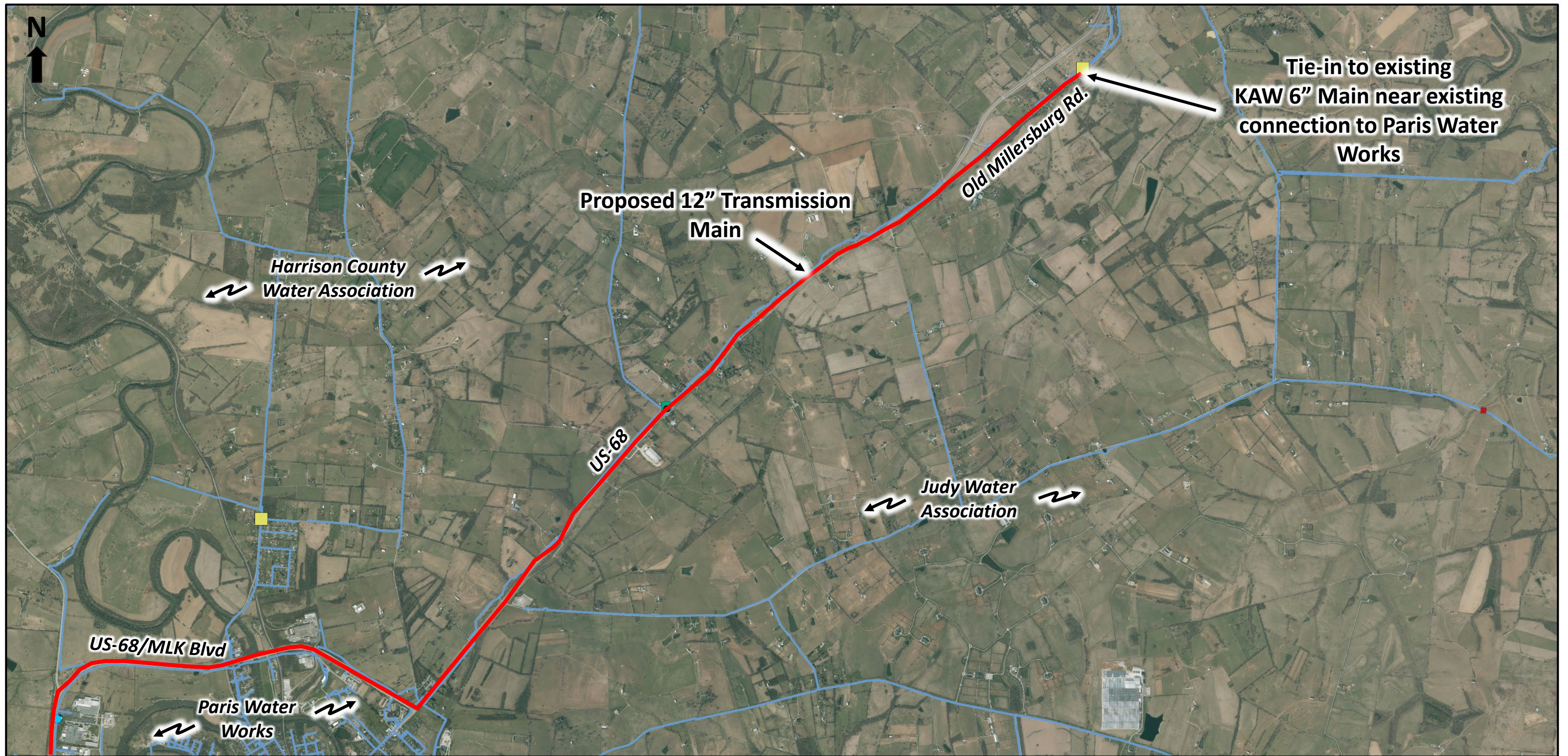
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|------------------------|----------------------------|----------------------|
| Water Lines | Pump Stations | Water Pumps |
| Well Sources | Water Meters | Non-Community Points |
| Water Treatment Plants | Surface and Spring Sources | |
| Water Tanks | Purchase Sources | |











Note:
 Map generated using Kentucky Infrastructure Authority WRIS portal. Additional annotations provided added by Kentucky American Water.

Kentucky Infrastructure Authority (KIA), Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS

**Figure 4:
Kentucky American Water Millersburg Transmission Main – North Detail View**



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- | | | |
|--|--|--|
|  Water Lines |  Pump Stations |  Water Pumps |
|  Well Sources |  Water Meters |  Non-Community Points |
|  Water Treatment Plants |  Surface and Spring Sources | |
|  Water Tanks |  Purchase Sources | |

Note:

Map generated using Kentucky Infrastructure Authority WRIS portal. Additional annotations provided added by Kentucky American Water.

Kentucky Infrastructure Authority (KIA), Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS



To:	John Magner, PE	From:	Stantec Consulting Services Inc.
	Kentucky American Water Company		Lexington, KY
File:	mem_001_175569504	Date:	June 21, 2023

Reference: Millersburg Water Supply Project– Preliminary Planning Study

Kentucky American Water Company (KAW) owns and operates the Millersburg Municipal Water Works distribution system in Millersburg, Bourbon County, KY. Currently, KAW purchases water from Paris Water Works to supply Millersburg. This water is supplied via Paris Water Works’ 6-inch diameter drinking water main constructed along US-68.

KAW is proposing the Millersburg Water Supply Project to increase the available drinking water supply and improve water quality to Millersburg. The Project will include a new drinking water main connecting KAW’s Central Division system in southwest Bourbon County to the Millersburg system.

To support this project, Stantec Consulting Services Inc. (Stantec) completed preliminary engineering analyses of the proposed project, including the following:

- Calculated the existing Millersburg demand (both annual total volume and peak flow rate).
- Determined a potential future water demand volume/rate based on potential wholesale sales and population growth.
- Performed high-level hydraulic calculations to evaluate potential pipe diameters for the proposed Millersburg Water Supply Project.

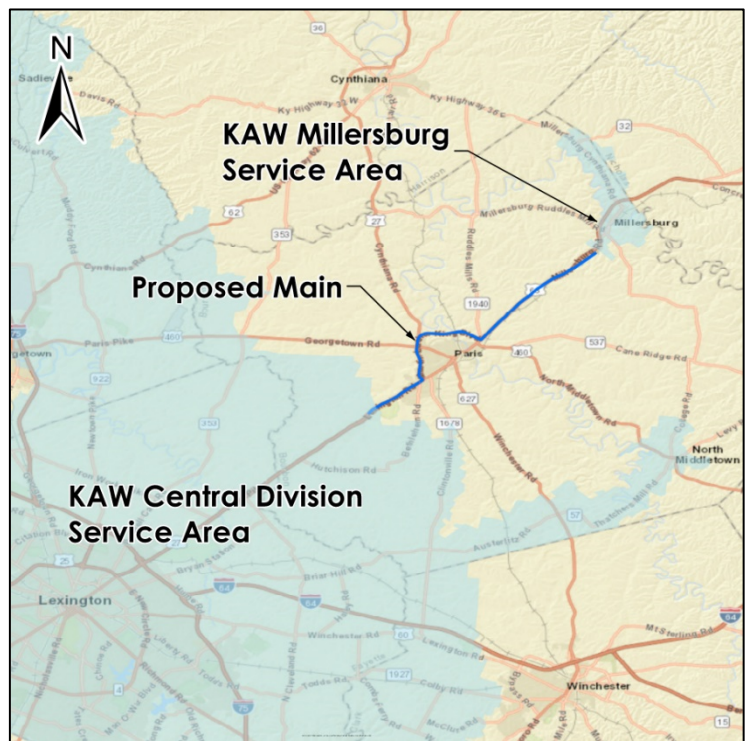


Figure 1: Project Overview (not to scale)

These preliminary calculations are described in this Memorandum.

Reference: Millersburg Water Supply Project– Preliminary Planning Study

EXISTING DEMAND

Stantec reviewed Monthly Operations Reports (MOR, KDOW EEC Form #4012) provided by KAW. These MORs document the total monthly volume of drinking water purchased and sold from the KAW Millersburg system. Five years of data were reviewed as show in Figure 2. Purchase master meter locations and system layouts are shown in Attachment A.

