PRELIINARY ENGINEERING REPORT

AC WATER LINE REPLACEMENT PROJECT
FARMDALE WATER DISTRICT
FRANKLIN COUNTY, KENTUCKY

SEPTEMBER 2019

9/30/19

Prepared By:

PROFESSIONAL ENGINEERS, INC

3 HMB CIRCLE
FRANKFORT, KENTUCKY
502-695-9800
502-695-9810-FAX

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I INTRODUCTION

This Preliminary Engineering Report will examine the proposed AC Water Line Replacement for the Farmdale Water District. The District is currently pursuing funding to replace and upgrade approximately 64,000 l.f. of various size asbestos cement (A.C.) water lines located throughout the District's service area that are believed to be the main contributor to the District's high water loss. By upgrading several of the water lines, the District will also be able to provide better water service to areas of the system that are under served with smaller size water lines. It is estimated that the proposed project will have a construction cost of $1,936,075 and a project cost of $2,458,000.

II DESCRIPTION OF WATER DISTRICT

Farmdale Water District was created in approximately 1968. There are three members of the Board of Commissioners that are nominated by the Judge Executive of Franklin County and must be approved by the Fiscal Court. These Commissioners transact and administer all business of the District at its office located at 100 Highwood Drive, Frankfort, Kentucky. The day to day work is handled by the office manager or the maintenance supervisor. The majority of the District's service areas is in Franklin County south of I-64. It includes Farmdale, Evergreen, Coolbrook and Huntington Woods.

III EXISTING WATER SYSTEM

Farmdale Water District provides safe potable water service to approximately 2,650 customers. The system is comprised of approximately 18 miles of water line ranging in sizes from 2 inch to 12 inch and consists of two (2) water storage tanks. The Cardwell Lane Tank is a stand pipe style tank located next to the District's office and has a capacity of 220,000 gallons. The Stewart Home Tank is an elevated tank located along Old US 127 near the Stewart Home with a capacity of 500,000 gallons. Both tanks are filled from the booster pump station located on Evergreen Road.

The District purchases all of its water from the Frankfort Plant Board through a master meter located along Evergreen Road. The District purchases approximately 18 million gallons per month.

IV NEED FOR PROJECT

Farmdale Water District has been experiencing an extremely high percentage of water loss. The average monthly water loss for 2018 was approximately 30 percent. The District believes much of the water loss can be contributed to the existing asbestos cement (A.C.). water line. During the early years of the District's formation, a majority of the water lines constructed were made of A.C. A.C. water line is notorious for becoming brittle and more susceptible to leaking and breaks as the pipe ages. Water line leaks and breaks create health and sanitary risks to the residential and commercial customers. The A.C. water lines are also considered a hazardous material that poses potential health hazards to the maintenance crew when repairing a leak (See Appendix A – DOW Letter).

The excessive water loss also causes a financial burden on the District which in turn creates a financial burden on its customers. At an average water loss of 30 percent, it costs the District approximately $167,000 per year in lost water. Although District's water loss will never be completely eliminated, if it could be reduced by 25 percent by replacing the A.C. water line, it would save the District approximately $42,000 per year.

Since the District's conception, there has been substantial growth in the service area including several subdivisions. Most of these areas are still served with the original water lines. Although the District maintains the required minimum standards, the system could be much better served with larger water lines.

During the warmer months of summer, the District is experiencing chlorine levels below the Division of Water requirements. This requires the District to put the customers on a boil water advisory. There are many possible circumstances that can contribute to low chlorine levels. One of the most common is poor turnover in water storage tanks. This can allow the water temperature to increase causing the chlorine levels to drop.

V THE PROPOSED PROJECT

The Farmdale Water District proposes to replace or upgrade approximately 64,000 l.f. of A.C. water line with PVC water line as part of the A.C. Replacement Project. This Project includes the following roads: Green Wilson Road, KY 151, Old

Lawrenceburg Road, Jones Lane, Twighlight Trail, Ninevah Road and Johnson Road. Refer to Appendix B – Project Map. Although this project won't completely eliminate water line leaks and breaks, it should greatly reduce the frequency of them. The use of PVC water line will also eliminated the potential health hazards associated with exposure to A.C. water line.

Several of the water lines being replaced will be upgraded to a larger size. This will allow the District to provide better service to its existing and future customers.

In order to help maintain adequate chlorine levels, the District proposes to install a mixing system in the Highwood Water Storage Tank. The mixing system will keep the water turned over by mixing fresh water with the older water. This also helps keeps the water temperature down.

VI COST SUMMARY

The estimated construction cost for the A.C. Water Line Replacement Project is $1,936,075 and is summarized in Tables 1 to 8. The estimated project cost is $2,458,000 and is summarized in Table 9.

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Water/Wastewater
Transportation
Engineers
Environmental

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Table 1
Construction Cost Estimate
for
Green Wilson Water Line Upgrade
Farmdale Water District

Item	Quantity	Unit Price	Total
8" Water Line (SDR-21)	14,100	$18	$253,800
8" DI Water Line w/Nitrile Gaskets	300	$60	$18,000
14" Road Bore	175	$125	$21,875
8" Open Bore	525	$50	$26,250
Fire Hydrant Assembly (Every 1000')	14	$4,500	$63,000
Connection to Existing Water Line	10	$2,000	$20,000
New Service Connection (Opposite Side)	27	$1,250	$33,750
New Service Connection (Same Side)	22	$1,000	$22,000
Cust. Reconnect (Opposite Side)	27	$650	$17,550
Cust. Reconnect (Same Side)	22	$500	$11,000
Additional Service Line	500	$7	$3,500
Air Release Valve (Every 4,000')	3	$1,500	$4,500
8" Gate Valve	8	$1,100	$8,800
6" Gate Valve	3	$800	$2,400
4" Gate Valve	2	$600	$1,200
3" Gate Valve	3	$500	$1,500
8" Creek Crossing	50	$50	$2,500
Crushed Stone	500	$10	$5,000
Bit. Replacement	200	$40	$8,000
Reconnect Master Meter	1	$3,000	$3,000
Misc. Items	1	$50,000	$50,000
Total Estimated Construction Cost			$577,625

Notes:
Assumed half of the meter connection would be new and half would be reconnects.
Assumed existing meter would be used.

