

## PUBLIC UTILITY INFRASTRUCTURE IN ROWAN COUNTY

### *Water Service*

There are three water utilities in Rowan County. These are

<u>Permit No.</u>	<u>Name</u>	<u>Water Source</u>	<u>Manager</u>
KY 1030292	Morehead Utility Plant Board (MUPB)	Licking River	Holly McGrath-Rosas
KY 1030375	Rowan Water, Inc.	Purchase from MUPB	Jerry Patrick
KY 1030480	Morehead State University	Eagle Lake	John Mahaney

### Morehead Utility Plant Board

The MUPB water treatment plant provides potable water for all of Morehead and almost all of Rowan County. Rowan Water, Inc. is the county provider but purchases all of its water supply from Morehead at a wholesale rate for re-sale. Morehead State University operates its own water plant for service to the university campus and housing. In an emergency, the University system can purchase water from the MUPB as well. Table 1 shows a breakdown of the distribution of water service in the county. The Morehead water treatment plant, constructed in 1968, currently has a rated design capacity of 8.0 million gallons per day (mgd) with the average daily production at 5.4 mgd and a peak production of 7.4 mgd.

Morehead has performed a water system capacity study. This study describes the existing WTP and forecasts future flows to size our proposed WTP at 12 MGD, which is listed with the Kentucky Infrastructure Authority. Morehead also has a complete water system hydraulic model which allows the City to model any scenario of demand at any point in the system. Morehead Utility Plant Board is proposing to construct a new 12.0 million gallon per day water treatment plant (WTP) with a new water intake on Cave Run Lake, a new water transmission line, a new 1 MG ground storage tank on a site adjacent to the proposed WTP, and a new finished water transmission line from the treatment plant to the proposed storage tank. The project will be completed in three phases over a five-year period. Phase one was completed in the first year (2019) and includes the new raw water intake and transmission line. Phase two will begin on the second year and be completed in the fourth year (2020-2022); the second phase will include the construction of the new water treatment plant. The final phase of the project will be completed in the fifth year (2023) and will include the construction of the new ground storage tank and the finished raw water line.

The project includes the construction of a new raw water intake structure on Cave Run Lake. The new intake is a fixed structure and will allow variable intake depths. The new raw water intake replaces the old intake structure located approximately three miles below the Cave Run Lake Dam on the Licking River. The Cave Run Lake raw water intake structure includes a new 1,000 kW standby diesel generator. The intake structure features security fencing to encompass the site.

Approximately 6,500 LF of 24” DI pipe will be installed to connect the intake structure to the water treatment plant.

The project also proposes to construct a new 12 million gallons per day (MGD) regional water treatment plant (WTP) to replace the existing 8 MGD WTP. The proposed 12 MGD regional WTP will feature new and improved technologies that have been introduced to the treatment process since the last major expansion of the existing plant in 2002. The plant will employ pre-treatment flocculation using flash mix and a flocculation basin, membrane pressure filtration system, and a granular activated carbon (GAC) adsorption system for treatment. The new WTP will include all new treatment and administration facilities on a site near the existing WTP, upgraded SCADA/telemetry for the WTP and distribution system sites along with an increased clearwell capacity of 1,800,000 gallons (currently 1,237,000 gallons). Three 1 MG earthen lagoons will be constructed (for a total capacity of 3 MG) for residual sludge containment of the washwater generated from membrane backwashes, flux maintenance, enhanced flux maintenance, and clean-in-place operations. The site will be secured through the construction of security fencing to surround the facility.

Approximately 4,500 LF of finished waterline will be extended to a new 1,000,000-gallon ground storage tank. The existing US 60 tank will be decommissioned (621,000 gallons) and the new tank will serve as its replacement. The project will increase the net storage volume of the utility by 329,000 gallons once the increased clearwell capacity is obtained and the decommission of the US 60 tank. Given the demand for potable water in the area, no issues are anticipated with respect to mixing or turnover for the new tank. To reduce risk of disinfection by-product (DBP) formation, the issue will be taken into consideration during the design phase and site identification of the storage tank.

#### *Morehead Utility Plant Board Proposed Water System Improvements Projects*

In addition to the new water treatment plant and Cave Run Lake intake already described, MUPB has other projects underway or planned and awaiting funding. These are:

- An extension of water service to the AppHarvest Greenhouse operation on HWY 801 North. (Under construction).
- Replacement of 6” water line on Sun Street
- Replacement of 4 miles of 10” water line on KY 801 South as well as other miscellaneous locations
- Installation of approximately 3,400 remote reading water meters throughout the system.

#### Rowan Water, Inc.

Rowan Water, Inc. purchases water at wholesale rate from the water plant operated by the Morehead Utility Board. Rowan Water serves most of rural Rowan County and extends service to portions of 5 adjacent counties (Bath, Carter, Elliott, Fleming and Morgan). There are six connection points where Rowan Water is supplied by Morehead in order for Rowan Water to serve its 7,085 customers (16,110 population). Because Rowan Water, Inc. does not produce potable water, the system is largely dependent on the Morehead Plant to control water quality issues. Rowan Water is required to maintain minimum required levels of disinfectant in its system without

producing excessive levels of disinfection byproducts. The most recent water quality report on file with the Kentucky Division of Water shows not water quality violations in the system.

*Rowan Water, Inc. Water System Improvements projects*

- Construct a new pump station and a new 250,000-gallon water tank near the Rowan County High School
- Installation of approximately 6,500 remote reading water meters throughout the system
- Replace 2 miles of transmission line along Route 32 in order to increase size from 8”/10” to 16” diameter
- Replace 5 miles of asbestos-cement lines along US 60 East and increase size from 6” to 10” diameter.

