

Case No. 2019-00080
City of Pikeville Wholesale Water Service Rates
Responses to Commission Staff's Post-Hearing Data Request

1. Pikeville pays for its gasoline and telephone/public works expenses and then receives a reimbursement from Utility Management Group (UMG) for these expenses. Provide the history and the reason for this arrangement between Pikeville and UMG.

Response: The City is able to purchase fuel at a lower cost and bill to UMG, which puts burden back on UMG to operate in an efficient manner. The phone system is tied together with public works due to customer service, and UMG reimburses for phones allocated to them.

WITNESS: Tonya Taylor; Grondall Potter

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2. State whether these expenses (gasoline and telephone/public works) are being recovered by UMG through its annual management fee. If the response is yes, identify the amount of expense reimbursement that was recovered in UMG's test-year management fee.

Response: Yes, these expenses are being recovered by UMG. UMG's fuel expense for Pikeville's entire water system is \$24,421 in Fiscal Year 2017. UMG does not break out the telephone expense by operations.

WITNESS: Tonya Taylor; Grondall Potter

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3. State whether Pikeville or UMG originally decided how to allocate the UMG contract costs between the following Pikeville divisions: Water Treatment Plant, Waste Water Treatment Plant, Solid Waste, Parks, Landscaping, Government Liason, Outside Water, Inside Sewer, Inside Water, Outside Sewer, Streets, and Gas Distribution.

Response: Based on discussions with current UMG staff, the City understands that there was a joint effort between UMG and Pikeville City administrators was utilized to achieve departmental allocations when the contractual relationship was initiated. Historical information was reviewed and taken into account to establish each department allocation and percentage based on the overall contract price.

WITNESS: Tonya Taylor; Grondall Potter

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4. Provide a detailed description of the methodology(s) UMG uses to allocate its contract costs between the following Pikeville divisions: Water Treatment Plant, Waste Water Treatment Plant, Solid Waste, Parks, Landscaping, Government Liason, Outside Water, Inside Sewer, Inside Water, Outside Sewer, Streets, and Gas Distribution. Include the reason(s) the allocation methodology(s) was chosen and describe the input that was provided by Pikeville in the development of the allocation methodology(s).

Response: Please refer to the response to Item 3 above. In addition to the information provided there, UMG utilizes the Cost – Plus methodology (Direct costs, Indirect costs and Fixed costs) to allocate contract cost between departments. It is a reasonable method for allocation. The City of Pikeville assisted with pertinent information of costs to establish departmental allocations.

WITNESS: Grondall Potter

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5. Provide a schedule comparing the UMG contract costs broken down by Pikeville divisions for the Fiscal Years ending June 30, 2014, through June 30, 2017.

Division	UMG Annual Management Fees - Breakdown (Fiscal Years)						
	2014	2015	% Inc. 2014-2015	2016	% Inc. 2015-2016	2017	% Inc. 2016-2017
Water Treatment Plant							
Waste Water Treatment Plant							
Gas Distribution							
Solid Waste							
Parks							
Lanscaping							
Government Liaison							
Outside Water							
Inside Sewer							
Inside Water							
Outside Sewer							
Streets							
Gas Distribution							

Response:

WITNESS:

UMG Annual Management Fees-Breakdown (Fiscal Years)							
Division	2014	2015	% Inc. 2014- 2015	2016	% Inc. 2015- 2016	2017	% Inc. 2016- 2017
Water Treatment Plant	597,483	604,056	1.10%	612,996	1.48%	619,126	1.00%
Wastewater Treatment Plant	219,610	222,026	1.10%	225,312	1.48%	227,565	1.00%
Gas Distribution	406,747	411,222	1.10%	417,308	1.48%	421,481	1.00%
Solid Waste	531,755	537,604	1.10%	545,560	1.48%	551,016	1.00%
Parks	357,641	361,575	1.10%	366,926	1.48%	370,595	1.00%
Lanscaping	65,019	65,734	1.10%	66,707	1.48%	67,374	1.00%
Government Liason	82,804	83,714	1.10%	84,953	1.48%	85,803	1.00%
Outside Water	354,703	358,605	1.10%	363,912	1.48%	367,551	1.00%
Inside Sewer	179,243	181,214	1.10%	183,896	1.48%	185,735	1.00%
Inside Water	660,581	667,847	1.10%	677,731	1.48%	684,508	1.00%
Outside Sewer	132,168	133,621	1.10%	135,599	1.48%	136,955	1.00%
Streets	602,269	608,894	1.10%	617,906	1.48%	624,085	1.00%
	4,190,023	4,236,112		4,298,806		4,341,794	

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6. Review Pikeville's Supplemental Response to Mountain Water District's Initial Data Request, Item 69.

a. The monthly Invoices from UMG to Pikeville list a charge of \$7,150 for a "Government Liaison." Provide a detailed description of this position and describe the services this UMG employee provides to Pikeville.

b. Identify the amount of this annual cost of \$85,803 for the Government Liaison that UMG allocates to the inside city water system.

Response:

a. The "Government Liaison" position is a service UMG provides to identify and assist in application of the City of Pikeville with various funding sources of grants and resources potentially available to the City as a whole. This position is not filled by one UMG employee, but could be one of several depending on the field of expertise required. The cost is to reimburse UMG for employee(s) time, travel or any related expenses incurred. But, this cost is not relevant in this particular case as none of Pikeville's water departments are impacted since it is not allocated to any of those departments.

b. No expense for the Governmental Liaison position is allocated to inside water system.

WITNESS: Grondall Potter; Tonya Taylor

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7. Explain and describe the direct correlation between water consumption and UMG management contract cost allocations.

Response: The line item for Water Treatment Plant on the monthly UMG contract invoices is split between inside water and outside water based upon consumption.

WITNESS: Tonya Taylor

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8. Explain and describe the direct correlation between water consumption and repairs and maintenance expense allocations.

Response: For account 210.10.630.09 Repairs and Maintenance Plant, the expenses are allocated between inside water and outside water based upon % consumption. This account is for expenses related to the water treatment plant only. There is a direct correlation between consumption and maintenance and repairs. As water infrastructure is used because of consumption over time, there will be a need for maintenance/repair. The water treatment plant expenses should be allocated to inside water and outside water, and an allocation for the treatment plant based on consumption is reasonable.

For account 210.10.630.00 Repairs and Maint., there is no allocation because it includes only expenses related to inside water.

WITNESS: Tonya Taylor

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9. Provide the results of the Pikeville master meter tests for fiscal years ending June 30, 2014-2018.

Response: Please see the attached documentation. The following Mountain Water District Master meters were changed out with new meters in 2014: Chloe, Indian Hills, Cedar Gap (Hurricane), Island Creek, Coon Branch, Hoopwood, and Town Mountain.

WITNESS: Grondall Potter

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Master Meter Testing



Branch Office
 740 Enterprise Drive
 Lexington, KY 40510
 Phone: (859)255-0852
 Fax: (859)259-1171

CITCO Large Meter Test Record

Customer Name: Pikeville, KY.

Date: 12-28-2016

Meter Info:

Make: Sensus

Serial #: None Visible

Size: 2"

Location: Coons Branch

Meter Tester Information:

Make: Sensus

Type: 125W

Serial #: 70846211

Size: 3"

Last Tested: 09/08/2016

Test As Found

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH	120	90	301	308	97.73%	98.70%	96.46%
LOW	4	105	103	100	103.00%	99.20%	102.18%
Average of Tests As Found:							99.32%

Test After Repair

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH					#DIV/0!		#DIV/0!
MED					#DIV/0!		#DIV/0!
LOW					#DIV/0!		#DIV/0!
Average of Tests After Repair:							#DIV/0!

Tested By: Michael Shipley

Card#: Sensus

Comments: High Side is Low...



Branch Office
 740 Enterprise Drive
 Lexington, KY 40510
 Phone: (859)255-0852
 Fax: (859)259-1171

CITCO Large Meter Test Record

Customer Name: Pikeville, KY.

Date: 12/08/2016

Meter Info:

Make: Badger Compound

Serial #: 45918735

Size: 4"

Location: Island Creek

Meter Tester Information:

Make: Sensus

Type: 125W

Serial #: 70846211

Size: 3"

Last Tested:

9/8/2016

Test As Found

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH	380	75	1011	1002	100.90%	98.50%	99.38%
MED	20	115	1000	1000	100.00%	98.50%	98.50%
LOW	15	105	102	101	100.99%	99.20%	100.18%
Average of Tests As Found:							99.36%

Test After Repair

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH					#DIV/0!		#DIV/0!
MED					#DIV/0!		#DIV/0!
LOW					#DIV/0!		#DIV/0!
Average of Tests After Repair:							#DIV/0!

Tested By: Michael Shipley

Card#: Sensus

Comments: PASSED



Branch Office
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 Lexington, KY 40510
 Phone: (859)255-0852
 Fax: (859)259-1171

CITCO Large Meter Test Record

Customer Name: Pikeville, KY.

Date: 12/08/2016

Meter Info:

Make: 2" Sensus

Serial #:

Size: 2"

Location: Hoopwood Hollow

Meter Tester Information:

Make: Sensus

Type: 125W

Serial #: 70846211

Size: 3"

Last Tested:

9/8/2016

Test As Found

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH	120	110	306	301	101.66%	98.70%	100.34%
MED	10	125	102	100.2	101.80%	99.20%	100.98%
LOW	4	145	102	100.5	101.49%	99.20%	100.68%
Average of Tests As Found:							100.67%

Test After Repair

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH					#DIV/0!		#DIV/0!
MED					#DIV/0!		#DIV/0!
LOW					#DIV/0!		#DIV/0!
Average of Tests After Repair:							#DIV/0!

Tested By: Michael Shipley

Card#: Sensus

Comments: PASSED



Branch Office
 740 Enterprise Drive
 Lexington, KY 40510
 Phone: (859)255-0852
 Fax: (859)259-1171

CITCO Large Meter Test Record

Customer Name: Pikeville, KY.

Date: 12/08/2016

Meter Info:

Make: Sensus

Serial #: 45918734

Size: 4"

Location: Chloe Creek

Meter Tester Information:

Make: Sensus

Type: 125W

Serial #: 70846211

Size: 3"

Last Tested: 09/08/2016

Test As Found

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH	298	45	1010	1004	100.60%	98.50%	99.09%
MED	20	85	1005	1001	100.40%	98.50%	98.89%
LOW	15	90	100	99.2	100.81%	99.20%	100.00%
Average of Tests As Found:							99.33%

Test After Repair

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH					#DIV/0!		#DIV/0!
MED					#DIV/0!		#DIV/0!
LOW					#DIV/0!		#DIV/0!
Average of Tests After Repair:							#DIV/0!

Tested By: Michael Shipley

Card#: Sensus

Comments: PASSED

The service side valve lets a lot of water through. This site definitely needs a ball valve on the test port.



Branch Office
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 Lexington, KY 40510
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 Fax: (859)259-1171

CITCO Large Meter Test Record

Customer Name: Pikeville, KY.

Date: 12/08/2016

Meter Info:

Make: Sensus

Serial #: 1116830

Size: 4"

Location: Hurrigan

Meter Tester Information:

Make: Sensus

Type: 125W

Serial #: 70846211

Size: 3"

Last Tested: 09/08/2016

Test As Found

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH	500	125	1020	1003	101.69%	98.50%	100.17%
MED	20	195	990	1000	99.00%	100.00%	99.00%
LOW	15	195	100	100.4	99.60%	99.20%	98.80%
Average of Tests As Found:							99.32%

Test After Repair

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH					#DIV/0!		#DIV/0!
MED					#DIV/0!		#DIV/0!
LOW					#DIV/0!		#DIV/0!
Average of Tests After Repair:							#DIV/0!

Tested By: Michael Shipley

Card#: Sensus

Comments: PASSED



Branch Office
740 Enterprise Drive
Lexington, KY 40510
Phone: (859)255-0852
Fax: (859)259-1171

CITCO Large Meter Test Record

Customer Name: Pikeville, KY.

Date: 06-04-18

Meter Info:

Make: Sensus

Serial #: 45918734

Size: 4"

Location: Chloe Creek

Meter Tester Information:

Make: Sensus

Type: 125W

Serial #: 70846211

Size: 3"

Test As Found

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH	298	45	0	0	#DIV/0!	98.50%	#DIV/0!
MED	20	85	0	0	#DIV/0!	98.50%	#DIV/0!
LOW	15	90	0	0	#DIV/0!	99.20%	#DIV/0!
Average of Tests As A							#DIV/0!

WASTED HOUR couldn't test

Test After Repair

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH					#DIV/0!		#DIV/0!
MED					#DIV/0!		#DIV/0!
LOW					#DIV/0!		#DIV/0!
Average of Tests After Repair:							#DIV/0!

Tested By: Michael Shipley

Card#:Sensus

Comments: Cant test - Downtime 1 hour

The service side valve lets a lot of water through. This site definitely needs a ball valve on the test port.



Branch Office
740 Enterprise Drive
Lexington, KY 40510
Phone: (859)255-0852
Fax: (859)259-1171

CITCO Large Meter Test Record

Customer Name: Pikeville, KY.

Date: 06-05-18

Meter Info:

Make: Badger T-1000

Serial #: 45918738

Size: 4"

Location: Indian Hills

Meter Tester Information:

Make: Sensus

Type: 125W

Serial #: 70846211

Size: 3"

Test As Found

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH	333	65	1025	1010	101.49%	99.30%	100.77%
LOW	15	90	115	113	101.77%	99.30%	101.06%
Average of Tests As Found:							100.92%

Test After Repair

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH					#DIV/0!		#DIV/0!
MED					#DIV/0!		#DIV/0!
LOW					#DIV/0!		#DIV/0!
Average of Tests After Repair:							#DIV/0!

Tested By: Michael Shipley

Card#: Sensus

Comments: PASSED



Branch Office
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 Fax: (859)259-1171

CITCO Large Meter Test Record

Customer Name: Pikeville, KY.

Date: 06-04-18

Meter Info:

Make: Sensus

Serial #: 1116830

Size: 4"

Location: Hurrlican

Meter Tester Information:

Make: Sensus

Type: 125W

Serial #: 70846211

Size: 3"

Test As Found

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH	500	110	1010	1001	100.90%	99.30%	100.19%
LOW	15	180	90	225	40.00%	99.30%	
Average of Tests As Found:							69.96%

Test After Repair

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH					#DIV/0!		#DIV/0!
MED					#DIV/0!		#DIV/0!
LOW					#DIV/0!		#DIV/0!
Average of Tests After Repair:							#DIV/0!

Tested By: Michael Shipley

Card#: Sensus

Comments: LOW SIDE FAILED BAD



Branch Office
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 Phone: (859)255-0852
 Fax: (859)259-1171

CITCO Large Meter Test Record

Customer Name: Pikeville, KY.

