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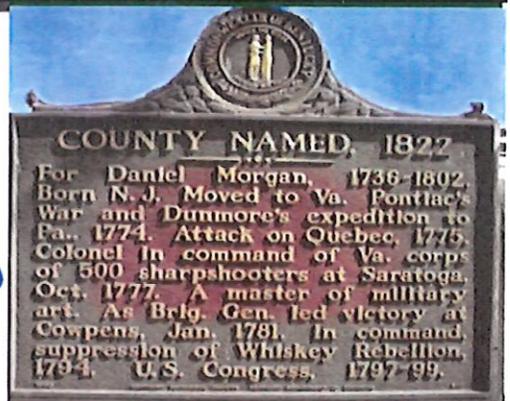
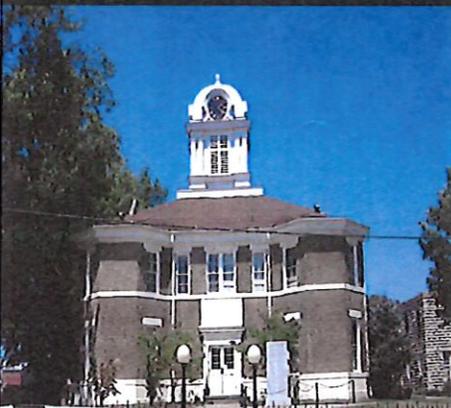
July 2019

Revised January 2020

# MORGAN COUNTY WATER DISTRICT

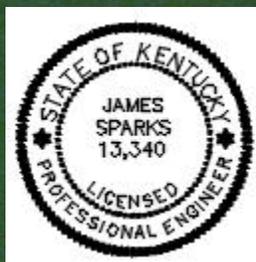
## West Liberty, Kentucky

### Preliminary Engineering Report Waterline Replacement Project Phase 1



SUBMITTED TO:  
Rural Development and Appalachian Regional  
Commission

PREPARED BY:  
Nesbitt Engineering, Inc.  
227 N. Upper Street  
Lexington, KY 40507-1016  
859-233-3111



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**TABLE OF CONTENTS**

**PRELIMINARY ENGINEERING REPORT**

I	General Introduction.....	1
II	Project Planning Area.....	2
	A.    Location	
	B.    Environmental Resources Present	
	C.    Population Trends	
	D.    Community Engagement	
III	Existing Facilities.....	3
	A.    History	
	B.    Condition of Existing Facilities	
	C.    Financial Status of Existing Facilities	
IV	Need for Project .....	4
	A.    Health, Sanitation, and Security	
	B.    System O&M	
	C.    Growth	
V	Alternatives Considered .....	5
VI	Selection of an Alternative.....	5
VII	Proposed Project / Project Cost / Financing .....	6
	A.    Proposed Project	
	B.    Project Schedule	
	C.    Approvals and Permit Requirements	
	D.    Opinion of Probable Cost	
VIII	Conclusions and Recommendations .....	7