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Table 2
Construction Cost Estimate
for
KY 151
Farmdale Water District

Item	Quantity	Unit Price	Total
6" Water Line (SDR-21)	15,600	$16	$249,600
6" DI Water Line w/Nitrile Gaskets	400	$45	$18,000
12" Road Bore	160	$115	$18,400
6" Open Bore	80	$50	$4,000
Fire Hydrant Assembly	4	$4,500	$18,000
Connection to Existing Water Line	4	$2,000	$8,000
New Service Connection (Opposite Side)	7	$1,250	$8,750
New Service Connection (Same Side)	8	$1,000	$8,000
Cust. Reconnect (Opposite Side)	6	$650	$3,900
Cust. Reconnect (Same Side)	8	$500	$4,000
Additional Service Line	600	$7	$4,200
Air Release Valve (Every 4,000')	4	$1,500	$6,000
6" Gate Valve	9	$800	$7,200
6" Creek Crossing	30	$50	$1,500
Crushed Stone	500	$10	$5,000
Misc. Items	1	$15,000	$15,000
Total Estimated Construction Cost			$379,550

Notes:
Assumed half of the meter connection would be new and half would be reconnects.
Assumed existing meter would be used.

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Table 3
Construction Cost Estimate
for
Old Lawrenceburg Rd.
Farmdale Water District

Item	Quantity	Unit Price	Total
8" Water Line (SDR-21)	8,250	$18	$148,500
6" Water Line (SDR-21)	2,600	$16	$41,600
3" Water Line	2,600	$12	$31,200
14" Road Bore	140	$125	$17,500
10" Road Bore	140	$100	$14,000
8" Open Bore	120	$50	$6,000
6" Open Bore	120	$50	$6,000
Fire Hydrant Assembly	5	$4,500	$22,500
Blowoff Hydrant	1	$2,000	$2,000
Connection to Existing Water Line	6	$2,000	$12,000
New Service Connection (Opposite Side)	5	$1,250	$6,250
New Service Connection (Same Side)	13	$1,000	$13,000
Cust. Reconnect (Opposite Side)	5	$650	$3,250
Cust. Reconnect (Same Side)	13	$500	$6,500
Additional Service Line	250	$7	$1,750
Air Release Valve (Every 4,000')	3	$1,500	$4,500
8" Gate Valve	4	$1,100	$4,400
6" Gate Valve	3	$800	$2,400
4" Gate Valve	1	$600	$600
3" Gate Valve	1	$500	$500
3" Creek Crossing	50	$50	$2,500
Crushed Stone	400	$10	$4,000
Bit. Replacement	300	$40	$12,000
Reconnect Master Meter	1	$3,000	$3,000
Misc. Items	1	$25,000	$25,000
Total Estimated Construction Cost			$390,950

Notes:
Assumed half of the meter connection would be new and half would be reconnects.
Assumed existing meter would be used.

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Table 4
Construction Cost Estimate
for
Ninevah Road
Farmdale Water District

Item	Quantity	Unit Price	Total
6" Water Line (SDR-21)	1,500	$16	$24,000
6" Water Line (SDR-17)	2,500	$18	$45,000
6" Open Bore	50	$50	$2,500
Fire Hydrant Assembly	3	$4,500	$13,500
Connection to Existing Water Line	3	$2,000	$6,000
New Service Connection (Opposite Side)	3	$1,250	$3,750
New Service Connection (Same Side)	3	$1,000	$3,000
Cust. Reconnect (Opposite Side)	3	$650	$1,950
Cust. Reconnect (Same Side)	3	$500	$1,500
Additional Service Line	100	$7	$700
Air Release Valve (Every 4,000')	1	$1,500	$1,500
6" Gate Valve	4	$800	$3,200
4" Gate Valve	1	$600	$600
Crushed Stone	100	$10	$1,000
Misc. Items	1	$10,000	$10,000
Total Estimated Construction Cost			$118,200

Notes:
Assumed half of the meter connection would be new and half would be reconnects.
Assumed existing meter would be used.
Assumed approximately 1200' had previously been replaced.

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Table 5
Construction Cost Estimate
for
Johnson Road
Farmdale Water District

Item	Quantity	Unit Price	Total
4" Water Line (SDR-21)	5,500	$12	$66,000
3" Water Line (at Ninevah Road)	300	$20	$6,000
4" Open Bore	50	$50	$2,500
Fire Hydrant Assembly	3	$4,500	$13,500
Connection to Existing Water Line	2	$2,000	$4,000
New Service Connection (Opposite Side)	5	$1,250	$6,250
New Service Connection (Same Side)	4	$1,000	$4,000
Cust. Reconnect (Opposite Side)	5	$650	$3,250
Cust. Reconnect (Same Side)	3	$500	$1,500
Additional Service Line	100	$7	$700
Air Release Valve (Every 4,000')	1	$1,500	$1,500
4" Gate Valve	5	$600	$3,000
3" Gate Valve	1	$500	$500
3" Aerial Crossing in Existing Casing	1	$2,500	$2,500
Crushed Stone	100	$10	$1,000
Misc. Items	1	$10,000	$10,000
Total Estimated Construction Cost			$126,200

Notes:
Assumed half of the meter connection would be new and half would be reconnects.
Assumed existing meter would be used.