Date: 06-04-18

Meter Info:

Make: Badger Compound

Serial #: 45918735

Size: 4"

Location: Island Creek

Meter Tester Information:

Make: Sensus

Type: 125-W

Serial #: 70846211

Size: 3"

9/8/2016

Test As Found

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH	380	75	1001	1005	99.60%	99.30%	98.90%
LOW	15	105	111	109	101.83%	99.30%	101.12%
Average of Tests As Found:							100.01%

Test After Repair

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH					#DIV/0!		#DIV/0!
MED					#DIV/0!		#DIV/0!
LOW					#DIV/0!		#DIV/0!
Average of Tests After Repair:							#DIV/0!

Tested By: Michael Shipley
 Installed: 2" Ball Valve, 2" x 4" Nipple
 Comments: PASSED

Card#: Sensus



Branch Office
 740 Enterprise Drive
 Lexington, KY 40510
 Phone: (859)255-0852
 Fax: (859)259-1171

CITCO Large Meter Test Record

Customer Name: Pikeville, KY.

Date: 06-04-2018

Meter Info:

Make: Sensus

Serial #:

Size: 2"

Location: Coons Branch

Meter Tester Information:

Make: Sensus

Type: 125-W

Serial #: 70846211

Size: 3"

Test As Found

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH	120	70	315	315	100.00%	99.30%	99.30%
LOW	4	95	100	99	101.01%	99.30%	100.30%
Average of Tests As Found:							99.80%

Test After Repair

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH					#DIV/0!		#DIV/0!
MED					#DIV/0!		#DIV/0!
LOW					#DIV/0!		#DIV/0!
Average of Tests After Repair:							#DIV/0!

Tested By: Michael Shipley
 Installed: 1.5" Ball Valve, 1.5" x 4" Nipple
 Comments:

Card#: Sensus



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CITCO Large Meter Test Record

Customer Name: Pikeville, KY.

Date: 06-04-18

Meter Info:

Make: 2" Sensus

Serial #:

Size: 2"

Location: Hoopwood Hollow

Meter Tester Information:

Make: Sensus

Type: 125W

Serial #: 70846211

Size: 3"

9/8/2016

Test As Found

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH	120	125	321	318	100.94%	99.30%	100.24%
LOW	4	155	110	109	100.92%	99.30%	100.21%
Average of Tests As Found:							100.22%

Test After Repair

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH					#DIV/0!		#DIV/0!
MED					#DIV/0!		#DIV/0!
LOW					#DIV/0!		#DIV/0!
Average of Tests After Repair:							#DIV/0!

Tested By: Michael Shipley

Card#: Sensus

Comments: PASSED



Branch Office
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 Lexington, KY 40510
 Phone: (859)255-0852
 Fax: (859)259-1171

CITCO Large Meter Test Record

Customer Name: Pikeville, KY.

Date: 06-05-18

Meter Info:

Make: Badger T-3500

Serial #: 45918743

Size: 8"

Location: Town Mountain

Meter Tester Information:

Make: Sensus

Type: 125-W

Serial #: 70846211

Size: 3"

Test As Found

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH	1500/4000	55	4021	3999	100.55%	99.30%	99.85%
					#DIV/0!	99.30%	#DIV/0!
LOW	50/1000	75	1001	1002	99.90%	99.30%	99.20%
Average of Tests As Found:							#DIV/0!

Test After Repair

	Flow Rate	Residual Pressure	Meter	Prover	Result %=(A/B)x100	Curve	Meter Accuracy
HIGH					#DIV/0!		#DIV/0!
MED					#DIV/0!		#DIV/0!
LOW					#DIV/0!		#DIV/0!
Average of Tests After Repair:							#DIV/0!

Tested By: Michael Shipley

Card#: Sensus

Comments: PASSED

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10. Provide a copy of the engineering report or any other documentation that explains how the construction project funded with the proceeds of the USDA Series 2016A Bonds to serve the KY Enterprise Industrial Park was modified to reflect the demands of Mountain Water District on the Southern Section of Pikeville's distribution system.

Response: Please find attached preliminary engineering report. Pages 3, 4, 5 & 6 reference MWD's system hydraulics and demands (also included in the report are hydraulic models) being taken into account during design. In addition, the documents filed by MWD on September 17, 2019, in this case show that Pikeville considered MWD's needs when designing the project.

WITNESS: Grondall Potter

Case No. 2019-00080
City of Pikeville Wholesale Water Service Rates
Responses to Commission Staff's Post-Hearing Data Request

Preliminary Engineering Report

**SUMMIT
ENGINEERING INC.**

Civil Engineering

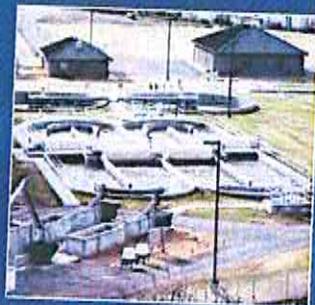
Marions Branch Water Supply Study Pikeville, Kentucky

**Preliminary
Engineering
Report**
July 2014



Owner:
City of Pikeville
243 Main Street
Pikeville, Kentucky 41501

Prepared By:
Summit Engineering, Inc.
131 Summit Drive
Pikeville, Kentucky 41501



Civil Engineering • Mining Engineering • Environmental Engineering • Architecture • Surveying

Marions Branch Water Supply Study
Preliminary Engineering Report

SECTION 4 – NEED FOR THE PROJECT

The mountainous terrain surrounding the City of Pikeville has long been an impediment to development. The Marions Branch site offers nearly 400 acres of relatively flat land. The City seeks to provide infrastructure to the site in an effort to stimulate its development.

The site was originally zoned as mostly residential; however a recent decline in the mining industry has led to the site being re-zoned as industrial. Sewer lines in the area were recently upgraded and sized to handle the additional flow expected from the development. The City now intends to provide potable water service to the site.

SECTION 5 – PROPOSED PLAN

The proposed plan to serve the development with potable water features a 10-inch water main connecting to the existing 12-inch main on the suction side of the existing Indian Hills Pump Station. It would then parallel the existing 8-inch line south through Fords Branch. A new variable-frequency drive pump station would be built near the intersection of US 23 and Smiley Fork to supply water to the proposed 1,000,000 gallon storage tank. Three-phase power appears to be available near the proposed pump station site.

The proposed tank must be at an elevation that will provide sufficient pressure to the end users. The Kentucky Division of Water requires the availability of 30 psi in the water line under peak demand conditions. To ensure this requirement is met, the tank should be placed at a minimum elevation of 1400 ft.

A review of the mining history in the area revealed that extensive underground mining had taken place beneath the ridges that had not been surface mined. These areas are expected to be geologically unstable and thus unsuitable for water storage tank construction. A geotechnical investigation should be conducted at the proposed tank site during design.

The proposed location of the tank is atop the ridge between Marions Branch and Smiley Fork. This location is at a base elevation of approximately 1430 ft., providing adequate water pressure to the development. Additionally, no records of underground mining were found beneath this ridge.

Two regulators will be included to control flow and pressure from the proposed tank back into the existing lines. The regulators, pump station, and tank will all be connected into telemetry that can be operated by MWD and the City. This is in an effort to give both entities more control and options for operating their systems, as well as to provide backup capacity.

SECTION 6 – HYDRAULIC ANALYSIS

A hydraulic analysis of the proposed plan was performed using KYPIPE modeling software. LiDAR imagery obtained from the Kentucky Division of Water was used to determine elevations. Aerial imagery from Pictometry International was used to identify ground features.

Marions Branch Water Supply Study
Preliminary Engineering Report

The first KYPIPE model was produced to simulate the existing conditions in the study area. Utility records were used to identify the size and location of existing pipe. Pressures at the Indian Hills Pump Station, Shelbiana, and Foggy Mountain were provided by MWD and used to calibrate the model of the existing system. **Exhibit E** contains two static model runs of the existing system:

- E-1) City to Foggy Mountain
- E-2) Shelbiana Tank to Foggy Mountain

A second KYPIPE model was developed by adding the proposed plan to the existing model.

The following calculations were used to estimate potential demand and to tentatively size the Smiley Fork Pump Station.

Estimated Demand

Marions Branch is currently zoned for industrial development. A typical value for estimating demand for industrial developments is 1,000 GPD/acre. The site has approximately 400 acres of flat land.

$$1,000 \text{ GPD/acre} \times 400 \text{ acres} = 400,000 \text{ GPD} = 277.78 \text{ GPM}$$

Pumping Head

The head loss due to friction was calculated using the Hazen Williams formula.

$$h_f = 0.002083 \times L \times (100/C)^{1.85} (F^{1.85}/d^{4.8655})$$

- where h_f is the head loss due to friction
- L is the length of pipe (ft.)
- C is the roughness coefficient
- F is the flow in GPM
- d is the inner diameter of the pipe (in.)

Substituting the appropriate values yields:

$$h_f = 0.002083 \times 7760 \times (100/130)^{1.85} (277.78^{1.85}/10.34^{4.8655}) = 2.17 \text{ ft.} \quad \text{28 feet}$$

The height of the proposed tank is 38 ft. with the base at an elevation of 1,435 ft. The proposed Smiley Fork Pump Station is at an elevation of 740 ft. The pressure on the suction side of the Indian Hills Pump Station where the new line will connect is 115 psi static, or 266 ft., according to MWD. The proposed Smiley Fork Pump Station is 33 ft. higher than Indian Hills. From this, the head necessary for the pump can be calculated as follows:

$$H = 1,435 + 38 + 2.17 - 740 - (266 - 33) = 502.17 \text{ ft.}$$

1500
↓
less 4 of 5 based higher flow

Marions Branch Water Supply Study
Preliminary Engineering Report

Pump Selection

The preliminary operating point is 280 GPM at 505 ft. The proposed pump for the Smiley Fork Pump Station is a Grundfos CR 120-5-2 with a variable-frequency drive (see **Exhibit F**). The station will contain two pumps arranged in parallel. The VFD and parallel arrangement will enable the City and MWD to adjust the operating point as needed to meet demands.

KYPIPE Modeling

With a pump selected, the KYPIPE model of the proposed plan could be completed. **Exhibit E** contains the following static model runs of the proposed system:

- E-3) Smiley Fork Pump to Marions Branch Tank
- E-4) Marions Branch Tank to City
- E-5) Marions Branch Tank to Foggy Mountain

SECTION 7 - CONSTRUCTION COST ESTIMATE

The estimated total project cost for the proposed plan is \$2,690,000.00. The Engineer's Opinions of Probable Project Cost contains an itemized list and is provided as **Exhibit D**.

SECTION 8 - ANTICIPATED OPERATIONS COST

At the preliminary operating point, the Smiley Fork pump motor runs at 59.6 HP, or 44.4 kW, and pumps 1,000 gallons in 3.57 minutes. The current energy charge for Kentucky Power is 8.59 cents/kWh. This rate does not include additional surcharges, local taxes, or other fees. The cost per 1,000 gallons pumped is estimated as follows:

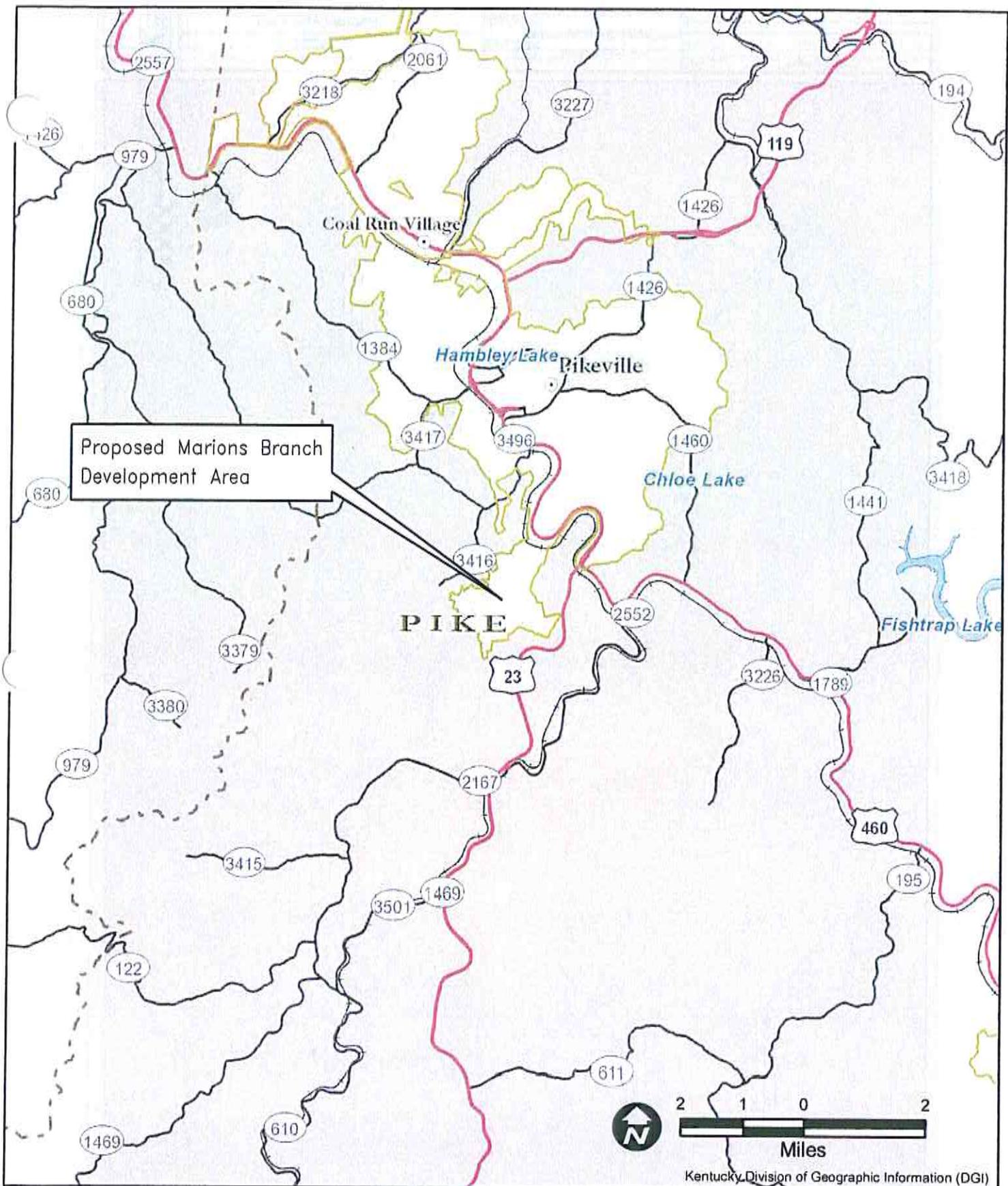
$$C_{1,000 \text{ gal}} = 44.4 \text{ kW} \times 3.57 \text{ min (1hr./60 min)} \times 8.59 \text{ ¢/kWh} = 22.7 \text{ cents}$$

This cost is for a single pump running at 280 GPM.