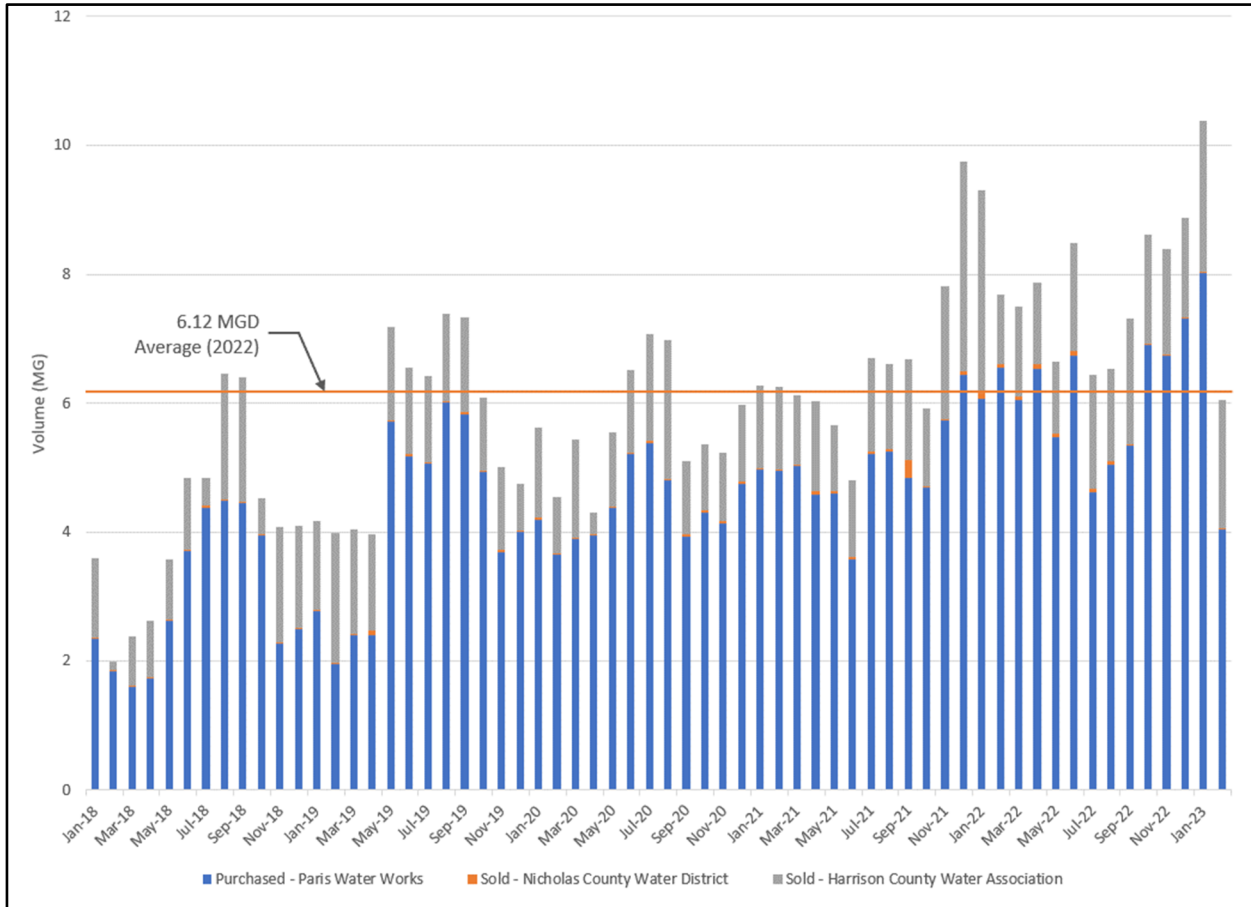


Figure 2: Millersburg Monthly Purchase/Sell Volumes

The following were summarized from this review:

- Millersburg purchased an average monthly volume of 6.12 million gallons (MG) in 2022, or about 200,000 gallons per day (GPD). This is distributed to the roughly 370 customers in Millersburg or sold to neighboring water systems (1.64 MG to Harrison and 0.06 MG to Nicholas County in 2022).
- Applying this 200,000 GPD demand over 24 hours calculates an average daily rate of about 140 gallons per minute (gpm) expected in the system.
- Instantaneous peak demands can be calculated by applying a peak-day to average-day multiplier. Design guidance provided in the American Water Works Association (AWWA) Manual of Water Supply Practices “Computer Modeling of Water Distribution Systems” (AWWA M32) recommends a

Reference: Millersburg Water Supply Project– Preliminary Planning Study

multiplier of about 1.5 to 2.0. Conservatively applying a 2.0 peak-day to average-day multiplier calculates an expected peak-day demand of 280 gpm for the existing Millersburg System.

- The total annual volumes purchased/sold in the Millersburg System have increased since 2018.

Volumes reported in the MOR were compared to meter data collected from the KAW system. In specific, data from the Millersburg Pump Station was reviewed, with the values shown in Figure 3 (instantaneous flow data for water purchased from Paris Water Works and water used by Millersburg).

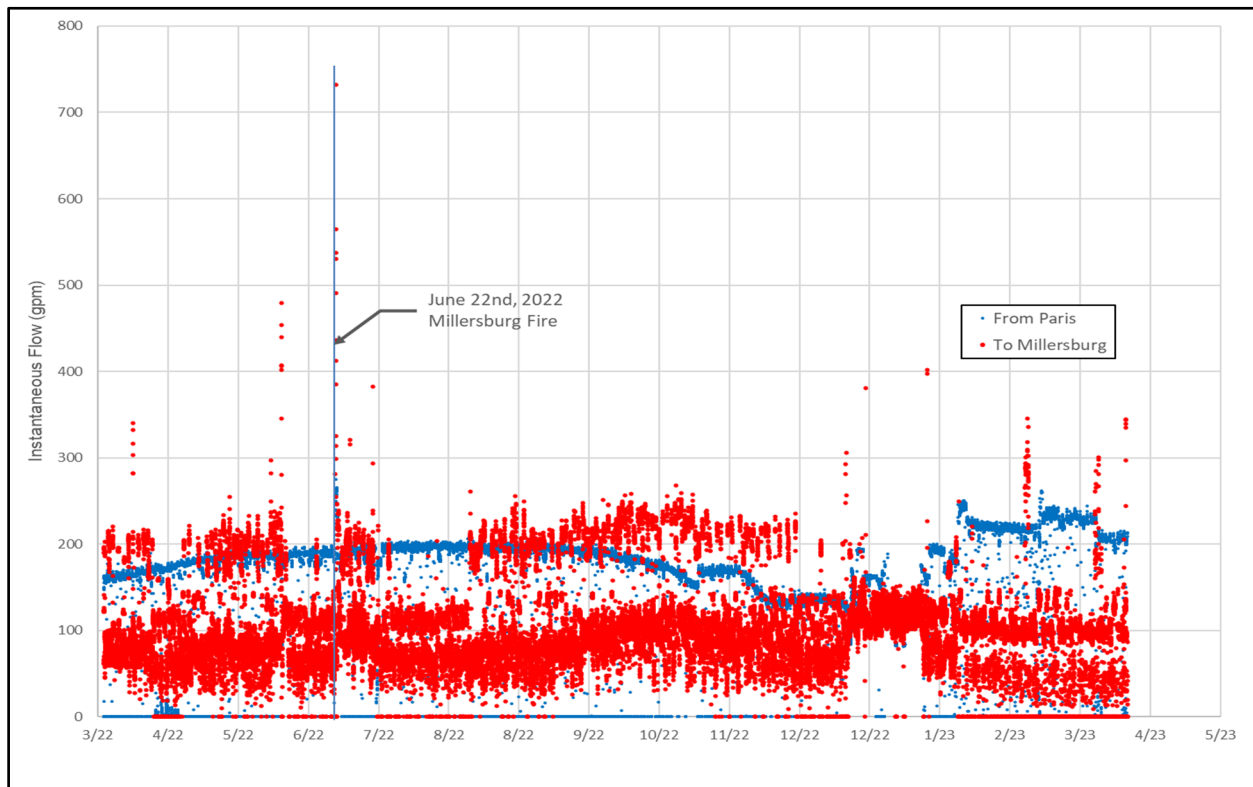


Figure 3: Instantaneous Flows through Millersburg Pump Station

As shown in Figure 3, a peak inflow of about 250 gpm was reported in the data reviewed. This supports the estimated peak-day multiplier of 2.0 and an existing peak-day demand of 280 gpm calculated above.

FIRE FLOW DEMAND

Meter data shown in Figure 3 also displays the impact of fire demand on the existing system – recorded peak flows of almost 750 gpm were pumped to Millersburg during the June 22, 2022 downtown fire. Fire flow demand at this rate was also recorded to completely empty the Millersburg Pump Station ground tank, severely limiting the amount of water provided. Based on this recorded event, Stantec recommends planning for a fire flow demand of 500 gpm.

