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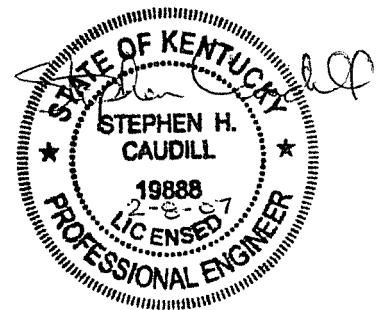
# Final Engineering Report

CAMP BRANCH—AREA 2  
AND LITTLE DRY FORK

LETCHER COUNTY WATER & SEWER DISTRICT

December 2006

Revised February 2007



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Case No. 2007-00070

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FINAL ENGINEERING REPORT

for

CAMP BRANCH-AREA 2, KY 7 AND LITTLE DRY FORK  
LETCHER COUNTY WATER AND SEWER DISTRICT  
LETCHER COUNTY, KENTUCKY

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Recommendation for Award  
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**FINAL ENGINEERING REPORT  
CAMP BRANCH-AREA 2, KY 7 AND LITTLE DRY FORK  
LETCHER COUNTY WATER AND SEWER DISTRICT  
LETCHER COUNTY, KENTUCKY**

**I. INTRODUCTION**

The Letcher County Water and Sewer District (LCWSD) intends to undertake a project that will extend potable water service to residents in the Camp Branch, KY 7 and Little Dry Fork areas of Letcher County. Residents in these areas of the county must currently rely on groundwater as their primary source of potable water. In many cases the groundwater has been polluted and is no longer suitable for use as a drinking water source. This poses serious health risks to residents and stifles growth of the community. The project will provide a means of remedying these problems.

**II. PROJECT AREA**

The project area (See Figure 1) covers various locations in the LCWSD service area. The proposed project has been divided into two contracts. Water mains will generally follow county and state roads but may on occasion follow cross country routes.

**Contract 519-03-05, Area 2** -- This area lies north of the City of Whitesburg, Kentucky. The proposed water line will extend water service along Kentucky 931 & KY 7 from the intersection of KY 931 / KY 1862 to the intersection of KY 1410 / KY 7. Also included in this project are the areas of Pistol City, Ragwood Road, Cookeville Road, Glass Road, Winter Drive, Berry Lane, Mandrill Drive, Kentland Drive, Cane Hollow, Sugar Run, Derby Road and DeLong Road.

**Contract 519-03-06** -- This area lies north of the City of Whitesburg, Kentucky. The proposed water line will extend water service along KY 7 from the intersection of KY 1410 / KY 7 to the community of Democrat and along Little Dry Fork Road. Also included in the project area are the communities of Beaver Dam Road, Fantasy Road, Diamond Drive, Custom Drive, Buck Creek Road, Spring Branch Road, Loves Branch Road and Kentucky May Drive,

**III. BLACKKEY WATER TREATMENT PLANT**

The Letcher County Water and Sewer District has assumed day-to-day operations of the Blackey Water Treatment Plant. The LCWSD intends to take ownership of the plant and assume its outstanding debt upon approval of this transaction by the Kentucky Public Service Commission. Since assuming operation of the Blackey Water Treatment Plant and its associated distribution lines, the LCWSD has incurred \$27,870.83 in expenses that are directly attributable to the Blackey system.

OS - 2  
(10/84)

KENTUCKY PUBLIC SERVICE COMMISSION

MAIN CASE FILE NOTES

*Map in main Case file*

#### IV. PROJECT BIDDING

Bids for the two contracts were opened on November 21, 2006. A total of four bids were received for each of the two contracts. Copies of the bid tabulations and recommendation for award letters are included in Appendices A through D of this document.

The bidding documents advised contractors that the low bidder will be determined on the basis of base bids. Further, only the alternates of the low bidder are to be reviewed for possible inclusion in the contract. The low base bids received are summarized as follows:

<u>Contract</u>	<u>Bidder Name</u>	<u>Bid Amount</u>
519-03-05, Area 2	Akins Excavating	\$ 661,910.00
519-03-06, Division A	Akins Excavating	\$ 841,766.80
519-03-06, Division B	Akins Excavating	<u>\$ 168,441.60</u>
		<b>\$1,672,118.40</b>

Alternate bids received from Akins Excavating were as follows:

##### **Contract 519-03-05, Area 2**

Alternate 1	Pistol City	\$ 90,936.00
Alternate 2	Ragweed Road	\$ 72,222.00
Alternate 3	Cookeville Road	\$ 20,896.00
Alternate 4	Glass Road	\$ 30,276.00
Alternate 5	Winter Drive	\$ 20,584.00
Alternate 6	Berry Lane	\$ 31,605.00
Alternate 7	Mandrill Drive	\$ 39,265.00
Alternate 8	Kentland Drive	\$ 22,811.00
Alternate 9	Cane Hollow	\$ 81,193.00
Alternate 10	Sugar Run	\$ 54,863.80
Alternate 11	Derby Road	\$ 12,134.00
Alternate 12	DeLong Road	<u>\$ 18,391.00</u>
<b>TOTAL</b>		<b>\$495,176.80</b>

##### **Contract 519-03-06**

Alternate 1	Beaver Dam, Custom	\$207,201.50
Alternate 2	Buck Creek, Spring	\$146,421.00
Alternate 3	Loves Branch	\$ 53,586.00
Alternate 4	Kentucky May	\$ 65,629.00
Alternate 5 – ‘A’	KY 15/Dry Fork	\$449,292.95
Alternate 5 – ‘B’	Dry Fork Side Roads	<u>\$197,123.60</u>
		<b>\$1,119,254.05</b>

**Total Base Bid Plus all Alternates: \$3,286,549.25**

## V. PROJECT FUNDING

Project funds are summarized below:

<u>Funding Source</u>	<u>Amount</u>
Rural Development Grant	\$ 800,000.00
Rural Development Loan	\$1,000,000.00
Coal Settlement Funds	<u>\$1,500,000.00</u>
	<b>\$3,300,000.00</b>

Rural Development Grant and Loan money will be available at the beginning of the project. However, the \$1,500,000.00 of Coal Settlement money cannot be accessed until all 29 of the plaintiffs in a legal action concerning damage to their water supply have received water service.

## VI. PROJECT SEQUENCING

Because the \$1,500,000.00 of Coal Settlement funds cannot be accessed until all 29 of the plaintiffs have received water service, the LCWDS intends to award only the portion of the project funded by Rural Development. The LCWSD will reserve the right to award the alternates by change order after the Coal Settlement money is in hand. This will prevent the District from obligating itself should unforeseen legal circumstances delay the availability of the Coal Settlement money. The initial award shall be in the amount of \$1,800,000.00. The initial award will result in the delay of service to customers in the following areas:

<b>Contract 519-03-05-Area 2</b>		<b>Customers</b>
Alternate 1	Pistol City	19
Alternate 2	Ragweed Road	9
Alternate 3	Cookeville Road	7
Alternate 5	Winter Drive	2
Alternate 6	Berry Lane	9
Alternate 9	Cane Hollow	17
Alternate 10	Sugar Run	7
Alternate 11	Derby Road	2
Alternate 12	Delong Road	5
<b>Contract 519-03-06</b>		
Division A	Mainline	9
Division B	Side Roads	39
Alternate 1	Beaver Dam, Custom	30
Alternate 2	Buck Creek, Spring	27
Alternate 3	Loves Branch	14
Alternate 4	Kentucky May	53
Alternate 5	KY 15/Dry Fork	<u>43</u>
<b>TOTAL CUSTOMERS DELAYED</b>		<b>292</b>

## VII. PROJECT BUDGET

The LCWSD will delay the water lines beyond the intersection of KY 7 and Indian Creek Road. It will also delay Division B of Contract 519-03-06 and all alternates. The proposed initial project budget is as follows:

Construction	
Contract 519-03-05-Area 2	\$ 661,910.00
519-03-06, Division A	\$ 738,218.95
Non-Construction	
Environmental	\$ 5,000.00
Project Development	\$ 0.00
Project Design	\$ 0.00
Other	\$ 533.60
Project Bidding	\$ 21,790.00
Construction Administration	\$ 39,200.00
Resident Inspection	\$ 88,591.00
Operator Training & Start-up	\$ 5,000.00
Interest During Construction	\$ 50,000.00
Legal & Administrative	\$ 25,000.00
O&M Reserve	\$ 25,000.00
Construction Contingencies	\$ <u>139,756.45</u>
	<b>\$1,800,000.00</b>

Construction contingencies are calculated based on 5% of the total anticipated contract award upon receipt of the \$1,500,000.00 in Coal Settlement funds. Delayed lines will be added to the project based on customer concentration once the Coal Settlement funds are available.

Three of the bid alternates (Kentland Drive, Mandrill Drive and Glass Drive) have plaintiffs residing along these roads. These roads were also bid as part of the Camp Branch Phase I Project currently under construction. It is the intent of the LCWSD to utilize Phase I construction contingency funds to construct these lines. This will prevent a delay in service for the 19 customers residing along these roads.

## VIII. PROPOSED SCHEDULE

The proposed project schedule is as follows:

1.	Finish Design	Complete
2.	Advertise for Construction Bids	Complete
3.	Bid Opening	Complete
4.	Begin Construction	03/01/2007
5.	End Construction	08/01/2007
6.	Finish project Closeout	01/30/2008

# APPENDIX A

## BID TABULATION CONTRACT 519-03-05, AREA 2



CONTRACT 519-03-05  
AREA 2

WATER SYSTEM IMPROVEMENTS  
CAMP BRANCH  
LETCHER COUNTY WATER AND SEWER DISTRICT  
LETCHER COUNTY, KENTUCKY

We certify that the following is a true and complete tabulation of all bids received by the Letcher County Water and Sewer District, Whitesburg, Kentucky, on November 21, 2006 for the titled project.

BELL ENGINEERING

*Steph Campbell*

ITEM NO.	ITEM	QUANTITY	UNIT	Engineer's Opinion of Probable Project Cost		Akins Excavating Co., Inc. 182 Busy Lane Corbin, Kentucky 40701		K. Carrender Construction Co., Inc. 200 Ringgold Road Somerset, Kentucky 42503		Ronnie Mullins and Sons, Inc. P.O. Box 427 Elkhorn City, Kentucky 41522		Kenney, Inc. P.O. Box 1305 Mt. Sterling, Kentucky 40353	
				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
Division "A" - KY 931 and KY 1862													
1	8-inch Ductile Iron Pipe, Class 350, Furnishing, Trenching, Bedding, Laying and Backfilling, Unclassified Excavation, Complete	14,202	L.F.	\$27.00	\$383,454.00	\$25.50	\$362,151.00	\$26.25	\$372,802.50	\$23.00	\$326,646.00	\$33.33	\$473,352.66
2	8-Inch Restrained Joint Ductile Iron Pipe, Class 350, Furnishing, Trenching, Bedding, Laying and Backfilling, Unclassified Excavation, Complete	160	L.F.	\$50.00	\$8,000.00	\$30.80	\$4,928.00	\$35.00	\$5,600.00	\$31.50	\$5,040.00	\$44.44	\$7,110.40
3	3-Inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	550	L.F.	\$7.00	\$3,850.00	\$15.30	\$8,415.00	\$8.55	\$4,702.50	\$12.00	\$6,600.00	\$10.00	\$5,500.00
4	8-Inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	13	Each	\$950.00	\$12,350.00	\$907.00	\$11,791.00	\$750.00	\$9,750.00	\$1,200.00	\$15,600.00	\$1,666.50	\$21,664.50
5	4-Inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	3	Each	\$600.00	\$1,800.00	\$542.00	\$1,626.00	\$450.00	\$1,350.00	\$725.00	\$2,175.00	\$1,111.00	\$3,333.00
6	3-Inch Mechanical Joint Resilient Seated Gate Valve and Box, Including Concrete Collar, Complete	1	Each	\$400.00	\$400.00	\$485.00	\$485.00	\$400.00	\$400.00	\$700.00	\$700.00	\$999.90	\$999.90
7	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	3,100	L.B.	\$4.00	\$12,400.00	\$5.00	\$15,500.00	\$5.00	\$15,500.00	\$4.00	\$12,400.00	\$5.56	\$17,236.00
8	5/8-inch x 3/4-inch Meter Setting, Including PRV, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	106	Each	\$800.00	\$84,800.00	\$800.00	\$84,800.00	\$750.00	\$79,500.00	\$800.00	\$84,800.00	\$1,111.00	\$117,766.00
9	1-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	460	L.F.	\$9.00	\$4,140.00	\$9.00	\$4,140.00	\$13.50	\$6,210.00	\$10.00	\$4,600.00	\$7.78	\$3,578.80
10	1-inch Corporation Stop, Furnish and Install, Complete	4	Each	\$125.00	\$500.00	\$110.00	\$440.00	\$300.00	\$1,200.00	\$300.00	\$1,200.00	\$555.50	\$2,222.00
11	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	3,875	L.F.	\$7.25	\$28,094.00	\$8.00	\$31,000.00	\$13.10	\$50,762.50	\$9.00	\$34,875.00	\$7.22	\$27,977.50
12	14-inch x 0.281-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	424	L.F.	\$50.00	\$21,200.00	\$60.00	\$25,440.00	\$40.00	\$16,960.00	\$90.00	\$38,160.00	\$83.33	\$35,331.92
13	Boring or Jacking for 14-Inch Steel Cover Pipe, Unclassified Excavation	424	L.F.	\$150.00	\$63,600.00	\$125.00	\$53,000.00	\$110.00	\$46,640.00	\$150.00	\$63,600.00	\$166.65	\$70,659.60

CONTRACT 519-03-05  
AREA 2

WATER SYSTEM IMPROVEMENTS  
CAMP BRANCH  
LETCHER COUNTY WATER AND SEWER DISTRICT  
LETCHER COUNTY, KENTUCKY

We certify that the following is a true and complete tabulation of all bids received by the Letcher County Water and Sewer District, Whitesburg, Kentucky, on November 21, 2006 for the titled project.