SECTION 9 - RIGHT OF WAY AND PERMITS

The proposed tank site is located on City-owned property. The proposed water line follows existing roads to the head of Smiley Fork. It will likely be necessary to acquire easements for the water line where the alignment leaves County right-of-way on Smiley Fork. The proposed pump station will also likely require an easement or right-of-way acquisition.

An encroachment permit from the Kentucky Transportation Cabinet will be required along US 23 and US 460. A Kentucky Division of Water Drinking Water Permit will need to be obtained before construction begins.



Kentucky Division of Geographic Information (DGI)



City of Pikeville
 243 Main Street
 Pikeville, KY 41501

Marions Branch Water Supply Study
 Location Map

DATE:	06/10/14
SCALE:	1" = 2 mi
DRAWN BY:	J. Newman
CHECKED:	
PROJECT NO:	
SHEET:	
OF:	Exhibit A

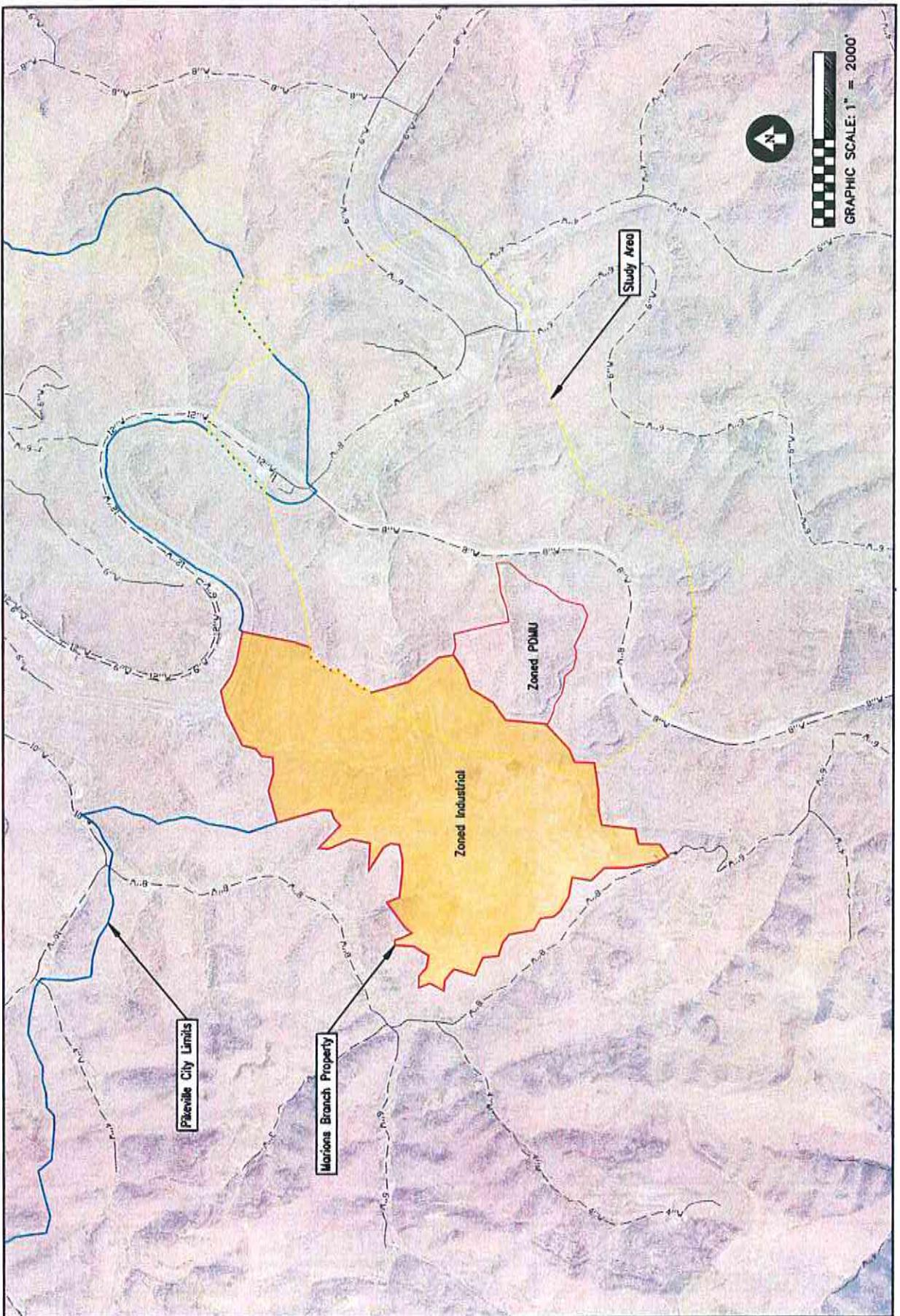


Exhibit D
Marions Branch Water Supply Study
ENGINEER'S OPINION OF PROBABLE COST
June 20, 2014

Item No.	Item Description	Unit	Unit Price	Quantity	Amount
1	GENERAL				
a	Mobilization/Demobilization (Note 1)	LS	\$ 60,000.00	1	\$ 60,000.00
b	Seeding and Clean-up	LS	\$ 3,830.00	1	\$ 3,830.00
c	Pavement Replacement	LS	\$ 20,000.00	1	\$ 20,000.00
2	WATER LINE				
a	Connect to Existing	EA	\$ 5,000.00	2	\$ 10,000.00
b	10" DI Water Line, CL 350, P	LF	\$ 70.00	7,660	\$ 536,200.00
c	10" DI River Crossing Pipe	LF	\$ 250.00	400	\$ 100,000.00
d	Bore and Encase 10" DI Water Line	LF	\$ 300.00	240	\$ 72,000.00
3	VALVES AND FITTINGS				
a	10" Resilient Wedge Gate Valve, MJ	EA	\$ 2,000.00	10	\$ 20,000.00
b	Blowoff Hydrant Assembly (Note 2)	EA	\$ 4,000.00	3	\$ 12,000.00
c	PRV Station w/ Telemetry	EA	\$ 100,000.00	1	\$ 100,000.00
d	Master Meter Station	EA	\$ 50,000.00	2	\$ 100,000.00
4	TANK AND PUMP STATION				
a	1,000,000 Gallon Water Storage Tank w/ Telemetry, Complete, In-Service	LS	\$ 861,250.00	1	\$ 861,250.00
b	VFD Booster Pump Station w/ PRV Bypass and Telemetry, Complete, In-Service	LS	\$ 200,000.00	1	\$ 200,000.00
ESTIMATED CONSTRUCTION COSTS					\$ 2,095,280.00
Construction Contingencies @ 10%				10.0%	\$ 209,528.00
Basic Engineering @ 100% RD Rate				7.52%	\$ 173,298.51
Resident Inspection @ 100% RD Rate				4.42%	\$ 101,803.37
Geotechnical					\$ 50,000.00
Environmental					\$ 10,000.00
Miscellaneous / ROW Permits / Etc.					\$ 30,090.12
TOTAL PROJECT COST					\$ 2,670,000.00

1. The amount bid for "Mobilization/Demobilization" may not exceed 3% of the Base Bid Total.
2. Includes tee, pipe, and valve.

EXHIBIT E-1

Existing - City to Foggy Mountain
Node Value = Pressure (PSI)
Pipe Value = Flow (GPM)

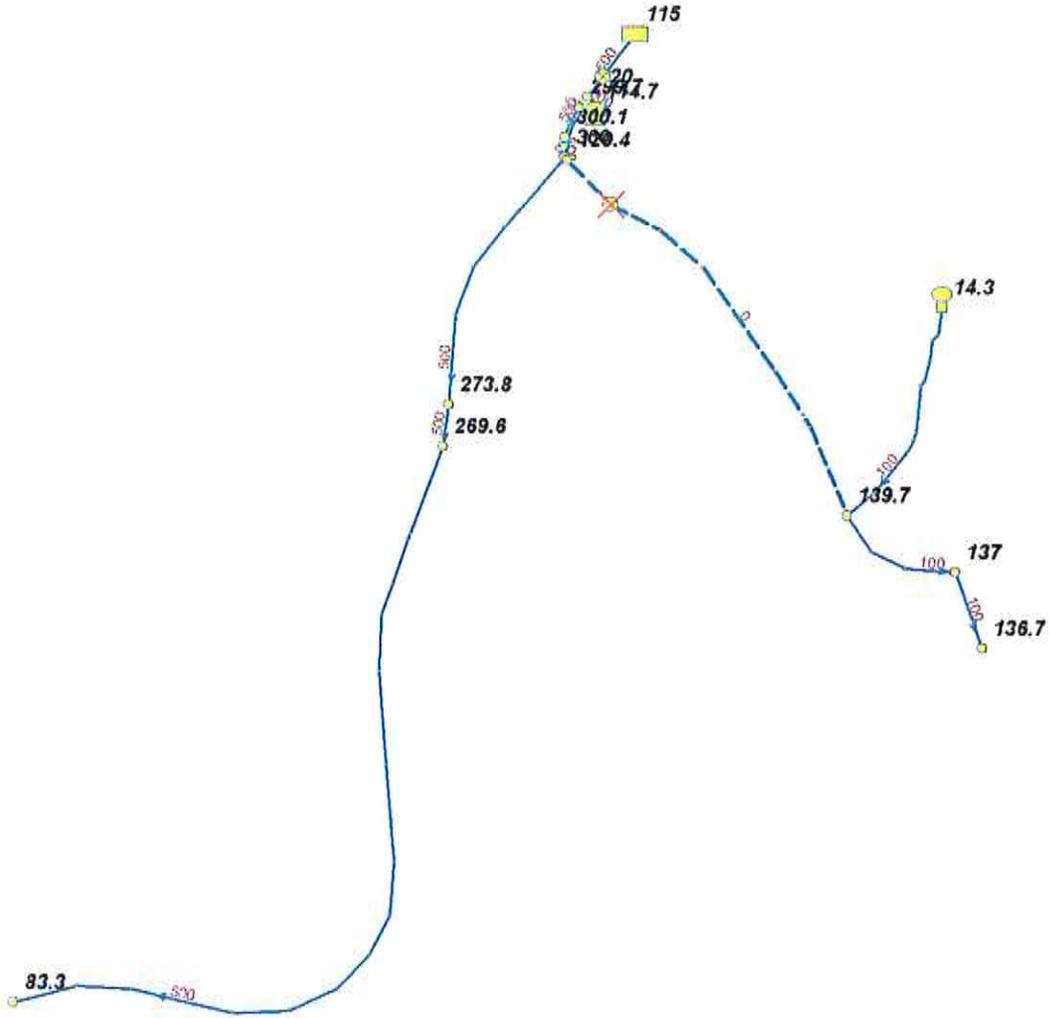


EXHIBIT E-1

Existing - City to Foggy Mountain

```

***** KYPIPE 5 *****
*
*       Pipe Network Modeling Software
*
*       Copyrighted by KYPIPE LLC
*       Version 5 - February 2010
*
*****
    
```

Date & Time: Tue Jul 08 10:47:14 2014

Master File : z:\civil projects\2014\city of pikeville\marions branch\kypipe\existing.KYP\existing.P2K

```

*****
SUMMARY OF ORIGINAL DATA
*****
    
```

UNITS SPECIFIED

```

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig
    
```

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	NODE NAMES #2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-1	R-1	J-9	687.70	12.00	130.0000	0.00
P-2	J-3	J-11	2462.17	8.00	130.0000	0.00
P-4	J-4	J-1	7864.68	8.00	130.0000	0.00
P-5	Shelbiana	J-8	2086.79	8.00	130.0000	0.00
P-6	J-7	J-6	296.64	12.00	130.0000	0.00
P-7	J-70-Indian H	J-2	140.40	12.00	130.0000	0.00
P-8	J-8	J-2	1140.17	8.00	130.0000	0.00
P-9	I-Indian H	J-9	144.13	12.00	130.0000	0.00
P-11-CV	J-6	J-3	176.18	12.00	130.0000	0.00
P-12-XX	J-10	J-8	4043.20	8.00	130.0000	0.00
P-13	J-10I-Indian H	J-2	633.16	8.00	130.0000	0.00
P-14	J-2	J-12	701.01	6.00	130.0000	0.00
P-15	J-11	J-4	366.18	8.00	130.0000	0.00

PUMP/LOSS ELEMENT DATA

THERE IS A DEVICE AT NODE Indian Hil DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
495.00	0.00	75.00 (Default)
494.00	50.00	75.00 (Default)
492.00	100.00	75.00 (Default)
491.00	150.00	75.00 (Default)
490.00	200.00	75.00 (Default)
470.00	300.00	75.00 (Default)
440.00	400.00	75.00 (Default)
415.00	500.00	75.00 (Default)
402.00	550.00	75.00 (Default)
385.00	600.00	75.00 (Default)
365.00	650.00	75.00 (Default)
325.00	700.00	75.00 (Default)



EXHIBIT E-1

Existing - City to Foggy Mountain

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
I-Indian H		0.00	707.00	
Shelbiana		----	987.00	1020.00
J-1		500.00	1140.00	
J-2		0.00	703.00	
J-3		0.00	694.00	
J-4		0.00	750.00	
J-6		0.00	694.00	
J-7		0.00	695.00	
J-8		0.00	697.00	
J-9		0.00	695.00	
J-10		0.00	694.00	
J-11		0.00	742.00	
J-12		100.00	703.00	
R-1		----	707.00	972.38
O-Indian H		0.00	707.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT
 MAXIMUM AND MINIMUM PRESSURES = 5
 MAXIMUM AND MINIMUM VELOCITIES = 5
 MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES(p) = 13
 NUMBER OF END NODES(j) = 12
 NUMBER OF PRIMARY LOOPS(l) = 0
 NUMBER OF SUPPLY NODES(s) = 2
 NUMBER OF SUPPLY ZONES(z) = 1

Case: 0

RESULTS OBTAINED AFTER 3 TRIALS; ACCURACY = 0.00000

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E N A M E	N O D E N U M B E R S		F L O W R A T E (gpm)	H E A D L O S S (ft)	M I N O R L O S S (ft)	L I N E V E L O . (ft/s)	H L + M L / 1000 (ft/ft)	H L / 1000 (ft/ft)
	#1	#2						
P-1	R-1	J-9	500.00	0.48	0.00	1.42	0.70	0.70
P-2	J-3	J-11	500.00	12.46	0.00	3.19	5.06	5.06
P-4	J-4	J-1	500.00	39.80	0.00	3.19	5.06	5.06
P-5	Shelbiana	J-8	100.00	0.54	0.00	0.64	0.26	0.26
P-6	J-7	J-6	500.00	0.21	0.00	1.42	0.70	0.70
P-7	J-7O-Indian H		-500.00	0.10	0.00	1.42	0.70	0.70
P-8	J-8	J-2	100.00	0.29	0.00	0.64	0.26	0.26
P-9	I-Indian H	J-9	-500.00	0.10	0.00	1.42	0.70	0.70
P-11-CV	J-6	J-3	500.00	0.12	0.00	1.42	0.70	0.70
P-12-XX	J-10	J-8						
P-13	J-10I-Indian H		0.00	0.00	0.00	0.00	0.00	0.00
P-14	J-2	J-12	100.00	0.73	0.00	1.13	1.04	1.04