Reference: Millersburg Water Supply Project– Preliminary Planning Study

FUTURE INCREASE IN DEMANDS

Stantec met with KAW on Wednesday April 5, 2023 for an informal discussion of future drinking water sales to surrounding water systems. Estimates of future annual volumes sold were defined by KAW:

- Harrison County Water Association: additional 14 MG
- Nicholas County Water District: additional 62 MG

Other potential customers, such as Judy Water Association, Sharpsburg Water District, and Paris Water Works were discussed. Future increases in annual volumes sold to these customers were assumed as follows:

- Judy Water Association: double the annual sales from 30 MG to 60 MG.
- Sharpsburg Water District: replace Carlisle annual sales to Sharpsburg (additional 25 MG)
- Paris Water Works: provide 117 MG for resiliency in the region (15% of City of Paris demand)

POPULATION CHANGES

According to the Kentucky State Data Center (KSDC) “Population and Household Projections”, the population in the Millersburg Water Supply Project area could grow over the next 30 years. Population trends are presented in Figure 4. Most customers potentially supplied by the proposed Millersburg Water Supply Project are in Montgomery, Bath, Harrison, Bourbon, and Nicholas counties, which are expected to experience a net population increase of about 5,500 people, a 6% increase. Therefore, increases in projected water demands were accounted for Judy Water Association, Sharpsburg Water District, and Nicholas County Water District as stated above.

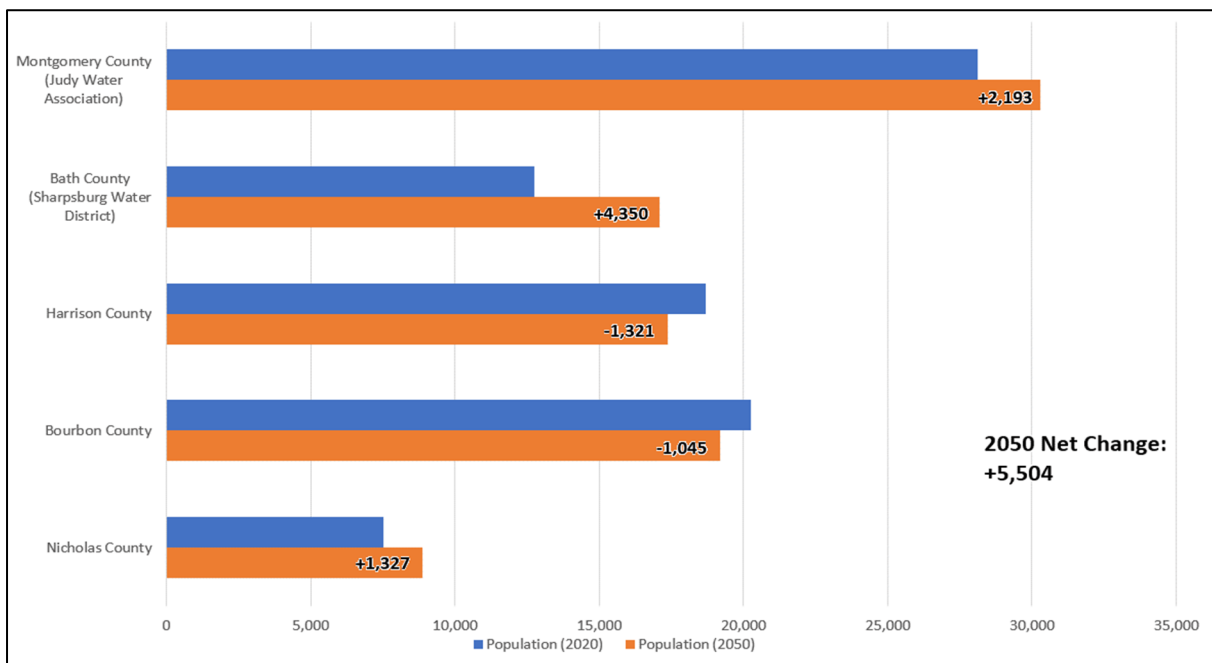


Figure 4: Population Changes in Project Area (KSDC, 2020)

Reference: Millersburg Water Supply Project– Preliminary Planning Study

DEMAND CALCULATION SUMMARY

Calculations described in this Memorandum are summarized below.

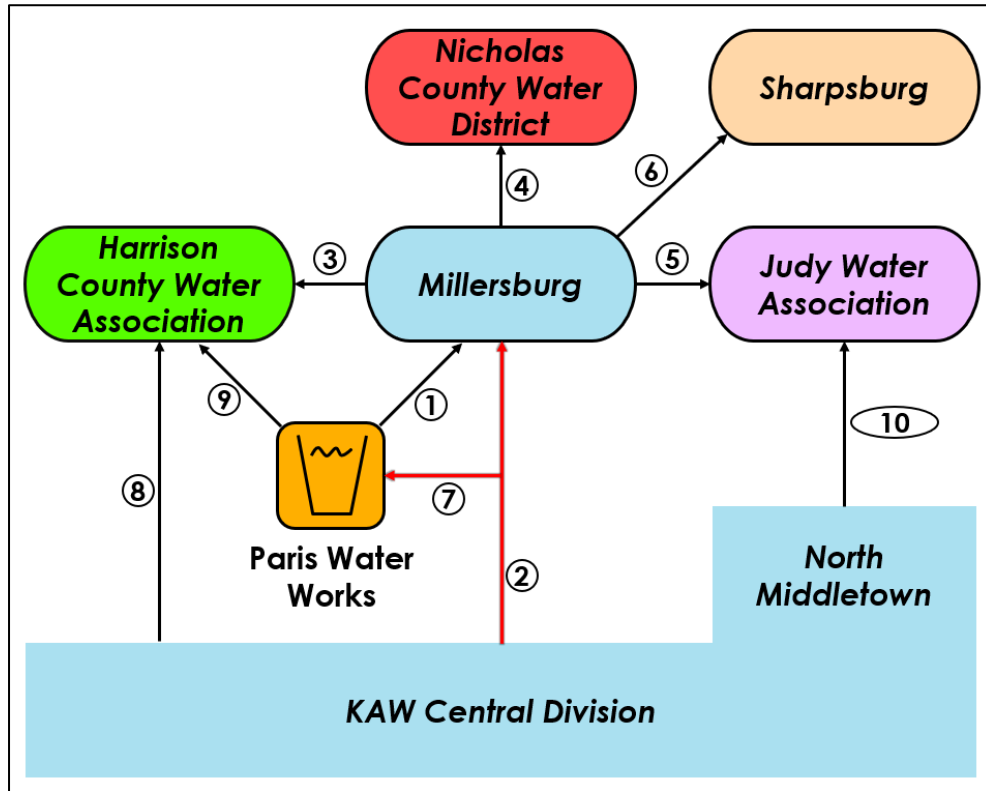


Figure 5: Demand Calculation Summary

Table 1: Hydraulic Calculation Summary

Stream No.	Existing Demand		Future Demand	
	Total Annual Volume (MG) ¹	Peak (gpm)	Total Annual Volume (MG)	Peak (gpm)
1	73	280	-	-
2	-	-	683	1,800²
3	20	75	34	130
4	<1	3	63	240
5	-	-	30	115
6	-	-	25	95
7	-	-	117	444
8	38	145	No demand applied in this study – values shown for reference	
9	<1	3		
10	30	115		

Notes:

Reference: Millersburg Water Supply Project– Preliminary Planning Study

1. Values are referenced from the following sources:
 - KAW MORs (nos. 1, 3, and 4)
 - KY Infrastructure Agency (KIA) Water Resource Information System (in italic: nos. 8, 9, and 10)
2. A 500 gpm fire-flow was included in the 1,800 gpm for the Millersburg Supply Project.

Peak demands calculated with assumed 2.0 peak-day to average-day multiplier. As shown in Table 5, the future peak-day demand to be provided by the Millersburg Supply Project is **1,800 gpm**.