BELL ENGINEERING

ITEM NO.	ITEM	QUANTITY	UNIT	Engineer's Opinion of Probable Project Cost		Akins Excavating Co., Inc. 182-Busy Lane Corbin, Kentucky 40701		K. Carrender Construction Co., Inc. 200 Ringold Road Somerset, Kentucky 42503		Ronnie Mullins and Sons, Inc. P.O. Box 427 Elkhorn City, Kentucky 41522		Kemney, Inc. P.O. Box 1305 Mt. Sterling, Kentucky 40353	
				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
14	10-inch x 0.250-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	80	L.F.	\$50.00	\$4,000.00	\$45.00	\$3,600.00	\$30.00	\$2,400.00	\$80.00	\$6,400.00	\$55.55	\$4,444.00
15	Boring or Jacking for 10-inch Steel Cover Pipe, Unclassified Excavation	80	L.F.	\$150.00	\$12,000.00	\$125.00	\$10,000.00	\$100.00	\$8,000.00	\$150.00	\$12,000.00	\$166.65	\$13,332.00
16	Test Meter Assembly, Furnish and Install, Complete	1	L.S.	\$1,000.00	\$1,000.00	\$731.00	\$731.00	\$900.00	\$900.00	\$2,000.00	\$2,000.00	\$1,111.00	\$1,111.00
17	Concrete Line Marker, Furnish and Install, Complete (Tall or Short Marker)	17	Each	\$100.00	\$1,700.00	\$50.00	\$850.00	\$60.00	\$1,020.00	\$50.00	\$850.00	\$111.10	\$1,888.70
18	Flushing Hydrant Assembly, Furnish and Install, Complete	4	Each	\$3,000.00	\$12,000.00	\$1,910.00	\$7,640.00	\$2,500.00	\$10,000.00	\$3,000.00	\$12,000.00	\$3,555.20	\$14,220.80
19	Blow-off Assembly, Furnish and Install, Complete	2	Each	\$800.00	\$1,600.00	\$624.00	\$1,248.00	\$1,000.00	\$2,000.00	\$900.00	\$1,800.00	\$1,111.00	\$2,222.00
20	Crushed Rock on Trench Surface, In Place	500	Ton	\$20.00	\$10,000.00	\$23.00	\$11,500.00	\$15.00	\$7,500.00	\$30.00	\$15,000.00	\$27.78	\$13,890.00
21	2-inch Thickness Bituminous Surface Replacement, Trench Width, On Streets, Drives and Roads, Complete	1,300	L.F.	\$20.00	\$26,000.00	\$15.00	\$19,500.00	\$15.50	\$20,150.00	\$30.00	\$39,000.00	\$27.78	\$36,114.00
22	6-7-inch Thickness, Concrete Surface Replacement, Trench Width on Drawings, Complete	50	L.F.	\$25.00	\$1,250.00	\$16.50	\$825.00	\$45.00	\$2,250.00	\$50.00	\$2,500.00	\$83.33	\$4,166.50
23	Extra for Mechanical Tamping of Trench Backfill, When Not Required by Plans and/or Specifications, Only On Order of the Engineer	20	C.Y.	\$20.00	\$400.00	\$23.00	\$460.00	\$1.00	\$20.00	\$40.00	\$800.00	\$111.10	\$2,222.00
24	Extra for Crushed Rock for Trench Stabilization, Only on Order of the Engineer	40	Ton	\$20.00	\$800.00	\$23.00	\$920.00	\$1.00	\$40.00	\$40.00	\$1,600.00	\$22.22	\$888.80
25	Extra for Crushed Rock for Pipe Bedding, Only on Order of the Engineer	40	Ton	\$20.00	\$800.00	\$23.00	\$920.00	\$1.00	\$40.00	\$40.00	\$1,600.00	\$22.22	\$888.80
Subtotal Division "A"					\$696,138.00		\$661,910.00		\$665,697.50		\$691,946.00		\$882,120.88
<b>BID ALTERNATE 1</b>													
Pistol Branch													
1	4-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	3,062	L.F.	\$18.00	\$55,116.00	\$16.00	\$48,992.00	\$15.00	\$45,930.00	\$25.00	\$76,550.00	\$10.00	\$30,620.00
2	4-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	3	Each	\$600.00	\$1,800.00	\$542.00	\$1,626.00	\$450.00	\$1,350.00	\$725.00	\$2,175.00	\$1,111.00	\$3,333.00
3	10-inch x 0.250-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	40	L.F.	\$50.00	\$2,000.00	\$45.00	\$1,800.00	\$30.00	\$1,200.00	\$60.00	\$2,400.00	\$55.55	\$2,222.00
4	Boring and Jacking for 10-inch Steel Cover Pipe, Unclassified Excavation	40	L.F.	\$150.00	\$6,000.00	\$125.00	\$5,000.00	\$100.00	\$4,000.00	\$130.00	\$5,200.00	\$166.65	\$6,666.00

CONTRACT 519-03-05  
AREA 2

WATER SYSTEM IMPROVEMENTS  
CAMP BRANCH  
LETCHER COUNTY WATER AND SEWER DISTRICT  
LETCHER COUNTY, KENTUCKY

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				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
5	5/8-inch x 3/4-inch Meter Setting, Including PRV, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	19	Each	\$800.00	\$15,200.00	\$800.00	\$15,200.00	\$750.00	\$14,250.00	\$800.00	\$15,200.00	\$1,111.00	\$21,109.00
6	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	475	L.F.	\$7.25	\$3,444.00	\$8.00	\$3,800.00	\$13.10	\$6,222.50	\$9.00	\$4,275.00	\$7.22	\$3,429.50
7	Crushed Rock on Trench Surface, In Place	160	Ton	\$20.00	\$3,200.00	\$23.00	\$3,680.00	\$15.00	\$2,400.00	\$40.00	\$6,400.00	\$27.78	\$4,444.80
8	2-inch Thickness Bituminous Surface Replacement, Trench Width, On Streets, Drives and Roads, Complete	600	L.F.	\$20.00	\$12,000.00	\$15.00	\$9,000.00	\$15.50	\$9,300.00	\$40.00	\$24,000.00	\$27.78	\$16,668.00
9	Concrete Line Marker, Furnish and Install, Complete (Tall or Short Marker)	3	Each	\$100.00	\$300.00	\$50.00	\$150.00	\$60.00	\$180.00	\$50.00	\$150.00	\$111.10	\$333.30
10	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	88	Lbs.	\$4.00	\$352.00	\$5.00	\$440.00	\$5.00	\$440.00	\$4.00	\$352.00	\$5.56	\$489.28
11	Flushing Hydrant Assembly, Furnish and Install, Complete	2	Each	\$3,000.00	\$6,000.00	\$624.00	\$1,248.00	\$2,500.00	\$5,000.00	\$2,800.00	\$5,600.00	\$3,555.20	\$7,110.40
Subtotal Bid Alternate 1 - Pistol City				\$105,412.00	\$90,936.00	\$90,272.50	\$142,302.00						
<b>BID ALTERNATE 2</b>													
<b>Ragweed Road</b>													
1	4-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	730	L.F.	\$8.00	\$5,840.00	\$16.00	\$11,680.00	\$15.00	\$10,950.00	\$15.00	\$10,950.00	\$10.00	\$7,300.00
2	4-inch Ductile Iron Pipe, Class 350, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Trace Wire, Unclassified Excavation, Complete	540	L.F.	\$18.00	\$9,720.00	\$23.20	\$12,528.00	\$30.00	\$16,200.00	\$20.00	\$10,800.00	\$27.78	\$15,001.20
3	4-inch Mechanical Joint Resilient Seated Gate Valve and Box, Including Concrete Valve Box Collar, Complete	1	Each	\$600.00	\$600.00	\$542.00	\$542.00	\$450.00	\$450.00	\$725.00	\$725.00	\$1,111.00	\$1,111.00
4	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	50	Lbs.	\$4.00	\$200.00	\$5.00	\$250.00	\$5.00	\$250.00	\$4.00	\$200.00	\$5.56	\$278.00
5	Blowoff Assembly, Furnish and Install, Complete	1	Each	\$800.00	\$800.00	\$624.00	\$624.00	\$1,000.00	\$1,000.00	\$900.00	\$900.00	\$1,111.00	\$1,111.00
6	10-inch x 0.250-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	90	L.F.	\$50.00	\$4,500.00	\$45.00	\$4,050.00	\$30.00	\$2,700.00	\$70.00	\$6,300.00	\$55.59	\$5,003.10
7	Boring and Jacking for 10-inch Steel Cover Pipe, Unclassified Excavation	90	L.F.	\$150.00	\$13,500.00	\$125.00	\$11,250.00	\$100.00	\$9,000.00	\$140.00	\$12,600.00	\$166.65	\$14,998.50

CONTRACT 519-03-05  
AREA 2

WATER SYSTEM IMPROVEMENTS  
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BELL ENGINEERING

ITEM NO.	ITEM	QUANTITY	UNIT	Engineer's Opinion of Probable Project Cost		Akins Excavating Co., Inc. 182 Busy Lane Corbin, Kentucky 40701		K. Carrender Construction Co., Inc. 200 Ringgold Road Somerset, Kentucky 42503		Ronnie Mullins and Sons, Inc. P.O. Box 427 Elkhorn City, Kentucky 41522		Kenney, Inc. P.O. Box 1305 Mt. Sterling, Kentucky 40353	
				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
8	5/8-inch x 3/4-inch Meter Setting, Including PRV, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	9	Each	\$800.00	\$7,200.00	\$860.00	\$7,200.00	\$750.00	\$6,750.00	\$700.00	\$6,300.00	\$1,111.00	\$9,999.00
9	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	175	L.F.	\$7.25	\$1,269.00	\$8.00	\$1,400.00	\$13.10	\$2,292.50	\$9.00	\$1,575.00	\$7.22	\$1,263.50
10	Crushed Rock on Trench Surface, In Place	40	Ton	\$20.00	\$800.00	\$23.00	\$920.00	\$15.00	\$600.00	\$40.00	\$1,600.00	\$27.78	\$1,111.20
11	2-inch Thickness Bituminous Surface Replacement, Trench Width, On Streets, Drives, and Roads, Complete	55	L.F.	\$20.00	\$1,100.00	\$15.00	\$825.00	\$15.50	\$852.50	\$40.00	\$2,200.00	\$27.78	\$1,527.90
12	Concrete Line Marker, Furnish and Install, Complete (Fall or Short Marker)	1	Each	\$100.00	\$100.00	\$50.00	\$50.00	\$60.00	\$60.00	\$50.00	\$50.00	\$111.10	\$111.10
13	Test Meter Assembly, Furnish and Install, Complete	1	Each	\$1,000.00	\$1,000.00	\$731.00	\$731.00	\$900.00	\$900.00	\$2,000.00	\$2,000.00	\$1,111.00	\$1,111.00
14	Master PRV Assembly, Furnish and Install, Complete	1	Each	\$10,000.00	\$10,000.00	\$17,400.00	\$17,400.00	\$15,000.00	\$15,000.00	\$14,000.00	\$14,000.00	\$11,110.00	\$11,110.00
15	Pressure Reducing Station, Furnish and Install, Complete	1	Each	\$10,000.00	\$10,000.00	\$2,772.00	\$2,772.00	\$25,000.00	\$25,000.00	\$20,000.00	\$20,000.00	\$11,110.00	\$11,110.00
Subtotal Bid Alternate 2 - Ragweed Road					\$66,629.00		\$72,222.00		\$92,005.00		\$90,200.00		\$82,146.50
BID ALTERNATE 3													
Cookeville Road													
1	3-Inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	710	L.F.	\$6.00	\$4,260.00	\$15.30	\$10,863.00	\$8.55	\$6,070.50	\$14.00	\$9,940.00	\$10.00	\$7,100.00
2	3-Inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	1	Each	\$500.00	\$500.00	\$485.00	\$485.00	\$400.00	\$400.00	\$900.00	\$900.00	\$999.90	\$999.90
3	5/8-inch x 3/4-inch Meter Setting, Including PRV, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	7	Each	\$800.00	\$5,600.00	\$800.00	\$5,600.00	\$750.00	\$5,250.00	\$900.00	\$6,300.00	\$1,111.00	\$7,777.00
4	1-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	150	L.F.	\$5.00	\$750.00	\$9.00	\$1,350.00	\$13.50	\$2,025.00	\$10.00	\$1,500.00	\$7.78	\$1,167.00
5	Concrete Line Marker, Furnish and Install, Complete (Fall or Short Marker)	2	Each	\$100.00	\$200.00	\$50.00	\$100.00	\$60.00	\$120.00	\$50.00	\$100.00	\$111.10	\$222.20
6	Blow-off Assembly, Furnish and Install, Complete	2	Each	\$700.00	\$1,400.00	\$624.00	\$1,248.00	\$1,000.00	\$2,000.00	\$1,000.00	\$2,000.00	\$1,111.00	\$2,222.00
7	Crushed Rock on Trench Surface, In Place	40	Ton	\$20.00	\$800.00	\$23.00	\$920.00	\$15.00	\$600.00	\$40.00	\$1,600.00	\$27.78	\$1,111.20

CONTRACT 519-03-05  
AREA 2

WATER SYSTEM IMPROVEMENTS  
CAMP BRANCH  
LETCHER COUNTY WATER AND SEWER DISTRICT  
LETCHER COUNTY, KENTUCKY

We certify that the following is a true and complete tabulation of all bids received by the Letcher County Water and Sewer District, Whitesburg, Kentucky, on November 21, 2006 for the titled project.

BELL ENGINEERING

ITEM NO.	ITEM	QUANTITY	UNIT	Engineer's Opinion of Probable Project Cost		Akins Excavating Co., Inc. 182 Busy Lane Corbin, Kentucky 40701		K. Carrender Construction Co., Inc. 200 Ringgold Road Somerset, Kentucky 42503		Ronnie Mullins and Sons, Inc. P.O. Box 427 Elkhorn City, Kentucky 41522		Kenney, Inc. P.O. Box 1305 Mt. Sterling, Kentucky 40353	
				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
8	Extra for Mechanical Tamping of Trench Backfill, When Not Required by Plans and/or Specifications, Only On Order of the Engineer	2	C.Y.	\$5.00	\$10.00	\$50.00	\$100.00	\$1.00	\$2.00	\$40.00	\$80.00	\$111.10	\$222.20
9	Extra for Crushed Rock for Trench Stabilization, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
10	Extra for Crushed Rock for Pipe Bedding, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
	Subtotal Bid Alternate 3 - Cookeville Road				\$13,720.00		\$20,896.00		\$16,477.50		\$22,820.00		\$21,043.70
<b>BID ALTERNATE 4</b>													
Glass Road													
1	4-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	1,300	L.F.	\$7.00	\$9,100.00	\$16.00	\$20,800.00	\$15.00	\$19,500.00	\$15.00	\$19,500.00	\$10.00	\$13,000.00
2	4-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	1	Each	\$600.00	\$600.00	\$542.00	\$542.00	\$450.00	\$450.00	\$900.00	\$900.00	\$1,111.00	\$1,111.00
3	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	25	L.B.	\$2.50	\$62.50	\$5.60	\$125.00	\$5.00	\$125.00	\$4.00	\$100.00	\$5.56	\$139.00
4	5/8-inch x 3/4-inch Meter Setting, Including PRV, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	7	Each	\$800.00	\$5,600.00	\$800.00	\$5,600.00	\$750.00	\$5,250.00	\$900.00	\$6,300.00	\$1,111.00	\$7,777.00
5	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	210	L.F.	\$4.00	\$840.00	\$8.00	\$1,680.00	\$13.10	\$2,751.00	\$9.00	\$1,890.00	\$7.22	\$1,516.20
6	Blow-off Assembly, Furnish and Install, Complete	1	Each	\$700.00	\$700.00	\$624.00	\$624.00	\$1,000.00	\$1,000.00	\$900.00	\$900.00	\$1,111.00	\$1,111.00
7	Crushed Rock on Trench Surface, In Place	25	Ton	\$20.00	\$500.00	\$23.00	\$575.00	\$15.00	\$375.00	\$40.00	\$1,000.00	\$27.78	\$694.50
8	Extra for Mechanical Tamping of Trench Backfill, When Not Required by Plans and/or Specifications, Only On Order of the Engineer	2	C.Y.	\$5.00	\$10.00	\$50.00	\$100.00	\$1.00	\$2.00	\$40.00	\$80.00	\$111.10	\$222.20
9	Extra for Crushed Rock for Trench Stabilization, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
10	Extra for Crushed Rock for Pipe Bedding, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
	Subtotal Bid Alternate 4 - Glass Road				\$17,613.00		\$30,276.00		\$29,463.00		\$31,070.00		\$25,793.10

CONTRACT 519-03-05  
AREA 2

WATER SYSTEM IMPROVEMENTS  
CAMP BRANCH  
LETCHER COUNTY WATER AND SEWER DISTRICT  
LETCHER COUNTY, KENTUCKY

We certify that the following is a true and complete tabulation of all bids received by the Letcher County Water and Sewer District, Whitesburg, Kentucky, on November 21, 2006 for the titled project.