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Table 6
Construction Cost Estimate
for
Twlight Trail
Farmdale Water District

Item	Quantity	Unit Price	Total
6" Water Line (SDR-21)	4,900	$16	$78,400
6" DI Water Line w/Nitrile Gaskets	500	$50	$25,000
12" Road Bore	90	$115	$10,350
6" Open Bore	200	$50	$10,000
Fire Hydrant Assembly	4	$4,500	$18,000
Connection to Existing Water Line	6	$2,000	$12,000
New Service Connection (Opposite Side)	3	$1,250	$3,750
New Service Connection (Same Side)	5	$1,000	$5,000
Cust. Reconnect (Opposite Side)	5	$650	$3,250
Cust. Reconnect (Same Side)	4	$500	$2,000
Additional Service Line	150	$7	$1,050
Air Release Valve (Every 4,000')	1	$1,500	$1,500
6" Gate Valve	4	$800	$3,200
3" Gate Valve	1	$500	$500
Crushed Stone	75	$10	$750
Bit. Replacement	150	$40	$6,000
Misc. Items	1	$15,000	$15,000
Total Estimated Construction Cost			$195,750

Notes:
Assumed half of the meter connection would be new and half would be reconnects.
Assumed existing meter would be used.
Assumed bore not required under US 127.

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Table 7
Construction Cost Estimate
for
Jones Lane
Farmdale Water District

Item	Quantity	Unit Price	Total
4" Water Line (SDR-21)	4,700	$12	$56,400
4" Open Bore	120	$50	$6,000
Blowoff Hydrant	2	$2,000	$4,000
Connection to Existing Water Line	3	$2,000	$6,000
New Service Connection (Opposite Side)	3	$1,250	$3,750
New Service Connection (Same Side)	11	$1,000	$11,000
Cust. Reconnect (Opposite Side)	2	$650	$1,300
Cust. Reconnect (Same Side)	11	$500	$5,500
Additional Service Line	150	$7	$1,050
Air Release Valve (Every 4,000')	1	$1,500	$1,500
4" Gate Valve	3	$600	$1,800
Crushed Stone	350	$10	$3,500
Bit. Replacement	150	$40	$6,000
Reconnect Master Meter	0	$3,000	$0
Misc. Items	1	$10,000	$10,000
Total Estimated Construction Cost			$117,800

Notes:
Assumed half of the meter connection would be new and half would be reconnects.
Assumed existing meter would be used.
Assumed bore not required under US 127.

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Table 8
Construction Cost Estimate
for
Highwood Tank Mixing System
Farmdale Water District

Item	Quantity	Unit Price	Total
Highwood Tank Mixing System	1	$30,000	$30,000
Total Estimated Construction Cost			$30,000

HMB PROFESSIONAL ENGINEERS, INC	**Water/Wastewater**	**Project:**	4290.00
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Table 9
Project Cost Estimate
for
Water Line Upgrade Project
Farmdale Water District

Construction Cost			$1,936,075
Engineering			$253,000
	Preliminary	$10,000	
	Design/Bid/CA	$152,000	
	Inspection	$91,000	
Environmental			$10,000
Utiltity Survey			$10,000
Legal/Administration			$20,000
Land/Rights			$5,000
Interest During Construction			$30,000
Contingencies			$193,925
Total Estimated Project Cost			**$2,458,000**

VII FUNDING

Proposed funding for this project is being made available by the following:

TABLE 10

PROPOSED FUNDING

Rural Development Loan	$2,458,000
TOTAL PROJECT FUNDING	$2,458,000

VIII RECOMMENDATIONS

It is recommended that the project be funded by Rural Development and a Letter of Conditions be issued as soon as possible.

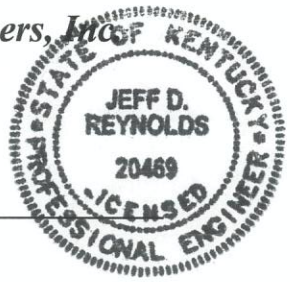
IX REMAINING FUNDS

Farmdale Water District proposes to use any remaining funds to improve service to its customers by making the following system improvements (See Appendix C – Map of Potential Add-On Improvements):

- Upgrade water line along South Benson Road
- Upgrade water line along Avenstoke Road
- Install a chlorine booster station at the Main Pump Station
- Install a tank mixing system at the Highwood Tank
- Upgrade the Twilight Trail Pump Station.

Prepared By:

HMB Professional Engineers, Inc.



Jeff Reynolds, P.E.
Project Manager

Appendix A

DOW Letter

MATTHEW G. BEVIN
GOVERNOR

CHARLES G. SNAVELY
SECRETARY

ENERGY AND ENVIRONMENT CABINET
Department for Environmental Protection

Aaron B. Keatley
COMMISSIONER

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601

September 19, 2019

Hilda Legg
Rural Development
771 Corporate Drive, Suite 200
Lexington, KY 40503

Re: Water Quality Certification
Farmdale Water District
Agency Interest: 33876, SGC20190001
AC Waterline Replacements

Dear Hilda Legg:

Information provided by Jeff Reynolds of HMB Professional Engineers indicates that the Farmdale Water District drinking water system has 64,000 LF of existing asbestos cement water line that is subject to numerous leaks and breaks creating health risks for not only customers, but also maintenance crews tasked with repair/replacement of the pipe as broken asbestos cement water line is considered a hazardous material. The proposed project would replace the 64,000 LF of AC pipe with new PVC waterline reducing the number of breaks and the hazards associated with maintenance and repair of a hazardous material.

Based on the information provided, the Division of Water hereby certifies that health and/or sanitary hazards currently exist for the above community. Therefore, the proposed improvements stated in your letter regarding the subject project are necessary and provide residents with adequate service consistent with the requirements of regulation 401 KAR 8:100.