HYDRAULIC CALCULATIONS

Preliminary hydraulic calculations were completed for the proposed Millersburg Water Supply project. The following were generally performed:

1. Evaluate a conceptual configuration where the proposed Millersburg Water Supply watermain will connect the existing KAW Central System to a ground tank at the Millersburg Pump Station. Several pipe diameters were considered (i.e., 12-inch, 16-inch, and 20-inch diameter ductile iron pipes).
2. Calculate system losses with the Hazen-Williams equation (detailed in Attachment B).
 - Flow rate = 1,800 gpm (future peak-day demand)
 - Hazen-Williams C = 120 (conservative for DIP)
3. Compare losses calculated to the available system head (i.e., the Central System Hydraulic Grade Line minus the highest local elevation along the proposed Millersburg Water Supply Project water main).
 - Central System Hydraulic Grade Line (per. current KAW Hydraulic Model) = 1100 feet (minimum value)
 - Overflow elevation of the Millersburg Pump Station Tank = 830 feet
 - Available system head = 1100 feet – 830 feet = 270 feet

Reference: Millersburg Water Supply Project– Preliminary Planning Study

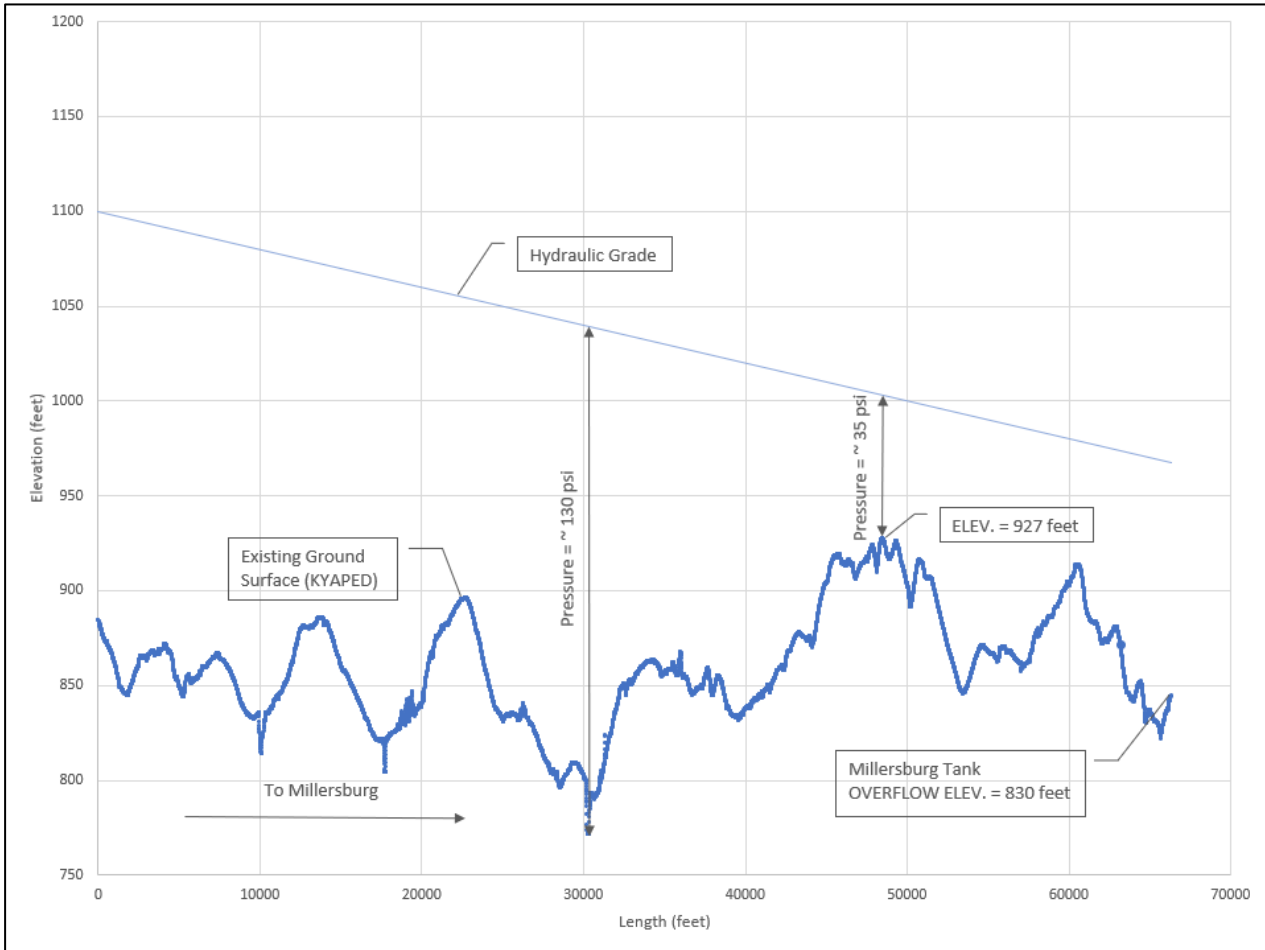


Figure 6: Existing Ground Surface Profile

Hydraulic calculations are summarized in the table below.

Table 2: Hydraulic Calculation Summary

Dia.	Peak-Day Velocity (ft/s @ 1800 gpm)	Total Head Losses (feet)
12	4.8	508.4
16	2.8	132.5
20	1.8	44.6

Reference: **Millersburg Water Supply Project– Preliminary Planning Study**

CLOSURE

Based on these preliminary calculations, Stantec recommends proceeding with detailed design of the Millersburg Water Supply Project with the following general configuration:

- A 16-inch diameter water main from the existing KAW Central Division Service area to north of Paris (at the end of MLK JR Boulevard/the US68 Paris Bypass).
- Transitioning from 16-inch diameter to a 12-inch diameter water main from north of Paris (at the end of MLK JR Boulevard/the US68 Paris Bypass) to the existing Millersburg Pump Station.

This will likely provide sufficient flow capacity to meet future demands of the Millersburg, Harrison County Water Association, Nicholas County Water District, Judy Water Association, and Sharpsburg Water District and provide resiliency in the region.

We appreciate the opportunity to assist KAW with this project. If you have any questions, please contact us.

Stantec Consulting Services Inc.



Rueben Golyatov EIT
Engineer in Training
rueben.golyatov@stantec.com



Sam Lee PE
Senior Water Resources Engineer
samuel.lee2@stantec.com

LIST OF ATTACHMENTS

Attachment A: Project Overview Figure

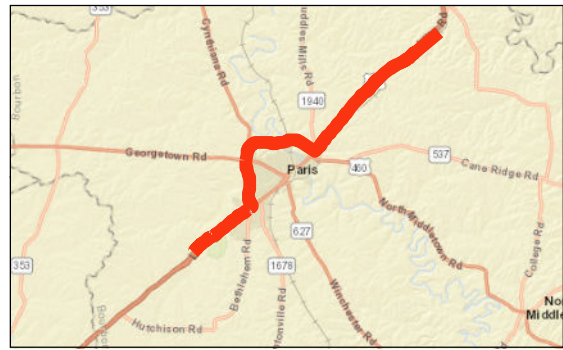
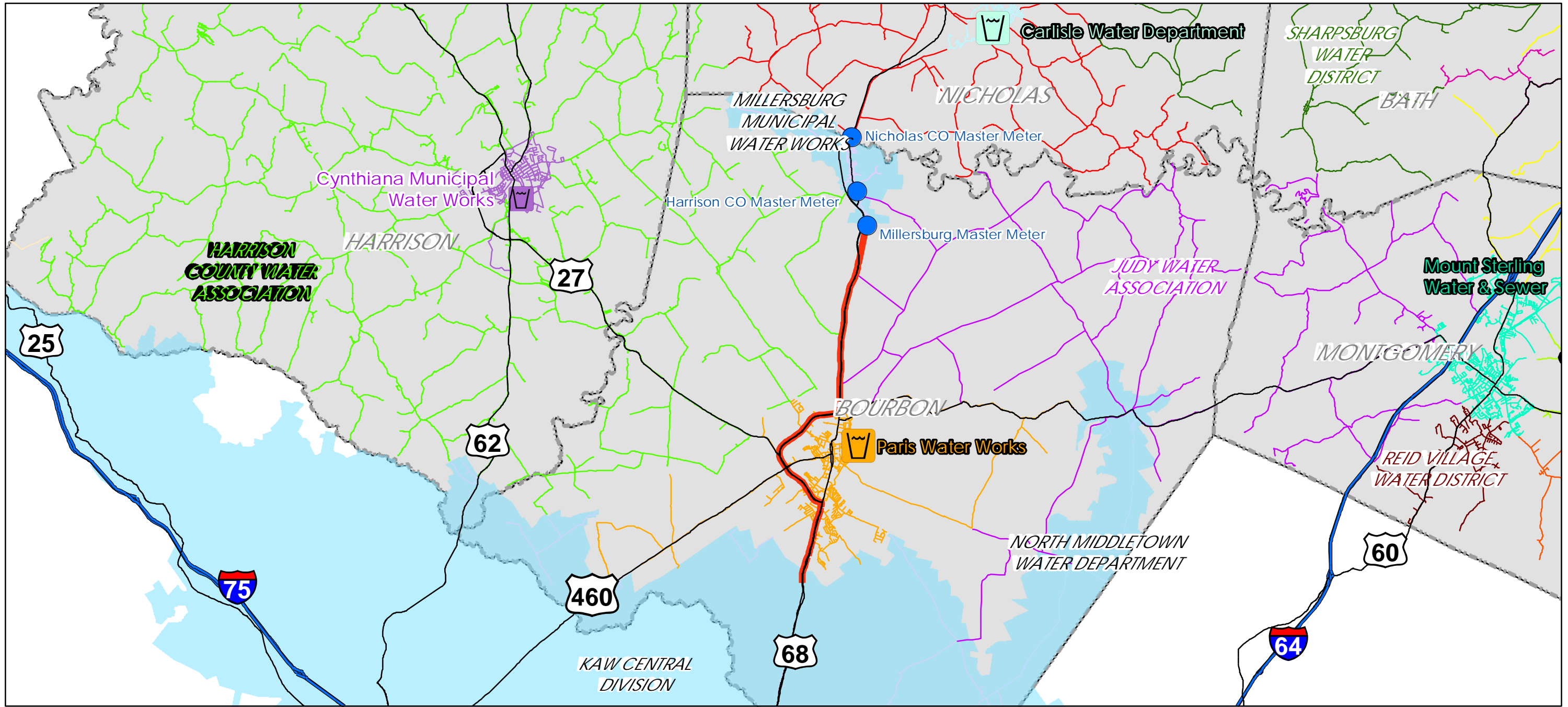
Attachment B: Hydraulic Calculations