BELL ENGINEERING

ITEM NO.	ITEM	QUANTITY	UNIT	Engineer's Opinion of Probable Project Cost		Akins Excavating Co., Inc. 182 Busy Lane Corbin, Kentucky 40701		K. Carrender Construction Co., Inc. 200 Ringgold Road Somerset, Kentucky 42503		Ronnie Mullins and Sons, Inc. P.O. Box 427 Elkhorn City, Kentucky 41522		Kenney, Inc. P.O. Box 1305 Mt. Sterling, Kentucky 40353	
				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
<b>BID ALTERNATE 5</b>													
<b>Winter Drive</b>													
1	3-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	950	L.F.	\$6.00	\$5,700.00	\$15.30	\$14,535.00	\$8.55	\$8,122.50	\$14.00	\$13,300.00	\$10.00	\$9,500.00
2	3-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	1	Each	\$500.00	\$500.00	\$485.00	\$485.00	\$400.00	\$400.00	\$900.00	\$900.00	\$999.90	\$999.90
3	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	94	L.B.	\$2.50	\$235.00	\$5.00	\$470.00	\$5.00	\$470.00	\$4.00	\$376.00	\$5.56	\$522.64
4	5/8-inch x 3/4-inch Meter Setting, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	2	Each	\$800.00	\$1,600.00	\$800.00	\$1,600.00	\$750.00	\$1,500.00	\$1,000.00	\$2,000.00	\$1,111.00	\$2,222.00
5	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	30	L.F.	\$4.00	\$120.00	\$8.00	\$240.00	\$13.10	\$393.00	\$9.00	\$270.00	\$7.22	\$216.60
6	Blow-off Assembly, Furnish and Install, Complete	1	Each	\$700.00	\$700.00	\$624.00	\$624.00	\$1,000.00	\$1,000.00	\$900.00	\$900.00	\$1,111.00	\$1,111.00
7	Crushed Rock on Trench Surface, in Place	100	Ton	\$20.00	\$2,000.00	\$23.00	\$2,300.00	\$15.00	\$1,500.00	\$40.00	\$4,000.00	\$27.78	\$2,778.00
8	Extra for Mechanical Tamping of Trench Backfill, When Not Required by Plans and/or Specifications, Only On Order of the Engineer	2	C.Y.	\$5.00	\$10.00	\$50.00	\$100.00	\$1.00	\$2.00	\$40.00	\$80.00	\$111.10	\$222.20
9	Extra for Crushed Rock for Trench Stabilization, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
10	Extra for Crushed Rock for Pipe Bedding, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
Subtotal Bid Alternate 5 - Winter Drive					\$11,065.00		\$20,584.00		\$13,397.50		\$22,226.00		\$17,794.54
<b>BID ALTERNATE 6</b>													
<b>Berry Lane</b>													
1	4-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	1,224	L.F.	\$7.00	\$8,568.00	\$16.00	\$19,584.00	\$15.00	\$18,360.00	\$15.00	\$18,360.00	\$10.00	\$12,240.00
2	4-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	1	Each	\$600.00	\$600.00	\$542.00	\$542.00	\$450.00	\$450.00	\$900.00	\$900.00	\$1,111.00	\$1,111.00
3	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	80	L.B.	\$2.50	\$200.00	\$5.00	\$400.00	\$5.00	\$400.00	\$4.00	\$320.00	\$5.56	\$444.80

CONTRACT 519-03-05  
AREA 2

WATER SYSTEM IMPROVEMENTS  
CAMP BRANCH  
LETCHER COUNTY WATER AND SEWER DISTRICT  
LETCHER COUNTY, KENTUCKY

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				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
4	5/8-inch x 3/4-inch Meter Setting, Meter Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	9	Each	\$800.00	\$7,200.00	\$800.00	\$7,200.00	\$750.00	\$6,750.00	\$900.00	\$8,100.00	\$1,111.00	\$9,999.00
5	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	200	L.F.	\$4.00	\$800.00	\$8.00	\$1,600.00	\$13.10	\$2,620.00	\$9.00	\$1,800.00	\$7.22	\$1,444.00
6	Blow-off Assembly, Furnish and Install, Complete	1	Each	\$700.00	\$700.00	\$624.00	\$624.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,111.00	\$1,111.00
7	Crushed Rock on Trench Surface, In Place	25	Ton	\$20.00	\$500.00	\$23.00	\$575.00	\$15.00	\$375.00	\$40.00	\$1,000.00	\$27.78	\$694.50
8	2-inch Thickness Bituminous Surface Replacement, Trench Width, On Streets, Drives and Roads, Complete	50	L.F.	\$20.00	\$1,000.00	\$15.00	\$750.00	\$15.50	\$775.00	\$40.00	\$2,000.00	\$27.78	\$1,389.00
9	Extra for Mechanical Tamping of Trench Backfill, When Not Required by Plans and/or Specifications, Only On Order of the Engineer	2	C.Y.	\$5.00	\$10.00	\$50.00	\$100.00	\$1.00	\$2.00	\$40.00	\$80.00	\$111.10	\$222.20
10	Extra for Crushed Rock for Trench Stabilization, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
11	Extra for Crushed Rock for Pipe Bedding, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
Subtotal Bid Alternate 6 - Berry Lane					\$19,778.00		\$31,605.00		\$30,742.00		\$33,960.00		\$28,877.70
BID ALTERNATE 7													
Mandril Drive													
1	4-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	1,540	L.F.	\$7.00	\$10,780.00	\$16.00	\$24,640.00	\$15.00	\$23,100.00	\$15.00	\$23,100.00	\$10.00	\$15,400.00
2	4-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	3	Each	\$600.00	\$1,800.00	\$542.00	\$1,626.00	\$450.00	\$1,350.00	\$900.00	\$2,700.00	\$1,111.00	\$3,333.00
3	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	119	L.B.	\$2.50	\$297.50	\$5.00	\$595.00	\$5.00	\$595.00	\$4.00	\$476.00	\$5.56	\$661.64
4	5/8-inch x 3/4-inch Meter Setting, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	7	Each	\$800.00	\$5,600.00	\$800.00	\$5,600.00	\$750.00	\$5,250.00	\$900.00	\$6,300.00	\$1,111.00	\$7,777.00
5	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	200	L.F.	\$4.00	\$800.00	\$8.00	\$1,600.00	\$13.10	\$2,620.00	\$9.00	\$1,800.00	\$7.22	\$1,444.00
6	Concrete Line Marker, Furnish and Install, Complete (Tall or Short Marker)	2	Each	\$100.00	\$200.00	\$50.00	\$100.00	\$60.00	\$120.00	\$50.00	\$100.00	\$111.10	\$222.20

CONTRACT 519-03-05 WATER SYSTEM IMPROVEMENTS  
 AREA 2 CAMP BRANCH  
 LETCHER COUNTY WATER AND SEWER DISTRICT  
 LETCHER COUNTY, KENTUCKY

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BELL ENGINEERING

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				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
7	Blow-off Assembly, Furnish and Install, Complete	1	Each	\$700.00	\$700.00	\$624.00	\$624.00	\$1,000.00	\$1,000.00	\$900.00	\$900.00	\$1,111.00	\$1,111.00
8	Crushed Rock on Trench Surface, In Place	50	Ton	\$20.00	\$1,000.00	\$23.00	\$1,150.00	\$15.00	\$750.00	\$40.00	\$2,000.00	\$27.78	\$1,389.00
9	2-Inch Thickness Bituminous Surface Replacement, Trench Width, On Streets, Drives and Roads, Complete	200	L.F.	\$20.00	\$4,000.00	\$15.00	\$3,000.00	\$15.50	\$3,100.00	\$40.00	\$8,000.00	\$27.78	\$5,556.00
10	Extra for Mechanical Tamping of Trench Backfill, When Not Required by Plans and/or Specifications, Only On Order of the Engineer	2	C.Y.	\$5.00	\$10.00	\$50.00	\$100.00	\$1.00	\$2.00	\$40.00	\$80.00	\$111.10	\$222.20
11	Extra for Crushed Rock for Trench Stabilization, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.20	\$111.00
12	Extra for Crushed Rock for Pipe Bedding, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.20	\$111.00
Subtotal Bid Alternate 7 - Mandrill Drive					\$25,388.00		\$39,265.00		\$37,897.00		\$45,856.00		\$37,338.04
<b>BID ALTERNATE 8</b>													
Kentland Drive													
1	4-Inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	850	L.F.	\$7.00	\$5,950.00	\$16.00	\$13,600.00	\$15.00	\$12,750.00	\$15.00	\$12,750.00	\$10.00	\$8,500.00
2	4-Inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	1	Each	\$600.00	\$600.00	\$542.00	\$542.00	\$450.00	\$450.00	\$900.00	\$900.00	\$1,111.00	\$1,111.00
3	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	41	L.B.	\$2.50	\$102.50	\$5.00	\$205.00	\$5.00	\$205.00	\$4.00	\$164.00	\$5.56	\$227.96
4	5/8-Inch x 3/4-Inch Meter Setting, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	5	Each	\$800.00	\$4,000.00	\$800.00	\$4,000.00	\$750.00	\$3,750.00	\$900.00	\$4,500.00	\$1,111.00	\$5,555.00
5	3/4-Inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	100	L.F.	\$4.00	\$400.00	\$8.00	\$800.00	\$13.10	\$1,310.00	\$10.00	\$1,000.00	\$7.22	\$722.00
6	Blow-off Assembly, Furnish and Install, Complete	1	Each	\$700.00	\$700.00	\$624.00	\$624.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,111.00	\$1,111.00
7	Crushed Rock on Trench Surface, In Place	20	Ton	\$20.00	\$400.00	\$23.00	\$460.00	\$15.00	\$300.00	\$40.00	\$800.00	\$27.78	\$555.60
8	2-Inch Thickness Bituminous Surface Replacement, Trench Width, On Streets, Drives and Roads, Complete	150	L.F.	\$20.00	\$3,000.00	\$15.00	\$2,250.00	\$15.50	\$2,325.00	\$40.00	\$6,000.00	\$27.78	\$4,167.00
9	Extra for Mechanical Tamping of Trench Backfill, When Not Required by Plans and/or Specifications, Only On Order of the Engineer	2	C.Y.	\$5.00	\$10.00	\$50.00	\$100.00	\$1.00	\$2.00	\$40.00	\$80.00	\$111.10	\$222.20



CONTRACT 519-03-05  
 AREA 2  
 WATER SYSTEM IMPROVEMENTS  
 CAMP BRANCH  
 LETCHER COUNTY WATER AND SEWER DISTRICT  
 LETCHER COUNTY, KENTUCKY

We certify that the following is a true and complete tabulation of all bids received by the Letcher County Water and Sewer District, Whitesburg, Kentucky, on November 21, 2006 for the titled project.

BELL ENGINEERING

ITEM NO.	ITEM	QUANTITY	UNIT	Engineer's Opinion of Probable Project Cost		Akins Excavating Co., Inc. 182 Busy Lane Corbin, Kentucky 40701		K. Carrender Construction Co., Inc. 200 Ringgold Road Somerset, Kentucky 42503		Ronnie Mullins and Sons, Inc. P.O. Box 427 Elkhorn City, Kentucky 41522		Kenney, Inc. P.O. Box 1305 Mt. Sterling, Kentucky 40353	
				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
10	Extra for Crushed Rock for Trench Stabilization, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
11	Extra for Crushed Rock for Pipe Bedding, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
	Subtotal Bid Alternate 8 - Kentland Drive				\$15,363.00		\$22,811.00		\$22,102.00		\$27,594.00		\$22,393.96
BID ALTERNATE 9													
Cane Hollow													
1	4-Inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	3,700	L.F.	\$7.00	\$25,900.00	\$16.00	\$59,200.00	\$15.00	\$55,500.00	\$15.00	\$55,500.00	\$10.00	\$37,000.00
2	4-Inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	2	Each	\$600.00	\$1,200.00	\$542.00	\$1,084.00	\$450.00	\$900.00	\$900.00	\$1,800.00	\$1,111.00	\$2,222.00
3	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	61	L.B.	\$2.50	\$152.50	\$5.00	\$305.00	\$5.00	\$305.00	\$4.00	\$244.00	\$5.56	\$339.16
4	5/8-Inch x 3/4-Inch Meter Setting, Including PRV, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap and Touch Read Assembly, Furnish and Install, Complete	17	Each	\$800.00	\$13,600.00	\$800.00	\$13,600.00	\$750.00	\$12,750.00	\$900.00	\$15,300.00	\$1,111.00	\$18,887.00
5	3/4-Inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	450	L.F.	\$4.00	\$1,800.00	\$8.00	\$3,600.00	\$13.10	\$5,895.00	\$9.00	\$4,050.00	\$7.22	\$3,249.00
6	Concrete Line Marker, Furnish and Install, Complete (Tall or Short Marker)	3	Each	\$100.00	\$300.00	\$50.00	\$150.00	\$60.00	\$180.00	\$50.00	\$150.00	\$111.10	\$333.30
7	Blow-off Assembly, Furnish and Install, Complete	1	Each	\$700.00	\$700.00	\$624.00	\$624.00	\$1,000.00	\$1,000.00	\$900.00	\$900.00	\$1,111.00	\$1,111.00
8	Crushed Rock on Trench Surface, In Place	100	Ton	\$20.00	\$2,000.00	\$23.00	\$2,300.00	\$15.00	\$1,500.00	\$40.00	\$4,000.00	\$27.78	\$2,778.00
9	Extra for Mechanical Tamping of Trench Backfill, When Not Required by Plans and/or Specifications, Only On Order of the Engineer	2	C.Y.	\$5.00	\$10.00	\$50.00	\$100.00	\$1.00	\$2.00	\$40.00	\$80.00	\$111.10	\$222.20
10	Extra for Crushed Rock for Trench Stabilization, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
11	Extra for Crushed Rock for Pipe Bedding, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
	Subtotal Bid Alternate 9 - Cane Hollow				\$45,863.00		\$81,193.00		\$78,042.00		\$82,424.00		\$66,363.86

CONTRACT 519-03-05  
AREA 2

WATER SYSTEM IMPROVEMENTS  
CAMP BRANCH  
LETCHER COUNTY WATER AND SEWER DISTRICT  
LETCHER COUNTY, KENTUCKY

We certify that the following is a true and complete tabulation of all bids received by the Letcher County Water and Sewer District, Whitesburg, Kentucky, on November 21, 2006 for the titled project.