Figure 1 – County Location Map

Appendix A – Opinion of Probable Construction Cost

Appendix B – Opinion of Probable Project Cost & Possible Funding Sources

Appendix C – Project Area Map

## **Chapter 1 – General Introduction**

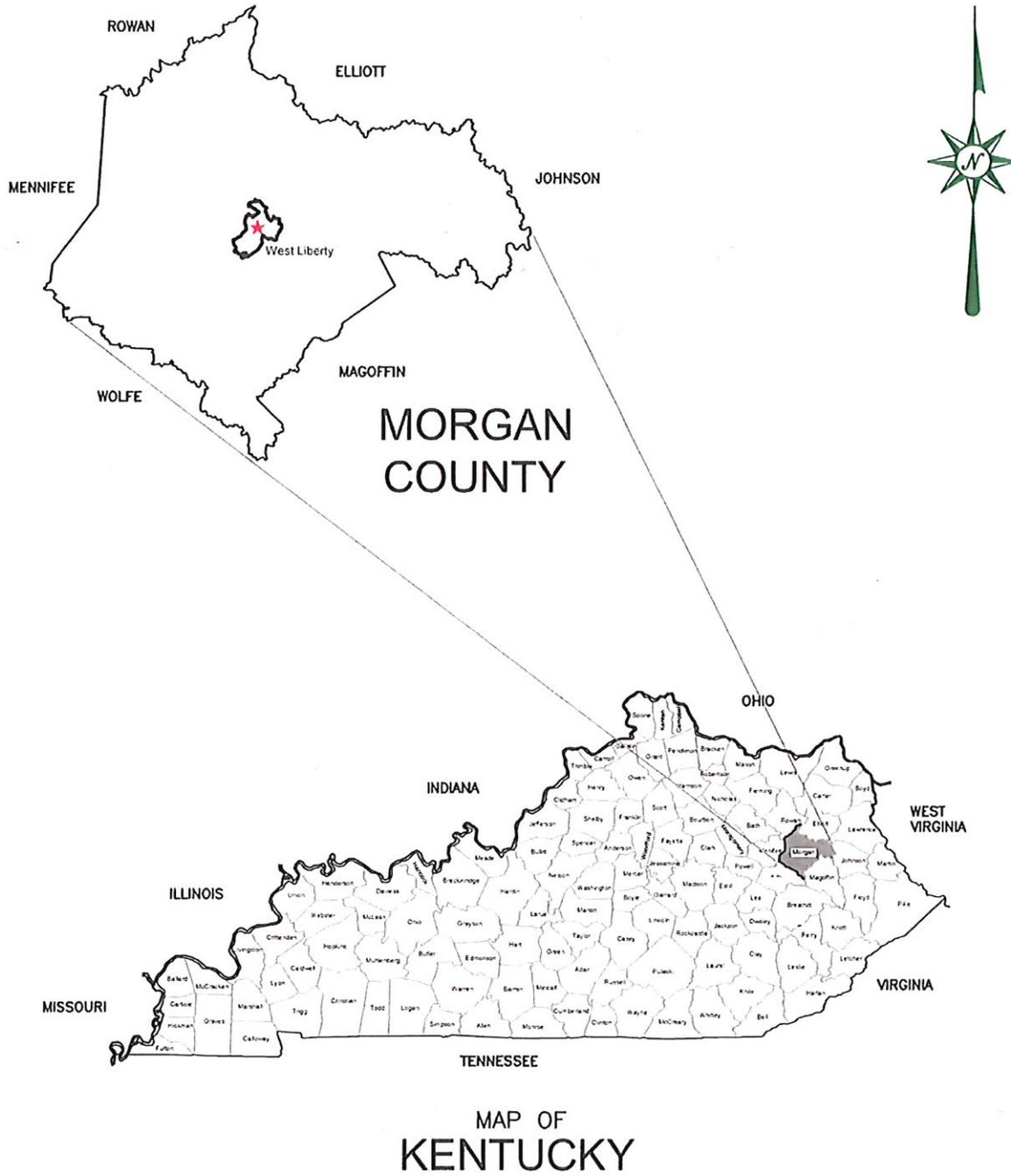
Morgan County is located in the eastern part of Kentucky approximately 88 miles east of Lexington, 67 miles northwest of Pikeville, 63 miles north of Hazard and 24 miles southeast of Morehead Kentucky. Morgan County is bordered by Wolfe, Menifee, Rowan, Elliott, Johnson and Magoffin Counties (see Figure 1).

West Liberty is the County Seat of Morgan County and is a 4th class city. In 2015 it is estimated that of the total county population of 13,275, there were 3,330, or approximately 25% of the County population living in the city of West Liberty with the remaining 75% (approx. 10,000) people living in Morgan County.

Morgan County Water District was created in 1992 and is under the auspices of the KY PSC. They have approx. 2800 customers (residential and commercial and have the ability to provide water to 3 wholesale customers. The 2010 US Census population figure for Morgan County is 13,923. There are 4,860 households which equates to 2.86 persons per household.