LIST OF REFERENCES

American Water Works Association (AWWA, 2017). *Manual of Water Supply Practices No. M32: Computer Modeling of Water Distribution Systems, Fourth Edition*. Denver, Co, American Water Works Association, 2017.

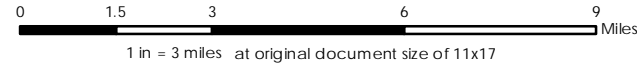
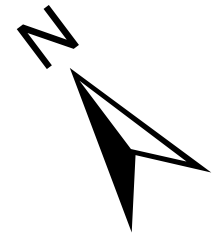
Kentucky State Data Center (KSDC, 2020). *Population and Household Projections* (KSDC, 2020). Obtained from <https://louisville.app.box.com/s/ndp7uvqbi6xtsv1sd2yIntvaer02kklq>

**ATTACHMENT A:
PROJECT OVERVIEW FIGURE**



LEGEND

- Proposed Millersburg Supply Watermain
- Purchase Source
- Water Treatment Plant
- KAW Service Area



Project Location
 Millersburg Water Supply Project
 Millersburg, Bourbon CO, KY

Client/Project
 Kentucky American Water Company
 2300 Richmond Road
 Lexington, KY

Attachment No.
 A

Title
 Project Overview Figure

- Notes
1. Coordinate System:
 NAD 1983 StatePlane Kentucky North FIPS 1601 Feet
 2. KIA WRIS Geospatial Data 2020

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**ATTACHMENT B:
HYDRAULIC CALCULATIONS**

Millersburg Supply Water Main

Proposed Water Main - Hydraulic Calculations

Water Main Inputs

Parameter	Value	Unit	Comment
Pipe Material	DI		
Average Pipe Inside Dia.	12.39	inches	Class 350 DIP
Average Pipe Inside Dia.	1.033	ft	
Average Pipe Area	0.837	square feet	
Hazen-Williams C	120		Assumed conservative for small diameter pipes
Length	66,233	feet	length estimated from GIS

HGL Inputs

Parameter	Value	Unit	Comment
HGL Elev.	1100.00	feet	Minimum Central Division HGL; obtained from WaterGEMS model
Overflow Elevation	830.00	feet	Millersburg Pump Station tank overflow elevation; obtained from as built drawings
Allowable Head Loss	270.00	feet	

Fitting Loss Inputs

Loss	K	No.	Comment
Exit	1	1	Losses at tank inlet
90 Bend	0.37	10	Assumed number of bends needed along profile
Main Line Valve (Gate)	0.08	66	Assumed gate valve every 1000 ft
45 Bend	0.25	50	Assumed number of bends needed along profile
Tee	0.1	14	Assumed fire hydrant tees every 5000 ft
TOTAL	23.88		Sum

System Head

Flow (GPM)	1660.00	1680.00	1700.00	1720.00	1740.00	1760.00	1780.00	1800.00	1820.00	1840.00	1860.00	1880.00	1900.00	1920.00	1940.00	1960.00	1980.00
Velocity (fps)	4.4	4.5	4.5	4.6	4.6	4.7	4.7	4.8	4.8	4.9	4.9	5.0	5.1	5.1	5.2	5.2	5.3
Vel. Head (ft)	0.303	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Fitting Loss (ft)	7.236	7.4	7.6	7.8	8.0	8.1	8.3	8.5	8.7	8.9	9.1	9.3	9.5	9.7	9.9	10.1	10.3
Hf/1000 ft	6.50	6.6	6.8	6.9	7.1	7.2	7.4	7.5	7.7	7.9	8.0	8.2	8.3	8.5	8.7	8.8	9.0
Friction Loss (ft)	430.37	440.0	449.8	459.6	469.5	479.6	489.7	499.9	510.2	520.7	531.2	541.8	552.5	563.3	574.2	585.2	596.3
Total Losses (ft)	437.61	447.4	457.3	467.4	477.5	487.7	498.0	508.4	518.9	529.6	540.3	551.1	562.0	573.0	584.1	595.3	606.6
TOTAL HEAD (ft)	437.6	447.4	457.3	467.4	477.5	487.7	498.0	508.4	518.9	529.6	540.3	551.1	562.0	573.0	584.1	595.3	606.6

Millersburg Supply Water Main

Proposed Water Main - Hydraulic Calculations

Water Main Inputs

Parameter	Value	Unit	Comment
Pipe Material	DI		
Average Pipe Inside Dia.	16.35	inches	Class 350 DIP
Average Pipe Inside Dia.	1.363	ft	
Average Pipe Area	1.458	square feet	
Hazen-Williams C	120		Assumed conservative for small diameter pipes
Length	66,233	feet	length estimated from GIS

HGL Inputs

Parameter	Value	Unit	Comment
HGL Elev.	1100.00	feet	Minimum Central Division HGL; obtained from WaterGEMS model
Overflow Elevation	830.00	feet	Millersburg Pump Station tank overflow elevation; obtained from as built drawings
Allowable Head Loss	270.00	feet	

Fitting Loss Inputs

Loss	K	No.	Comment
Exit	1	1	Losses at tank inlet
90 Bend	0.37	10	Assumed number of bends needed along profile
Main Line Valve (Gate)	0.08	66	Assumed gate valve every 1000 ft
45 Bend	0.25	50	Assumed number of bends needed along profile
Tee	0.1	14	Assumed fire hydrant tees every 5000 ft
TOTAL	23.88		Sum

System Head

Flow (GPM)	1660.00	1680.00	1700.00	1720.00	1740.00	1760.00	1780.00	1800.00	1820.00	1840.00	1860.00	1880.00	1900.00	1920.00	1940.00	1960.00	1980.00
Velocity (fps)	2.5	2.6	2.6	2.6	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.9	2.9	2.9	3.0	3.0	3.0
Vel. Head (ft)	0.100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fitting Loss (ft)	2.386	2.4	2.5	2.6	2.6	2.7	2.7	2.8	2.9	2.9	3.0	3.1	3.1	3.2	3.3	3.3	3.4
Hf/1000 ft	1.69	1.7	1.8	1.8	1.8	1.9	1.9	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.3	2.3
Friction Loss (ft)	111.64	114.1	116.7	119.2	121.8	124.4	127.0	129.7	132.4	135.1	137.8	140.5	143.3	146.1	149.0	151.8	154.7
Total Losses (ft)	114.02	116.6	119.2	121.8	124.4	127.1	129.8	132.5	135.2	138.0	140.8	143.6	146.4	149.3	152.2	155.1	158.1
TOTAL HEAD (ft)	114.0	116.6	119.2	121.8	124.4	127.1	129.8	132.5	135.2	138.0	140.8	143.6	146.4	149.3	152.2	155.1	158.1