**TABLE 1: SUMMARY OF WATER USERS – ROWAN COUNTY WATER SYSTEMS**

Population Served	Morehead Water Plant	Rowan Water, Inc.	Morehead State University
Bath County	5	3	0
Fleming County	23	118	0
Rowan County	8046	13,247	1707
Carter County	0	1,929	0
Morgan County	0	231	0
Elliott County	0	582	0
Annual Water Purchased by Other Systems (MG)	Morehead Water Plant	Rowan Water, Inc.	Morehead State University
Bath Co. W.D.	450.584	0	0
Rowan Water, Inc.	688.415	568.76	0
Morehead St. Univ.	0	0	0
City of Olive Hill	0	0.35	0
Fleming Co. W.A.	0	12.743	0
Sandy Hook W.D.	0	0.378	0

MG – Million Gallons; WD – Water District; WA – Water Association

Exhibit 1, 2 and 3 provide maps of the water service area for each provider.

## *Sewer Service*

### General

There are three permitted wastewater treatment plants in Rowan County. One is at Tildon Hogge Elementary School and the USDA Forest Service operates a plant at the Twin Knobs Recreation Site. The third plant operated by the Morehead Utility Plant Board is the only plant providing service to the community at-large and is the only one considered for this plan.

### Wastewater Treatment Plant

The MUPB operates the City's plant under permit number KY 0052752. The plant is located on US 60 East at Blue Hole. The plant discharge is routed to an outfall on the Licking River about 2.5 miles west of the plant.

The plant serves a population of about 15,127 people distributed as follows:

- Bath County – 922
- Fleming County – 176
- Rowan County – 14,029

The plant constructed in 1980, has a rated design capacity of 5.0 mgd and treats about 3.51 million gallons per day. The plant can pass up to 10 mgd with disinfection only, but cannot provide complete treatment at these higher rates of flow.

A plant expansion is on the horizon, but is a secondary priority to the more critical water plant expansion. The City has an implementation program to reduce inflow/infiltration in the sewer lines in an effort to delay the date for an expansion. MUPB is currently gathering information for "Phase III" of a multi-phase sanitary sewer capacity study. The results of this study, to this point, are two projects that will take care of 90% of MUPB SSO's and capacity issues. One project is currently underway and the other is listed with KIA; hopefully to bid this summer.

In addition, a significant number of customers are served by grinder pump stations and pressure sewers which are not subject to infiltration or inflow. Expansion of the plant will require the 201 Facilities Plan to be updated as the last revision was in 2001.

### Sewer System

The Morehead sewer system has over 1,018,950 LF of services up to 36" in diameter. Exhibit 4 provides of map of the sewer service area. In order to service such a wide spread, diverse area, 73 sewage lift stations are required to transport wastewater to the Blue Hole site.

**TABLE 2: PROPOSED SEWER SYSTEM PROJECTS**

SX 21205031	<p><b>MUPB Residential Grinder Pump Replacement Project</b>  This project proposes to replace 100 malfunctioning residential grinder pump stations.</p>
SX 21205033	<p><b>MUPB Phase 5 Inflow and Infiltration Elimination Project</b>  This project is a continuation of complete system infiltration/inflow elimination including camera inspection and repair of problem areas in the sewage collection system.</p>
SX 21205035	<p><b>MUPB 519 Sewer Extension</b>  The project proposes to extend 3,600 LF of 2” force main along KY 519 to serve 13 houses and an animal shelter. Project includes 13 grinder pump stations and a duplex pump station.</p>
SX 21205036	<p><b>KY 801 and KY 158 Sewer Extension Project</b>  This project proposes to extend sewer services to the KY 801 - KY 158 area in Sharkey, Kentucky flowing from west to east starting at a point along KY 158 (38° 14' 10.414" N, 83° 33' 3.773" W) and ending at an existing 8" sewer line on KY 32 (38° 14' 33.21" N 83° 30' 48.92" W). The sewer main will be constructed along the north side of KY 158 (Sharkey Road) and will comprise of 2", 4" and 6" force main and 8" gravity lines. To direct flow, two lift stations will be constructed. Lift Station #1 (38° 14' 17.129" N, 83° 32' 51.389" W), west of Old Baptist Road, has a proposed capacity of 80 GPM. Lift Station #2 (38° 14' 29.402" N, 83° 32' 21.491" W), west of Shawnee Drive, has a proposed capacity of 40 GPM.</p> <p>Side roads to be included in the project off of KY 158 include:  Old Baptist Road - 1,200 LF of 8" PVC, Eldridge Lane - 1,500 LF of 8" PVC, Willowbrook Lane - 1,300 LF of 8" PVC, Willowbrook Court - 550 LF of 8" PVC, Ball Park Way - 600 LF of 8" PVC, Shawnee Drive - 2,100 LF of 8" PVC, Cheyenne Drive - 1,400 LF of 8" PVC, Unnamed Road off of KY 158 - 800 LF 2" HDPE, Seneca Drive - 1,150 LF of 2" HDPE, Jackson Cemetery Road - 2,800 LF of 2" HDPE, Derrickson Road - 3,000 LF of 2" HDPE, Caudill Cemetery Road - 1,200 LF of 4" PVC and 3,500 LF of 2" HDPE, plus an additional 2,100 LF of 2" HDPE for extended structure connections, Lookout Lane - 600 LF of 2" HDPE, Beechmont Road - 1,200 LF of 2" HDPE, and Parker Lane - 2,100 LF of 2" HDPE.</p> <p>Up to 103 residential grinders are proposed to be installed on various side roads off of KY 158 where force main will be constructed. These roads include but are not limited to: KY 158, Parker Ln, Derrickson Rd, Lookout Ln, Caudill Cemetery Rd, Beechmont Rd, and Jackson Cemetery Rd. Approximately 50 manholes will be installed on sections of 8" gravity line.</p>

SX 21205041	<p><b>MUPB US 60 Sewer Line Rehabilitation</b></p> <p>The proposed project will clean, inspect, and repair problem areas in the 36" gravity concrete sewer line running parallel to US 60. The project will begin near the Seal Master manufacturing facility and extend approximately 18,100 LF in a southwesterly direction to the WWTP. In addition to the sewer line rehab work, the project will also inspect, re-line, and re-seal approximately 45 manholes. This is the main sewer line coming from the City of Morehead to the WWTP.</p>
SX 21205042	<p><b>Derrickson Lift Station Upgrade</b></p> <p>This project would replace the existing Derrickson Lift Station and corresponding force main to address sanitary sewer overflow (SSO) event by constructing a new lift station on the adjacent site. The new lift station (approximately 700 GPM) would be designed with higher flow pumps and a larger wet well, designed to current regulations. Due to the expansion and growth in customer base in the northern part of Rowan County, approximately 11,000 LF of 10-inch force main would be installed to replace the existing 6-inch force main to increase capacity within this section of the collection system.</p>

Due to the growth being experienced by HWY 801 North with new industry and residential expansion the MUPB is currently constructing a major sewer system improvement and expansion in that area as well as other system locations.