EXHIBIT E-1

Existing - City to Foggy Mountain

P-15 J-11 J-4 500.00 1.85 0.00 3.19 5.06 5.06

PUMP/LOSS ELEMENT RESULTS

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	PUMP HEAD (ft)	EFFIC- ENCY (%)	USEFUL POWER (Hp)	INCREMENTL COST (\$)	TOTAL COST (\$)	#PUMPS PARALLEL	#PUMPS SERIES	NPSH Avail. (ft)
Indian Hil	500.00	264.80	679.80	415.0	75.00	0.	0.0	0.0	**	**	298.0

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
I-Indian H		0.00	971.80	707.00	264.80	114.75
Shelbiana		----	1020.00	987.00	33.00	14.30
J-1		500.00	1332.26	1140.00	192.26	83.31
J-2		0.00	1019.17	703.00	316.17	137.01
J-3		0.00	1386.37	694.00	692.37	300.03
J-4		0.00	1372.06	750.00	622.06	269.56
J-6		0.00	1386.49	694.00	692.49	300.08
J-7		0.00	1386.70	695.00	691.70	299.74
J-8		0.00	1019.46	697.00	322.46	139.73
J-9		0.00	971.90	695.00	276.90	119.99
J-10		0.00	971.80	694.00	277.80	120.38
J-11		0.00	1373.91	742.00	631.91	273.83
J-12		100.00	1018.44	703.00	315.44	136.69
R-1		----	972.38	707.00	265.38	115.00
O-Indian H		0.00	1386.80	707.00	679.80	294.58

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-6	300.08	Shelbiana Ta	14.30
J-3	300.03	J-1	83.31
J-7	299.74	I-Indian Hil	114.75
O-Indian Hil	294.50	R-1	115.00
J-11	273.83	J-9	119.99

VELOCITIES

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-2	3.19	P-5	0.64
P-4	3.19	P-8	0.64
P-15	3.19	P-14	1.13
P-1	1.42	P-1	1.42
P-6	1.42	P-6	1.42

HL + ML / 1000

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
P-2	5.06	P-5	0.26
P-4	5.06	P-8	0.26
P-15	5.06	P-1	0.70



EXHIBIT E-1

Existing - City to Foggy Mountain

P-14	1.04	P-6	0.70
P-7	0.70	P-7	0.70

HL / 1000

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-2	5.06	P-5	0.26
P-4	5.06	P-8	0.26
P-15	5.06	P-1	0.70
P-14	1.04	P-6	0.70
P-7	0.70	P-7	0.70

SUMMARY OF INFLOWS AND OUTFLOWS

- (+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
- (-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
Shelbiana T	100.00	
R-1	500.00	

NET SYSTEM INFLOW = 600.00
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 600.00

***** HYDRAULIC ANALYSIS COMPLETED *****



EXHIBIT E-2

Existing - Shelbiana Tank to Foggy Mountain
Node Value = Pressure (PSI)
Pipe Value = Flow (GPM)

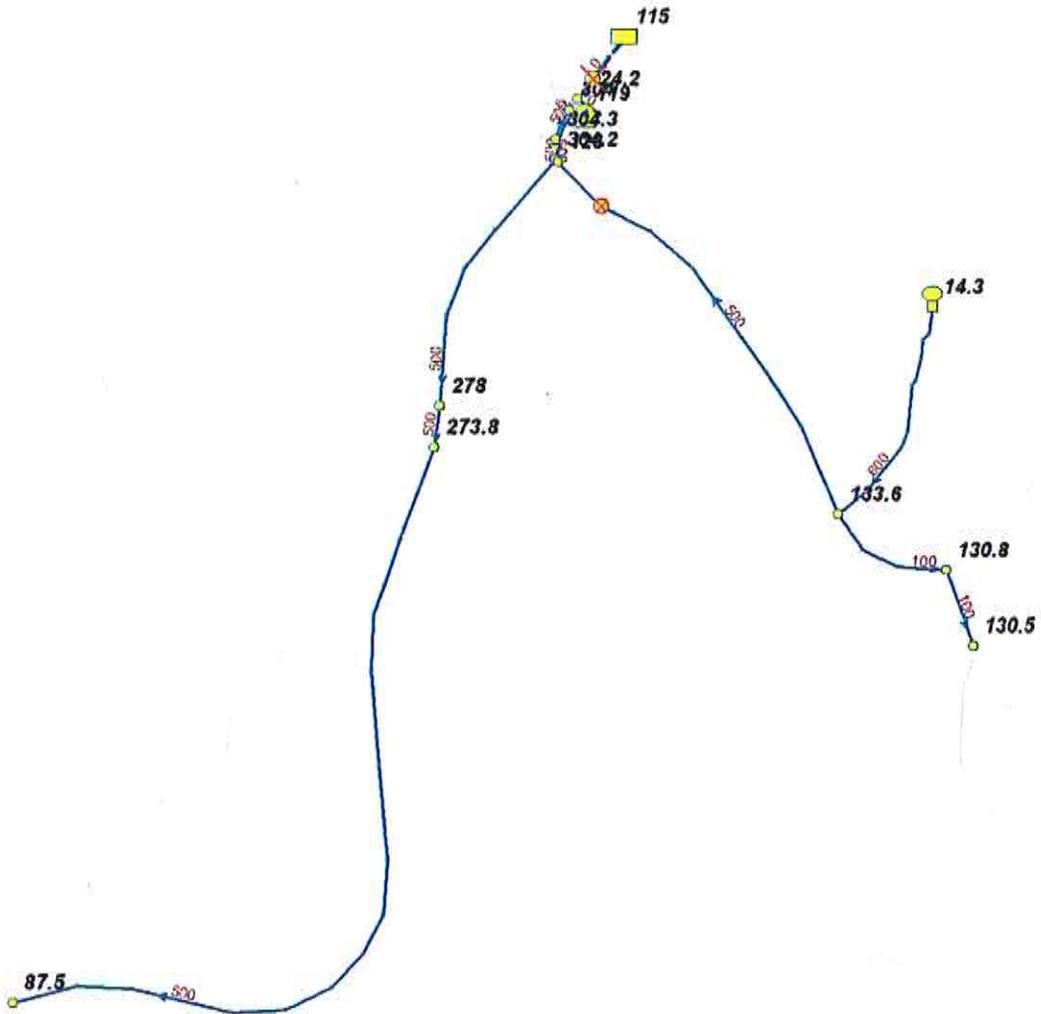


EXHIBIT E-2

Existing - Shelbiana Tank to Foggy Mountain

```

***** KYPIPE5 *****
*
* Pipe Network Modeling Software
*
* Copyrighted by KYPIPE LLC
* Version 5 - February 2010
*
*****
    
```

Date & Time: Tue Jul 08 10:55:40 2014

Master File : z:\civil projects\2014\city of pikeville\marions branch\kypipe\existing.KYP\existing.P2K

```

*****
SUMMARY OF ORIGINAL DATA
*****
    
```

UNITS SPECIFIED

```

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig
    
```

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	NODE NAMES #2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-1-XX	R-1	J-9	687.70	12.00	130.0000	0.00
P-2	J-3	J-11	2462.17	8.00	130.0000	0.00
P-4	J-4	J-1	7864.68	8.00	130.0000	0.00
P-5	Shelbiana	J-8	2086.79	8.00	130.0000	0.00
P-6	J-7	J-6	296.64	12.00	130.0000	0.00
P-7	J-70-Indian H		140.40	12.00	130.0000	0.00
P-8	J-8	J-2	1140.17	8.00	130.0000	0.00
P-9	I-Indian H	J-9	144.13	12.00	130.0000	0.00
P-11-CV	J-6	J-3	176.18	12.00	130.0000	0.00
P-12	J-10	J-8	4043.20	8.00	130.0000	0.00
P-13	J-10I-Indian H		633.16	8.00	130.0000	0.00
P-14	J-2	J-12	701.01	8.00	130.0000	0.00
P-15	J-11	J-4	366.18	8.00	130.0000	0.00

PUMP/LOSS ELEMENT DATA

THERE IS A DEVICE AT NODE Indian Hill DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
495.00	0.00	75.00 (Default)
494.00	50.00	75.00 (Default)
492.00	100.00	75.00 (Default)
491.00	150.00	75.00 (Default)
490.00	200.00	75.00 (Default)
470.00	300.00	75.00 (Default)
440.00	400.00	75.00 (Default)
415.00	500.00	75.00 (Default)
402.00	550.00	75.00 (Default)
385.00	600.00	75.00 (Default)
365.00	650.00	75.00 (Default)
325.00	700.00	75.00 (Default)



EXHIBIT E-2

Existing - Shelbiana Tank to Foggy Mountain

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
I-Indian H		0.00	707.00	
Shelbiana		----	987.00	1020.00
J-1		500.00	1140.00	
J-2		0.00	703.00	
J-3		0.00	694.00	
J-4		0.00	750.00	
J-6		0.00	694.00	
J-7		0.00	695.00	
J-8		0.00	697.00	
J-9		0.00	695.00	
J-10		0.00	694.00	
J-11		0.00	742.00	
J-12		100.00	703.00	
R-1		----	707.00	972.38
O-Indian H		0.00	707.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT
 MAXIMUM AND MINIMUM PRESSURES = 5
 MAXIMUM AND MINIMUM VELOCITIES = 5
 MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES (p) = 13
 NUMBER OF END NODES (j) = 12
 NUMBER OF PRIMARY LOOPS (l) = 0
 NUMBER OF SUPPLY NODES (f) = 2
 NUMBER OF SUPPLY ZONES (z) = 1

Case: 0

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE #1	NODE #2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL+ML/1000 (ft/ft)	HL/1000 (ft/ft)
P-1-XX	R-1	J-9						
P-2	J-3	J-11	500.00	12.46	0.00	3.19	5.06	5.06
P-4	J-4	J-1	500.00	39.80	0.00	3.19	5.06	5.06
P-5	Shelbiana	J-8	600.00	14.80	0.00	3.83	7.09	7.09
P-6	J-7	J-6	500.00	0.21	0.00	1.42	0.70	0.70
P-7	J-70-Indian H		-500.00	0.10	0.00	1.42	0.70	0.70
P-8	J-8	J-2	100.00	0.29	0.00	0.64	0.26	0.26
P-9	I-Indian H	J-9	0.00	0.00	0.00	0.00	0.00	0.00
P-11-CV	J-6	J-3	500.00	0.12	0.00	1.42	0.70	0.70
P-12	J-10	J-8	-500.00	20.46	0.00	3.19	5.06	5.06
P-13	J-10I-Indian H		500.00	3.20	0.00	3.19	5.06	5.06
P-14	J-2	J-12	100.00	0.73	0.00	1.13	1.04	1.04



EXHIBIT E-2

Existing - Shelbiana Tank to Foggy Mountain

P-15 J-11 J-4 509.00 1.85 0.00 3.19 5.06 5.06

PUMP/LOSS ELEMENT RESULTS

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	PUMP HEAD (ft)	EFFIC- ENCY (%)	USEFUL POWER (Hp)	INCREMENTL COST (\$)	TOTAL COST (\$)	#PUMPS PARALLEL	#PUMPS SERIES	NPSH Avail. (ft)
Indian Hill	500.00	274.53	689.53	415.0	75.00	0.	0.0	0.0	**	**	307.7

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
I-Indian H Shelbiana		0.00	981.53	707.00	274.53	118.96
		----	1020.00	987.00	33.00	14.30
J-1		500.00	1341.99	1140.00	201.99	87.53
J-2		0.00	1004.91	703.00	301.91	130.83
J-3		0.00	1396.10	694.00	702.10	304.24
J-4		0.00	1381.79	750.00	631.79	273.78
J-6		0.00	1396.23	694.00	702.23	304.30
J-7		0.00	1396.44	695.00	701.44	303.96
J-9		0.00	1005.20	697.00	308.20	133.55
J-9		0.00	981.53	695.00	286.53	124.16
J-10		0.00	984.74	694.00	290.74	125.99
J-11		0.00	1383.64	742.00	641.64	278.05
J-12		100.00	1004.17	703.00	301.17	130.51
R-1		----	972.38	707.00	265.38	115.00
O-Indian H		0.00	1396.53	707.00	689.53	298.60

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-6	304.30	Shelbiana Ta	14.30
J-3	304.24	J-1	37.53
J-7	303.96	R-1	115.00
O-Indian Hill	298.00	I-Indian Hill	118.96
J-11	278.05	J-9	124.16

VELOCITIES

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-5	3.83	P-8	0.64
P-2	3.19	P-14	1.13
P-4	3.19	P-6	1.42
P-12	3.19	P-7	1.42
P-13	3.19	P-11	1.42

HL + ML / 1000

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
P-5	7.09	P-8	0.26
P-2	5.06	P-6	0.70
P-12	5.06	P-7	0.70



EXHIBIT E-2

Existing - Shalbiana Tank to Foggy Mountain

P-4	5.06	P-11	0.70
P-13	5.06	P-14	1.04

HL / 1000

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-5	7.09	P-8	0.26
P-2	5.06	P-6	0.70
P-12	5.06	P-7	0.70
P-4	5.06	P-11	0.70
P-13	5.06	P-14	1.04

SUMMARY OF INFLOWS AND OUTFLOWS

- (+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
- (-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
Shalbiana T	600.00	
R-1	0.00	

NET SYSTEM INFLOW = 600.00
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 600.00

***** HYDRAULIC ANALYSIS COMPLETED *****



EXHIBIT E-3

Proposed - Smiley Fork Pump to Marions Branch Tank

Node Value = Pressure (PSI)

Pipe Value = Flow (GPM)