Millersburg Supply Water Main

Proposed Water Main - Hydraulic Calculations

Water Main Inputs

Parameter	Value	Unit	Comment
Pipe Material	DI		
Average Pipe Inside Dia.	20.47	inches	Class 350 DIP
Average Pipe Inside Dia.	1.706	ft	
Average Pipe Area	2.285	square feet	
Hazen-Williams C	120		Assumed conservative for small diameter pipes
Length	66,233	feet	length estimated from GIS

HGL Inputs

Parameter	Value	Unit	Comment
HGL Elev.	1100.00	feet	Minimum Central Division HGL; obtained from WaterGEMS model
Overflow Elevation	830.00	feet	Millersburg Pump Station tank overflow elevation; obtained from as built drawings
Allowable Head Loss	270.00	feet	

Fitting Loss Inputs

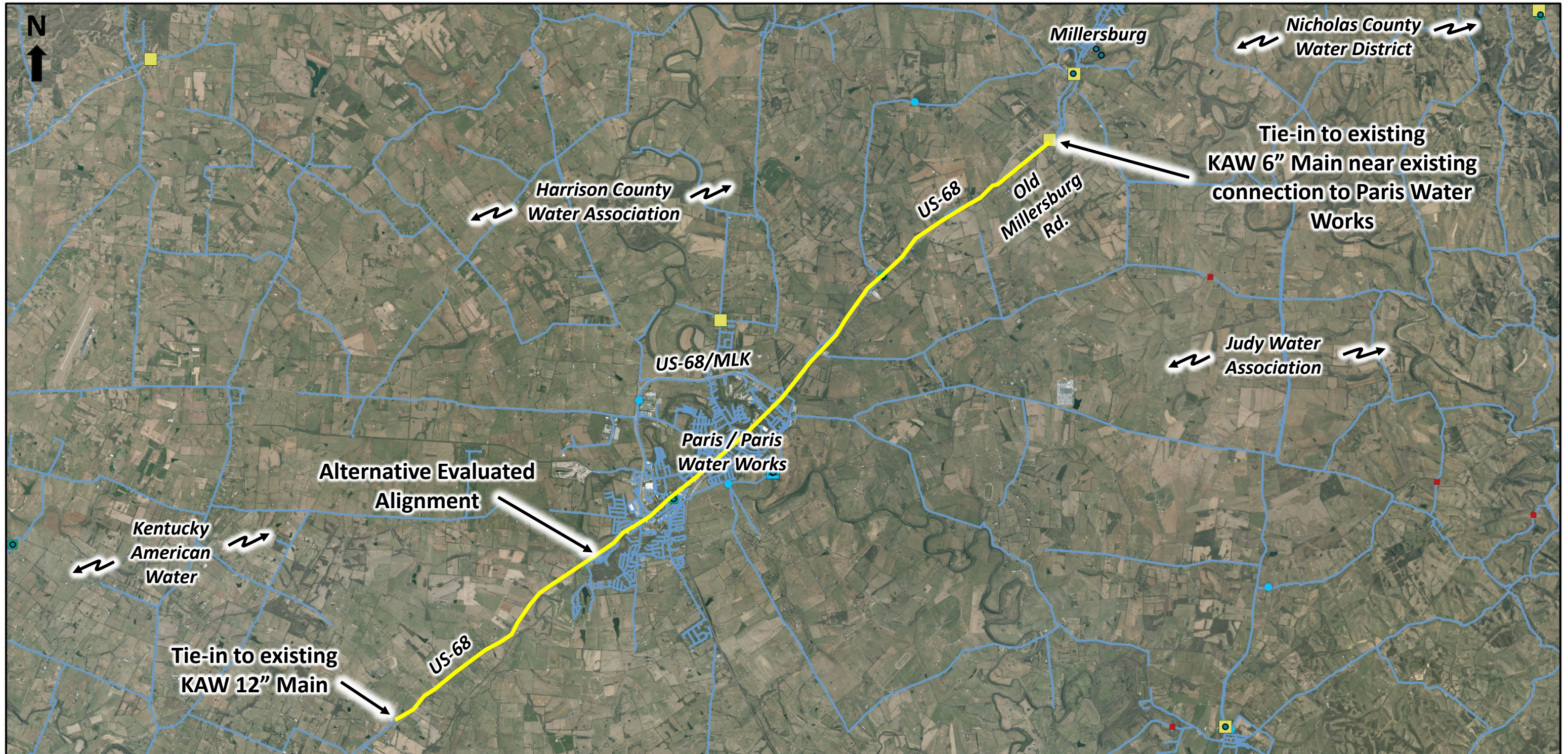
Loss	K	No.	Comment
Exit	1	1	Losses at tank inlet
90 Bend	0.37	10	Assumed number of bends needed along profile
Main Line Valve (Gate)	0.08	66	Assumed gate valve every 1000 ft
45 Bend	0.25	50	Assumed number of bends needed along profile
Tee	0.1	14	Assumed fire hydrant tees every 5000 ft
TOTAL	23.88		Sum

System Head

Flow (GPM)	1660.00	1680.00	1700.00	1720.00	1740.00	1760.00	1780.00	1800.00	1820.00	1840.00	1860.00	1880.00	1900.00	1920.00	1940.00	1960.00	1980.00
Velocity (fps)	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9
Vel. Head (ft)	0.041	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fitting Loss (ft)	0.971	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4
Hf/1000 ft	0.56	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8
Friction Loss (ft)	37.41	38.2	39.1	39.9	40.8	41.7	42.6	43.5	44.3	45.3	46.2	47.1	48.0	49.0	49.9	50.9	51.8
Total Losses (ft)	38.38	39.2	40.1	41.0	41.9	42.8	43.7	44.6	45.5	46.4	47.4	48.3	49.3	50.3	51.2	52.2	53.2
TOTAL HEAD (ft)	38.4	39.2	40.1	41.0	41.9	42.8	43.7	44.6	45.5	46.4	47.4	48.3	49.3	50.3	51.2	52.2	53.2

Figure 1:

Kentucky American Water Millersburg Transmission Main – Alternative Evaluated Alignment – Main Through Downtown Paris



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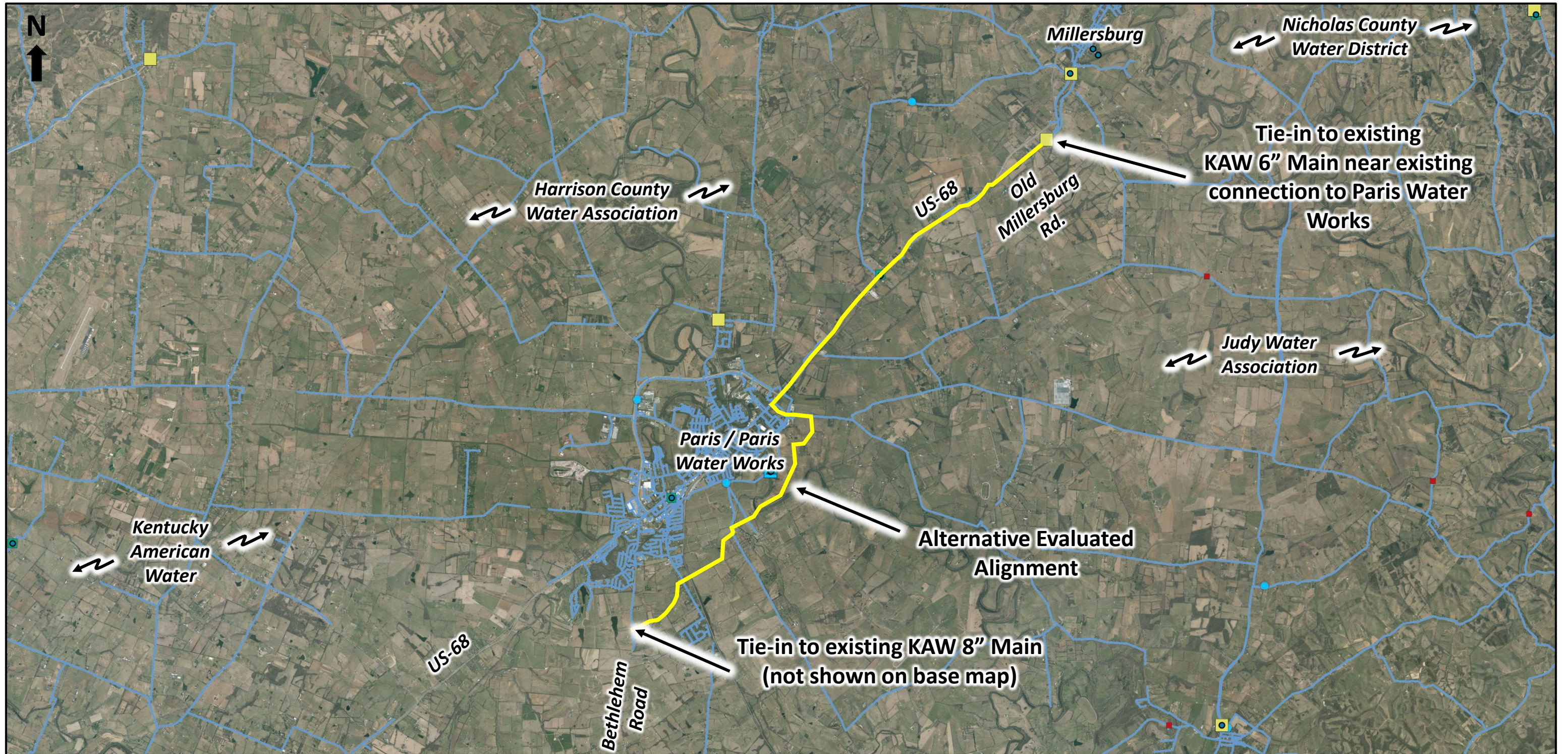
- Water Lines
- Well Sources
- Water Treatment Plants
- Water Tanks
- Pump Stations
- Water Meters
- ▲ Surface and Spring Sources
- Purchase Sources
- Water Pumps
- Non-Community Points