The project proposes capital improvements throughout sections of Morehead Utility Plant Board's (MUPB) collection system to correct capacity issues and sanitary sewer overflows (SSO). By installing new interceptors between lift stations and increasing the capacity and total dynamic head of several lift stations, the overall capacity in the area will increase and reduce the number of SSO events, the primary goal of this project.

**Force Main 5 – Salt Lick to Midland**

Approximately 7,900 LF of new 6" PVC force main will be installed from the Salt Lick Fire Station Lift Station (LS-48) to the Trailer Sales Lift Station (LS-46). The proposed 6" line will run in a northeasterly direction, parallel to the existing 4" line. All lift stations from the Salt Lick Fire Department (LS-48) to the Trailer Sales (LS-46) will connect to the proposed 6" line. The existing grinder services utilizing the 4-inch line will be moved to the proposed 6-inch line

**Force Main 2 – Midland to Leo's Lift Station**

Approximately 13,000 LF of proposed 6" PVC force main will tie into the existing force main at the Trailer Sales Lift Station and run parallel to the existing 6" line to Leo's Lift Station. A valve will be inserted on the existing 6" line to restrict flow, forcing flow into the proposed 6" line. Flow from all lift stations from Trailer Sales (LS-46) west and to Leo's Lift Station will travel in the proposed 6" line. All existing grinder services will utilize the existing 6" line. The Trailer Sales

Lift Station will be rehabbed to increase the flow capacity from 204 GPM to 300 GPM. The new pumps installed at the existing lift stations will have energy efficient VFD devices.

#### Force Main 1 – Leo’s Lift Station to WWTP

Approximately 13,600 LF of new 10” PVC force main will connect Leo’s Lift Station (LS-40) to the manhole located at the MUPB WWTP. The proposed 10” line will transmit flow from the west of Leo’s Lift Station to the plant. Flow from the Farmers School Lift Station and the Plumbing Supply Lift Station (east of Leo’s Lift Station) will connect into the proposed 10” force main. The existing 8” line will remain in service to transmit flow from 801 North to the interstate and 801 South.

The existing Leo’s Lift Station will be demolished and a new lift station will be constructed on the adjacent property. The new lift station will increase the capacity from 550 GPM to 1,000 GPM. The lift station is being moved to an adjacent property because the existing site is not large enough for the proposed lift station. The Leo’s Lift Station rehab will include SCADA and energy efficient VFD devices.

#### Force Main 3 – KY 801 North to Bullfork Road

Approximately 31,250 LF of new 10” PVC force main will connect the Armory Lift Station (LS-14) to the MUPB WWTP. The new 10” PVC force main will run parallel to the existing 6” force main for 3,700 LF before deviating through the MMRC Industrial Park, running parallel to an existing waterline to Bullfork Road, crossing I64 under an overpass bridge (via approximately 500 LF of steel casing), and continuing down Bullfork Road before crossing Triplett Creek to the WWTP. Up to 20 new customers, and grinder pump stations, will be added on the new 10” force main line. The existing Family Dollar Lift Station will be replaced with a new lift station to increase the capacity from 78 GPM to 900 GPM and include SCADA and energy efficient VFD devices. Additionally, the Eagle Travel Plaza Lift Station and the River Edge Lift Station will be rehabbed by replacing the existing pumps and increasing the total dynamic head.

The flow on KY 801 North will be split on the existing 6” force main by installing a valve near I-64. The flow will be diverted to a new 800 GPM Armory Lift Station and through the proposed 10” line to the WWTP. This will reduce the volume from KY 801 North into the existing force main at Leo’s Lift Station. Approximately 2,000 LF of 8” PVC gravity line will be installed from the existing 280 GPM Armory Lift Station to the proposed lift station. The existing Armory Lift Station will be eliminated.

## *Natural Gas*

There are two natural gas distribution systems in Rowan County. The Delta Natural Gas Company Inc. supplies the western portion of Rowan County and extends east to Morehead. Delta is a private company, established in 1949. In addition to providing a supply for Morehead, Delta also serves areas along US 60 West and highway 801 North where the MMRC Regional Business Park, AppHarvest Greenhouse and the Independent Stave Cooperage (under construction). Expansion of the gas distribution lines in that area is currently under construction to meet the larger demand. Delta's system in Rowan County is supplied by a take point on the interstate Tennessee Gas Pipeline system. As a large private system, Delta is regulated by the Kentucky Public Service Commission and has been able to successfully meet growing requirements while maintaining the existing system in good order.

The Morehead Utility Plant Board operates a municipal gas distribution system that serves about 1225 customers in the City. The Morehead system was rehabbed in 1982 and converted to 98% polyethylene piping. The average operating pressures is 60 psi. Morehead has three purchase points – Two from Kinder Morgan on North side and one from Delta, Inc on south. The last 5 years of purchased gas volumes are:

2019- 657,053 mcf  
2018- 714,891 mcf  
2017- 608,384 mcf  
2016- 639,892 mcf  
2015- 642,164 mcf

Morehead's gas facilities improvement plan has factored \$5 million of capital investment over the next 5 years – focused around replacing 3 – 4 miles of steel line because of age and excessive leaks and meter replacement.

## *Communications Service*

The City of Morehead is a destination in the KENTUCKYWIRE project. This project is designed to ultimately bring high speed internet service to all of Kentucky. KentuckyWired is a physical system of fiber optic cable, also referred to as the “middle mile” or backbone, infrastructure that will allow broadband service to be brought closer to communities throughout Kentucky. What's unique about KentuckyWired is that it will be an open access network owned by the Commonwealth of Kentucky. This means local public or private Internet service providers (ISPs) can connect to the network and extend services locally (the “last mile”).