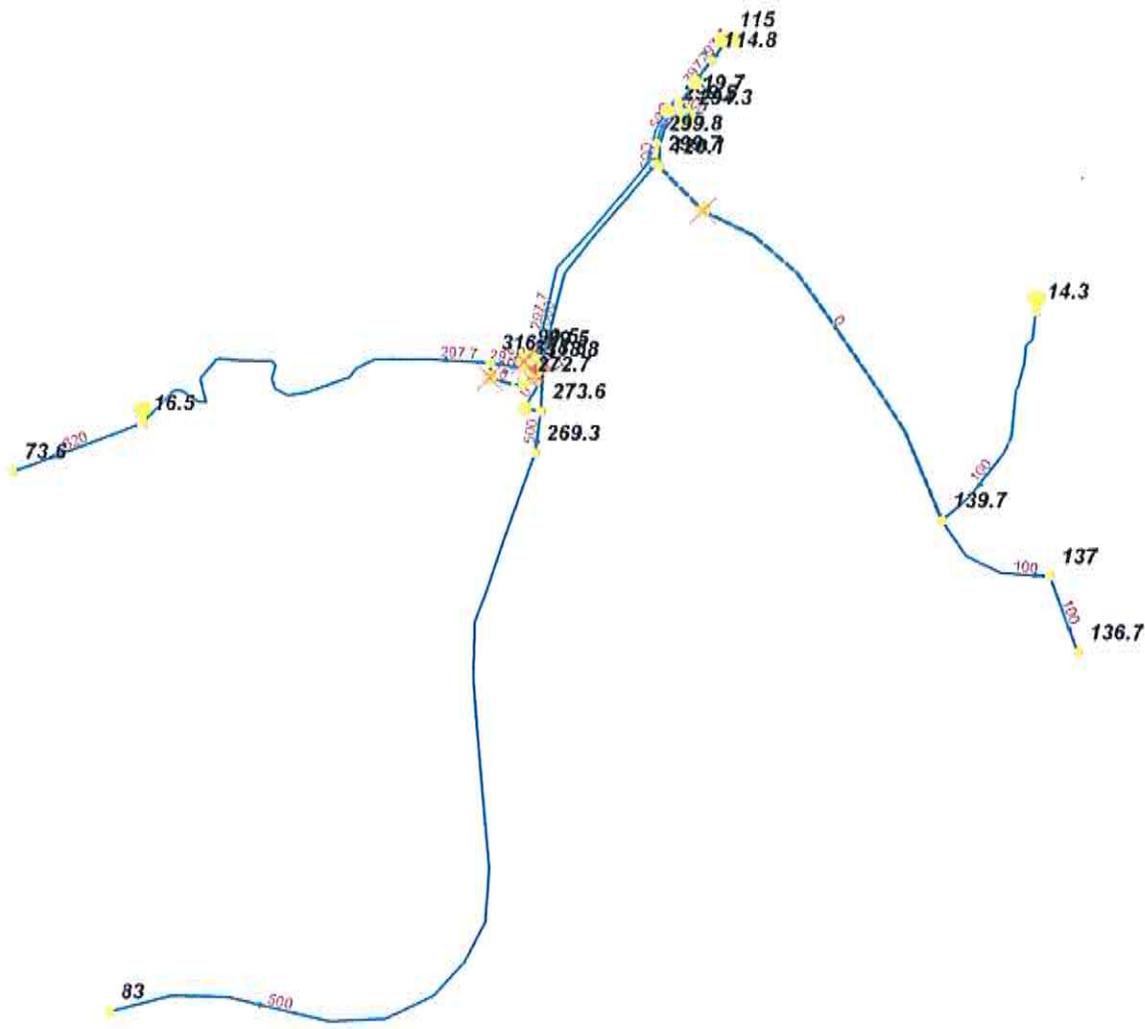


EXHIBIT E-3

Proposed - Smiley Fork Pump to Marions Branch Tank

Node Value = Pressure (PSI)

Pipe Value = Flow (GPM)