**This phase of the project will replace main lines, water meters and other items to assist in reducing the District's unaccounted for water, which is approx. 50%. Some of the oldest lines in the system along with lines of frequent repairs will be targeted. The major construction items are 7,500 LF of 8" PVC, 13,500 LF of 6' PVC, 5,500 LF of 4" PVC, 4,500 LF of 3" PVC and 600 LF of 2" PVC, replacement of meters, testing of meters, leak detection equipment, storage tank inspections and rehabbing a corroded chlorine room at the Hwy 437 Pump Station. A detailed listing of all items is provided in Appendix A (Opinion of Probable Construction Cost). The project will also install four flow measurement vaults to aid in future leak detection.**

Funding for the Project is estimated to come from a **KIA** loan and **ARC** grant.



MAP OF KENTUCKY



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**PROPOSED WATERLINE REPLACEMENT  
 EXISTING WATER DISTRIBUTION SYSTEM  
 PERRY COUNTY SANITATION DISTRICT #1**

**FIGURE 1  
 AREA MAP**

drawn by: JCW	job no.: 1191.01
date: 5-16-2019	scale: NOT TO SCALE

## **Chapter 2 – Project Planning Area**

### **A. Location**

This phase of the proposed project is located along KY 460 and 172 which are some of the older lines in the system. The meters to be replaced will also be the oldest. The project improvements are depicted on the included map (see Appendix “C”).

### **B. Environmental Resources Present**

The project area shall be existing road right of ways or easements (previously disturbed areas). There are no known Environmental Resources Present that will be affected or impacted by this project.

### **C. Population Trends**

This project is located in Morgan County, Kentucky, according to the 2010 US Census figures, Morgan County had a population of 13,275 persons, with 75% living outside of the County Seat of West Liberty. A slight decrease is projected for the county thru 2040.

### **D. Community Engagement**

There has not been any Community Engagement related to this project, it is considered a maintenance project for the District’s existing customers.

## **Chapter 3 – Existing Facilities**

### **A. History**

The District serves 2,800 households and commercial buildings with potable water. They also have 3 master meters to provide wholesale water to the cities of Campton, Paintsville and Frenchburg. The District does not have a water treatment plant, so all of the water they sell is purchased. Their supplier is the Cane Run Water Association.

The existing facilities include approximately 356 miles of various size waterlines, 6 active pump stations and 7 water storage tanks. Most of the water distribution system was installed from the time the District was created in 1992 to 2010. There are some lines that are close to 30 years old. Extensions occurred periodically. The pump stations and tanks were installed as the system grew to meet the demand.

### **B. Condition of Existing Facilities**

Existing facilities are aging and have exceeded the end of their life cycle. Water leaks are common, and efforts have been made to make repairs as needed. This project is an example of those efforts, by replacing the oldest waterlines in the system and those lines known to have frequent repairs.

### **C. Financial Status of any Existing Facilities**

The Water District strives to operate all water infrastructure in a financially solvent manner. Audits are performed on an annual basis by an outside consultant to evaluate financial resources for daily operation and known maintenance expenses of the system. Due to failing infrastructure, the District finds it difficult to maintain adequate funds in reserve for unexpected operation and maintenance expenses. New water lines and meters will have a positive impact on eliminating some of the lost water and will help the financial stability of the District.

**Chapter 4 – Need for Project**

**A. Health, Sanitation, and Security**

Waterline breaks are common in aging systems, these increase the risk of contamination and require notification to the customer of a boil water advisory.

**B. System O&M**

Operation and maintenance of the District's water distribution system will continue to be provided by the existing, certified and licensed staff of the District. The District water system operates within the regulatory requirements of the Kentucky Division of Water and the KY Public Service Commission.

**C. Growth**

Population projections available from the UL State Data Center indicate a future decline in the population of Morgan County. Recent improvements to KY highways in the county have provided improved traffic flow in and through the county. These improvements are anticipated to promote residential growth or at least slow the population decline.

## **Chapter 5 – Alternatives Considered**

Alternatives considered:

- (1) replacing some of the waterlines,
- (2) continue repairing waterlines as need,
- (3) deleting leaking waterlines from the system
- (4) do nothing

## **Chapter 6 – Selection of an Alternative**

Replacing some of the waterlines and some of the meters is the most desirable alternative. The use of modern pipe and system mapping will make the system more operator friendly. Removing the waterlines from the system is not an alternative to be considered, due to existing customers that are served through these waterlines. Repairing leaking waterlines as needed is costly and in most cases waterline locations are unknown and leaks cannot be detected. Some valves are not operable to aid in repairing these lines. Doing nothing only increases the amount of cost for the purchased water.