The middle mile is the system that will connect the worldwide Internet to “exit ramps” closer to a community. Internet Service Providers (ISPs), such as the cable or phone company, can then connect their equipment and fiber system to the KentuckyWired network to create a high speed link between the global Internet and local communities. ISPs will be the ones to actually extend fiber to a home or business.



Morehead is in the northern ring that is planned to go from Lexington to Morehead to Ashland and south through Prestonsburg. The portion of that loop connecting to Morehead is now complete. Middle mile connection points in Morehead include the Rowan County Courthouse, Morehead City Building, Morehead State University, St. Claire Regional Hospital and the Rowan Campus of the Maysville Community and Technical College which is newly located in the MMRC Regional Business Park.

Rowan County is now making plans for an implementation program to insure that “last mile” projects are completed to serve residents and businesses in the community.

### ***Summary***

Rowan County’s estimated 2020 population is 24,708 which reflects 5.9% growth since the 2010 census. The Kentucky Infrastructure Authority (KIA) estimates 8,046 of these Rowan Countians are provided direct water service by the Morehead Utility Plant Board (MUPB) and an additional 16,110 are directly served by the Rowan Water Inc. distribution system. Therefore 97.8% of Rowan County’s population has potable water service.

Also, KIA estimates that 14,097 Rowan residents are provided public sewer service by the MUPB, which is 57% of the County’s residents.

Long term utility planning for the County has concluded that two major projects must be implemented in a timely manner to avoid hampering community growth and economic development. The largest and most urgent is the water treatment plant expansion project previously described. That project will be followed by a wastewater treatment plant expansion project. This project planning has not started as the utility is currently focused on reducing infiltration and inflow (I/I) into the sewage collection system. This work, if successful, will result in a reduction of the required wastewater treatment plant capacity.

A required step for the wastewater system is an update of the Section 201 wastewater facilities plan, which should be undertaken as the current phase of I/I reduction is completed.

MUPB and Rowan Water will continue to implement small water and sewer line projects as the need arises and the county/city experience growth. However, the magnitude of the two treatment plant projects dwarf the other capital improvement and maintenance projects.