BELL ENGINEERING

ITEM NO.	ITEM	QUANTITY	UNIT	Engineer's Opinion of Probable Project Cost		Akins Excavating Co., Inc. 182 Busy Lane Corbin, Kentucky 40701		K. Carrender Construction Co., Inc. 200 Ringgold Road Somerset, Kentucky 42503		Ronnie Mullins and Sons, Inc. P.O. Box 427 Elkhorn City, Kentucky 41522		Kenney, Inc. P.O. Box 1305 Mt. Sterling, Kentucky 40353	
				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
<b>BID ALTERNATE 10</b>													
<b>Sugar Run</b>													
1	4-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	1,094	L.F.	\$7.00	\$7,658.00	\$16.00	\$17,504.00	\$15.00	\$16,410.00	\$15.00	\$16,410.00	\$10.00	\$10,940.00
2	4-inch Resilient Joint Ductile Iron Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	314	L.F.	\$22.00	\$6,908.00	\$23.20	\$7,284.80	\$30.00	\$9,420.00	\$30.00	\$9,420.00	\$27.78	\$8,722.92
3	4-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	2	Each	\$600.00	\$1,200.00	\$542.00	\$1,084.00	\$450.00	\$900.00	\$900.00	\$1,800.00	\$1,111.00	\$2,222.00
4	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	100	L.B.	\$2.50	\$250.00	\$5.00	\$500.00	\$5.00	\$500.00	\$4.00	\$400.00	\$5.56	\$556.00
5	5/8-inch x 3/4-inch Meter Setting, Including PRV, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	7	Each	\$800.00	\$5,600.00	\$800.00	\$5,600.00	\$750.00	\$5,250.00	\$900.00	\$6,300.00	\$1,111.00	\$7,777.00
6	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	200	L.F.	\$4.00	\$800.00	\$8.00	\$1,600.00	\$13.10	\$2,620.00	\$9.00	\$1,800.00	\$7.22	\$1,444.00
7	10-inch x 0.250-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	113	L.F.	\$50.00	\$5,650.00	\$45.00	\$5,085.00	\$30.00	\$3,390.00	\$70.00	\$7,910.00	\$55.55	\$6,277.15
8	Boring or Jacking for 10-inch Steel Cover Pipe, Unclassified Excavation	113	L.F.	\$150.00	\$16,950.00	\$125.00	\$14,125.00	\$100.00	\$11,300.00	\$140.00	\$15,820.00	\$166.65	\$18,831.45
9	Concrete Line Marker, Furnish and Install, Complete (Tall or Short Marker)	2	Each	\$100.00	\$200.00	\$50.00	\$100.00	\$60.00	\$120.00	\$50.00	\$100.00	\$111.10	\$222.20
10	Test Meter Assembly, Furnish and Install, Complete	1	Each	\$350.00	\$350.00	\$731.00	\$731.00	\$900.00	\$900.00	\$2,500.00	\$2,500.00	\$1,111.00	\$1,111.00
11	Crushed Rock on Trench Surface, In Place	40	Ton	\$20.00	\$800.00	\$23.00	\$920.00	\$15.00	\$600.00	\$40.00	\$1,600.00	\$27.78	\$1,111.20
12	Extra for Mechanical Tamping of Trench Backfill, When Not Required by Plans and/or Specifications, Only On Order of the Engineer	2	C.Y.	\$5.00	\$10.00	\$50.00	\$100.00	\$1.00	\$2.00	\$40.00	\$80.00	\$111.10	\$222.20
13	Extra for Crushed Rock for Trench Stabilization, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
14	Extra for Crushed Rock for Pipe Bedding, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
<b>Subtotal Bid Alternate 10 - Sugar Run</b>					\$46,576.00		\$54,863.80		\$51,422.00		\$64,540.00		\$59,659.32

CONTRACT 519-03-05  
AREA 2

WATER SYSTEM IMPROVEMENTS  
CAMP BRANCH  
LETCHER COUNTY WATER AND SEWER DISTRICT  
LETCHER COUNTY, KENTUCKY

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BELL ENGINEERING

ITEM NO.	ITEM	QUANTITY	UNIT	Engineer's Opinion of Probable Project Cost		Akins Excavating Co., Inc. 182 Busy Lane Corbin, Kentucky 40701		K. Carrender Construction Co., Inc. 200 Ringold Road Somerset, Kentucky 42503		Ronnie Mullins and Sons, Inc. P.O. Box 427 Elkhorn City, Kentucky 41522		Kenney, Inc. P.O. Box 1305 Mt. Sterling, Kentucky 40353	
				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
<b>BID ALTERNATE 11</b>													
Derby Road													
1	3-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	500	L.F.	\$6.00	\$3,000.00	\$15.30	\$7,650.00	\$8.55	\$4,275.00	\$14.00	\$7,000.00	\$10.00	\$5,000.00
2	3-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	1	Each	\$500.00	\$500.00	\$485.00	\$485.00	\$400.00	\$400.00	\$900.00	\$900.00	\$999.90	\$999.90
3	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	25	L.B.	\$2.50	\$62.50	\$5.00	\$125.00	\$5.00	\$125.00	\$4.00	\$100.00	\$5.56	\$139.00
4	5/8-inch x 3/4-inch Meter Setting, Including PRV, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	2	Each	\$800.00	\$1,600.00	\$800.00	\$1,600.00	\$750.00	\$1,500.00	\$1,000.00	\$2,000.00	\$1,111.00	\$2,222.00
5	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	50	L.F.	\$4.00	\$200.00	\$8.00	\$400.00	\$13.10	\$655.00	\$10.00	\$500.00	\$7.22	\$361.00
6	Blow-off Assembly, Furnish and Install, Complete	1	Each	\$700.00	\$700.00	\$624.00	\$624.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,111.00	\$1,111.00
7	Crushed Rock on Trench Surface, In Place	40	Ton	\$20.00	\$800.00	\$23.00	\$920.00	\$15.00	\$600.00	\$40.00	\$1,600.00	\$27.78	\$1,111.20
8	Extra for Mechanical Tamping of Trench Backfill, When Not Required by Plans and/or Specifications, Only On Order of the Engineer	2	C.Y.	\$5.00	\$10.00	\$50.00	\$100.00	\$1.00	\$2.00	\$40.00	\$80.00	\$111.10	\$222.20
9	Extra for Crushed Rock for Trench Stabilization, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
10	Extra for Crushed Rock for Pipe Bedding, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
Subtotal Bid Alternate 11 - Derby Road					\$7,073.00		\$12,134.00		\$8,567.00		\$13,580.00		\$11,388.50
<b>BID ALTERNATE 12</b>													
Delong Road													
1	4-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	660	L.F.	\$7.00	\$4,620.00	\$16.00	\$10,560.00	\$15.00	\$9,900.00	\$15.00	\$9,900.00	\$10.00	\$6,600.00
2	4-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	1	Each	\$600.00	\$600.00	\$542.00	\$542.00	\$450.00	\$450.00	\$900.00	\$900.00	\$1,111.00	\$1,111.00
3	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	43	L.B.	\$2.50	\$107.50	\$5.00	\$215.00	\$5.00	\$215.00	\$4.00	\$172.00	\$5.56	\$239.08

CONTRACT 519-03-05  
AREA 2

WATER SYSTEM IMPROVEMENTS  
CAMP BRANCH  
LETCHER COUNTY WATER AND SEWER DISTRICT  
LETCHER COUNTY, KENTUCKY

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BELL ENGINEERING

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				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
4	5/8-inch x 3/4-inch Meter Setting, Including PRV, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	5	Each	\$4.00	\$20.00	\$800.00	\$4,000.00	\$750.00	\$3,750.00	\$900.00	\$4,500.00	\$1,111.00	\$5,555.00
5	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	150	L.F.	\$0.00	\$0.00	\$8.00	\$1,200.00	\$13.10	\$1,965.00	\$10.00	\$1,500.00	\$7.22	\$1,083.00
6	Blow-off Assembly, Furnish and Install, Complete	1	Each	\$700.00	\$700.00	\$624.00	\$624.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,111.00	\$1,111.00
7	Crushed Rock on Trench Surface, In Place	40	Ton	\$20.00	\$800.00	\$23.00	\$920.00	\$15.00	\$600.00	\$40.00	\$1,600.00	\$27.78	\$1,111.20
8	Extra for Mechanical Tamping of Trench Backfill, When Not Required by Plans and/or Specifications, Only On Order of the Engineer	2	C.Y.	\$5.00	\$10.00	\$50.00	\$100.00	\$1.00	\$2.00	\$40.00	\$80.00	\$111.10	\$222.20
9	Extra for Crushed Rock for Trench Stabilization, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
10	Extra for Crushed Rock for Pipe Bedding, Only on Order of the Engineer	5	Ton	\$20.00	\$100.00	\$23.00	\$115.00	\$1.00	\$5.00	\$40.00	\$200.00	\$22.22	\$111.10
Subtotal Bid Alternate 12 - Delong Road					\$7,058.00		\$18,391.00		\$17,892.00		\$20,052.00		\$17,254.68
Subtotal Division "A"					\$696,138.00		\$661,910.00		\$665,697.50		\$691,946.00		\$882,120.88
SUMMARY													
Subtotal Division "A"					\$696,138.00		\$661,910.00		\$665,697.50		\$691,946.00		\$882,120.88
TOTAL CONTRACT 519-03-05													
Total Bid Alternate No. 1					\$105,412.00		\$90,936.00		\$90,272.50		\$142,302.00		\$96,425.28
Total Bid Alternate No. 2					\$66,629.00		\$72,222.00		\$92,005.00		\$90,200.00		\$82,146.50
Total Bid Alternate No. 3					\$13,720.00		\$20,896.00		\$16,477.50		\$22,820.00		\$21,043.70
Total Bid Alternate No. 4					\$17,613.00		\$30,276.00		\$29,463.00		\$31,070.00		\$25,793.10
Total Bid Alternate No. 5					\$11,065.00		\$20,584.00		\$13,397.50		\$22,226.00		\$17,794.54
Total Bid Alternate No. 6					\$19,778.00		\$31,605.00		\$30,742.00		\$33,960.00		\$28,877.70
Total Bid Alternate No. 7					\$23,388.00		\$39,265.00		\$37,897.00		\$45,856.00		\$37,338.04
Total Bid Alternate No. 8					\$15,363.00		\$22,811.00		\$22,102.00		\$27,594.00		\$22,393.96
Total Bid Alternate No. 9					\$45,863.00		\$81,193.00		\$78,042.00		\$82,424.00		\$66,363.86
Total Bid Alternate No. 10					\$46,576.00		\$54,863.80		\$51,422.00		\$64,540.00		\$59,659.32
Total Bid Alternate No. 11					\$7,073.00		\$12,134.00		\$8,567.00		\$13,580.00		\$11,388.50
Total Bid Alternate No. 12					\$7,058.00		\$18,391.00		\$17,892.00		\$20,052.00		\$17,254.68

# APPENDIX B

BID TABULATION  
CONTRACT 519-03-06

CONTRACT 519-03-06 WATER SYSTEM IMPROVEMENTS  
 KY 7 AND LITTLE DRY FORK  
 LETCHER COUNTY WATER AND SEWER DISTRICT  
 LETCHER COUNTY, KENTUCKY

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BELL ENGINEERING

*Steph Cantrell*

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				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
Division "A" - KY 7													
1	8-inch Ductile Iron Pipe, Class 350, Furnishing, Trenching, Bedding, Laying and Backfilling, Unclassified Excavation, Complete	23,242	L.F.	\$27.00	\$627,534.00	\$24.90	\$578,725.80	\$26.25	\$610,102.50	\$23.00	\$534,566.00	\$38.89	\$903,881.38
2	8-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	0	L.F.	\$21.00	\$0.00	\$16.35	\$0.00	\$25.00	\$0.00	\$30.00	\$0.00	\$33.33	\$0.00
3	4-inch Ductile Restrainted Joint Pipe, Class 350, Furnishing, Trenching, Bedding, Laying and Backfilling, Unclassified Excavation, Complete	54	L.F.	\$18.00	\$972.00	\$21.00	\$1,134.00	\$30.00	\$1,620.00	\$30.00	\$1,620.00	\$44.44	\$2,399.76
4	6-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	100	L.F.	\$18.00	\$1,800.00	\$14.10	\$1,410.00	\$18.00	\$1,800.00	\$20.00	\$2,000.00	\$27.78	\$2,778.00
5	4-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	590	L.F.	\$8.00	\$4,720.00	\$12.40	\$7,316.00	\$15.00	\$8,850.00	\$15.00	\$8,850.00	\$11.11	\$6,554.90
6	1-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	52	L.F.	\$8.00	\$416.00	\$9.00	\$468.00	\$13.50	\$702.00	\$10.00	\$520.00	\$16.67	\$866.84
7	8-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	15	EA.	\$950.00	\$14,250.00	\$906.00	\$13,590.00	\$750.00	\$11,250.00	\$1,000.00	\$15,000.00	\$1,666.50	\$24,997.50
8	6-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	1	EA.	\$800.00	\$800.00	\$688.00	\$688.00	\$700.00	\$700.00	\$900.00	\$900.00	\$1,444.30	\$1,444.30
9	4-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	3	EA.	\$600.00	\$1,800.00	\$549.00	\$1,647.00	\$450.00	\$1,350.00	\$725.00	\$2,175.00	\$1,333.20	\$3,999.60
10	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	2,273	L.B.	\$4.00	\$9,092.00	\$5.00	\$11,365.00	\$5.00	\$11,365.00	\$4.00	\$9,092.00	\$5.56	\$12,637.88
11	5/8-Inch x 3/4-Inch Meter Setting, Including PRV, Meter, Meter Box Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	66	Each	\$800.00	\$52,800.00	\$800.00	\$52,800.00	\$750.00	\$49,500.00	\$800.00	\$52,800.00	\$1,111.00	\$73,326.00
12	3/4-Inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	2,435	L.F.	\$7.25	\$17,654.00	\$8.00	\$19,480.00	\$13.10	\$31,898.50	\$9.00	\$21,915.00	\$10.00	\$24,350.00
13	1-inch Corporation Stop, Saddle, and Tap, Furnish and Install Complete	1	Each	\$125.00	\$125.00	\$110.00	\$110.00	\$300.00	\$300.00	\$300.00	\$300.00	\$555.50	\$555.50