If you have any questions concerning this request, please contact us at (502) 782-6983.

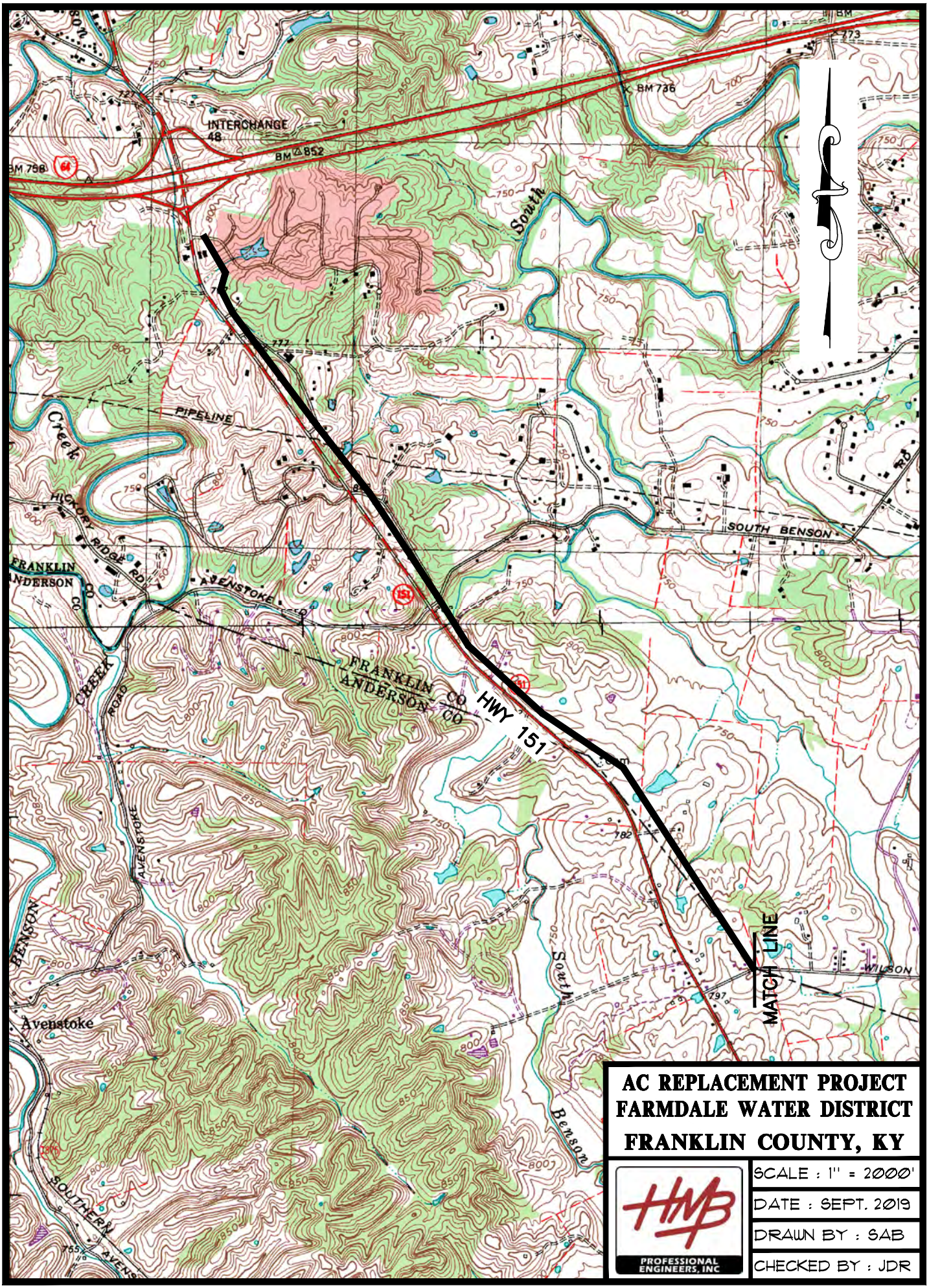
Sincerely,

Terry Humphries, P.E.
Supervisor, Engineering Section
Water Infrastructure Branch
Division of Water

C: Farmdale Water District
HMB Professional Engineers, Inc.