## **Exhibits**

*Morehead Utility Plant Board Water Service Area Map*

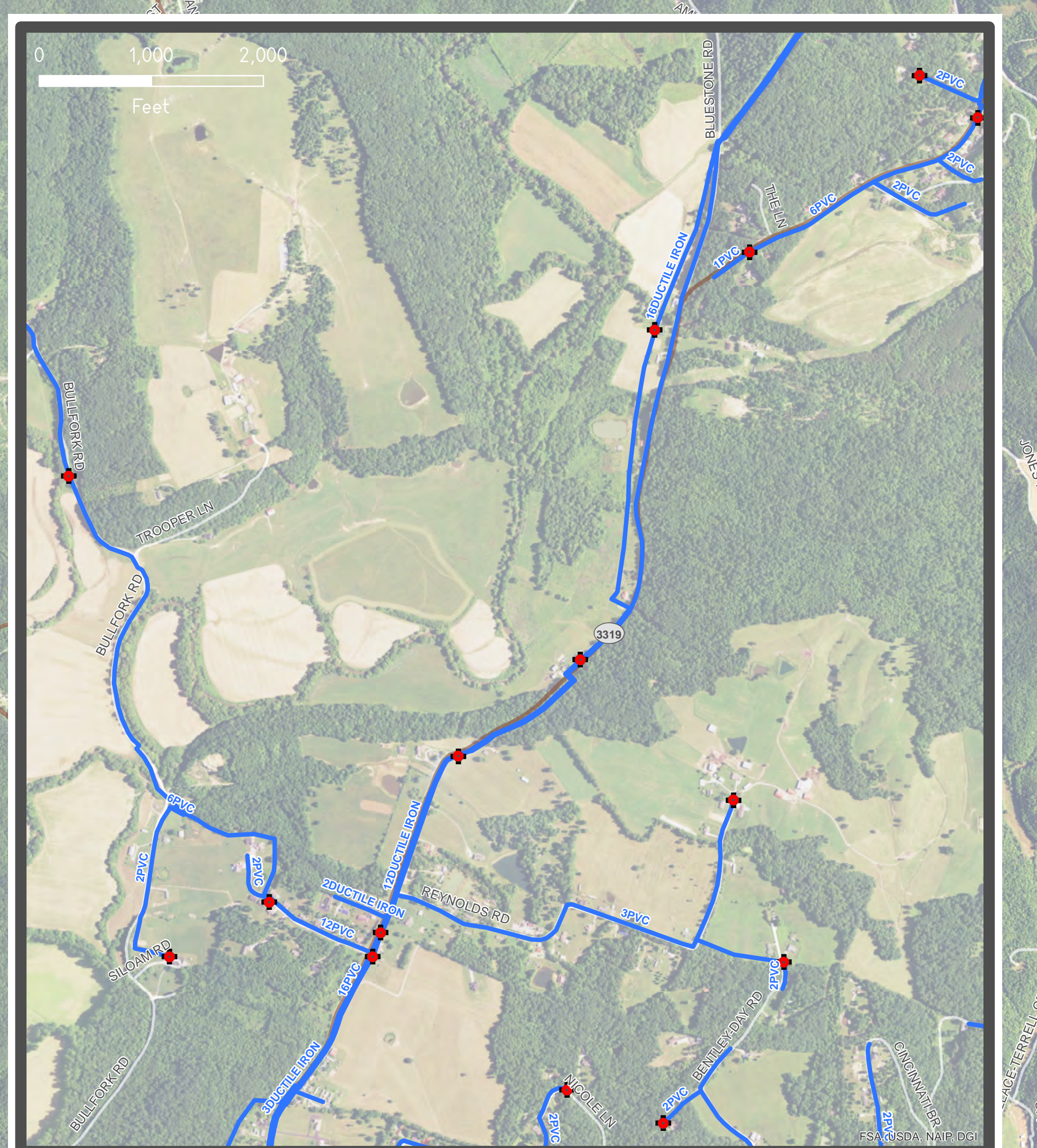
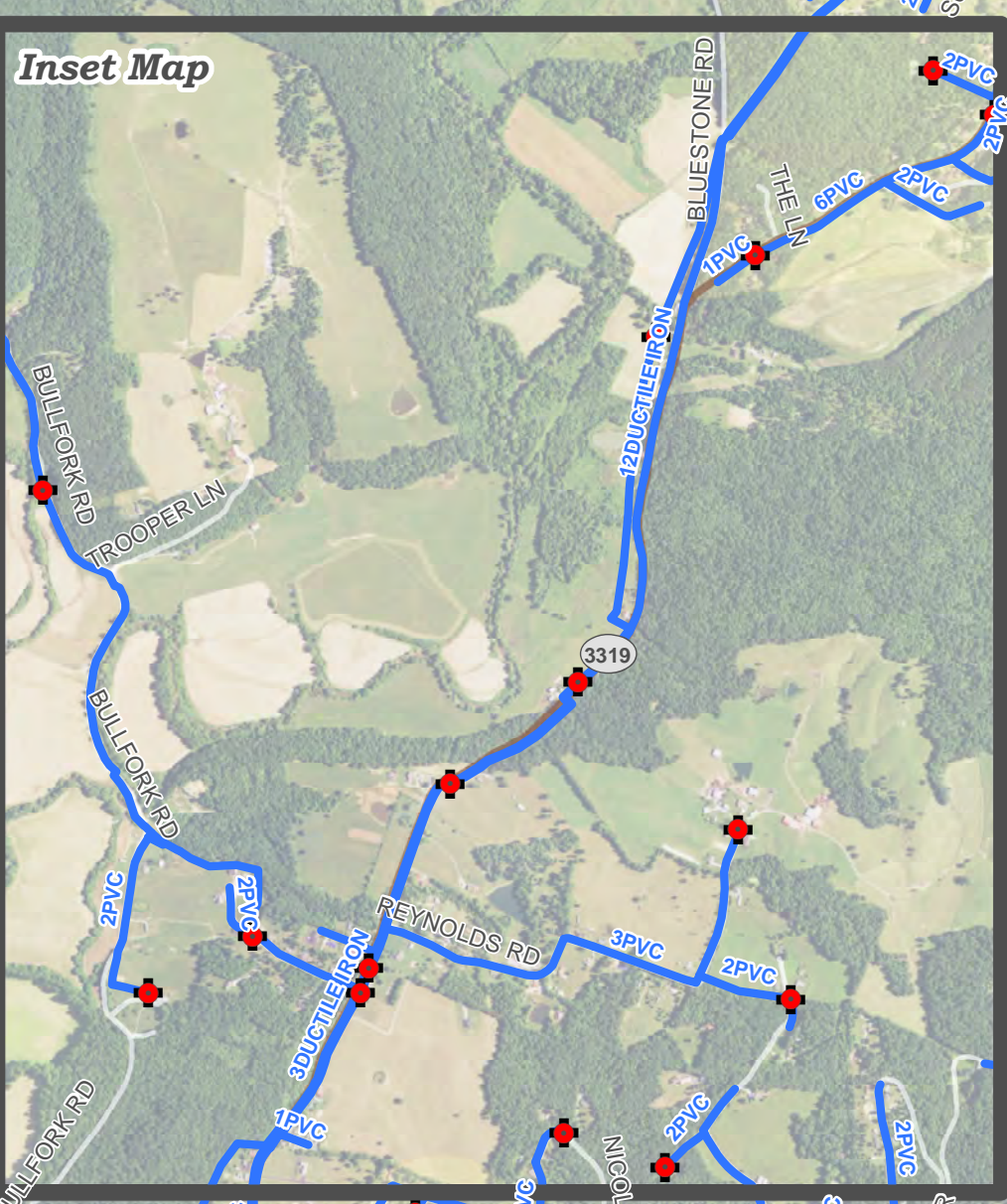
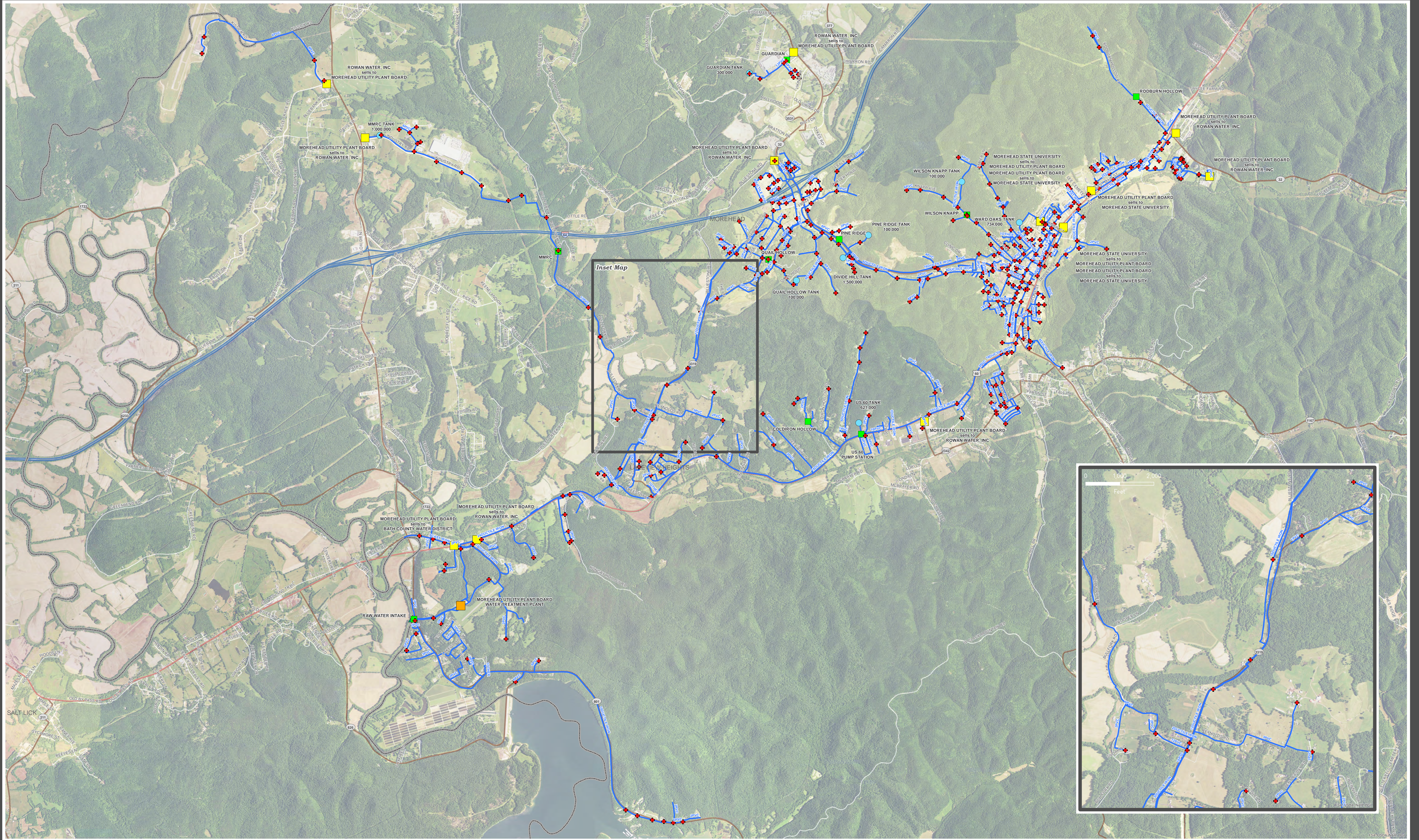
*Rowan Water, Inc. Water Service Area Map*