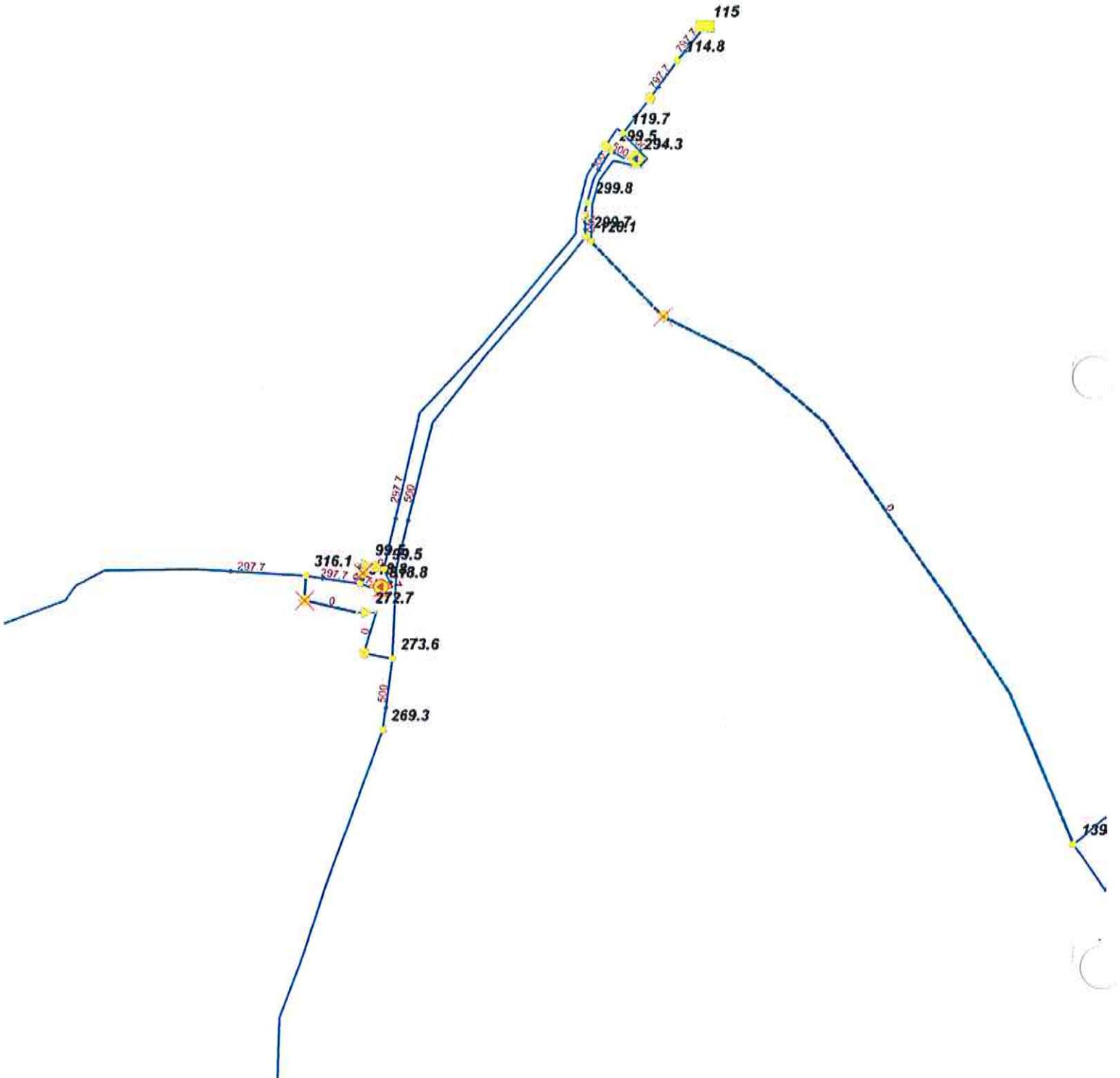


EXHIBIT E-3

Proposed - Smiley Fork Pump to Marions Branch Tank

```

***** K Y P I P E S *****
*
*           Pipe Network Modeling Software           *
*
*           Copyrighted by KYPIPE LLC               *
*           Version 5 - February 2010               *
*
*****
    
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Date & Time: Tue Jul 08 11:24:00 2014

Master File : z:\civil projects\2014\city of pikeville\marions branch\kypipe\proposed.KYP\proposed.P2K

SUMMARY OF ORIGINAL DATA

UNITS SPECIFIED

FLOWRATE = gallons/minute
HEAD (HGL) = feet
PRESSURE = psig

REGULATING VALVE DATA

VALVE LABEL	VALVE TYPE	VALVE SETTING (ft or gpm)
RV-1	PRV-1	1436.31
RV-2	FCV-1	500.00

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	NODE NAMES #2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-1	City	J-13	223.42	12.00	130.0000	0.00
P-2	J-3	J-11	2456.02	8.00	130.0000	0.00
P-3	J-13	J-9	462.94	12.00	130.0000	0.00
P-4	J-4	J-1	7964.68	8.00	130.0000	0.00
P-5	Shelbiana	J-8	2086.79	8.00	130.0000	0.00
P-6	J-7	J-6	296.64	12.00	130.0000	0.00
P-7	J-70-Indian H		140.40	12.00	130.0000	0.00
P-8	J-8	J-2	1140.17	8.00	130.0000	0.00
P-9	I-Indian H	J-9	145.63	12.00	130.0000	0.00
P-10	O-Smiley F	J-14	107.48	10.00	130.0000	0.00
P-11-CV	J-6	J-3	176.18	12.00	130.0000	0.00
P-12-XX	J-10	J-8	4043.20	8.00	130.0000	0.00
P-13	J-10I-Indian H		633.16	8.00	130.0000	0.00
P-14	J-2	J-12	701.01	6.00	130.0000	0.00
P-15	J-11	J-4	366.18	8.00	130.0000	0.00
P-16	Marions Br	J-5	1199.71	10.00	130.0000	0.00
P-17	J-14	J-16	285.46	10.00	130.0000	0.00
P-19-XX	J-14	I-RV-2	101.70	10.00	130.0000	0.00
P-19	J-15I-Smiley F		92.48	10.00	130.0000	0.00
P-20	Marions Br	J-16	3876.55	10.00	130.0000	0.00
P-21-XX	J-16	I-RV-1	453.87	8.00	130.0000	0.00
P-22	O-RV-1	J-11	356.95	8.00	130.0000	0.00
P-23	O-RV-2	J-15	91.09	10.00	130.0000	0.00
P-24	J-15	J-9	2658.82	10.00	130.0000	0.00



EXHIBIT E-3

Proposed - Smiley Fork Pump to Marions Branch Tank

P U M P / L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Indian Hil DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
495.00	0.00	75.00 (Default)
494.00	50.00	75.00 (Default)
492.00	100.00	75.00 (Default)
491.00	150.00	75.00 (Default)
490.00	200.00	75.00 (Default)
470.00	300.00	75.00 (Default)
440.00	400.00	75.00 (Default)
415.00	500.00	75.00 (Default)
402.00	550.00	75.00 (Default)
385.00	600.00	75.00 (Default)
365.00	650.00	75.00 (Default)
325.00	700.00	75.00 (Default)

THERE IS A DEVICE AT NODE Smiley For DESCRIBED BY THE FOLLOWING DATA: (ID= 2)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
700.00	0.00	75.00 (Default)
695.00	100.00	75.00 (Default)
690.00	200.00	75.00 (Default)
665.00	300.00	75.00 (Default)
635.00	400.00	75.00 (Default)
600.00	500.00	75.00 (Default)
560.00	600.00	75.00 (Default)
505.00	700.00	75.00 (Default)

Pump speed ratio for the above pump = 0.880

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
City		----	707.00	972.38
I-Indian H		0.00	707.00	
Marions Br		----	1435.00	1473.00
Shelbiana		----	987.00	1020.00
I-Smiley F		0.00	740.00	
J-1		500.00	1140.00	
J-2		0.00	703.00	
J-3		0.00	694.00	
J-4		0.00	750.00	
J-5		620.00	1300.00	
J-6		0.00	694.00	
J-7		0.00	695.00	
J-8		0.00	697.00	
J-9		0.00	695.00	
J-10		0.00	694.00	
J-11		0.00	742.00	
J-12		100.00	703.00	
J-13		0.00	707.00	
J-14		0.00	740.00	
J-15		0.00	740.00	
J-16		0.00	746.00	
O-RV-1		----	744.00	1436.31
O-RV-2		0.00	740.00	
I-RV-1		0.00	744.00	
I-RV-2		0.00	740.00	
O-Indian H		0.00	707.00	
O-Smiley F		0.00	740.00	

O U T P U T O P T I O N D A T A



EXHIBIT E-3

Proposed - Smiley Fork Pump to Marions Branch Tank

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT
 MAXIMUM AND MINIMUM PRESSURES = 5
 MAXIMUM AND MINIMUM VELOCITIES = 5
 MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

SYSTEM CONFIGURATION

NUMBER OF PIPES(p) = 24
 NUMBER OF END NODES(j) = 20
 NUMBER OF PRIMARY LOOPS(l) = 2
 NUMBER OF SUPPLY NODES(E) = 3
 NUMBER OF SUPPLY ZONES(z) = 1

Case: 0

RESULTS OBTAINED AFTER 4 TRIALS: ACCURACY = 0.00001

SIMULATION DESCRIPTION (LABEL)

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE #1	NODE #2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL+ML/1000 (ft/ft)	HL/1000 (ft/ft)
P-1	City	J-13	797.68	0.37	0.00	2.26	1.67	1.67
P-2	J-3	J-11	500.00	12.43	0.00	3.19	5.06	5.06
P-3	J-13	J-9	797.68	0.77	0.00	2.26	1.67	1.67
P-4	J-4	J-1	500.00	39.80	0.00	3.19	5.06	5.06
P-5	Shelbiana	J-8	100.00	0.54	0.00	0.64	0.26	0.26
P-6	J-7	J-6	500.00	0.21	0.00	1.42	0.70	0.70
P-7	J-70-Indian H	J-2	-500.00	0.10	0.00	1.42	0.70	0.70
P-8	J-8	J-2	100.00	0.29	0.00	0.64	0.26	0.26
P-9	I-Indian H	J-9	-500.00	0.10	0.00	1.42	0.70	0.70
P-10	O-Smiley F	J-14	297.68	0.07	0.00	1.22	0.65	0.65
P-11-CV	J-6	J-3	500.00	0.12	0.00	1.42	0.70	0.70
P-12-XX	J-10	J-8						
P-13	J-10I-Indian H		0.00	0.00	0.00	0.00	0.00	0.00
P-14	J-2	J-12	100.00	0.73	0.00	1.13	1.04	1.04
P-15	J-11	J-4	500.00	1.85	0.00	3.19	5.06	5.06
P-16	Marions Dr	J-5	620.00	3.05	0.00	2.53	2.54	2.54
P-17	J-14	J-16	297.68	0.19	0.00	1.22	0.65	0.65
P-18-XX	J-14	I-RV-2						
P-19	J-15I-Smiley F		297.68	0.06	0.00	1.22	0.65	0.65
P-20	Marions Br	J-16	-297.68	2.53	0.00	1.22	0.65	0.65
P-21-XX	J-16	I-RV-1						
P-22	O-RV-1	J-11	0.00	0.00	0.00	0.00	0.00	0.00
P-23	O-RV-2	J-15	0.00	0.00	0.00	0.00	0.00	0.00
P-24	J-15	J-9	-297.68	1.74	0.00	1.22	0.65	0.65
-GRV-2-RV	I-RV-2	O-RV-2	0.00	0.00	0.00	0.00	0.00	0.00

PUMP/LOSS ELEMENT RESULTS

NAME	FLOWRATE (gpm)	INLET HEAD (Ft)	OUTLET HEAD (ft)	PUMP HEAD (Ft)	EFFIC-ENCY (%)	USEFUL POWER (Hp)	INCREMENTL COST (\$)	TOTAL COST (\$)	#PUMPS PARALLEL	#PUMPS SERIES	NPSH Avail. (Ft)
Indian Hil	500.00	264.14	679.14	415.0	75.00	0.	0.0	0.0	**	**	297.3
Smiley For	297.68	229.44	735.79	506.3	75.00	0.	0.0	0.0	**	**	262.6



EXHIBIT E-3

Proposed - Smiley Fork Pump to Marions Branch Tank

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
City		----	972.38	707.00	265.38	115.00
I-Indian H		0.00	971.14	707.00	264.14	114.46
Marions Br		----	1473.00	1435.00	38.00	16.47
Shelbiana		----	1020.00	987.00	33.00	14.30
I-Smiley F		0.00	969.44	740.00	229.44	99.42
J-1		500.00	1331.63	1140.00	191.63	83.04
J-2		0.00	1019.17	703.00	316.17	137.01
J-3		0.00	1385.71	694.00	691.71	299.74
J-4		0.00	1371.42	750.00	621.42	269.28
J-5		620.00	1469.95	1300.00	169.95	73.64
J-6		0.00	1385.83	694.00	691.83	299.79
J-7		0.00	1386.04	695.00	691.04	299.45
J-8		0.00	1019.46	697.00	322.46	139.73
J-9		0.00	971.24	695.00	276.24	119.70
J-10		0.00	971.14	694.00	277.14	120.09
J-11		0.00	1373.28	742.00	631.28	273.55
J-12		100.00	1018.44	703.00	315.44	136.69
J-13		0.00	972.01	707.00	265.01	114.84
J-14		0.00	1475.72	740.00	735.72	318.81
J-15		0.00	969.50	740.00	229.50	99.45
J-16		0.00	1475.53	746.00	729.53	316.13
O-RV-1		----	1373.28	744.00	629.28	272.69
O-RV-2		0.00	969.50	740.00	229.50	99.45
I-RV-1		0.00	1373.28	744.00	629.28	272.69
I-RV-2		0.00	969.50	740.00	229.50	99.45
O-Indian H		0.00	1386.14	707.00	679.14	294.29
O-Smiley F		0.00	1475.79	740.00	735.79	318.84

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
O-Smiley For	318.84	Shelbiana Ta	14.30
J-14	318.81	Marions Bran	16.47
J-16	316.13	J-5	73.64
J-6	299.79	J-1	93.04
J-3	299.74	I-Smiley For	99.42

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-2	3.19	P-5	0.64
P-4	3.19	P-8	0.64
P-15	3.19	P-14	1.13
P-16	2.53	P-19	1.22
P-1	2.26	P-24	1.22

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
P-2	5.06	P-5	0.26
P-4	5.06	P-8	0.26
P-15	5.06	P-19	0.65
P-16	2.54	P-24	0.65
P-1	1.67	P-20	0.65



EXHIBIT E-3

Proposed - Smiley Fork Pump to Marions Branch Tank

HL / 1000

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-2	5.06	P-5	0.26
P-4	5.06	P-8	0.26
P-15	5.06	P-19	0.65
P-16	2.54	P-24	0.65
P-1	1.67	P-20	0.65

REGULATING VALVE REPORT

VALVE LABEL	VALVE TYPE	VALVE SETTING (psi or gpm)	VALVE STATUS	UPSTREAM PRESSURE (psi)	DOWNSTREAM PRESSURE (psi)	THROUGH FLOW (gpm)
RV-1	PRV-1	300.00	WIDE OPEN	272.69	272.69	0.00
RV-2	PCV-1	500.00	WIDE OPEN	99.45	99.45	0.00

SUMMARY OF INFLOWS AND OUTFLOWS

- (+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
- (-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
City	797.68	
Marions Bra	322.32	
Shelbiana T	100.00	

NET SYSTEM INFLOW = 1220.00
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 1220.00

***** HYDRAULIC ANALYSIS COMPLETED *****



EXHIBIT E-4

Proposed - Marions Branch Tank to City

Node Value = Pressure (PSI)

Pipe Value = Flow (GPM)

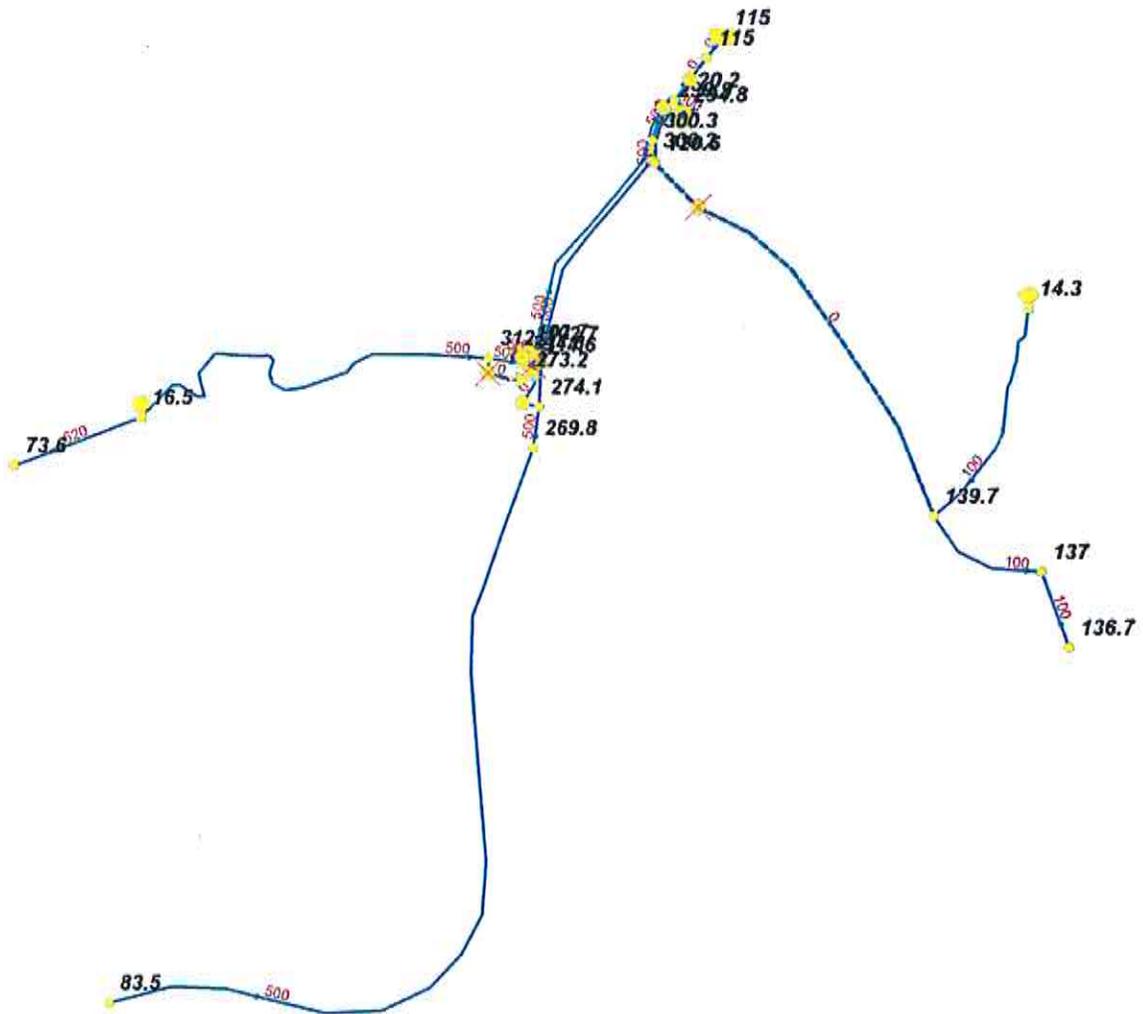


EXHIBIT E-4

Proposed - Marions Branch Tank to City

```

***** K Y P I P E 5 *****
*
*   Pipe Network Modeling Software
*
*   Copyrighted by KYPIPE LLC
*   Version 5 - February 2010
*
*****
    
```

Date & Time: Tue Jul 08 11:27:33 2014

Master File : z:\civil projects\2014\city of pikeville\marions branch\kypipe\proposed.KYP\proposed.P2K