Appendix B

Project Maps



AC REPLACEMENT PROJECT
FARMDALE WATER DISTRICT
FRANKLIN COUNTY, KY

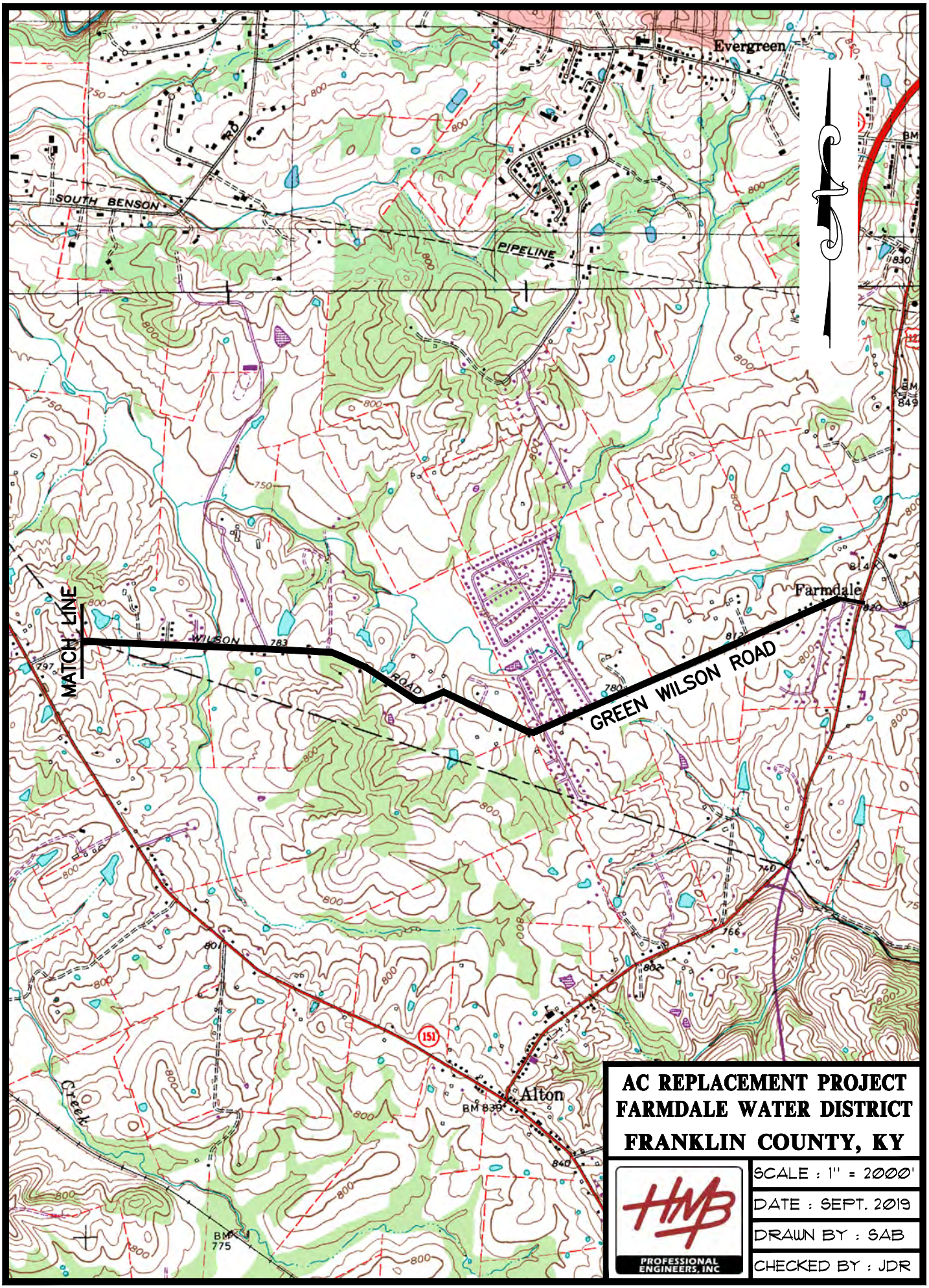
PROFESSIONAL ENGINEERS, INC

SCALE : 1" = 2000'

DATE : SEPT. 2019

DRAWN BY : SAB

CHECKED BY : JDR



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FARMDALE WATER DISTRICT
FRANKLIN COUNTY, KY

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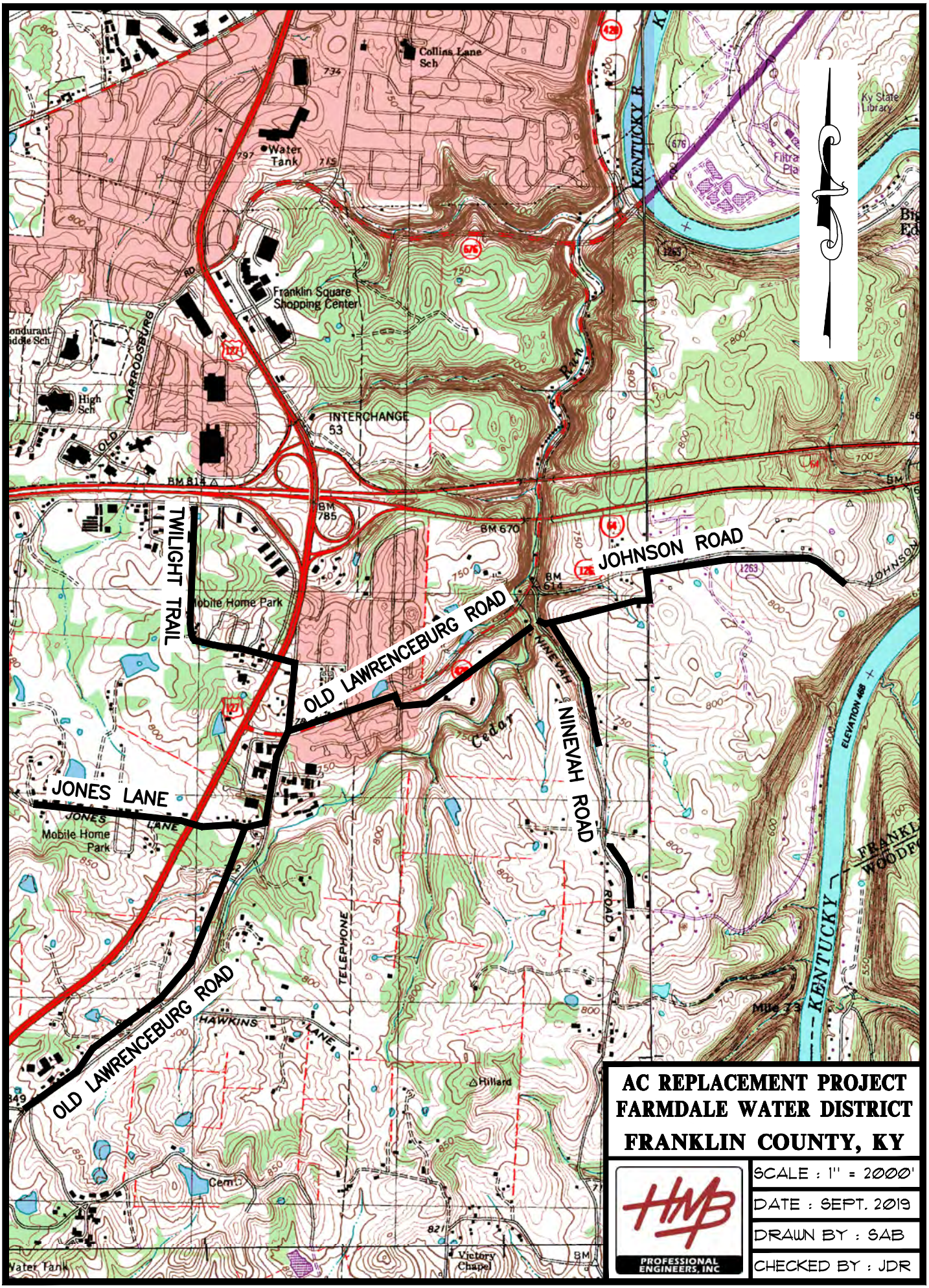