*Morehead State University Water Service Area Map*

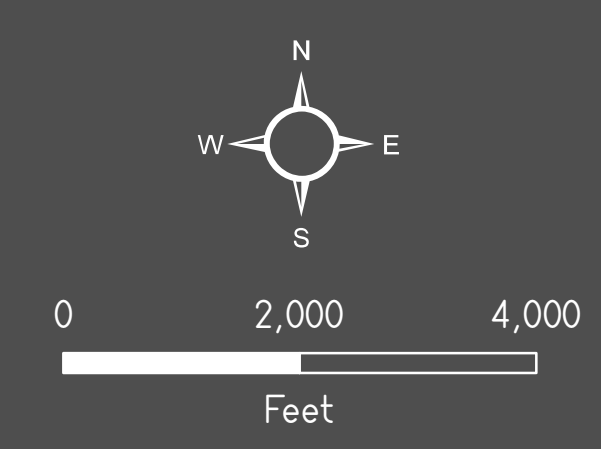
*Morehead Utility Plant Board Sewer Service Area Map*

# MOREHEAD UTILITY PLANT BOARD

## WATER DISTRIBUTION SYSTEM



- Meter
- + Hydrant
- Pump Station
- Water Tank
- Purchase Source
- Surface Source
- Water Treatment Plant
- Existing Waterline



**PHYSICAL ATTRIBUTES**

Miles of Line:	105
Storage Capacity:	5,392,000 G
Treatment Capacity:	8,000 MGD
Average Production:	5,163 MGD
Percent Capacity:	65%
Peak Production:	7,880 MGD
Treatment Type:	Chlorine Gas
Water Loss:	12%

**WHOLESALE UTILITIES**

<b>Sellers:</b>	Morehead State University Rowan Water, Inc.
<b>Purchasers:</b>	Bath County Water District Morehead State University Rowan Water, Inc.

**TANK CAPACITY**

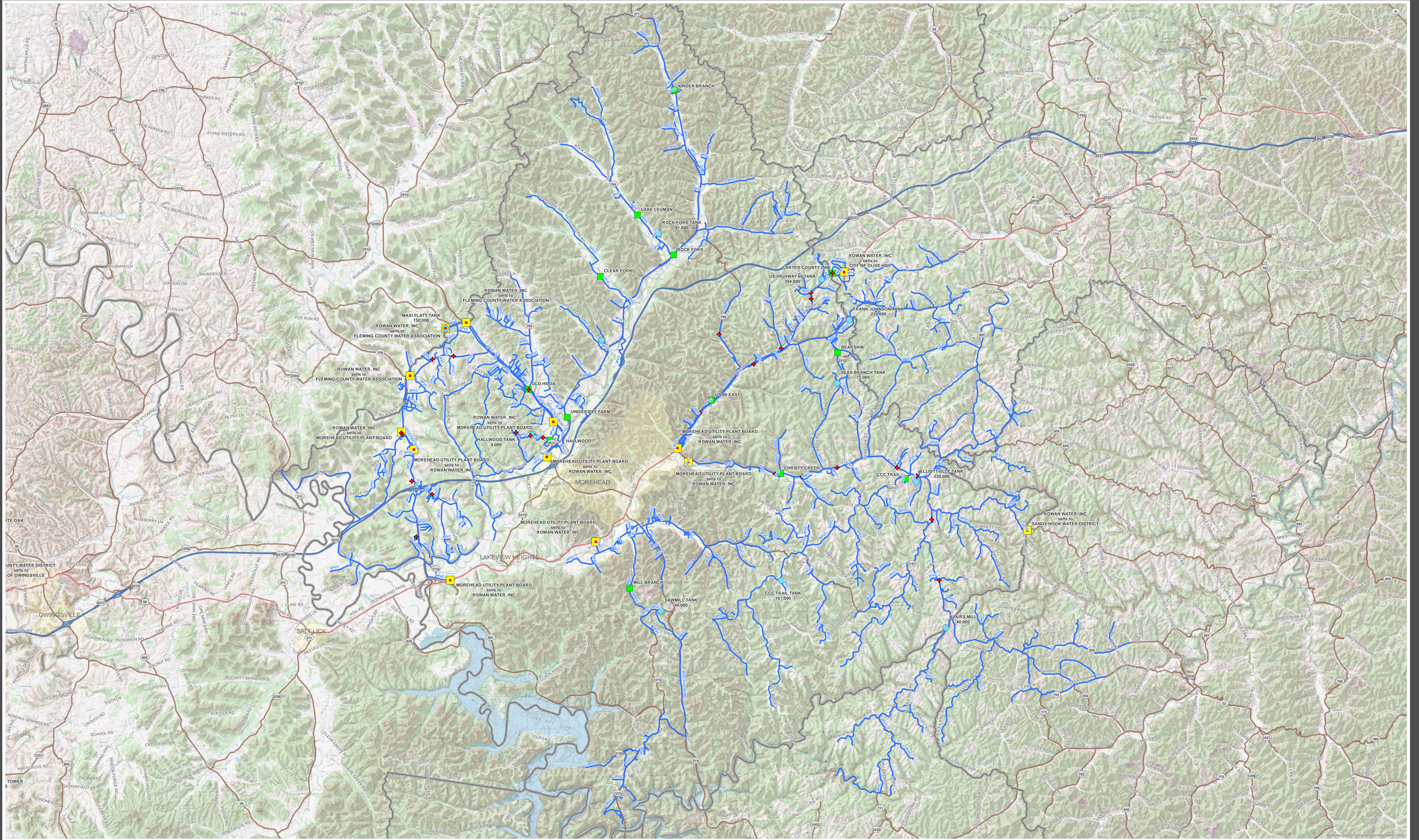
Divide Hill:	1,500,000 G
Guardian:	300,000 G
MMRC:	1,000,000 G
Pine Ridge:	100,000 G
Quail Hollow:	100,000 G
US 40:	621,000 G
Ward Oaks:	734,000 G
Wilson Knapp:	100,000 G