```

*****
SUMMARY OF ORIGINAL DATA
*****
    
```

UNITS SPECIFIED

```

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig
    
```

REGULATING VALVE DATA

VALVE LABEL	VALVE TYPE	VALVE SETTING (ft or gpm)
RV-1	PRV-1	1436.31
RV-2	FCV-1	500.00

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	NODE NAMES #2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-1	City	J-13	223.42	12.00	130.0000	0.00
P-2	J-3	J-11	2456.02	8.00	130.0000	0.00
P-3	J-13	J-9	462.94	12.00	130.0000	0.00
P-4	J-4	J-1	7064.60	0.00	130.0000	0.00
P-5	Shelbiana	J-8	2086.79	8.00	130.0000	0.00
P-6	J-7	J-6	296.64	12.00	130.0000	0.00
P-7	J-70-Indian H		140.40	12.00	130.0000	0.00
P-8	J-8	J-2	1140.17	8.00	130.0000	0.00
P-9	I-Indian H	J-9	145.63	12.00	130.0000	0.00
P-10	O-Smilely F	J-14	107.48	10.00	130.0000	0.00
P-11-CV	J-6	J-3	176.18	12.00	130.0000	0.00
P-12-XX	J-10	J-8	4043.20	8.00	130.0000	0.00
P-13	J-10I-Indian H		633.16	8.00	130.0000	0.00
P-14	J-2	J-12	701.01	6.00	130.0000	0.00
P-15	J-11	J-4	366.18	8.00	130.0000	0.00
P-16	Marions Br	J-5	1199.71	10.00	130.0000	0.00
P-17	J-14	J-16	285.46	10.00	130.0000	0.00
P-18	J-14	I-RV-2	101.70	10.00	130.0000	0.00
P-19	J-15I-Smilely F		92.48	10.00	130.0000	0.00
P-20	Marions Br	J-16	3876.55	10.00	130.0000	0.00
P-21-XX	J-16	I-RV-1	453.87	8.00	130.0000	0.00
P-22	O-RV-1	J-11	356.95	8.00	130.0000	0.00
P-23	O-RV-2	J-15	91.09	10.00	130.0000	0.00
P-24	J-15	J-9	2658.82	10.00	130.0000	0.00



EXHIBIT E-4

Proposed - Marions Branch Tank to City

PUMP/LOSS ELEMENT DATA

THERE IS A DEVICE AT NODE Indian Hill DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
495.00	0.00	75.00 (Default)
494.00	50.00	75.00 (Default)
492.00	100.00	75.00 (Default)
491.00	150.00	75.00 (Default)
490.00	200.00	75.00 (Default)
470.00	300.00	75.00 (Default)
440.00	400.00	75.00 (Default)
415.00	500.00	75.00 (Default)
402.00	550.00	75.00 (Default)
385.00	600.00	75.00 (Default)
365.00	650.00	75.00 (Default)
325.00	700.00	75.00 (Default)

THERE IS A DEVICE AT NODE Smiley For DESCRIBED BY THE FOLLOWING DATA: (ID= 2)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
700.00	0.00	75.00 (Default)
695.00	100.00	75.00 (Default)
690.00	200.00	75.00 (Default)
665.00	300.00	75.00 (Default)
635.00	400.00	75.00 (Default)
600.00	500.00	75.00 (Default)
560.00	600.00	75.00 (Default)
505.00	700.00	75.00 (Default)

Pump speed ratio for the above pump = 0.880

NODE DATA

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
City		----	707.00	972.38
I-Indian H		0.00	707.00	
Marions Br		----	1435.00	1473.00
Shelbiana		----	987.00	1020.00
I-Smiley F		0.00	740.00	
J-1		500.00	1140.00	
J-2		0.00	703.00	
J-3		0.00	694.00	
J-4		0.00	750.00	
J-5		620.00	1300.00	
J-6		0.00	694.00	
J-7		0.00	695.00	
J-8		0.00	697.00	
J-9		0.00	695.00	
J-10		0.00	694.00	
J-11		0.00	742.00	
J-12		100.00	703.00	
J-13		0.00	707.00	
J-14		0.00	740.00	
J-15		0.00	740.00	
J-16		0.00	746.00	
O-RV-1		----	744.00	1436.31
O-RV-2		0.00	740.00	
I-RV-1		0.00	744.00	
I-RV-2		0.00	740.00	
O-Indian H		0.00	707.00	
O-Smiley F		0.00	740.00	

OUTPUT OPTION DATA



EXHIBIT E-4

Proposed - Marions Branch Tank to City

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

MAXIMUM AND MINIMUM PRESSURES = 5
 MAXIMUM AND MINIMUM VELOCITIES = 5
 MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

SYSTEM CONFIGURATION

NUMBER OF PIPES (p) = 24
 NUMBER OF END NODES (j) = 20
 NUMBER OF PRIMARY LOOPS (l) = 2
 NUMBER OF SUPPLY NODES (f) = 3
 NUMBER OF SUPPLY ZONES (z) = 1

=====
 Casc: 0

RESULTS OBTAINED AFTER 8 TRIALS: ACCURACY = 0.00000

SIMULATION DESCRIPTION (LABEL)

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	NODE NUMBERS #2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL+ML/1000 (ft/ft)	HL/1000 (ft/ft)
P-1	City	J-13	0.00	0.00	0.00	0.00	0.00	0.00
P-2		J-3 J-11	500.00	12.43	0.00	3.19	5.06	5.06
P-3		J-13 J-9	0.00	0.00	0.00	0.00	0.00	0.00
P-4		J-4 J-1	500.00	39.80	0.00	3.19	5.06	5.06
P-5	Shelbiana	J-8	100.00	0.54	0.00	0.64	0.26	0.26
P-6		J-7 J-6	500.00	0.21	0.00	1.42	0.70	0.70
P-7		J-7O-Indian H	-500.00	0.10	0.00	1.42	0.70	0.70
P-8		J-8 J-2	100.00	0.29	0.00	0.64	0.26	0.26
P-9	I-Indian H	J-9	-500.00	0.10	0.00	1.42	0.70	0.70
P-10	O-Smiley F	J-14	0.00	0.00	0.00	0.00	0.00	0.00
P-11-CV		J-6 J-3	500.00	0.12	0.00	1.42	0.70	0.70
P-12-XX		J-10 J-8						
P-13		J-10I-Indian H	0.00	0.00	0.00	0.00	0.00	0.00
P-14		J-2 J-12	100.00	0.73	0.00	1.13	1.04	1.04
P-15		J-11 J-4	500.00	1.85	0.00	3.19	5.06	5.06
P-16	Marions Br	J-5	620.00	3.05	0.00	2.53	2.54	2.54
P-17		J-14 J-16	-500.00	0.49	0.00	2.04	1.71	1.71
P-18		J-14 I-RV-2	500.00	0.17	0.00	2.04	1.71	1.71
P-19		J-15I-Smiley F	0.00	0.00	0.00	0.00	0.00	0.00
P-20	Marions Br	J-16	500.00	6.62	0.00	2.04	1.71	1.71
P-21-XX		J-16 I-RV-1						
P-22		O-RV-1 J-11	0.00	0.00	0.00	0.00	0.00	0.00
P-23		O-RV-2 J-15	500.00	0.16	0.00	2.04	1.71	1.71
P-24		J-15 J-9	500.00	4.54	0.00	2.04	1.71	1.71
-GRV-2-RV		I-RV-2 O-RV-2						

PUMP/LOSS ELEMENT RESULTS

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	PUMP HEAD (ft)	EFFIC-ENCY (%)	USEFUL POWER (Hp)	INCREMENTL COST (\$)	TOTAL COST (\$)	#PUMPS PARALLEL	#PUMPS SERIES	NPSH Avail. (ft)
Indian Hil Device "Smiley Fork" is closed	500.00	265.28	680.28	415.0	75.00	0.	0.0	0.0	**	**	298.5
Smiley For	0.00	236.92	725.90	0.0	75.00	0.	0.0	0.0	**	**	270.1

Pipe2010 Analysis Report



EXHIBIT E-4

Proposed - Marions Branch Tank to City

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
City		----	972.38	707.00	265.38	115.00
I-Indian H		0.00	972.28	707.00	265.28	114.96
Marions Br		----	1473.00	1435.00	38.00	16.47
Shelbiana		----	1020.00	987.00	33.00	14.30
I-Smiley F		0.00	976.92	740.00	236.92	102.67
J-1		500.00	1332.77	1140.00	192.77	83.53
J-2		0.00	1019.17	703.00	316.17	137.01
J-3		0.00	1386.85	694.00	692.85	300.24
J-4		0.00	1372.57	750.00	622.57	269.78
J-5		620.00	1469.95	1300.00	169.95	73.64
J-6		0.00	1386.98	694.00	692.98	300.29
J-7		0.00	1387.18	695.00	692.18	299.95
J-8		0.00	1019.46	697.00	322.46	139.73
J-9		0.00	972.38	695.00	277.38	120.20
J-10		0.00	972.28	694.00	278.28	120.59
J-11		0.00	1374.42	742.00	632.42	274.05
J-12		100.00	1018.44	703.00	315.44	136.69
J-13		0.00	972.38	707.00	265.38	115.00
J-14		0.00	1465.90	740.00	725.90	314.55
J-15		0.00	976.92	740.00	236.92	102.67
J-16		0.00	1466.38	746.00	720.38	312.17
O-RV-1		----	1374.42	744.00	630.42	273.18
O-RV-2		0.00	977.08	740.00	237.08	102.73
I-RV-1		0.00	1374.42	744.00	630.42	273.18
I-RV-2		0.00	1465.72	740.00	725.72	314.48
O-Indian H		0.00	1387.28	707.00	680.28	294.79
O-Smiley F		0.00	1465.90	740.00	725.90	314.55

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-14	314.55	Shelbiana Ta	14.30
O-Smiley For	314.55	Marions Bran	16.47
I-RV-2	314.48	J-5	73.64
J-16	312.17	J-1	83.53
J-6	300.29	I-Smiley For	102.67

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-2	3.19	P-5	0.64
P-4	3.19	P-8	0.64
P-15	3.19	P-14	1.13
P-16	2.53	P-6	1.42
P-17	2.04	P-7	1.42

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
P-2	5.06	P-5	0.26
P-4	5.06	P-8	0.26
P-15	5.06	P-6	0.70
P-16	2.54	P-7	0.70



EXHIBIT E-4

Proposed - Marions Branch Tank to City

P-23 1.71 P-9 0.70

HL / 1000

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-2	5.06	P-5	0.26
P-4	5.06	P-8	0.26
P-15	5.06	P-6	0.70
P-16	2.54	P-7	0.70
P-23	1.71	P-9	0.70

REGULATING VALVE REPORT

VALVE LABEL	VALVE TYPE	VALVE SETTING (psi or gpm)	VALVE STATUS	UPSTREAM PRESSURE (psi)	DOWNSTREAM PRESSURE (psi)	THROUGH FLOW (gpm)
RV-1	PRV-1	300.00	WIDE OPEN	273.18	273.18	0.00
RV-2	FCV-1	500.00	ACTIVATED	314.48	102.73	500.00

SUMMARY OF INFLOWS AND OUTFLOWS

- (+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
- (-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
City	0.00	
Marions Bra	1120.00	
Shelbiana T	100.00	

NET SYSTEM INFLOW = 1220.00
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 1220.00

***** HYDRAULIC ANALYSIS COMPLETED *****



EXHIBIT E-5

Proposed - Marions Branch Tank to Foggy Mountain

Node Value = Pressure (PSI)

Pipe Value = Flow (GPM)

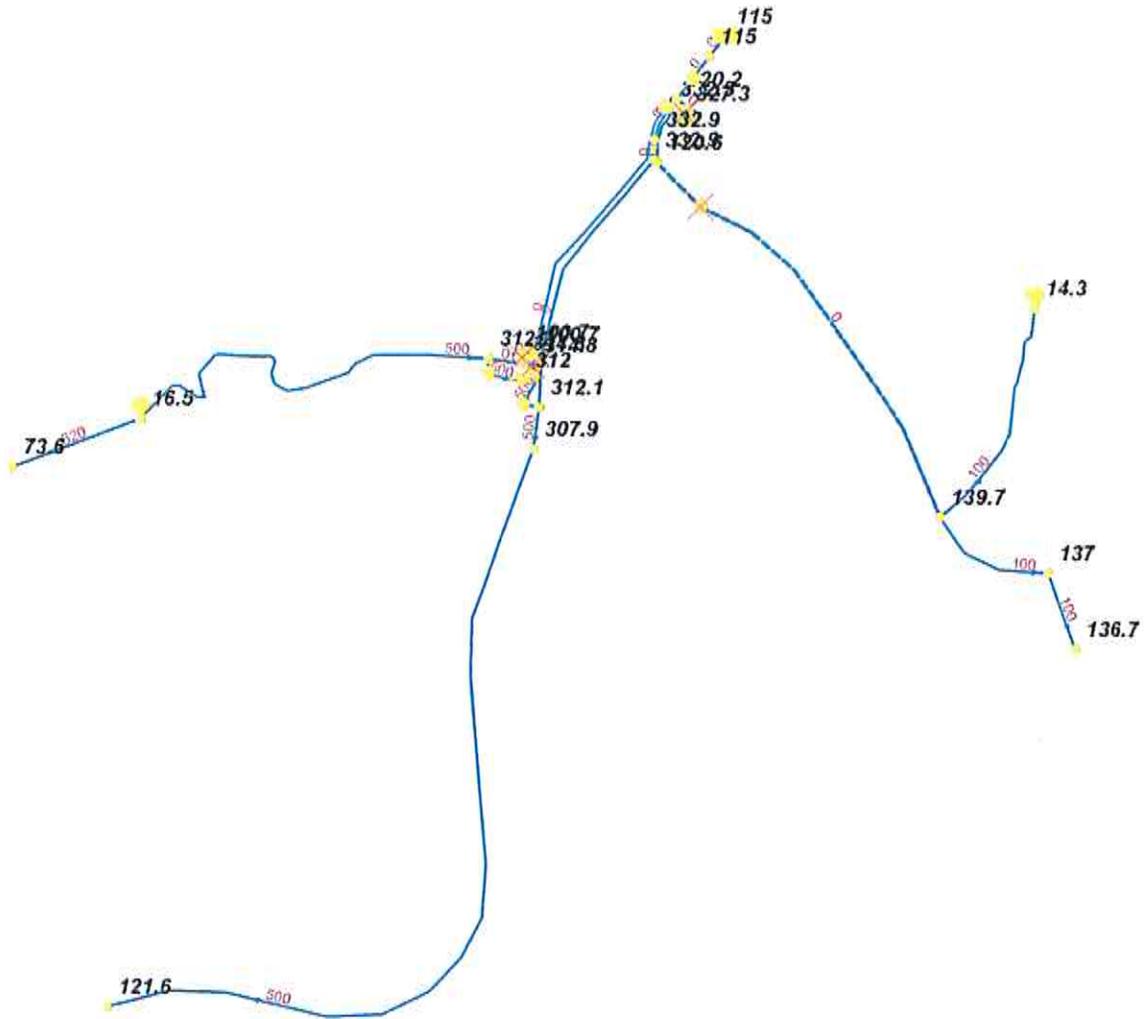


EXHIBIT E-5

Proposed - Marions Branch Tank to Foggy Mountain

```

***** KYPIPE5 *****
*
*           Pipe Network Modeling Software
*
*           Copyrighted by KYPIPE LLC
*           Version 5 - February 2010
*
*****
    