CONTRACT 519-03-06 WATER SYSTEM IMPROVEMENTS  
 KY 7 AND LITTLE DRY FORK  
 LETCHER COUNTY WATER AND SEWER DISTRICT  
 LETCHER COUNTY, KENTUCKY

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BELL ENGINEERING

ITEM NO.	ITEM	QUANTITY	UNIT	Engineer's Opinion of Probable Project Cost		Akins Excavating Co., Inc. 182 Busy Lane Corbin, Kentucky 40701		K. Carrender Construction Co., Inc. 200 Ringgold Road Somerset, Kentucky 42503		Ronnie Mullins and Sons, Inc. P.O. Box 477 Elkhorn City, Kentucky 41522		Kenney, Inc. P.O. Box 1305 Mt. Sterling, Kentucky 40353	
				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
14	10-inch x 0.250-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	40	L.F.	\$50.00	\$2,000.00	\$45.00	\$1,800.00	\$30.00	\$1,200.00	\$60.00	\$2,400.00	\$55.55	\$2,222.00
15	Boring or Jacking for 10-inch Steel Cover Pipe, Unclassified Excavation	40	L.F.	\$150.00	\$6,000.00	\$100.00	\$4,000.00	\$100.00	\$4,000.00	\$140.00	\$5,600.00	\$166.65	\$6,666.00
16	12-inch x 0.250-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	40	L.F.	\$50.00	\$2,000.00	\$51.00	\$2,040.00	\$35.00	\$1,400.00	\$70.00	\$2,800.00	\$55.55	\$2,222.00
17	Boring or Jacking for 12-inch Steel Cover Pipe, Unclassified Excavation	40	L.F.	\$150.00	\$6,000.00	\$100.00	\$4,000.00	\$105.00	\$4,200.00	\$140.00	\$5,600.00	\$166.65	\$6,666.00
18	14-Inch x 0.281-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	410	L.F.	\$50.00	\$20,500.00	\$57.00	\$23,370.00	\$40.00	\$16,400.00	\$80.00	\$32,800.00	\$83.33	\$34,165.30
19	Boring or Jacking for 14-Inch Steel Cover Pipe, Unclassified Excavation	410	L.F.	\$150.00	\$61,500.00	\$125.00	\$51,250.00	\$110.00	\$45,100.00	\$150.00	\$61,500.00	\$166.65	\$68,326.50
20	Concrete Line Marker, Furnish and Install, Complete (Tall or Short Marker)	18	Each	\$100.00	\$1,800.00	\$50.00	\$900.00	\$50.00	\$1,080.00	\$50.00	\$900.00	\$111.10	\$1,999.80
21	Flushing Hydrant Assembly, Furnish and Install, Complete	5	Each	\$3,000.00	\$15,000.00	\$1,910.00	\$9,550.00	\$2,500.00	\$12,500.00	\$2,800.00	\$14,000.00	\$3,555.20	\$17,776.00
22	Meter Vault Assembly, Per Detail, Complete (Beckman School)	1	Each	\$8,000.00	\$8,000.00	\$17,355.00	\$17,355.00	\$15,000.00	\$15,000.00	\$20,000.00	\$20,000.00	\$11,110.00	\$11,110.00
23	Automatic Air Release Assembly, Complete per detail	1	Each	\$1,000.00	\$1,000.00	\$430.00	\$430.00	\$800.00	\$800.00	\$2,000.00	\$2,000.00	\$555.50	\$555.50
24	Test Meter/Tap Assembly, Furnish and Install, Per Detail, Complete	2	Each	\$1,500.00	\$3,000.00	\$1,105.00	\$2,210.00	\$900.00	\$1,800.00	\$1,200.00	\$2,400.00	\$1,666.50	\$3,333.00
25	Crushed Rock on Trench Surface, In Place	390	Ton	\$20.00	\$7,800.00	\$23.00	\$8,970.00	\$15.00	\$5,850.00	\$40.00	\$15,600.00	\$27.78	\$10,834.20
26	2-inch Thickness Bituminous Surface Replacement, Trench Width, On Streets, Drives and Roads, Complete	500	L.F.	\$20.00	\$10,000.00	\$15.00	\$7,500.00	\$15.50	\$7,750.00	\$40.00	\$20,000.00	\$27.78	\$13,890.00
27	Extra for Mechanical Removal of Solid Rock, Only On Order of the Engineer	15	C.Y.	\$200.00	\$3,000.00	\$50.00	\$750.00	\$1.00	\$15.00	\$40.00	\$600.00	\$111.10	\$1,666.50
28	Extra for Mechanical Tamping of Trench Backfill, When Not Required by Plans and/or Specifications, Only On Order of the Engineer	20	C.Y.	\$20.00	\$400.00	\$50.00	\$1,000.00	\$1.00	\$20.00	\$40.00	\$800.00	\$111.10	\$2,222.00
29	Extra for Crushed Rock for Trench Stabilization, Only on Order of the Engineer	20	Ton	\$20.00	\$400.00	\$23.00	\$460.00	\$1.00	\$20.00	\$40.00	\$800.00	\$27.78	\$555.60
30	Extra for Crushed Rock for Pipe Bedding, Only on Order of the Engineer	20	Ton	\$20.00	\$400.00	\$23.00	\$460.00	\$1.00	\$20.00	\$40.00	\$800.00	\$27.78	\$555.60
31	3" Blowoff Assembly, furnish and Install, Complete	2	Each	\$800.00	\$1,600.00	\$1,135.00	\$2,270.00	\$950.00	\$1,900.00	\$1,000.00	\$2,000.00	\$2,444.20	\$4,888.40

CONTRACT 519-03-06 WATER SYSTEM IMPROVEMENTS  
 KY 7 AND LITTLE DRY FORK  
 LETCHER COUNTY WATER AND SEWER DISTRICT  
 LETCHER COUNTY, KENTUCKY

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BELL ENGINEERING

ITEM NO.	ITEM	QUANTITY	UNIT	Engineer's Opinion of Probable Project Cost		Akins Excavating Co., Inc. 1182 Busy Lane Corbin, Kentucky 40701		K. Carrender Construction Co., Inc. 200 Ringgold Road Somerset, Kentucky 42503		Ronnie Mullins and Sons, Inc. P.O. Box 427 Elkhorn City, Kentucky 41522		Kenney, Inc. P.O. Box 1305 Mt. Sterling, Kentucky 40353	
				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
32	3-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	960	L.F.	\$7.00	\$6,720.00	\$11.70	\$11,232.00	\$8.55	\$8,208.00	\$11.00	\$10,560.00	\$13.33	\$12,796.80
33	4-inch Blowoff Assembly, Furnish and Install, Complete	2	Each	\$800.00	\$1,600.00	\$1,274.00	\$2,548.00	\$1,000.00	\$2,000.00	\$1,000.00	\$2,000.00	\$1,666.50	\$3,333.00
34	2-inch Blowoff Assembly, Furnish and Install, Complete	1	Each	\$800.00	\$800.00	\$938.00	\$938.00	\$900.00	\$900.00	\$800.00	\$800.00	\$1,666.50	\$1,666.50
	Subtotal - Division "A"				\$891,483.00		\$841,766.80		\$859,601.00		\$853,698.00		\$1,265,242.36
Division "B" - Slide Roads													
1	6-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	4,376	L.F.	\$18.00	\$78,768.00	\$14.10	\$61,701.60	\$18.00	\$78,768.00	\$20.00	\$87,520.00	\$27.78	\$121,565.28
2	4-inch Ductile Restrained Joint Pipe, Class 350, Furnishing, Trenching, Bedding, Laying and Backfilling, Unclassified Excavation, Complete	120	L.F.	\$18.00	\$2,160.00	\$21.00	\$2,520.00	\$30.00	\$3,600.00	\$30.00	\$3,600.00	\$44.44	\$5,332.80
3	4-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	700	L.F.	\$8.00	\$5,600.00	\$12.40	\$8,680.00	\$15.00	\$10,500.00	\$15.00	\$10,500.00	\$11.11	\$7,777.00
4	2-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	256	L.F.	\$7.00	\$1,792.00	\$14.00	\$3,584.00	\$8.50	\$2,176.00	\$10.00	\$2,560.00	\$13.33	\$3,412.48
5	6-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	1	EA.	\$800.00	\$800.00	\$688.00	\$688.00	\$700.00	\$700.00	\$900.00	\$900.00	\$1,444.30	\$1,444.30
6	4-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	1	EA.	\$600.00	\$600.00	\$549.00	\$549.00	\$450.00	\$450.00	\$900.00	\$900.00	\$1,333.20	\$1,333.20
7	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	673	L.B.	\$4.00	\$2,692.00	\$5.00	\$3,365.00	\$5.00	\$3,365.00	\$4.00	\$2,692.00	\$5.56	\$3,741.88
8	12-inch x 0.250-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	40	L.F.	\$50.00	\$2,000.00	\$51.00	\$2,040.00	\$33.00	\$1,400.00	\$65.00	\$2,600.00	\$55.55	\$2,222.00
9	Boring or Jacking for 12-inch Steel Cover Pipe, Unclassified Excavation	40	L.F.	\$150.00	\$6,000.00	\$100.00	\$4,000.00	\$105.00	\$4,200.00	\$145.00	\$5,800.00	\$166.65	\$6,666.00
10	5/8-inch x 3/4-inch Meter Setting, Including PRV, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	39	Each	\$800.00	\$31,200.00	\$800.00	\$31,200.00	\$750.00	\$29,250.00	\$800.00	\$31,200.00	\$1,111.00	\$43,329.00
11	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by jacking, Copper Tracer Wire, Unclassified Excavation, Complete	1,450	L.F.	\$7.25	\$10,513.00	\$8.00	\$11,600.00	\$13.10	\$18,995.00	\$9.00	\$13,050.00	\$10.00	\$14,500.00



**CONTRACT 519-03-06 WATER SYSTEM IMPROVEMENTS  
KY 7 AND LITTLE DRY FORK  
LETCHER COUNTY WATER AND SEWER DISTRICT  
LETCHER COUNTY, KENTUCKY**

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BELL ENGINEERING

ITEM NO.	ITEM	QUANTITY	UNIT	Engineer's Opinion of Probable Project Cost		Akins Excavating Co.		K. Carrender Construction Co., Inc.		Ronnie Mullins and Sons, Inc.		Kenney, Inc.	
				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
12	Concrete Line Marker, Furnish and Install, Complete (Tall or Short Marker)	6	Each	\$100.00	\$600.00	\$50.00	\$300.00	\$60.00	\$360.00	\$50.00	\$300.00	\$111.10	\$666.60
13	Crushed Rock on Trench Surface, In Place	310	Ton	\$20.00	\$6,200.00	\$23.00	\$7,130.00	\$15.00	\$4,650.00	\$40.00	\$12,400.00	\$27.78	\$8,611.80
14	2-inch Thickness Bituminous Surface Replacement, Trench Width, On Streets, Drives and Roads, Complete	25	L.F.	\$20.00	\$500.00	\$15.00	\$375.00	\$15.50	\$387.50	\$40.00	\$1,000.00	\$27.78	\$694.50
15	2-inch Blow-Off Assembly, Furnish and Install, Complete	1	Each	\$800.00	\$800.00	\$938.00	\$938.00	\$900.00	\$900.00	\$800.00	\$800.00	\$1,666.50	\$1,666.50
16	Extra for Mechanical Removal of Solid Rock, Only On Order of the Engineer	15	C.Y.	\$200.00	\$3,000.00	\$50.00	\$750.00	\$1.00	\$15.00	\$40.00	\$600.00	\$111.10	\$1,666.50
17	Extra for Mechanical Tamping of Trench Backfill, When Not Required by Plans and/or Specifications, Only On Order of the Engineer	20	C.Y.	\$20.00	\$400.00	\$50.00	\$1,000.00	\$1.00	\$20.00	\$40.00	\$800.00	\$111.10	\$2,222.00
18	Extra for Crushed Rock for Trench Stabilization, Only on Order of the Engineer	20	Ton	\$20.00	\$400.00	\$23.00	\$460.00	\$1.00	\$20.00	\$40.00	\$800.00	\$27.78	\$555.60
19	Extra for Crushed Rock for Pipe Bedding, Only on Order of the Engineer	20	Ton	\$20.00	\$400.00	\$23.00	\$460.00	\$1.00	\$20.00	\$40.00	\$800.00	\$27.78	\$555.60
20	4-Inch Blowoff Assembly, Furnish and Install, Complete	5	Each	\$800.00	\$4,000.00	\$1,274.00	\$6,370.00	\$1,000.00	\$5,000.00	\$900.00	\$4,500.00	\$1,666.50	\$8,332.50
21	3-Inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	1,730	L.F.	\$7.00	\$12,110.00	\$11.70	\$20,241.00	\$8.55	\$14,791.50	\$12.00	\$20,760.00	\$13.33	\$23,060.90
22	3-Inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	1	EA.	\$600.00	\$600.00	\$490.00	\$490.00	\$400.00	\$400.00	\$700.00	\$700.00	\$1,333.20	\$1,333.20
Subtotal - Division "B"					\$1,711,135.00		\$1,684,411.60		\$1,799,968.00		\$204,782.00		\$260,689.64
<b>SUMMARY</b>													
Subtotal Division "A"					\$891,483.00		\$841,766.80		\$859,601.00		\$853,698.00		\$1,265,242.36
Subtotal Division "B"					\$1,711,135.00		\$1,684,411.60		\$1,799,968.00		\$204,782.00		\$260,689.64
<b>TOTAL BASE BID CONTRACT 519-03-06</b>					\$1,062,618.00		\$1,010,208.40		\$1,039,569.00		\$1,058,480.00		\$1,525,932.00
<b>BID ALTERNATE 1 - BEAVER DAM ROAD, FANTASY ROAD, DIAMOND DRIVE AND CUSTOM DRIVE</b>													
1	6-inch, Class 250 (SDR-17) PVC Pipe, Furnishing, Trenching, Bedding, Laying, and Backfilling, Copper Trace Wire, Unclassified Excavation, Complete	5,814	L.F.	\$18.00	\$104,652.00	\$14.10	\$81,977.40	\$18.00	\$104,652.00	\$20.00	\$116,280.00	\$27.78	\$161,512.92
2	4-Inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Trace Wire, Unclassified Excavation, Complete	4,986	L.F.	\$8.00	\$39,888.00	\$12.40	\$61,826.40	\$15.00	\$74,790.00	\$17.00	\$84,762.00	\$11.11	\$55,394.46