## **Chapter 7 – Proposed Project / Project Cost / Financing**

### **A. Proposed Project**

The **Morgan County Water District’s Waterline Replacement Project-Phase 1** will include the replacement of 7,500 LF of 8" PVC, 13,500 LF of 6" PVC, 5,500 LF of 4" PVC, 4,500 LF of 3" PVC, 600 LF of 2" PVC, approx. 700 new water meters and other items as shown in Appendix A (Opinion of Probable Construction Cost). The project will also install four leak monitoring vaults to aid in leak detection, install some flush hydrants and have inspections of their storage tanks. The chlorine room at the KY 437 PS needs to be rehabilitated due to excessive corrosion due to the chlorine gas.

### **B. Project Schedule**

The proposed project schedule is as follows:

Project Funding Commitment	March 2020
Begin Design & Environmental Review	March 2020
Complete Bid Documents	June 2020
Obtain Construction Permit	July 2020
Approval to Advertise for bids	July 2020
Open Bids	August 2020
Award Construction Contract	October 2020
Begin Construction	October 2020
Complete Construction	June 2021

### **C. Approvals and Permit Requirements**

This project will require engineering permits from the Division of Water. A permit from the Kentucky Transportation Cabinet will be necessary. Permits for construction in the floodplain or along a stream may have to be obtained.

### **D. Opinion of Probable Cost**

The Opinion of Estimated Construction Costs for this project is provided in Appendix “A”. An Opinion of Probable Project Cost is provided in Appendix “B”. Potential funding sources are also shown in Appendix “B”.

## **Chapter 8 – Conclusions & Recommendations**

The **Morgan Co. Water District's Waterline Replacement Project-Phase 1** will enable the MCWD to continue to offer safe, clean and reliable water to its customers. The proposed improvements should also aid in reducing the amount of unaccounted for water, which would in turn boost the District's bottom line. Therefore, we recommend alternative #1 replacing the some waterlines, some meters, etc..

**Appendix "A" – Opinion of Probable Construction Cost**

Opinion of Probable Construction Cost

# Morgan County Water District

## Appendix A - Opinion of Probable Construction Cost

### Scattered Waterline Replacement and Pump Station Rehab Project (1/2020)

Estimated Opinion of Probable Construction Cost				
Description	Units	Quantity	Unit Cost	Total Cost
Rehabilitate existing pump station	LS	1	\$ 47,485	\$ 47,485.00
Water meter Test Bench and accessories (allowance)	LS	1	\$ 17,350	\$ 17,350.00
8" PVC SDR 17 Pipe	LF	7500	\$ 18.50	\$ 138,750.00
6" PVC SDR 17 Pipe	LF	13500	\$ 16.75	\$ 226,125.00
4" PVC SDR 17 Pipe	LF	5500	\$ 14.50	\$ 79,750.00
3" PVC SDR 17 Pipe	LF	4500	\$ 13.00	\$ 58,500.00
2" PVC SDR 17 Pipe	LF	600	\$ 11.00	\$ 6,600.00
8" D.I.M.J. Gate Valve & Box	EA	5	\$ 1,800.00	\$ 9,000.00
6" D.I.M.J. Gate Valve & Box	EA	4	\$ 1,500.00	\$ 6,000.00
4" D.I.M.J. Gate Valve & Box	EA	4	\$ 1,350.00	\$ 5,400.00
3" D.I.M.J. Gate Valve & Box	EA	4	\$ 990.00	\$ 3,960.00
2" D.I.M.J. Gate Valve & Box	EA	4	\$ 850.00	\$ 3,400.00
Directional Drill	LF	200	\$ 100.00	\$ 20,000.00
Bore & Jack	LF	120	\$ 180.00	\$ 21,600.00
Combination Air Release Valve Assembly	EA	4	\$ 2,000.00	\$ 8,000.00
Flushing Hydrant Assembly Type 3	EA	2	\$ 2,525.00	\$ 5,050.00
5/8 x 3/4 meters (SR2's w metal bottoms)	EA	300	\$ 200.00	\$ 60,000.00
5/8 x 3/4 meters transmitter unit	EA	300	\$ 100.00	\$ 30,000.00
Flow Monitoring and Leak Detection Equipment	LS	1	\$ 15,000.00	\$ 15,000.00
Flow Monitoring and Leak Detection Vaults	EA	4	\$ 3,500.00	\$ 14,000.00
Existing Water Storage Tank Inspections	EA	7	\$ 7,000.00	\$ 49,000.00
Flushing Hydrant Assembly	EA	2	\$ 3,250.00	\$ 6,500.00
<b>Total Estimated Opinion of Probable Construction Cost</b>				<b>\$ 831,470.00</b>