```

Date & Time: Tue Jul 08 11:33:06 2014

Master File : z:\civil projects\2014\city of pikeville\marions branch\kypipe\proposed.KYP\proposed.P2K

SUMMARY OF ORIGINAL DATA

UNITS SPECIFIED

FLOWRATE = gallons/minute
HEAD (HGL) = feet
PRESSURE = psig

REGULATING VALVE DATA

VALVE LABEL	VALVE TYPE	VALVE SETTING (ft or gpm)
RV-1	FCV-1	500.00
RV-2	FCV-1	500.00

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE #1	NODE #2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-1	City	J-13	223.42	12.00	130.0000	0.00
P-2	J-3	J-11	2456.02	8.00	130.0000	0.00
P-3	J-13	J-9	462.94	12.00	130.0000	0.00
P-4	J-4	J-1	7864.68	8.00	130.0000	0.00
P-5	Shalbiana	J-8	2086.79	8.00	130.0000	0.00
P-6	J-7	J-6	296.64	12.00	130.0000	0.00
P-7	J-7O-Indian H	J-14	140.40	12.00	130.0000	0.00
P-8	J-8	J-2	1140.17	8.00	130.0000	0.00
P-9	I-Indian H	J-9	145.63	12.00	130.0000	0.00
P-10	O-Smiley F	J-14	107.48	10.00	130.0000	0.00
P-11-CV	J-6	J-3	176.18	12.00	130.0000	0.00
P-12-XX	J-10	J-8	4043.20	8.00	130.0000	0.00
P-13	J-10I-Indian H	J-14	633.16	8.00	130.0000	0.00
P-14	J-2	J-12	701.01	6.00	130.0000	0.00
P-15	J-11	J-4	366.13	8.00	130.0000	0.00
P-16	Marions Br	J-5	1199.71	10.00	130.0000	0.00
P-17	J-14	J-16	285.46	10.00	130.0000	0.00
P-18-XX	J-14	I-RV-2	101.70	10.00	130.0000	0.00
P-19	J-15I-Smiley F	J-15	92.43	10.00	130.0000	0.00
P-20	Marions Br	J-16	3876.55	10.00	130.0000	0.00
P-21	J-16	I-RV-1	453.87	8.00	130.0000	0.00
P-22	O-RV-1	J-11	356.95	8.00	130.0000	0.00
P-23	O-RV-2	J-15	91.09	10.00	130.0000	0.00
P-24	J-15	J-9	2658.82	10.00	130.0000	0.00



EXHIBIT E-5

Proposed - Marions Branch Tank to Foggy Mountain

PUMP/LOSS ELEMENT DATA

THERE IS A DEVICE AT NODE Indian Hil DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
495.00	0.00	75.00 (Default)
494.00	50.00	75.00 (Default)
492.00	100.00	75.00 (Default)
491.00	150.00	75.00 (Default)
490.00	200.00	75.00 (Default)
470.00	300.00	75.00 (Default)
440.00	400.00	75.00 (Default)
415.00	500.00	75.00 (Default)
402.00	550.00	75.00 (Default)
385.00	600.00	75.00 (Default)
365.00	650.00	75.00 (Default)
325.00	700.00	75.00 (Default)

THERE IS A DEVICE AT NODE Smiley For DESCRIBED BY THE FOLLOWING DATA: (ID= 2)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
700.00	0.00	75.00 (Default)
695.00	100.00	75.00 (Default)
690.00	200.00	75.00 (Default)
665.00	300.00	75.00 (Default)
635.00	400.00	75.00 (Default)
600.00	500.00	75.00 (Default)
560.00	600.00	75.00 (Default)
505.00	700.00	75.00 (Default)

Pump speed ratio for the above pump = 0.880

NODE DATA

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
City		----	707.00	972.38
I-Indian H		0.00	707.00	
Marions Br		----	1435.00	1473.00
Shelbiana		----	987.00	1020.00
I-Smiley F		0.00	740.00	
J-1		500.00	1140.00	
J-2		0.00	703.00	
J-3		0.00	694.00	
J-4		0.00	750.00	
J-5		620.00	1300.00	
J-6		0.00	694.00	
J-7		0.00	695.00	
J-8		0.00	697.00	
J-9		0.00	695.00	
J-10		0.00	694.00	
J-11		0.00	742.00	
J-12		100.00	703.00	
J-13		0.00	707.00	
J-14		0.00	740.00	
J-15		0.00	740.00	
J-16		0.00	746.00	
O-RV-1		0.00	744.00	
O-RV-2		0.00	740.00	
I-RV-1		0.00	744.00	
I-RV-2		0.00	740.00	
O-Indian H		0.00	707.00	
O-Smiley F		0.00	740.00	

OUTPUT OPTION DATA



EXHIBIT E-5

Proposed - Marions Branch Tank to Foggy Mountain

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

MAXIMUM AND MINIMUM PRESSURES = 5
 MAXIMUM AND MINIMUM VELOCITIES = 5
 MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

SYSTEM CONFIGURATION

NUMBER OF PIPES (p) = 24
 NUMBER OF END NODES (j) = 20
 NUMBER OF PRIMARY LOOPS (l) = 2
 NUMBER OF SUPPLY NODES (f) = 3
 NUMBER OF SUPPLY ZONES (z) = 1

Case: 0

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

SIMULATION DESCRIPTION (LABEL)

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE #1	NODE #2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL+ML/1000 (ft/ft)	HL/1000 (ft/ft)
P-1	City	J-13	0.00	0.00	0.00	0.00	0.00	0.00
P-2	J-3	J-11	0.00	0.00	0.00	0.00	0.00	0.00
P-3	J-13	J-9	0.00	0.00	0.00	0.00	0.00	0.00
P-4	J-4	J-1	500.00	39.80	0.00	3.19	5.06	5.06
P-5	Shelbiana	J-8	100.00	0.54	0.00	0.64	0.26	0.26
P-6	J-7	J-6	0.00	0.00	0.00	0.00	0.00	0.00
P-7	J-70-Indian H		0.00	0.00	0.00	0.00	0.00	0.00
P-8	J-8	J-2	100.00	0.29	0.00	0.64	0.26	0.26
P-9	I-Indian H	J-9	0.00	0.00	0.00	0.00	0.00	0.00
P-10	O-Smiley F	J-14	0.00	0.00	0.00	0.00	0.00	0.00
P-11-CV	J-6	J-3	0.00	0.00	0.00	0.00	0.00	0.00
P-12-XX	J-10	J-8						
P-13	J-10I-Indian H		0.00	0.00	0.00	0.00	0.00	0.00
P-14	J-2	J-12	100.00	0.73	0.00	1.13	1.04	1.04
P-15	J-11	J-4	500.00	1.85	0.00	3.19	5.06	5.06
P-16	Marions Dr	J-5	620.00	3.05	0.00	2.53	2.54	2.54
P-17	J-14	J-16	0.00	0.00	0.00	0.00	0.00	0.00
P-18-XX	J-14	I-RV-2						
P-19	J-15I-Smiley F		0.00	0.00	0.00	0.00	0.00	0.00
P-20	Marions Br	J-16	500.00	6.62	0.00	2.04	1.71	1.71
P-21	J-16	I-RV-1	500.00	2.30	0.00	3.19	5.06	5.06
P-22	O-RV-1	J-11	500.00	1.81	0.00	3.19	5.06	5.06
P-23	O-RV-2	J-15	0.00	0.00	0.00	0.00	0.00	0.00
P-24	J-15	J-9	0.00	0.00	0.00	0.00	0.00	0.00
-@RV-1-RV	I-RV-1	O-RV-1	500.00	0.00	0.00	0.02	0.00	0.00
-@RV-2-RV	I-RV-2	O-RV-2	0.00	0.00	0.00	0.00	0.00	0.00

PUMP/LOSS ELEMENT RESULTS

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	PUMP HEAD (ft)	EFFIC-ENCY (%)	USEFUL POWER (Hp)	INCREMENTL COST (\$)	TOTAL COST (\$)	#PUMPS PARALLEL	#PUMPS SERIES	NPSH Avail. (ft)
Device "Indian Hill" is closed											
Indian Hil	0.00	265.38	755.28	0.0	75.00	0.	0.0	0.0	**	**	298.6



EXHIBIT E-5

Proposed - Marions Branch Tank to Foggy Mountain

Device "Smiley Fork" is closed
 Smiley For 0.00 232.38 726.38 0.0 75.00 0. 0.0 0.0 ** ** 265.6

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
City		----	972.38	707.00	265.38	115.00
I-Indian H		0.00	972.38	707.00	265.38	115.00
Marions Br		----	1473.00	1435.00	38.00	16.47
Shelbiana		----	1020.00	987.00	33.00	14.30
I-Smiley F		0.00	972.38	740.00	232.38	100.70
J-1		500.00	1420.63	1140.00	280.63	121.61
J-2		0.00	1019.17	703.00	316.17	137.01
J-3		0.00	1462.28	694.00	768.28	332.92
J-4		0.00	1460.43	750.00	710.43	307.85
J-5		620.00	1469.95	1300.00	169.95	73.64
J-6		0.00	1462.28	694.00	768.28	332.92
J-7		0.00	1462.28	695.00	767.28	332.49
J-8		0.00	1019.46	697.00	322.46	139.73
J-9		0.00	972.38	695.00	277.38	120.20
J-10		0.00	972.38	694.00	278.38	120.63
J-11		0.00	1462.28	742.00	720.28	312.12
J-12		100.00	1018.44	703.00	315.44	136.69
J-13		0.00	972.38	707.00	265.38	115.00
J-14		0.00	1466.38	740.00	726.38	314.77
J-15		0.00	972.38	740.00	232.38	100.70
J-16		0.00	1466.38	746.00	720.38	312.17
O-RV-1		0.00	1464.09	744.00	720.09	312.04
O-RV-2		0.00	972.38	740.00	232.38	100.70
I-RV-1		0.00	1464.09	744.00	720.09	312.04
I-RV-2		0.00	972.38	740.00	232.38	100.70
O-Indian H		0.00	1462.28	707.00	755.28	327.29
O-Smiley F		0.00	1466.38	740.00	726.38	314.77

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
J-3	332.92	Shelbiana Ta	14.30
J-6	332.92	Marions Bran	16.47
J-7	332.49	J-5	73.64
O-Indian Hil	327.29	I-Smiley For	100.70
J-14	314.77	J-15	100.70

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-4	3.19	P-5	0.64
P-15	3.19	P-8	0.64
P-21	3.19	P-14	1.13
P-22	3.19	P-20	2.04
P-16	2.53	P-16	2.53

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
P-4	5.06	P-5	0.26
P-15	5.06	P-8	0.26



EXHIBIT E-5

Proposed - Marions Branch Tank to Foggy Mountain

P-21	5.06	P-14	1.04
P-22	5.06	P-20	1.71
P-16	2.54	P-16	2.54

HL / 1000

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-4	5.06	P-5	0.26
P-15	5.06	P-8	0.26
P-21	5.06	P-14	1.04
P-22	5.06	P-20	1.71
P-16	2.54	P-16	2.54

REGULATING VALVE REPORT

VALVE LABEL	VALVE TYPE	VALVE SETTING (psi or gpm)	VALVE STATUS	UPSTREAM PRESSURE (psi)	DOWNSTREAM PRESSURE (psi)	THROUGH FLOW (gpm)
RV-1	FCV-1	500.00	WIDE OPEN	312.04	312.04	500.00
RV-2	FCV-1	500.00	WIDE OPEN	100.70	100.70	0.00

SUMMARY OF INFLOWS AND OUTFLOWS

- (+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
- (-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
City	0.00	
Marions Bra	1120.00	
Shelbiana T	100.00	

NET SYSTEM INFLOW = 1220.00
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 1220.00

***** HYDRAULIC ANALYSIS COMPLETED *****



EXHIBIT F



Company name: Summit Engineering
 Created by: Jonathan Newman
 Phone: -
 Fax: -
 Date: -

Project: Marions Branch Water Supply
 Reference number: -

Client: City of Pikeville
 Client number: -
 Contact: -

96938667 CR 120-5-2 60 Hz

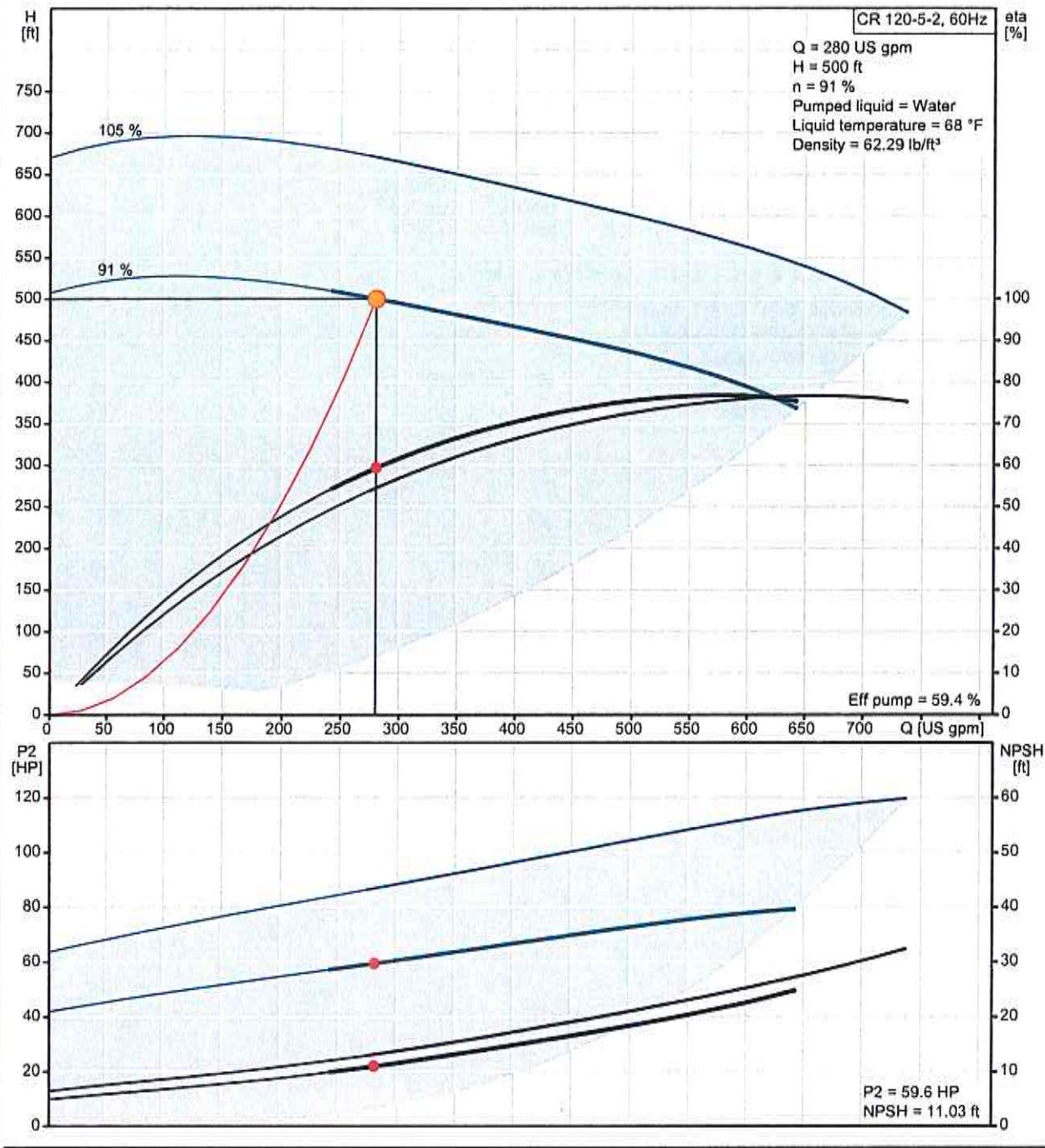


EXHIBIT F



Company name: Summit Engineering
Created by: Jonathan Newman
Phone: -
Fax: -
Date: -

Project: Marions Branch Water Supply
Reference number: -

Client: City of Pikeville
Client number: -
Contact: -

Description	Value
Rated speed:	3530 rpm
Enclosure class (IEC 34-5):	IP22
Insulation class (IEC 85):	F
Motor protection:	None
Motor Number:	84Z04581

Others:
Net weight: 919 lb
Gross weight: 937 lb
Sales region: Namreg

Case No. 2019-00080
City of Pikeville Wholesale Water Service Rates
Responses to Commission Staff's Post-Hearing Data Request

11. Refer to Pikeville's responses to the Commission's June 10, 2019 Order, Item 4.a, Inside Water General Ledger FYE June 30, 2017, Account No. 210.10.610, Public Works Water, and to Pikeville's Supplemental Response to Mountain Water District's Initial Data Request, Item 69. The monthly amounts billed by UMG for its management fees for August 2016 through June 30, 2017, for the inside city system are \$108,630,¹ while the amounts recorded in the general ledger for the same period is \$96,837 for a difference of \$11,793 per month. Provide an explanation for the difference between the amounts actually billed to Pikeville by UMG and the payment made to UMG that Pikeville recorded in its general ledger.

Response: Please note that UMG invoices for contract August 2016 to June 2017 show inside water at \$57,042.37/month and \$51,593.80 for water plant. The post-hearing data request shows inside water \$56,478 and water treatment plant \$51,594 according to note at bottom of page 4 which is incorrect.

The difference is because the cost of the water treatment plant is allocated between inside and outside water. The entire amount of \$51,593.80 is not expensed to inside water.

WITNESS: Tonya Taylor

¹ \$51,594 (Water Treatment Plant) + \$56,478 (Outside Water) = \$108,636.

Case No. 2019-00080
City of Pikeville Wholesale Water Service Rates
Responses to Commission Staff's Post-Hearing Data Request

12. Provide the following information for fiscal years ending June 30, 2014-2018.

Fiscal Years	Outside City			Inside City		
	Revenues	Consumption	Customers	Revenues	Consumption	Customers
2018						
2017						
2016						
2015						
2014						

Fiscal Years	Treatment Plant Production (Gallons)	Water Sales - Gallons			
		Inside - City	Outside City	Mountain District	Southern Water District
2018					
2017					
2016					
2015					
2014					

Response:

Fiscal Years	Outside City			Inside City		
	Revenues	Consumption	Customers	Revenues	Consumption	Customers
2018	\$ 685,006	76,950,631	1,541	\$ 2,099,007	821,066,414	3,152
2017	\$ 658,681	72,572,900	1,653	\$ 2,131,565	900,812,417	3,318
2016	\$ 662,113	76,437,700	1,639	\$ 2,112,250	893,171,400	3,251
2015	\$ 702,911	83,794,500	1,696	\$ 2,219,605	947,937,200	3,334
2014	\$ 733,708	89,936,400	1,727	\$ 2,218,891	942,816,600	3,384

Fiscal Years	Treatment Plant Production (Gallons)	Water Sales Gallons			
		Inside-City	Outside City	Mountain District	Southern Water District
2018	1,087,579,500	284,483,307	76,950,631	412,128,108	124,455,000
2017	1,155,123,700	281,672,417	72,572,900	463,158,000	155,982,000
2016	1,223,575,100	267,187,400	76,437,700	482,373,000	143,611,000
2015	1,320,837,800	279,392,200	83,794,500	509,484,000	159,061,000
2014	1,320,131,700	269,345,600	89,936,400	490,097,000	183,374,000

WITNESS: Tonya Taylor

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

In the Matter of:

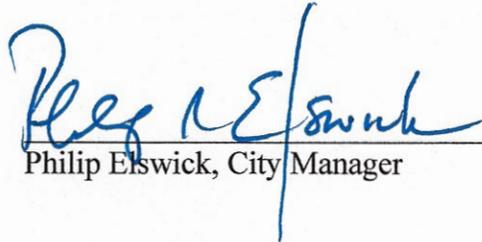
Proposed Adjustment of the Wholesale)
Water Service Rates of the City of Pikeville) Case No. 2019-00080
To Mountain Water District)

CERTIFICATION OF RESPONSES TO INFORMATION REQUESTS

This is to certify that I have supervised the preparation of the City of Pikeville's responses to the Post-Hearing Data Requests and that the responses are true and accurate to the best of my knowledge, information, and belief after reasonable inquiry.

Date: _____

9/20/19


Philip Elswick, City Manager