**GATEWAY**  
AREA DEVELOPMENT DISTRICT

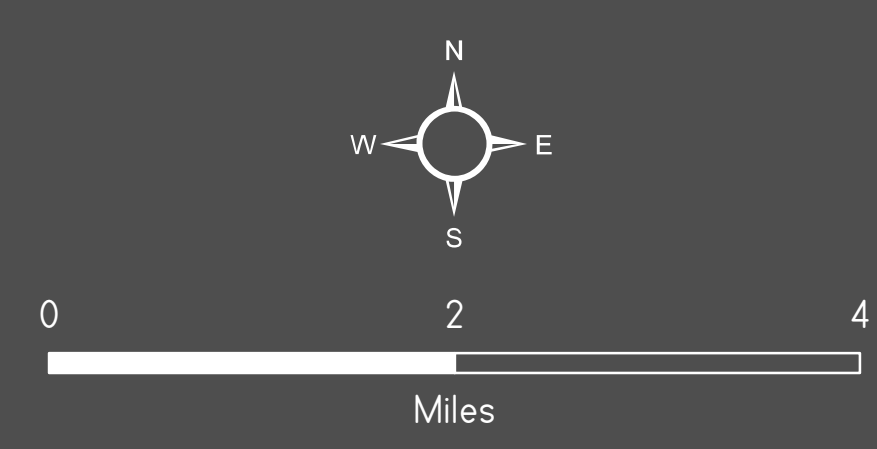
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# ROWAN WATER, INC.

## WATER DISTRIBUTION SYSTEM



- Meter
- + Hydrant
- Pump Station
- Water Tank
- Purchase Source
- Existing Waterline



**PHYSICAL ATTRIBUTES**

Miles of Line: 650  
 Storage Capacity: 1,463,000 G  
 Treatment Capacity: NA  
 Average Purchase: 1,706,432 G  
 Peak Capacity: NA  
 Peak Purchase: 00,000 G  
 Treatment Type: NA  
 Water Loss: 21%

**WHOLESALE UTILITIES**

**Sellers:** Morehead Utility Plant Board

**Purchasers:** City of Olive Hill  
 Fleming County Water Association  
 Morehead Utility Plant Board  
 Sandy Hook Water District

**TANK CAPACITY**

Blairs Mill:	40,000 G
CCC Trail:	161,000 G
Elliottville:	220,000 G
Frank Johnson:	220,000 G
Hallwood:	9,000 G
Maxi Flatt:	150,000 G
Pond Lick:	64,000 G
Rock Fork:	91,000 G
Sawmill:	40,000 G
Seas Branch:	75,000 G
US Highway 60:	394,000 G

### GATEWAY AREA DEVELOPMENT DISTRICT

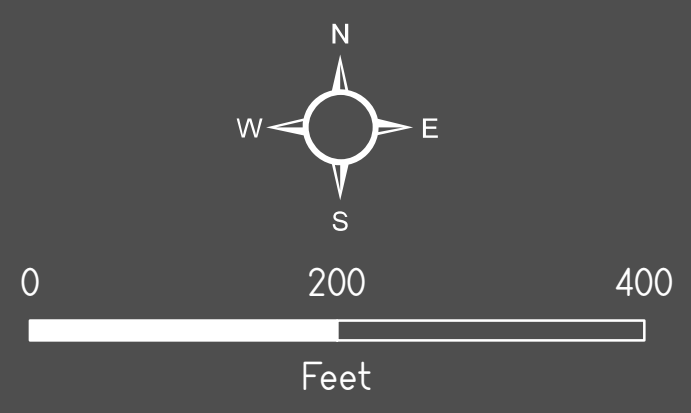
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# MOREHEAD STATE UNIVERSITY

## WATER DISTRIBUTION SYSTEM



- Meter
- + Hydrant
- Pump Station
- Water Tank
- Purchase Source
- ▲ Surface Source
- Water Treatment Plant
- Existing Waterline



**PHYSICAL ATTRIBUTES**

Miles of Line:	6
Storage Capacity:	450,000 G
Treatment Capacity:	1,260 MGD
Average Production:	0.276 MGD
Percent Capacity:	22%
Peak Production:	0.590 MGD
Treatment Type:	Chlorine Gas
Water Loss:	1%

**WHOLESALE UTILITIES**

Sellers: Morehead Utility Plant Board  
 Purchasers: Morehead Utility Plant Board