**Appendix "B" – Opinion of Probable Project Cost &  
Possible Funding Sources**

Opinion of Probable Project Cost & Possible Funding

# Morgan County Water District

## Appendix B - Opinion of Probable Project Cost Waterline Replacement Project (1/2020)

<b>Total Estimated Opinion of Probable Construction Cost</b>		<b>\$ 831,470.00</b>
<b>Estimated Opinion of Other Project Related Costs</b>		
Legal		\$5,500.00
Engineering		
Preliminary Engineering	\$	5,000.00
Design		\$66,000.00
Contract Admin.		\$17,000.00
Resident Observation		\$53,000.00
Permits (DOW, KTC, etc.)		\$5,000.00
Other Engineering (Easements, Survey, Reports, etc.)		\$10,000.00
Develop Hydraulic Model and Overall Map of Distribution System		\$25,000.00
Project Contingencies		\$82,030.00
Initial O&M		\$100,000.00
<b>Total Estimated Opinion of Probable Project and Construction Costs =</b>	<b>\$</b>	<b>1,200,000.00</b>

Possible Funding Sources		
Appalachian Regional Commission (Grant)	\$	800,000
Rural Development Grant	\$	120,000
Rural Development Loan	\$	280,000
<b>Total Project Funds</b>	<b>\$</b>	<b>1,200,000</b>



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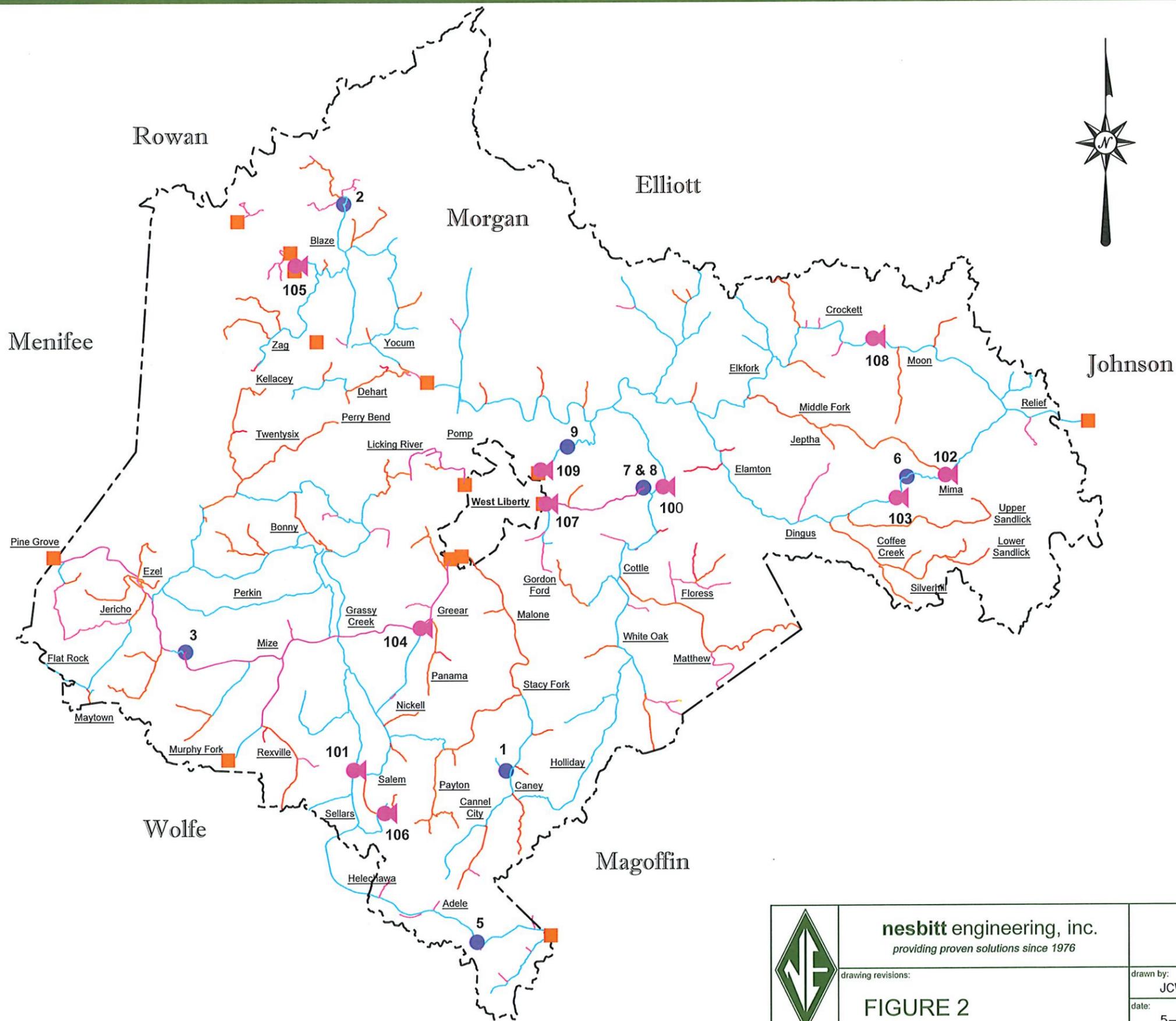
227 North Upper Street  
Lexington, KY 40507-1016