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ITEM NO.	ITEM	QUANTITY	UNIT	Engineer's Opinion of Probable Project Cost		Akins Excavating Co.		K. Carrender Construction Co., Inc.		Ronnie Mullins and Sons, Inc.		Kenney, Inc.	
				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
3	2-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Trace Wire, Unclassified Excavation, Complete	253	L.F.	\$7.00	\$1,771.00	\$14.00	\$3,542.00	\$8.50	\$2,150.50	\$15.00	\$3,795.00	\$13.33	\$3,372.49
4	6-inch Mechanical Joint Resilient Seated Gate Valve and Box, Including Concrete Valve Box Collar, Complete	4	Each	\$800.00	\$3,200.00	\$688.00	\$2,752.00	\$700.00	\$2,800.00	\$1,100.00	\$4,400.00	\$1,444.30	\$5,777.20
5	4-inch Mechanical Joint Resilient Seated Gate Valve and Box, Including Concrete Valve Box Collar, Complete	1	Each	\$600.00	\$600.00	\$549.00	\$549.00	\$450.00	\$450.00	\$925.00	\$925.00	\$1,333.20	\$1,333.20
6	2-inch Mechanical Joint Resilient Seated Gate Valve and Box, Including Concrete Valve Box Collar, Complete	1	Each	\$600.00	\$600.00	\$395.00	\$395.00	\$375.00	\$375.00	\$700.00	\$700.00	\$1,111.00	\$1,111.00
7	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	420	Lbs.	\$4.00	\$1,680.00	\$5.00	\$2,100.00	\$5.00	\$2,100.00	\$5.00	\$2,100.00	\$5.56	\$2,335.20
8	5/8-inch x 3/4-inch Meter Setting, Including PRV, Meter, Meter Box, Cover Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	30	Each	\$800.00	\$24,000.00	\$800.00	\$24,000.00	\$750.00	\$22,500.00	\$900.00	\$27,000.00	\$1,111.00	\$33,330.00
9	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by jacking, Copper Trace Wire, Unclassified Excavation, Complete	750	L.F.	\$7.25	\$5,438.00	\$8.00	\$6,000.00	\$13.10	\$9,825.00	\$11.00	\$8,250.00	\$10.00	\$7,500.00
10	Concrete Line Marker, Furnish and Install, Complete (Tall or Short Marker)	5	Each	\$100.00	\$500.00	\$50.00	\$250.00	\$60.00	\$300.00	\$100.00	\$500.00	\$111.10	\$555.50
11	Crushed Rock on Trench Surface, In Place	240	Ton	\$20.00	\$4,800.00	\$23.00	\$5,520.00	\$15.00	\$3,600.00	\$50.00	\$12,000.00	\$27.78	\$6,667.20
12	2-inch Thickness Bituminous Surface Replacement, Trench Width, On Streets, Drives and Roads, Complete	600	L.F.	\$20.00	\$12,000.00	\$15.00	\$9,000.00	\$15.50	\$9,300.00	\$50.00	\$30,000.00	\$27.78	\$16,668.00
13	6 to 7-inch Thickness, Concrete Surface Replacement, Trench Width, On Driveways, Complete	100	L.F.	\$25.00	\$2,500.00	\$16.50	\$1,650.00	\$45.00	\$4,500.00	\$70.00	\$7,000.00	\$83.33	\$8,333.00
14	Flushing Hydrant Assembly, Furnish and Install, Complete	4	Each	\$3,000.00	\$12,000.00	\$1,910.00	\$7,640.00	\$2,500.00	\$10,000.00	\$3,500.00	\$14,000.00	\$3,555.20	\$14,220.80
TOTAL BID ALTERNATE 1					\$213,629.00	\$207,201.80	\$247,342.50	\$311,712.00					\$318,110.97
BID ALTERNATE 2 - BUCK CREEK ROAD AND SPRING BRANCH ROAD													
1	4-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying, and Backfilling, Copper Trace Wire, Unclassified Excavation, Complete	7,150	L.F.	\$8.00	\$57,200.00	\$12.40	\$88,660.00	\$15.00	\$107,250.00	\$17.00	\$121,550.00	\$11.11	\$79,436.50



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				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
<b>BID ALTERNATE 3 - LOVES BRANCH ROAD</b>													
1	4-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying, and Backfilling, Copper Trace Wire, Unclassified Excavation, Complete	1,930	L.F.	\$8.00	\$15,440.00	\$12.40	\$23,932.00	\$15.00	\$28,950.00	\$17.00	\$32,810.00	\$11.11	\$21,442.30
2	4-inch Mechanical Joint Resilient Seated Gate Valve and Box, Including Concrete Valve Box Collar, Complete	1	Each	\$600.00	\$600.00	\$549.00	\$549.00	\$450.00	\$450.00	\$925.00	\$925.00	\$1,333.20	\$1,333.20
3	5/8-inch x 3/4-inch Meter Setting, Including PRV, Meter, Meter Box, Cover Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	20	Each	\$800.00	\$16,000.00	\$800.00	\$16,000.00	\$750.00	\$15,000.00	\$900.00	\$18,000.00	\$1,111.00	\$22,220.00
4	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Trace Wire, Unclassified Excavation, Complete	740	L.F.	\$7.25	\$5,365.00	\$8.00	\$5,920.00	\$13.10	\$9,694.00	\$11.00	\$8,140.00	\$10.00	\$7,400.00
5	Crushed Rock on Trench Surface, In Place	225	Ton	\$20.00	\$4,500.00	\$23.00	\$5,175.00	\$15.00	\$3,375.00	\$50.00	\$11,250.00	\$27.78	\$6,250.50
6	Concrete Line Marker, Furnish and Install, Complete (Tall or Short Marker)	2	Each	\$100.00	\$200.00	\$50.00	\$100.00	\$60.00	\$120.00	\$100.00	\$200.00	\$111.10	\$222.20
7	Flushing Hydrant Assembly, Furnish and Install, Complete	1	Each	\$3,000.00	\$3,000.00	\$1,910.00	\$1,910.00	\$2,500.00	\$2,500.00	\$3,500.00	\$3,500.00	\$3,555.20	\$3,555.20
<b>TOTAL BID ALTERNATE 3</b>					\$45,105.00		\$53,586.00		\$60,089.00		\$74,825.00		\$62,423.40
<b>BID ALTERNATE 4 - KENTUCKY MAY DRIVE</b>													
1	4-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying, and Backfilling, Copper Trace Wire, Unclassified Excavation, Complete	1,165	L.F.	\$8.00	\$9,320.00	\$12.40	\$14,446.00	\$15.00	\$17,475.00	\$17.00	\$19,805.00	\$11.11	\$12,943.15
2	4-inch Ductile Iron Pipe, Class 350, Furnishing, Trenching, Bedding, Laying and Backfilling, Unclassified Excavation, Complete	100	L.F.	\$18.00	\$1,800.00	\$19.60	\$1,960.00	\$25.00	\$2,500.00	\$25.00	\$2,500.00	\$27.78	\$2,778.00
3	4-inch Mechanical Joint Resilient Seated Gate Valve and Box, Including Concrete Valve Box Collar, Complete	2	Each	\$600.00	\$1,200.00	\$549.00	\$1,098.00	\$450.00	\$900.00	\$925.00	\$1,850.00	\$1,333.20	\$2,666.40
4	10-inch x 0.250-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by Open Cut or Boring)	140	L.F.	\$50.00	\$7,000.00	\$45.00	\$6,300.00	\$30.00	\$4,200.00	\$70.00	\$9,800.00	\$55.55	\$7,777.00
5	Boring and Jacking for 10-inch Steel Cover Pipe, Unclassified Excavation	140	L.F.	\$150.00	\$21,000.00	\$100.00	\$14,000.00	\$100.00	\$14,000.00	\$140.00	\$19,600.00	\$166.65	\$23,331.00
6	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	110	Lbs.	\$4.00	\$440.00	\$5.00	\$550.00	\$5.00	\$550.00	\$5.00	\$550.00	\$5.56	\$611.60

CONTRACT 519-03-06 WATER SYSTEM IMPROVEMENTS  
KY 7 AND LITTLE DRY FORK  
LETCHER COUNTY WATER AND SEWER DISTRICT  
LETCHER COUNTY, KENTUCKY

We certify that the following is a true and complete tabulation of all bids received by the Letcher County Water and Sewer District, Whitesburg, Kentucky, on November 21, 2006 for the titled project.

BELL ENGINEERING

ITEM NO.	ITEM	QUANTITY	UNIT	Engineer's Opinion of Probable Project Cost		Akins Excavating Co., 182 Busy Lane Corbin, Kentucky 40701		K. Carrender Construction Co., Inc., 200 Ringgold Road Somerset, Kentucky 42503		Ronnie Mullins and Sons, Inc., P.O. Box 427 Elkhorn City, Kentucky 41522		Kenney, Inc., P.O. Box 1305 Mt. Sterling, Kentucky 40353	
				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
7	5/8-inch x 3/4-inch Meter Setting, Including PRV, Meter, Meter Box, Cover Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	14	Each	\$800.00	\$11,200.00	\$800.00	\$11,200.00	\$750.00	\$10,500.00	\$900.00	\$12,600.00	\$1,111.00	\$15,554.00
8	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Trace Wire, Unclassified Excavation, Complete	300	L.F.	\$7.25	\$2,175.00	\$8.00	\$2,400.00	\$13.10	\$3,930.00	\$11.00	\$3,300.00	\$10.00	\$3,000.00
9	1-inch Corporation Stop, Saddle, and Tap, Furnish and Install, Complete	1	Each	\$125.00	\$125.00	\$110.00	\$110.00	\$300.00	\$300.00	\$200.00	\$200.00	\$555.50	\$555.50
10	1-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying, and Backfilling, or by Jacking, Copper Trace Wire, Unclassified Excavation, Complete	150	L.F.	\$9.00	\$1,350.00	\$9.00	\$1,350.00	\$13.50	\$2,025.00	\$12.00	\$1,800.00	\$16.67	\$2,500.50
11	Crushed Rock on Trench Surface, In Place	400	Ton	\$20.00	\$8,000.00	\$23.00	\$9,200.00	\$15.00	\$6,000.00	\$50.00	\$20,000.00	\$27.78	\$11,112.00
12	Flushing Hydrant Assembly, Furnish and Install, Complete	1	Each	\$3,000.00	\$3,000.00	\$1,910.00	\$1,910.00	\$2,500.00	\$2,500.00	\$2,500.00	\$2,500.00	\$3,555.20	\$3,555.20
13	Test Meter/Tap Assembly, Furnish and Install, Per Detail, Complete	1	Each	\$1,000.00	\$1,000.00	\$1,105.00	\$1,105.00	\$900.00	\$900.00	\$2,500.00	\$2,500.00	\$1,666.50	\$1,666.50
TOTAL BID ALTERNATE 4					\$67,610.00		\$65,629.00		\$65,780.00		\$97,005.00		\$88,050.85
BID ALTERNATE 5 - DIVISION "A" - KY 15 AND LITTLE DRY FORK													
1	6-inch Ductile Iron Pipe, Class 350, Furnishing, Trenching, Bedding, Laying and Backfilling, Unclassified Excavation, Complete	1,018	L.F.	\$24.00	\$24,432.00	\$19.20	\$19,545.60	\$30.00	\$30,540.00	\$30.00	\$30,540.00	\$33.33	\$33,929.94
2	6-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	18,650	L.F.	\$18.00	\$335,700.00	\$14.10	\$262,965.00	\$18.00	\$335,700.00	\$20.00	\$373,000.00	\$27.78	\$518,097.00
3	2-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	800	L.F.	\$7.00	\$5,600.00	\$14.00	\$11,200.00	\$8.50	\$6,800.00	\$15.00	\$12,000.00	\$13.33	\$10,664.00
4	1-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	100	L.F.	\$9.00	\$900.00	\$10.00	\$1,000.00	\$13.50	\$1,350.00	\$15.00	\$1,500.00	\$16.67	\$1,667.00
5	1-inch Corporation Stop, Saddle, and Tap, Furnish and Install Complete	1	Each	\$125.00	\$125.00	\$110.00	\$110.00	\$300.00	\$300.00	\$200.00	\$200.00	\$555.50	\$555.50
6	6-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	7	EA.	\$800.00	\$5,600.00	\$688.00	\$4,816.00	\$700.00	\$4,900.00	\$1,000.00	\$7,000.00	\$1,444.30	\$10,110.10
7	2-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	3	EA.	\$400.00	\$1,200.00	\$395.00	\$1,185.00	\$375.00	\$1,125.00	\$700.00	\$2,100.00	\$1,111.00	\$3,333.00

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We certify that the following is a true and complete tabulation of all bids received by the Letcher County Water and Sewer District, Whitesburg, Kentucky, on November 21, 2006 for the titled project.