Note:
 Map generated using Kentucky Infrastructure Authority WRIS portal. Additional annotations provided added by Kentucky American Water.

Kentucky Infrastructure Authority (KIA), Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS

Figure 2:

Kentucky American Water Millersburg Transmission Main – Alternative Evaluated Alignment – Rural Main South of Paris



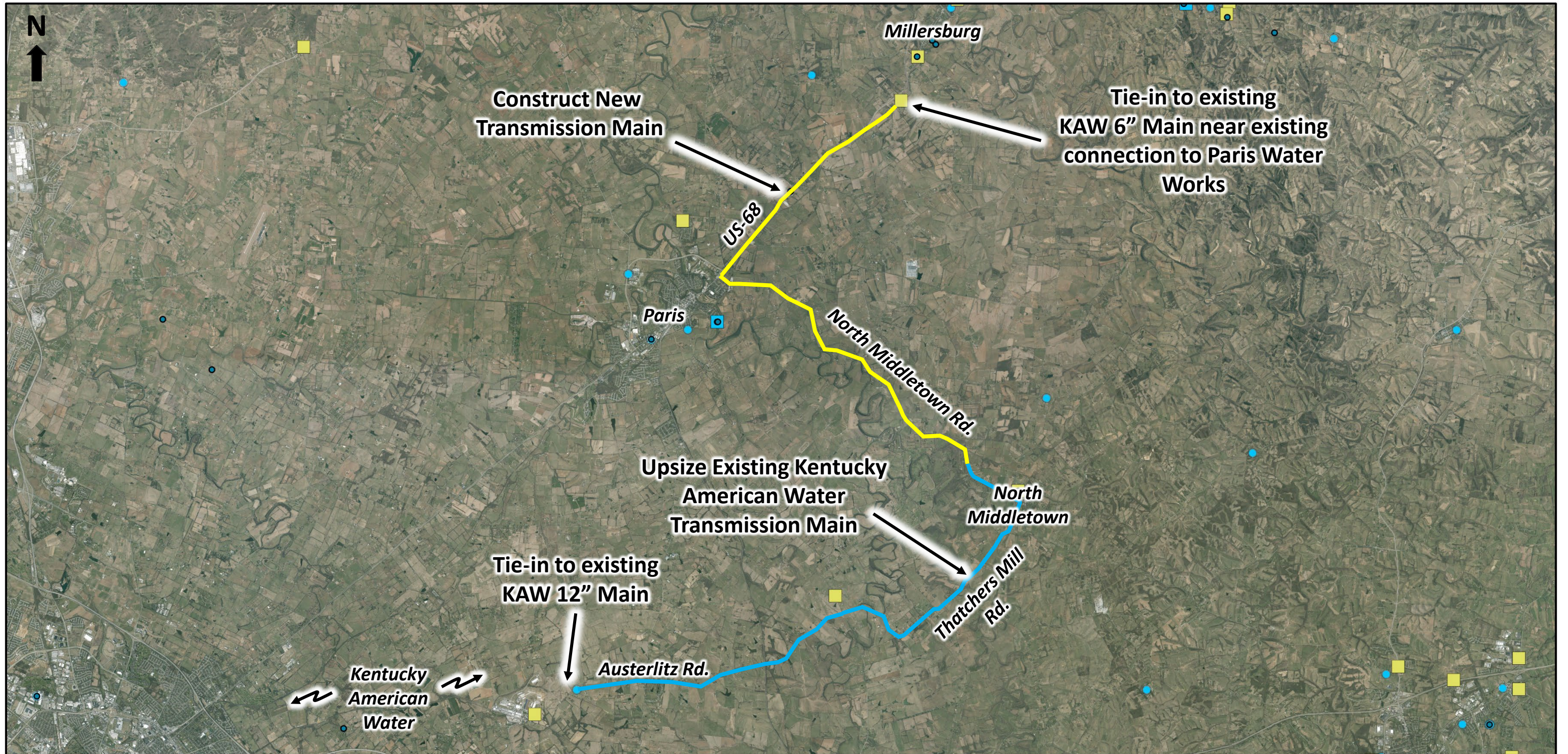
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- | | | |
|------------------------|----------------------------|----------------------|
| Water Lines | Pump Stations | Water Pumps |
| Well Sources | Water Meters | Non-Community Points |
| Water Treatment Plants | Surface and Spring Sources | |
| Water Tanks | Purchase Sources | |

Note:
Map generated using Kentucky Infrastructure Authority WRIS portal. Additional annotations provided added by Kentucky American Water.

Kentucky Infrastructure Authority (KIA), Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS

Figure 3:
Kentucky American Water Millersburg Transmission Main – Alternative Evaluated Alignment – Main from North Middletown



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- | | | |
|------------------------|----------------------------|----------------------|
| Water Lines | Pump Stations | Water Pumps |
| Well Sources | Water Meters | Non-Community Points |
| Water Treatment Plants | Surface and Spring Sources | |
| Water Tanks | Purchase Sources | |

Note:
 Map generated using Kentucky Infrastructure Authority WRIS portal. Additional annotations provided added by Kentucky American Water.

Kentucky Infrastructure Authority (KIA), Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS

Engineer's Opinion of Probable Project Costs					
Proj.	Millersburg Supply Main				
Date:	3/9/2023				
No.	Item	Unit	Quantity	Unit Price	Total Cost
Engineering/Design					\$ 409,520
1	Consultant Design Fee	LS	1	\$ 409,520	\$ 409,520
Materials					\$ 3,298,250
2	12" Ductile Iron Pipe	LF	31,000	\$ 40	\$ 1,240,000
3	16" Ductile Iron Pipe	LF	33,000	\$ 55	\$ 1,815,000
4	Gate Valve	EA	21	\$ 7,000	\$ 147,000
5	22.5° Bend	EA	130	\$ 350	\$ 45,500
6	45° Bend	EA	65	\$ 350	\$ 22,750
7	90° Bend	EA	6	\$ 500	\$ 3,000
8	Air Release Valve	EA	25	\$ 400	\$ 10,000
9	Flushing Hydrant	EA	10	\$ 1,500	\$ 15,000
Construction Labor					\$ 7,125,100
10	Mobilization/Demobalization	LS	1	\$ 600,000	\$ 600,000
11	Traffic Control	LS	1	\$ 300,000	\$ 300,000
12	Pipe Installation - Rural/ROW	LF	53,000	\$ 65	\$ 3,445,000
13	Pipe Installation - Roadway	LF	9,000	\$ 170	\$ 1,530,000
14	Pipe Installation - Road Crossing	LF	700	\$ 700	\$ 490,000
15	Pipe Installation - Creek Crossing	LF	1,000	\$ 600	\$ 600,000
16	Pipe Installation - Railroad Crossing	LF	75	\$ 1,500	\$ 112,500
17	Valve Installation	EA	21	\$ 600	\$ 12,600
18	Hydrant Installation	EA	10	\$ 3,000	\$ 30,000
19	Tie-in	EA	2	\$ 2,500	\$ 5,000
Overhead/Legal/Easements					\$ 1,937,000
20	AFUDC	LS	1	\$ 357,000	\$ 357,000
21	Overhead	LS	1	\$ 1,080,000	\$ 1,080,000
22	Legal/Easements	LS	1	\$ 500,000	\$ 500,000
Project Total					\$ 12,769,870

Commonwealth of Kentucky

STATE SENATE

STEPHEN A. WEST
State Senator
202 Vimont Lane
Paris, KY 40361



State Capitol Annex, Room 229
Frankfort, KY 40601
(502) 564-8100, Ext. 806

27TH DISTRICT

May 31, 2023

Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40601

To Whom It May Concern:

I am writing to express my support for Kentucky American Water's proposed waterline project that would extend a water transmission line from the company's existing infrastructure in Bourbon County through Millersburg.