**Appendix "C" – Project Maps**

Existing District Facilities Area Map – Figure 2

Proposed Improvements Map – Figure 3

DRAWING FILE LOCATION: N:\MARKETING\GATEWAY ADD\MORGAN CO\WATER DISTRICT\UTILITY MAPS\WATER DISTRIBUTION\WATER DISTRIBUTION 11X17.DWG



Morgan County Water District				
Number	Feature	Name	Capacity	Year Constructed
1	Tank	Hwy 191	175,000	1992
2	Tank	Ditney Ridge Hwy 1002	100,000	2004
3	Tank	Ezel Tank	150,000	1995
4	Tank	Hwy 172 (Abandoned)	110,000	1996
5	Tank	Hwy 134	100,000	2009
6	Tank	Smith Creek Tank	50,000	2007
7	Tank	Spaws Creek Tank #1	157,000	2002
8	Tank	Spaws Creek Tank #2	200,000	2014
9	Tank	Hwy 172 (Abandoned)		
100	Pump Station	Cow Branch (Abandoned)		
101	Pump Station	Hwy 205		
102	Pump Station	Hwy 437		
103	Pump Station	Hwy 437 (Abandoned)		
104	Pump Station	Hwy 460		
105	Pump Station	Hwy 519		
106	Pump Station	Perkins Cemetery		
107	Pump Station	Spaws Creek		
108	Pump Station	Split Wood (Abandoned)		
109	Pumap Station	Hwy 172 (Abandoned)		