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FARMDALE WATER DISTRICT
FRANKLIN COUNTY, KY

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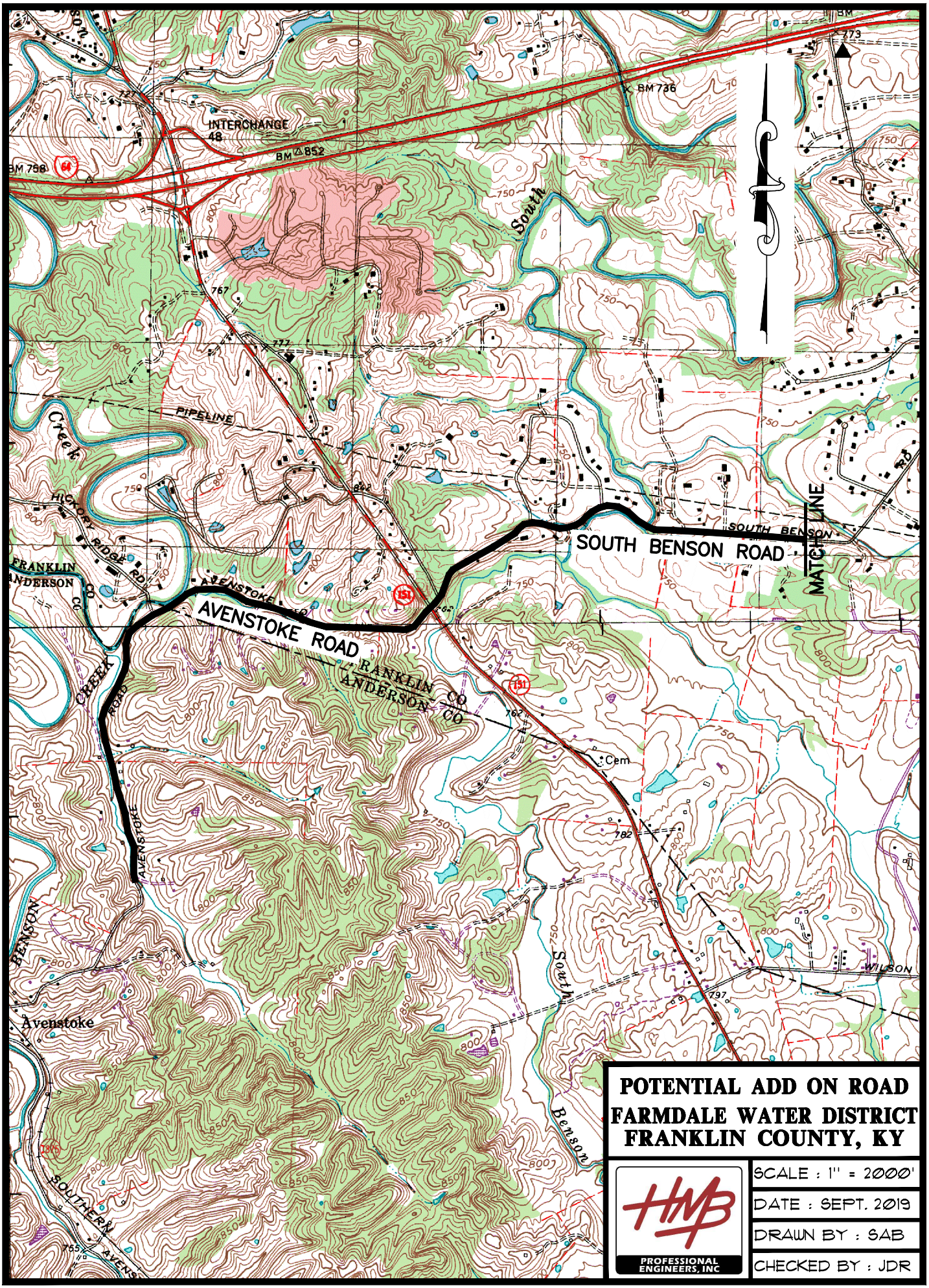
Appendix C