This project, if approved, will have a positive impact on water service reliability and fire protection in Millersburg as well as support our many economic development efforts in the Bourbon/Nicholas County region. Millersburg has been undergoing tremendous renewal, with residential properties undergoing refurbishment and a desire by various regional partners to develop new commercial and residential properties in the community. In addition, the plans include a new industrial park in the region that is projected to bring 200-300 more jobs to the area in the next few years alone.

Our region is excited about the prospect of such economic growth in the future, but additional water supply is critical to support these efforts. I am pleased to offer my support for the project. Thank you for your consideration. If I can be of any assistance, please do not hesitate to contact me at 502-564-8100.

Sincerely,

A handwritten signature in black ink that reads "Stephen West".

Stephen A. West
State Senate, 27th district

SW/lbh

Commonwealth of Kentucky

HOUSE OF REPRESENTATIVES

MATTHEW R. KOCH
STATE REPRESENTATIVE
HOUSE DISTRICT 72
OFFICE (502) 564-8100 EXT. 660



CAPITOL ANNEX
702 CAPITOL AVENUE, ROOM 384
FRANKFORT, KENTUCKY 40601

Matthew.Koch@lrc.ky.gov
TOLL-FREE MESSAGE LINE
1-800-372-7181

June 5, 2023

Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, KY 40601

To Whom It May Concern:

I am writing to share my support for Kentucky American Water's proposed waterline project. This project would extend a water transmission line from the company's existing infrastructure in Bourbon County through Millersburg.

This project, if approved, will have a positive impact on water service reliability and fire protection in Millersburg as well as support our economic development efforts in the Bourbon/Nicolas County region. Millersburg has been undergoing tremendous renewal, with residential properties undergoing refurbishment and a desire by various regional partners to develop new commercial and residential properties in the community. In addition, the plans include a new industrial park in the region that is projected to bring 200-300 more jobs to the area in the next few years alone.

Our region is excited about the prospect of such economic growth in the future, but additional water supply is critical to support these efforts. I am pleased to offer support for this project and I thank you for your consideration. If I can be of any assistance, please do not hesitate to contact me at 502-564-8100.

Sincerely,

A handwritten signature in black ink that reads "Matthew R. Koch".

Matthew R. Koch
State Representative
District 72

MK/emp



Steve Hamilton
Judge Executive Office
Nicholas County
Carlisle, KY 40311
(859)289-3725



April 19, 2023

To whom it may concern:

I am pleased to offer my support for the proposed Kentucky American Water investment project that will extend a pipeline from Fayette County through Millersburg in Bourbon County. This project will provide additional water supply for our region and positively impact our area for many years to come. Additional water supply will not only better prepare us for emergencies, but enable us to accommodate future economic growth for Nicholas County and to improve the quality of life for our region.

Thank you,

Judge Steve Hamilton
Nicholas County Judge Executive



Michael R. Williams
Bourbon County Judge Executive
Courthouse
Paris, Kentucky 40361

04-20-23

To whom it may concern:

I am pleased to offer my support for the proposed Kentucky American Water investment project that will extend a pipeline from Fayette County through Millersburg in Bourbon County. This project will provide additional water supply for our region and positively impact our area for many years to come. Additional water supply will not only better prepare us for emergencies, but enable us to accommodate future economic growth.

Thank you,

A handwritten signature in blue ink that reads "Michael R. Williams".

Michael R. Williams

Bourbon County Judge Executive



Paris-Bourbon County Economic Development Authority
525 High Street, Suite 117
Paris, KY 40361

June 5, 2023

To whom it may concern:

I'm writing to share my support for Kentucky American Water's proposed waterline project that would extend a water transmission line from the company's existing infrastructure in Bourbon County through Millersburg.

This project, if approved, will have a positive impact on water service reliability and fire protection in Millersburg as well as support our many economic development efforts in the Bourbon/Nicholas County region. Millersburg has been undergoing tremendous renewal, with residential properties undergoing refurbishment and a desire by various regional partners to develop new commercial and residential properties in the community, too. In addition, our plans include a new industrial park in the region that we project would bring 200-300 more jobs to the area in the next few years alone.

Our region is excited about the prospect of such economic growth in the future, but additional water supply is critical to support these efforts.

Best regards,

Gordon E. Wilson
Executive Director
Paris-Bourbon County EDA



June 9, 2023

Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, KY 40602

To whom it may concern:

I am writing to extend Commerce Lexington's support for Kentucky American Water's proposed project in Bourbon County to enhance water service there through the extension of a water transmission main from the company's existing system in Bourbon County through Millersburg.

Commerce Lexington is a nearly 2,000-member driven organization that works to promote economic development, job creation, and overall business growth in Lexington and Central Kentucky. We harness the collective power of the regional business community to influence public policy, support businesses and entrepreneurs, cultivate current and future leaders, and leverage collaboration within our nine-county economic development area to build a more competitive Bluegrass region.

Although much of Commerce Lexington's economic development efforts are focused within Fayette County, we also serve eight other Central Kentucky counties, including Bourbon. We understand the importance of having adequate infrastructure and the role it plays in maintaining affordability and enhancing the quality of life for our citizens.

We understand the proposed waterline project will enhance the quality and reliability of water service for Millersburg and beyond, thus supporting economic development in Bourbon and Nicholas counties that will undoubtedly have a positive impact on other parts of the region, too.

Sincerely,

A handwritten signature in black ink that reads "Robert L. Quick". The signature is written in a cursive style with a large, stylized "R" and "Q".

Robert L. Quick, IOM, CCE
President & CEO
Commerce Lexington Inc.



community ventures

Your Dream. Our Mission.

May 31, 2023

Chairman Kent Chandler
Kentucky Public Service Commission
P. O. Box 615
Frankfort, KY 40602-0615

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Board Member

Lorrain Smoot
Board Member

Charles Duke
Board Member

Artie Ford
Board Member

Todd Ziegler
Board Member

Dear Chairman Chandler:

Please accept this letter of support for Kentucky American Water's proposed project new transmission line from their current line in Bourbon County to Millersburg. Community Ventures is a non-profit community development entity that is engaged in comprehensive community development in Millersburg and is keenly attuned to the community's needs.

Community Ventures fosters many activities that support entrepreneurship and homeownership in Millersburg. We own and operate the former Millersburg Military Institute, now known as Mustard Seed Hill where our activities generate more than 75,000 annual visitors in the city. We are engaged daily to find and support businesses that wish to locate or relocate in Millersburg and now support six on the campus, including the Bourbon Christian Academy, Miracles Bakery, and Kentucky Woolworks. We have also purchased dozens of residential properties that are designated for new homeowners and have completed one new home construction, the first in the city in sixteen years.

A quality and reliable water supply is key to ensuring the town can grow, develop, and revitalize itself. The current situation—where water is purchased from Paris Water Works—is a limited arrangement where adequate supply is unreliable. Kentucky American Water can remedy that by building a new main line that will improve service, reliability, provide better fire protection, and be prepared for future industrial and residential growth in Millersburg and the region.

Community Ventures is wholeheartedly supportive of Kentucky American Water's proposal and view this as vital to not only the success of our revitalization efforts, but a catalytic factor for the proper quality of life Millersburg's residents deserve.

Sincerely,

Kevin R. Smith
President and CEO

MAIN OFFICE
1450 N BROADWAY
LEXINGTON, KY 40505

CVKY.ORG



U.S. Small Business Administration