**EXISTING FINISH WATERLINES**

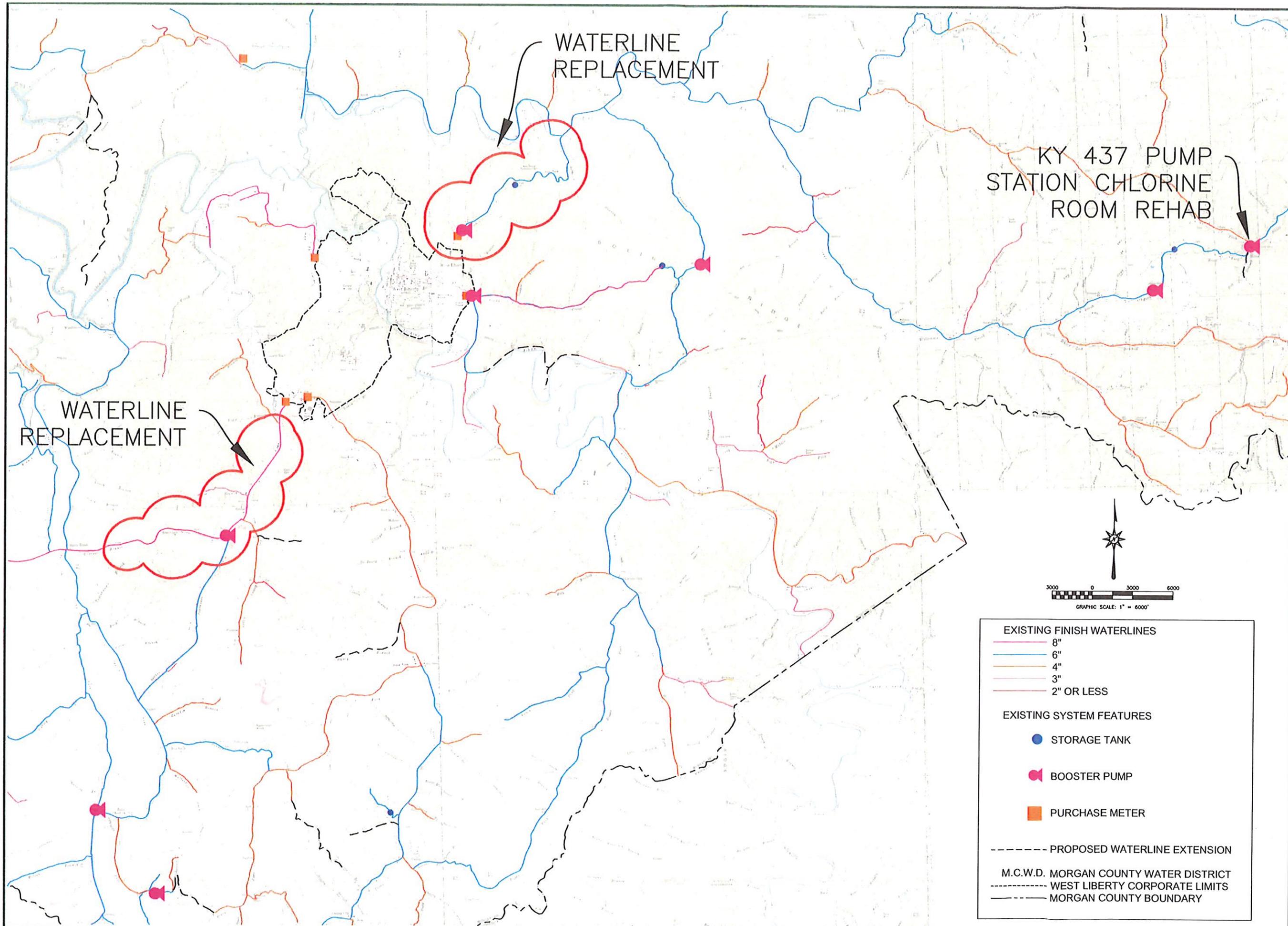
- 8" (pink line)
- 6" (blue line)
- 4" (orange line)
- 3" (light pink line)
- 2" OR LESS (red line)

**EXISTING SYSTEM FEATURES**

- STORAGE TANK (blue circle)
- BOOSTER PUMP (pink square)
- PURCHASE METER (orange square)

--- WEST LIBERTY CORPORATE LIMITS  
 - - - MORGAN COUNTY BOUNDARY

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	drawing revisions:		drawn by:	job no.:
	<b>FIGURE 2</b>		JCW	1191.01
		date:	scale:	
		5-20-2019	NOT TO SCALE	



MORGAN COUNTY WATER DISTRICT  
MORGAN COUNTY, KENTUCKY

FIGURE 3

SCATTERED WATER LINE REPLACEMENT AND PUMP STATION REHAB