Map of Potential of Add-On Improvements



POTENTIAL ADD ON ROAD
FARMDALE WATER DISTRICT
FRANKLIN COUNTY, KY

PROFESSIONAL ENGINEERS, INC

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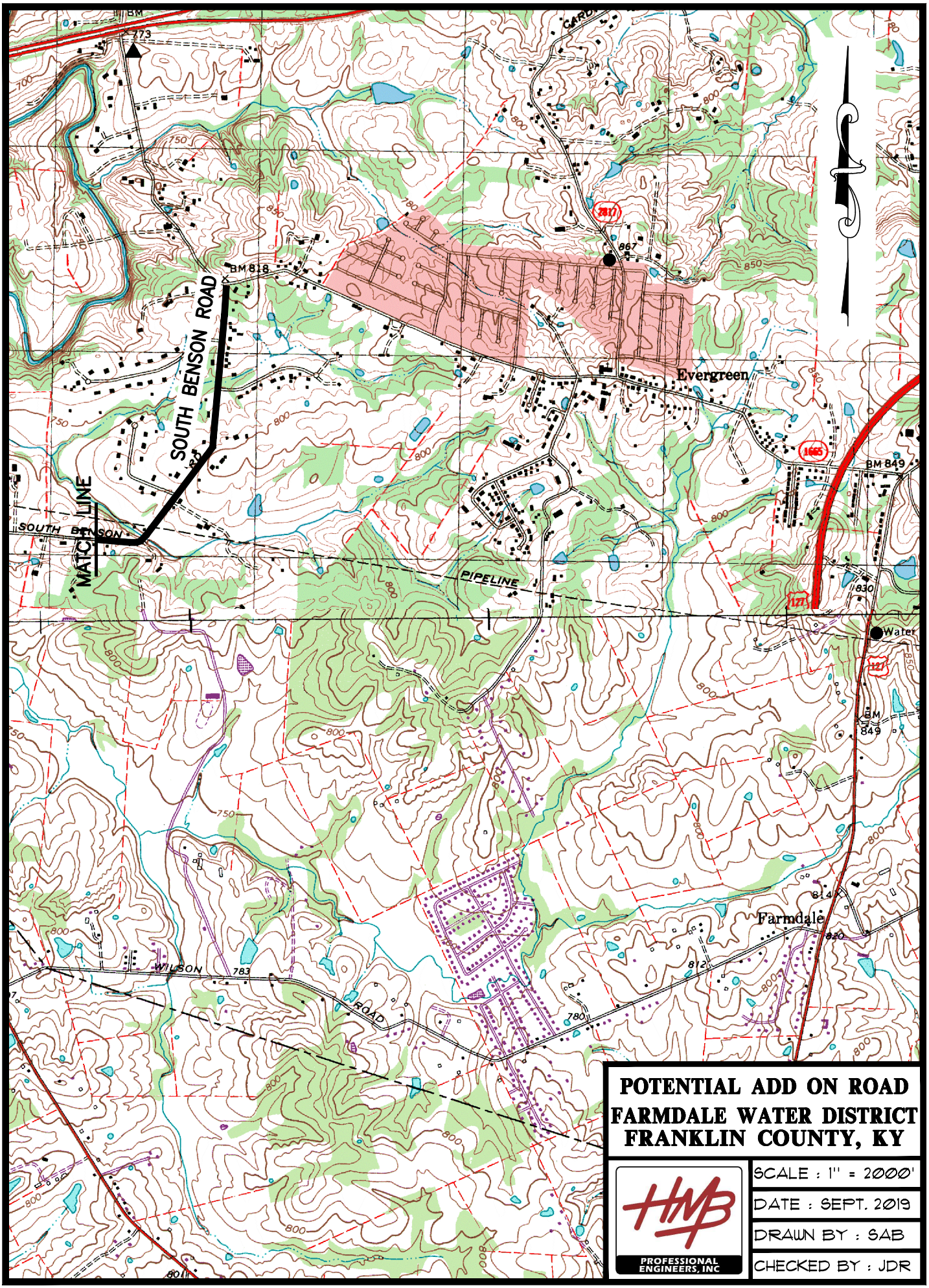