**TANK CAPACITY**

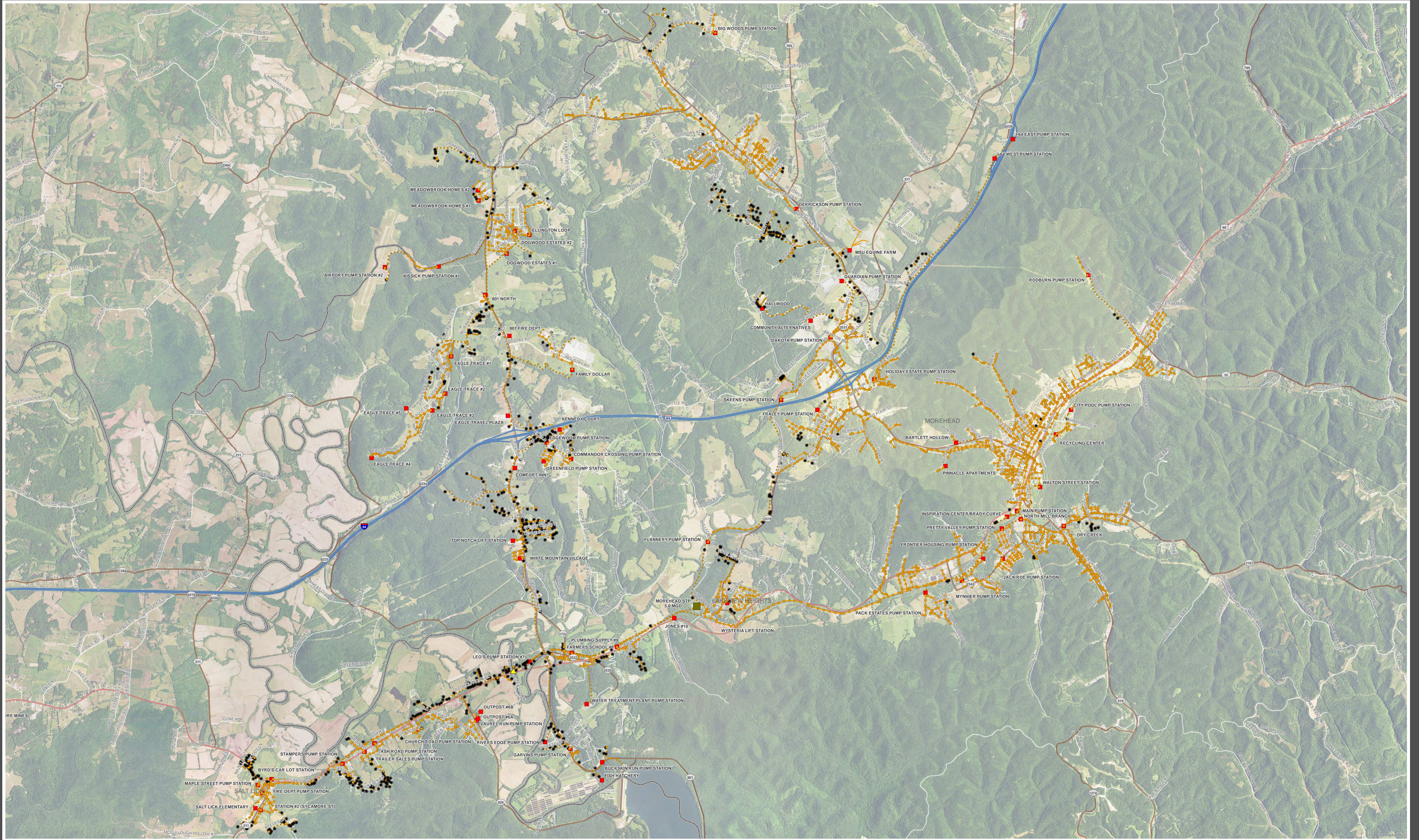
MSU:	250,000 G
MSU Ground:	200,000 G

**GATEWAY**  
 AREA DEVELOPMENT DISTRICT

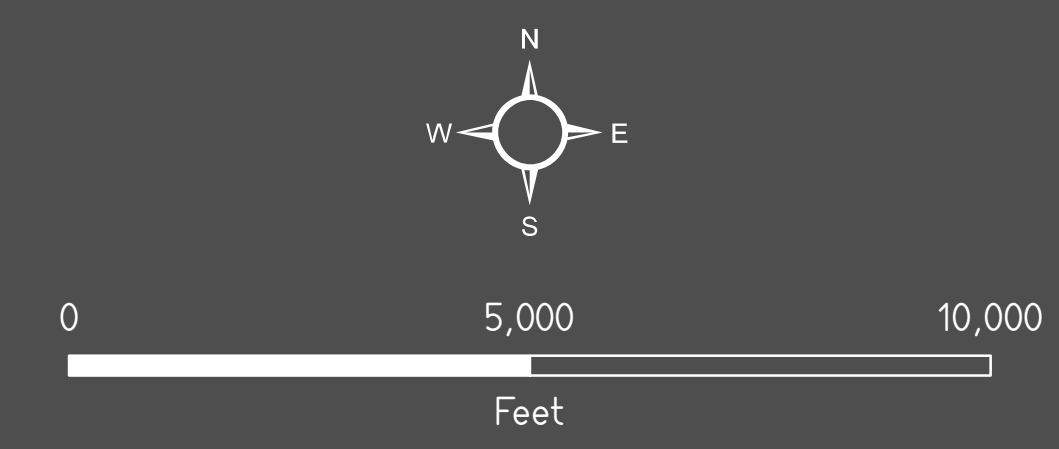
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# MOREHEAD UTILITY PLANT BOARD

## SEWER COLLECTION SYSTEM



- Manhole
- ⊗ Grinder Pump
- Lift Station
- ▲ WWTP Outfall
- Wastewater Treatment Plant
- Pressure Sewer
- Gravity Sewer



**PHYSICAL ATTRIBUTES**

Miles of Gravity:	105	Treatment Capacity:	5,000 MGD
Miles of Force:	86	Hydraulic Capacity:	10,000 MGD
Lift Stations:	73	Average Daily Flow:	2,595 MGD
Manholes:	2,684	Percent of Capacity:	52%
Grinder Pumps:	709	Peak Daily Flow:	7,027 MGD
		Treatment Type:	Extended Aeration

**GATEWAY**  
AREA DEVELOPMENT DISTRICT

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