BELL ENGINEERING

ITEM NO.	ITEM	QUANTITY	UNIT	Engineer's Opinion of Probable Project Cost		Akins Excavating Co.		K. Carrender Construction Co., Inc.		Ronnie Mullins and Sons, Inc.		Kenney, Inc.	
				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
8	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	1,475	L.B.	\$4.00	\$5,900.00	\$5.00	\$7,375.00	\$5.00	\$7,375.00	\$5.00	\$7,375.00	\$5.56	\$8,201.00
9	5/8-inch x 3/4-inch Meter Setting, Including Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	24	Each	\$800.00	\$19,200.00	\$775.00	\$18,600.00	\$700.00	\$16,800.00	\$900.00	\$21,600.00	\$1,111.00	\$26,664.00
10	5/8-inch x 3/4-inch Meter w/ Pressure Regulator, Including Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	29	Each	\$800.00	\$23,200.00	\$800.00	\$23,200.00	\$750.00	\$21,750.00	\$1,100.00	\$31,900.00	\$1,111.00	\$32,219.00
11	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	1,305	L.F.	\$7.25	\$9,462.00	\$8.00	\$10,440.00	\$13.10	\$17,095.50	\$11.00	\$14,355.00	\$10.00	\$13,050.00
12	3/4-inch Copper Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	125	L.F.	\$10.00	\$1,250.00	\$13.25	\$1,656.25	\$35.00	\$4,375.00	\$16.00	\$2,000.00	\$22.22	\$2,777.50
13	8-inch x 0.188-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	76	L.F.	\$50.00	\$3,800.00	\$33.85	\$2,572.60	\$20.00	\$1,520.00	\$60.00	\$4,560.00	\$55.55	\$4,221.80
14	Boring or Jacking for 8-inch Steel Cover Pipe, Unclassified Excavation	76	L.F.	\$150.00	\$11,400.00	\$100.00	\$7,600.00	\$90.00	\$6,840.00	\$80.00	\$6,080.00	\$166.65	\$12,665.40
15	10-inch x 0.25-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	40	L.F.	\$50.00	\$2,000.00	\$45.00	\$1,800.00	\$30.00	\$1,200.00	\$70.00	\$2,800.00	\$55.55	\$2,222.00
16	Boring or Jacking for 10-inch Steel Cover Pipe, Unclassified Excavation	40	L.F.	\$150.00	\$6,000.00	\$100.00	\$4,000.00	\$100.00	\$4,000.00	\$140.00	\$5,600.00	\$166.65	\$6,666.00
17	12-inch x 0.25-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	106	L.F.	\$50.00	\$5,300.00	\$51.00	\$5,406.00	\$35.00	\$3,710.00	\$80.00	\$8,480.00	\$55.55	\$5,888.30
18	Boring or Jacking for 12-inch Steel Cover Pipe, Unclassified Excavation	106	L.F.	\$150.00	\$15,900.00	\$100.00	\$10,600.00	\$105.00	\$11,130.00	\$150.00	\$15,900.00	\$166.65	\$17,664.90
19	Flushing Hydrant Assembly, Furnish and Install, Complete	1	Each	\$3,000.00	\$3,000.00	\$1,910.00	\$1,910.00	\$2,500.00	\$2,500.00	\$3,500.00	\$3,500.00	\$3,555.20	\$3,555.20
20	Automatic Air Release Assembly, Furnish and Install, Complete	1	Each	\$1,000.00	\$1,000.00	\$430.00	\$430.00	\$800.00	\$800.00	\$1,500.00	\$1,500.00	\$555.50	\$555.50
21	2-inch Blow-Off Assembly, Furnish and Install, Complete	3	Each	\$800.00	\$2,400.00	\$938.00	\$2,814.00	\$900.00	\$2,700.00	\$800.00	\$2,400.00	\$1,666.50	\$4,999.50
22	Concrete Line Marker, Furnish and Install, Complete (Tall or Short Marker)	9	Each	\$100.00	\$900.00	\$50.00	\$450.00	\$60.00	\$540.00	\$100.00	\$900.00	\$111.10	\$999.90
23	Crushed Rock on Trench Surface, In Place	370	Ton	\$20.00	\$7,400.00	\$23.00	\$8,510.00	\$15.00	\$5,550.00	\$50.00	\$18,500.00	\$27.78	\$10,278.60

CONTRACT 519-03-06 WATER SYSTEM IMPROVEMENTS  
 KY 7 AND LITTLE DRY FORK  
 LETCHER COUNTY WATER AND SEWER DISTRICT  
 LETCHER COUNTY, KENTUCKY

We certify that the following is a true and complete tabulation of all bids received by the Letcher County Water and Sewer District, Whitesburg, Kentucky, on November 21, 2006 for the titled project.

BELL ENGINEERING

ITEM NO.	ITEM	QUANTITY	UNIT	Engineer's Opinion of Probable Project Cost		Akina Excavating Co.		K. Carrender Construction Co., Inc.		Ronnie Mullins and Sons, Inc.		Kenney, Inc.	
				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
24	2-inch Thickness Bituminous Surface Replacement, Trench Width, On Streets, Drives and Roads, Complete	175	L.F.	\$20.00	\$3,500.00	\$15.60	\$2,730.00	\$15.50	\$2,712.50	\$50.00	\$8,750.00	\$27.78	\$4,861.50
25	6 to 7-inch Thickness, Concrete Surface Replacement, Trench Width, On Driveways Complete	55	L.F.	\$25.00	\$1,375.00	\$16.50	\$907.50	\$45.00	\$2,475.00	\$100.00	\$5,500.00	\$83.33	\$4,583.15
26	Extra for Mechanical Removal of Solid Rock, Only On Order of the Engineer	15	C.Y.	\$200.00	\$3,000.00	\$50.00	\$750.00	\$1.00	\$15.00	\$50.00	\$750.00	\$111.10	\$1,666.50
27	Extra for Mechanical Tamping of Trench Backfill, When Not Required by Plans and/or Specifications, Only On Order of the Engineer	20	C.Y.	\$20.00	\$400.00	\$50.00	\$1,000.00	\$1.00	\$20.00	\$50.00	\$1,000.00	\$111.10	\$2,222.00
28	Extra for Crushed Rock for Trench Stabilization, Only on Order of the Engineer	20	Ton	\$20.00	\$400.00	\$23.00	\$460.00	\$1.00	\$20.00	\$50.00	\$1,000.00	\$27.78	\$555.60
29	Extra for Crushed Rock for Pipe Bedding, Only on Order of the Engineer	20	Ton	\$20.00	\$400.00	\$23.00	\$460.00	\$1.00	\$20.00	\$50.00	\$1,000.00	\$27.78	\$555.60
30	Master PRV Assembly, Furnish and Install, Complete	2	Each	\$10,000.00	\$20,000.00	\$17,400.00	\$34,800.00	\$10,000.00	\$20,000.00	\$20,000.00	\$40,000.00	\$11,110.00	\$22,220.00
	Subtotal - Division "A"			\$520,744.00		\$449,292.95		\$513,863.00		\$631,790.00		\$767,649.49	
DIVISION "B" - SIDE ROADS													
1	4-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	6,614	L.F.	\$8.00	\$52,912.00	\$12.40	\$82,013.60	\$15.00	\$99,210.00	\$17.00	\$112,438.00	\$11.11	\$73,481.54
2	2-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	1,767	L.F.	\$7.00	\$12,369.00	\$14.00	\$24,738.00	\$8.50	\$15,019.50	\$15.00	\$26,505.00	\$13.33	\$23,554.11
3	1-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, Copper Tracer Wire, Unclassified Excavation, Complete	200	L.F.	\$9.00	\$1,800.00	\$10.00	\$2,000.00	\$13.50	\$2,700.00	\$12.00	\$2,400.00	\$16.67	\$3,334.00
4	1-inch Corporation Stop, Saddle, and Tap, Furnish and Install Complete	3	Each	\$125.00	\$375.00	\$110.00	\$330.00	\$300.00	\$900.00	\$200.00	\$600.00	\$55.50	\$166.50
5	4-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	3	EA.	\$600.00	\$1,800.00	\$549.00	\$1,647.00	\$450.00	\$1,350.00	\$925.00	\$2,775.00	\$1,333.20	\$3,999.60
6	2-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	5	EA.	\$400.00	\$2,000.00	\$395.00	\$1,975.00	\$375.00	\$1,875.00	\$700.00	\$3,500.00	\$1,111.00	\$5,555.00
7	Ductile Iron Compact Mechanical Joint Pipe Fittings, Furnish and Install, Including Concrete Blocking, Complete	327	L.B.	\$4.00	\$1,308.00	\$5.00	\$1,635.00	\$5.00	\$1,635.00	\$5.00	\$1,635.00	\$5.56	\$1,818.12

CONTRACT 519-03-06 WATER SYSTEM IMPROVEMENTS  
 KY 7 AND LITTLE DRY FORK  
 LETCHER COUNTY WATER AND SEWER DISTRICT  
 LETCHER COUNTY, KENTUCKY

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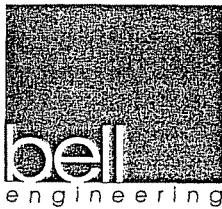
BELL ENGINEERING

ITEM NO.	ITEM	QUANTITY	UNIT	Engineer's Opinion of Probable Project Cost		Akins Excavating Co. 182 Busy Lairs Corbn, Kentucky 40701		K. Carrender Construction Co., Inc. 200 Ringgold Road Somerset, Kentucky 42503		Romie Mullins and Sons, Inc. P.O. Box 427 Elkhorn City, Kentucky 41522		Kemney, Inc. P.O. Box 1305 Mt. Sterling, Kentucky 40353	
				UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
8	5/8-inch x 3/4-inch Meter Setting, Including Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	18	Each	\$800.00	\$14,400.00	\$775.00	\$13,950.00	\$700.00	\$12,600.00	\$800.00	\$14,400.00	\$1,111.00	\$19,998.00
9	5/8-inch x 3/4-inch Meter Setting, Including PRV, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	25	Each	\$800.00	\$20,000.00	\$800.00	\$20,000.00	\$750.00	\$18,750.00	\$900.00	\$22,500.00	\$1,111.00	\$27,775.00
10	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	1,100	L.F.	\$7.25	\$7,975.00	\$8.00	\$8,800.00	\$13.10	\$14,410.00	\$11.00	\$12,100.00	\$10.00	\$11,000.00
11	10-inch x 0.188-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	80	L.F.	\$50.00	\$4,000.00	\$45.00	\$3,600.00	\$30.00	\$2,400.00	\$60.00	\$4,800.00	\$55.55	\$4,444.00
12	Boring or Jacking for 10-inch Steel Cover Pipe, Unclassified Excavation	40	L.F.	\$150.00	\$6,000.00	\$100.00	\$4,000.00	\$100.00	\$4,000.00	\$140.00	\$5,600.00	\$166.65	\$6,666.00
13	2-inch Blow-Off Assembly, Furnish and Install, Complete	5	Each	\$800.00	\$4,000.00	\$938.00	\$4,690.00	\$900.00	\$4,500.00	\$900.00	\$4,500.00	\$1,666.50	\$8,332.50
14	Flushing Hydrant Assembly, Furnish and Install, Complete	2	Each	\$3,000.00	\$6,000.00	\$1,910.00	\$3,820.00	\$2,500.00	\$5,000.00	\$3,500.00	\$7,000.00	\$3,555.20	\$7,110.40
15	Concrete Line Marker, Furnish and Install, Complete (Tall or Short Marker)	2	Each	\$100.00	\$200.00	\$50.00	\$100.00	\$60.00	\$120.00	\$100.00	\$200.00	\$111.10	\$222.20
16	Crushed Rock on Trench Surface, In Place	625	Ton	\$20.00	\$12,500.00	\$23.00	\$14,375.00	\$15.00	\$9,375.00	\$50.00	\$31,250.00	\$27.78	\$17,362.50
17	2-inch Thickness Bituminous Surface Replacement, Trench Width, On Streets, Drives and Roads, Complete	200	L.F.	\$20.00	\$4,000.00	\$15.00	\$3,000.00	\$15.50	\$3,100.00	\$50.00	\$10,000.00	\$27.78	\$5,556.00
18	Extra for Mechanical Removal of Solid Rock, Only on Order of the Engineer	15	C.Y.	\$200.00	\$3,000.00	\$50.00	\$750.00	\$1.00	\$15.00	\$50.00	\$750.00	\$111.10	\$1,666.50
19	Extra for Mechanical Tamping of Trench Backfill, When Not Required by Plans and/or Specifications, Only on Order of the Engineer	20	C.Y.	\$20.00	\$400.00	\$50.00	\$1,000.00	\$1.00	\$20.00	\$50.00	\$1,000.00	\$111.10	\$2,222.00
20	Extra for Crushed Rock for Trench Stabilization, Only on Order of the Engineer	20	Ton	\$20.00	\$400.00	\$23.00	\$460.00	\$1.00	\$20.00	\$50.00	\$1,000.00	\$27.78	\$555.60
21	Extra for Crushed Rock for Pipe Bedding, Only on Order of the Engineer	20	Ton	\$20.00	\$400.00	\$23.00	\$460.00	\$1.00	\$20.00	\$50.00	\$1,000.00	\$27.78	\$555.60
22	12-Foot Tubular Steel Farm Gate, Furnish and Install, Complete, Only on Order of the Engineer	2	Each	\$500.00	\$1,000.00	\$2,000.00	\$4,000.00	\$1,000.00	\$2,000.00	\$500.00	\$1,000.00	\$2,222.00	\$4,444.00
Subtotal - Division "B"					\$156,589.00		\$197,123.60		\$198,419.50		\$266,553.00		\$230,208.17
TOTAL BID ALTERNATE 5					\$677,333.00		\$646,416.55		\$712,282.50		\$898,343.00		\$997,857.66



APPENDIX C

RECOMMENDATION FOR AWARD  
CONTRACT 519-03-05, AREA 1



December 10, 2006

Letcher County Water and Sewer District  
P.O. Box 827  
Whitesburg, KY 41858

Attn: Mr. Don Profitt, Chairman

Subject: Recommendation for Award  
Contract 519-03-05-Area 2  
Water Line Extension  
Camp Branch  
Letcher County Water and Sewer District

Dear Mr. Profitt,

We are pleased to submit our recommendation for award of the subject contract. After your bid opening on November 21, 2006, Bell Engineering reviewed, mathematically checked and tabulated all bids received. A certified copy of the bid tabulation is enclosed for your records.

Contractor interest in your project was acceptable, with 5 plan holders and 4 bids being offered. Bid prices are summarized below. The low project base bid totaled \$661,910.00 compared to Bell's Opinion of As-Designed Probable Cost of \$696,138.00. The low bid, then, was \$34,228.00 (4.92%) below the Opinion of Probable Construction Cost. It is assumed that bidder work loads account for the difference between the bids.

***SUMMARY OF KEY BID RESULTS***

<u>BIDDER RANK</u>	<u>BIDDER NAME</u>	<u>BID AMOUNT</u>	<u>DIFF. ABOVE LOW</u>
1	<u>Akins Excavating, Inc.</u>	<u>\$661,910.00</u>	<u>Not Applicable</u>
2	<u>K. Carrender Construction Co., Inc.</u>	<u>\$665,697.50</u>	<u>\$ 3,787.50 (0.57%)</u>
3	<u>Ronnie Mullins and Sons, Inc.</u>	<u>\$691,946.00</u>	<u>\$30,036.00 (4.54%)</u>
4	<u>Kenney, Inc.</u>	<u>\$882,120.88</u>	<u>\$220,210.00 (33.27%)</u>

354 waller avenue lexington, kentucky 40504  
po box 546 lexington, kentucky 40588  
859.278.5412 phone 859.278.2911 fax www.hkbell.com

Mr. Don Profitt Letter  
December 10, 2006  
Page 2 of 2

Akins Excavating of Corbin, Kentucky has been in business since 1993. This contractor has completed several significant projects on which Bell Engineering provided the engineering services. The Contractor has also provided construction services for several significant water improvement projects for the Letcher County Water and Sewer District in the last several years. Past work performed by this contractor on these projects was satisfactory. We have discussed the project with Akins Excavating to further assess their abilities to complete your project. We believe them to be capable of completing Contract 519-03-05-Area 2 as bid.