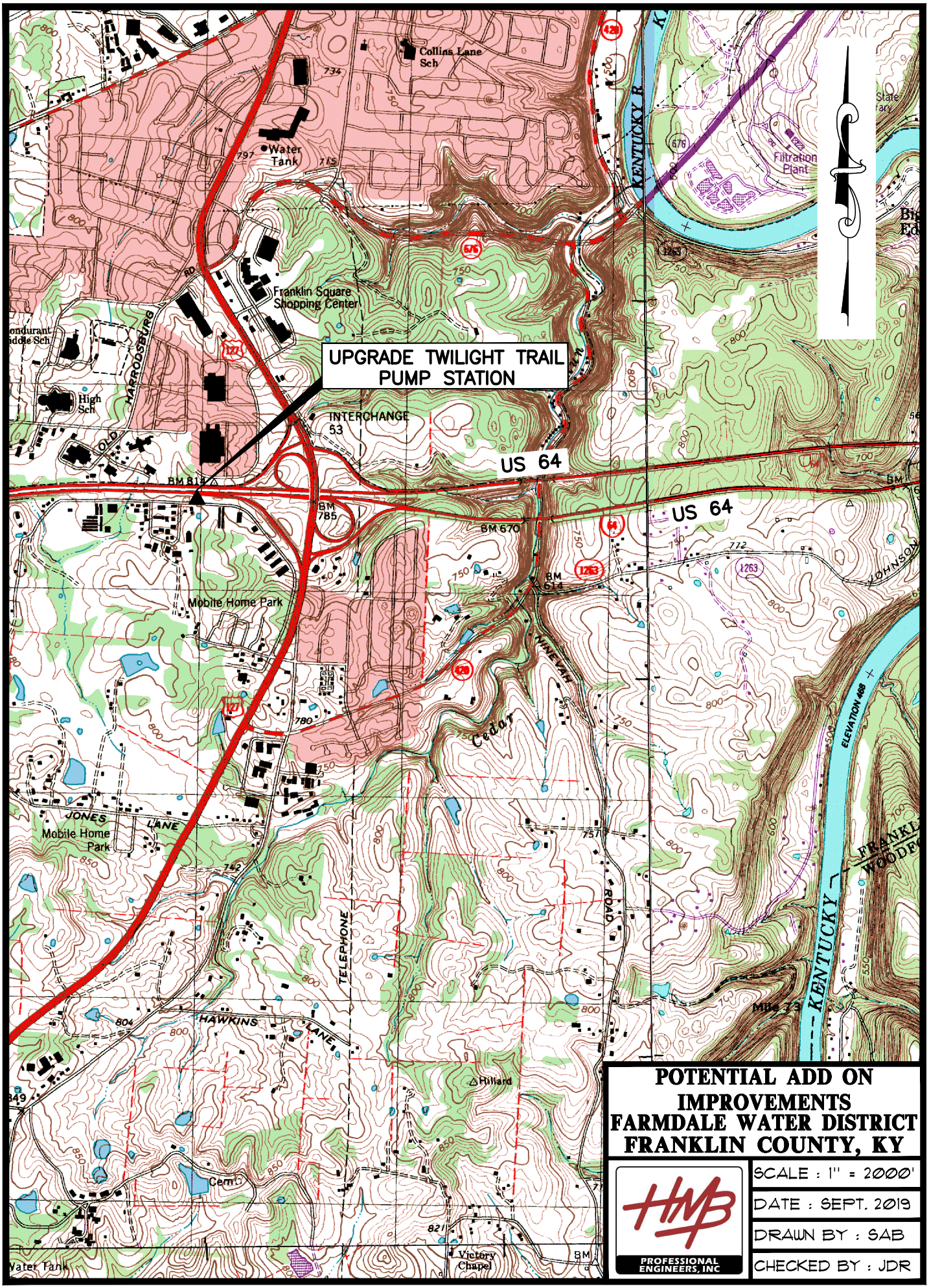

POTENTIAL ADD ON IMPROVEMENTS FARMDALE WATER DISTRICT FRANKLIN COUNTY, KY

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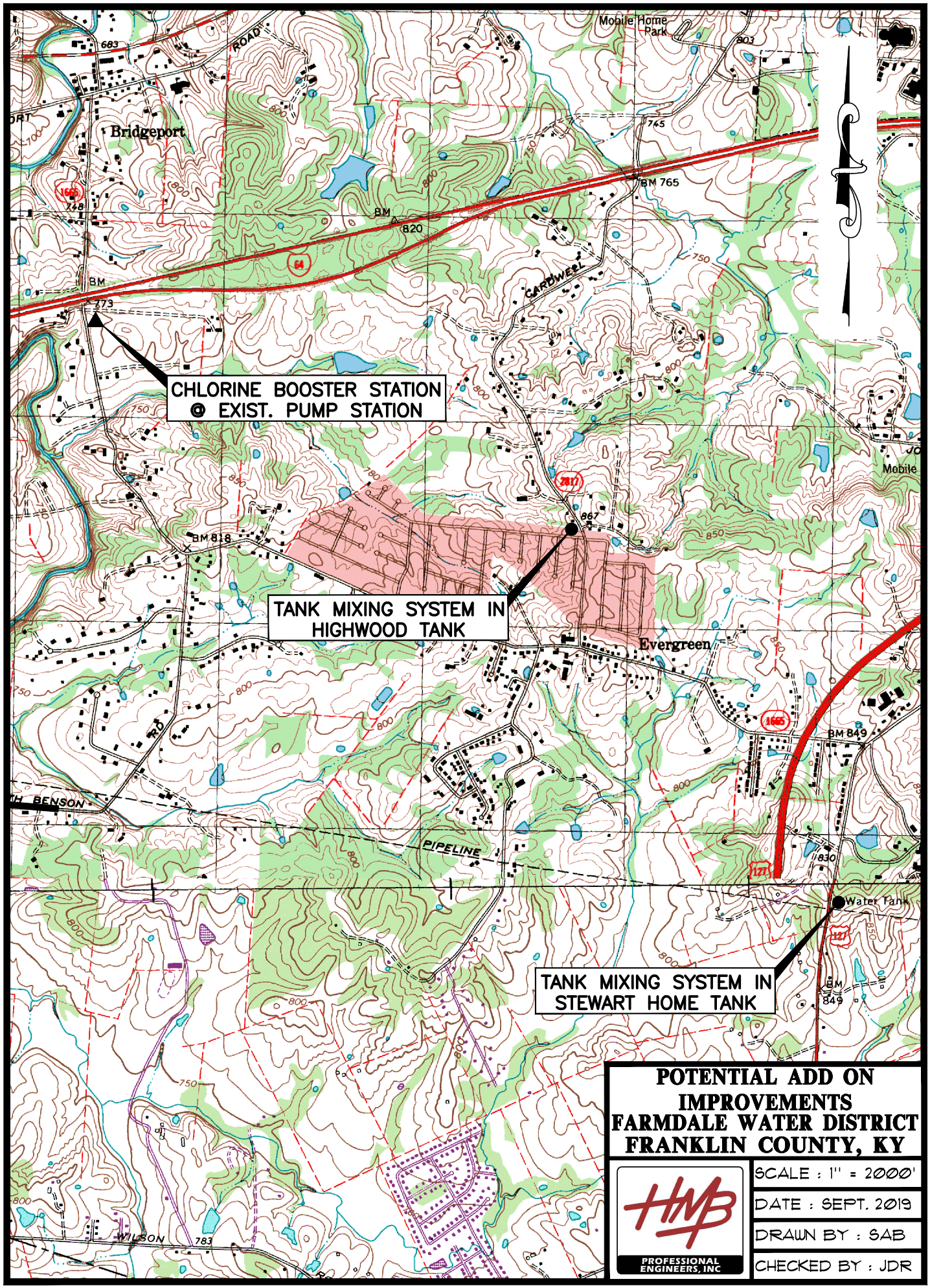

POTENTIAL ADD ON IMPROVEMENTS
FARMDALE WATER DISTRICT
FRANKLIN COUNTY, KY

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