Assuming sufficient funds are available for construction of the project, we suggest the District pass a resolution to award the contract to Akins Excavating. Multiple alternates were also bid for the project. Since the amount of this award should be in accordance with available monies, we suggest a separate meeting to discuss which alternates to include in the project. It is possible that in order to meet the requirement of the trust that each of the 29 plaintiffs receive water prior to release of trusts funds, the District may have to incur short-term debt to complete the project. For these reasons, we suggest a representative of the Coal Settlement Trust be included in this meeting.

Upon your directive, Bell Engineering will distribute contract documents for execution. We will be happy to meet with you and your District to discuss bid results at your convenience, if desired. Should you have any questions about this or any other matter, please do not hesitate to call.

Sincerely,  
Bell Engineering



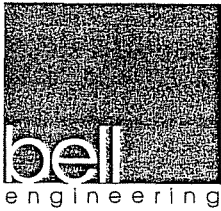
Stephen Caudill  
Project Manager

Enclosure

c: Mr. Jim Tolliver, Director, Letcher County Water and Sewer District

APPENDIX D

RECOMMENDATION FOR AWARD  
CONTRACT 519-03-06



December 10, 2006

Letcher County Water and Sewer District  
P.O. Box 827  
Whitesburg, KY 41858

Attn: Mr. Don Profitt, Chairman

Subject: **Recommendation for Award**  
**Contract 519-03-06**  
**Water Line Extension**  
**KY 7 & Little Dry Fork**  
**Letcher County Water and Sewer District**

Dear Mr. Profitt,

We are pleased to submit our recommendation for award of the subject contract. After your bid opening on November 21, 2006, Bell Engineering reviewed, mathematically checked and tabulated all bids received. Minor math errors were discovered but they did not alter the bidder's overall rank. A certified copy of the bid tabulation is enclosed for your records.

Contractor interest in your project was acceptable, with 5 plan holders and 4 bids being offered. Bid prices are summarized below. The low project base bid totaled \$1,010,208.40 compared to Bell's Opinion of As-Designed Probable Cost of \$1,062,618.00. The low bid, then, was \$52,409.60 (4.93%) below the Opinion of Probable Construction Cost. It is assumed that bidder work loads account for the difference between the bids.

***SUMMARY OF KEY BID RESULTS***

<b><u>BIDDER RANK</u></b>	<b><u>BIDDER NAME</u></b>	<b><u>BID AMOUNT</u></b>	<b><u>DIFF. ABOVE LOW</u></b>
<b>1</b>	<b><u>Akins Excavating, Inc.</u></b>	<b><u>\$1,010,208.40</u></b>	<b><u>Not Applicable</u></b>
<b>2</b>	<b><u>K. Carrender Construction Co., Inc.</u></b>	<b><u>\$1,039,569.00</u></b>	<b><u>\$29,360.60 (2.91%)</u></b>
<b>3</b>	<b><u>Ronnie Mullins and Sons, Inc.</u></b>	<b><u>\$1,058,480.00</u></b>	<b><u>\$48,271.60 (4.78%)</u></b>
<b>4</b>	<b><u>Kenney, Inc.</u></b>	<b><u>\$1,525,932.00</u></b>	<b><u>\$515,723.60 (51.05%)</u></b>

354 waller avenue lexington, kentucky 40504  
po box 546 lexington, kentucky 40588  
859.278.5412 phone 859.278.2911 fax www.hkbell.com

Mr. Don Profitt Letter  
December 10, 2006  
Page 2 of 2

Akins Excavating of Corbin, Kentucky has been in business since 1993. This contractor has completed several significant projects on which Bell Engineering provided the engineering services. The Contractor has also provided construction services for several significant water improvement projects for the Letcher County Water and Sewer District in the last several years. Past work performed by this contractor on these projects was satisfactory. We have discussed the project with Akins Excavating to further assess their abilities to complete your project. We believe them to be capable of completing Contract 519-03-06 as bid.

Assuming sufficient funds are available for construction of the project, we suggest the District pass a resolution to award the contract to Akins Excavating. Multiple alternates were also bid for the project. Since the amount of this award should be in accordance with available monies, we suggest a separate meeting to discuss which alternates to include in the project. It is possible that in order to meet the requirement of the trust that each of the 29 plaintiffs receive water prior to release of trusts funds, the District may have to incur short-term debt to complete the project. For these reasons, we suggest a representative of the Coal Settlement Trust be included in this meeting.

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Sincerely,  
Bell Engineering



Stephen Caudill  
Project Manager

Enclosure

c: Mr. Jim Tolliver, Director, Letcher County Water and Sewer District

RECEIVED

FEB 14 2007

PUBLIC SERVICE

Case No. 2007-00070

***PRELIMINARY ENGINEERING REPORT***

***PROPOSED WATER SYSTEM EXTENSIONS***

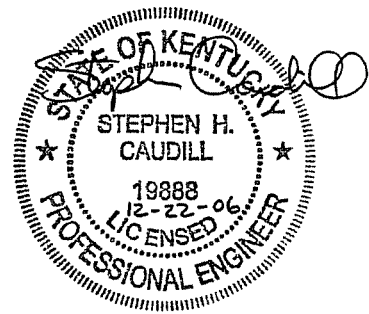
***LETCHER COUNTY WATER & SEWER DISTRICT  
LETCHER COUNTY, KENTUCKY***

Revised July 2003  
Amended Fall 2006

***Bell Engineering***

354 Waller Avenue, Lexington, Kentucky 40504

107 Forbes Drive, Hopkinsville, Kentucky 42240  
3983 Teays Valley Rd., Ste. 202, Hurricane, WV 25526



Case No. 2007-00070

**AMENDMENT TO THE PRELIMINARY ENGINEERING REPORT  
PROPOSED WATER SYSTEM IMPROVEMENTS  
LETCHER COUNTY WATER AND SEWER DISTRICT**

**RECEIVED**

FEB 14 2007

**INTRODUCTION**

**PUBLIC SERVICE  
COMMISSION**

The Letcher County Water and Sewer District (LCWSD) is incorporated in accordance with Chapter 273 of the Statutes of the Commonwealth of Kentucky and has an office located in Whitesburg, Kentucky. The LCWSD intends to undertake a project that will extend potable water service to residents in the Sandlick, Camp Branch, KY 7 and Little Dry Fork areas of Letcher County. Residents in these areas of the county must currently rely on groundwater as their primary source of potable water. In many cases the groundwater has been polluted and is no longer suitable for use as a drinking water source. This poses serious health risks to residents and stifles growth of the community. This project will provide a means of remedying these problems.

The proposed project will include the construction of 20.4 miles of water line. Water mains will generally follow county and state roads but may on occasion follow cross country routes. Since the project will generally follow various highway rights-of-way that have previously been disturbed, it is anticipated that few new areas will be disturbed by the project.

**PROJECT PLANNING AREA**

The project area covers various locations in the LCWSD service area and includes portions of Areas 1 and 2 shown in the preliminary engineering report. The proposed project has been divided into two contracts. These are as follows:

**Contract 519-03-01, Area 2** -- This area lies north of the City of Whitesburg, Kentucky. The proposed water line will extend water service along Kentucky 931 & KY 7 from the intersection of KY 931 / KY 1862 to the intersection of KY 1410 / KY 7. Also included in this project are the areas of Pistol City, Ragwood Road, Cookeville Road, Glass Road, Winter Drive, Berry Lane, Mandrill Drive, Kentland Drive, Cane Hollow, Sugar Run, Derby Road and Delong Road.

**Contract 519-03-06** -- This area lies north of the City of Whitesburg, Kentucky. The proposed water line will extend water service along KY 7 from the intersection of KY 1410 / KY 7 to the community of Democrat and along Little Dry Fork Road. Also included in the project area are the communities of Beaver Dam Road, Fantasy Road, Diamond Drive, Custom Drive, Buck Creek Road, Spring Branch Road, Loves Branch Road and Kentucky May Drive.



## BUDGET INFORMATION

Budget information for the project is as follows:

Contract 519-03-05-Area 2	\$ 661,910.00
Alternate 2 - Ragweed Road	\$ 72,222.00
Alternate 7 - Mandrill Drive	\$ 39,265.00
Alternate 8 - Kentland Drive	\$ 22,811.00
Alternate 9 - Cane Hollow	\$ 81,193.00
Alternate 10 - Sugar Run	\$ 54,863.80
Alternate 11 - Derby Road	\$ 12,134.00
Alternate 12 - Delong Road	\$ 18,391.00
Contract 519-03-06	\$1,010,208.40
Alternate 1 - Beaver Dam, Custom	\$ 207,201.80
Alternate 2 - Buck Creek, Spring	\$ 146,421.00
Alternate 3 - Loves Branch	\$ 53,586.00
Alternate 4 - Kentucky May	\$ 65,629.00
Alternate 5A - KY 15/Dry Fork	\$ 449,292.95
Non-Construction	
Environmental	\$ 5,000.00
Project Development	\$ 0.00
Project Design	\$ 0.00
Other	\$ 533.60
Project Bidding	\$ 21,790.00
Construction Administration	\$ 39,200.00
Resident Inspection	\$ 88,591.00
Operator Training & Start-up	\$ 5,000.00
Interest During Construction	\$ 50,000.00
Legal & Administrative	\$ 25,000.00
O&M Reserve	\$ 25,000.00
Construction Contingencies	\$ 144,756.45
	<b>\$3,300,000.00</b>

## PROPOSED PROJECT FUNDING

Proposed project funding is outlined below.

<u>Funding Source</u>	<u>Amount</u>
Rural Development Grant	\$ 700,000.00
Rural Development Loan	\$1,100,000.00
Coal Settlement Money	<u>\$1,500,000.00</u>
	<b>\$3,300,000.00</b>

## CONCLUSION

The proposed project will entail the construction of approximately 20.4 miles of 3, 4, 6 and 8-inch water lines. The project has been designed to facilitate the acceptance of potable water from the Knott County Water and Sewer District or the Southern Water District should these waters become available in the future.

**PRELIMINARY ENGINEERING REPORT  
LETCHER COUNTY WATER AND SEWER DISTRICT  
PROPOSED WATER SYSTEM EXTENSIONS**

**Revised July 2003**

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# PRELIMINARY ENGINEERING REPORT LETCHER COUNTY WATER AND SEWER DISTRICT PROPOSED WATER SYSTEM EXTENSIONS

## INTRODUCTION

The Letcher County Water and Sewer District (LCWSD) has been incorporated in accordance with Chapter 273, Statutes of the Commonwealth of Kentucky, and all of the district business is conducted by the commissioners. The district office is located in Whitesburg, Kentucky. The LCWSD is run by a director who coordinates the operation and maintenance of the system in addition to financial and managerial tasks. The LCWSD presently purchases water from the City of Blackey for its Phase I, Isom-Jeremiah project northeast of the Blackey community. The LCWSD has the goal of supplying potable water to all areas of Letcher County.

This preliminary engineering report involves proposed water system extensions to areas of the county to partly meet that goal. The LCWSD also has an agreement to furnish water to 29 residences in the Indian Creek/Camp Branch areas whose water has been impacted by coal mining operations. The water system extensions shown in this report will provide water to those areas. Available processed water is a big concern. The Cities of Blackey and Whitesburg have water treatment plants but raw water source is limited. This report presents alternatives for this situation.

A preliminary engineering report for the expansion of the City of Whitesburg water treatment plant is included in Appendix 3, but the expansion is not required to meet the demands for the proposed water system extensions.

## PROJECT PLANNING AREA

### A. Location

The planning area covers various locations in the LCWSD service area and for purposes of this report is divided into four areas. These are as follows:

- Area 1 lies in the northern section of Letcher County along and adjacent to Highway 7 from the Knott County line to Highway 931, Highway 317 from Highway 7 to the Fleming-Neon water system, Highway 1410 from Highway 7 to the Knott County line, Highway 931 from Highway 7 to Highway 1148, and Highway 1862 from Highway 931 to near Ermine.

- Area 2 lies in the central section of Letcher County along and adjacent to Highway 2034 (Crafts Colly), Highway 931 (Sandlick), Highway 15 (north of Whitco), Highway 160 (west of Highway 15 to Beetree), Highway 1811 (Smoot Creek), and Highway 3402 (Dry Fork).
- Area 3 lies in western Letcher County along Highways 510 and 160.
- Area 4 lies in southern Letcher County along Highway 119 near Pine Mountain.

The proposed new lines follow county and state roads and on some occasions follow cross country routes. There are approximately 301,550 feet of proposed water lines in area 1; 237,200 area 2; 110,400 in area 3; and 154,700 in area 4. The project areas are shown on the attached project map. In addition to the water line additions, a number of tanks and pump stations are added to the system. The system as proposed will obtain water from the City of Whitesburg, the Knott County Water and Sewer District, the City of Blackey, the Green Hills Water District (Harlan County), and the City of Cumberland.

## **B. Environmental Resources Present**

Archaeological and vegetative surveys will be performed in the undisturbed areas of the project during early stages of final design and in addition the project will be submitted to the Kentucky State Clearinghouse for review by pertinent state and national agencies. In general the project will follow various highway rights of way in areas that have previously been disturbed and few new areas are likely to be disturbed by the project.

## **C. Growth Areas and Population Trends**

The 2000 census population of Letcher County was 25,277, representing a 6.4 percent decrease in the area population since 1990. Because the project area is spread over such a large area of Letcher County, the population trend for the county is likely representative of the project area. Population trends have little bearing on the growth of the LCWSD because of the number of unserved areas in Letcher County. System growth for the LCWSD comes primarily from the extension of the service area into unserved areas.

## **EXISTING FACILITIES**

The Letcher County Water and Sewer District is in the process of completing construction of the Phase I of their Isom-Jeremiah water distribution project. Phase II of the project has been designed and is almost ready to proceed to the bidding phase. The Isom-Jeremiah project consists of 4, 6 and 8-inch waterline, a pump station and a 250,000 storage tank. The Isom-Jeremiah project receives its water supply from the City of Blackey. The areas of Phases I and II are shown on the attached maps as existing water lines.

Presently the City of Blackey water treatment plant has a capacity of 300,000 gallons per day (gpd) with an average demand of 71,000 gpd and the City of Whitesburg water treatment plant has a capacity of 864,000 gpd with average demand of 383,000 gpd.

## **NEED FOR PROJECT**

### **A. Health and Safety**

The service area covered by this project encompasses areas of Letcher County where groundwater is the primary source of potable water. In many cases the groundwater has been polluted and is no longer suitable for use as a potable water source. This project will provide a means of overcoming this health hazard.

### **B. Existing System O&M**

Because the system is new, an evaluation of the system's O&M procedures was not performed.

### **C. Growth**

The system is designed to meet current customer demands assuming that all households on all roads in the service area will request water service. Peak demand was calculated to be ten times the square root of the number of customers to be served. Note that for purposes of developing the operation and management cost only 75 percent of the potential customers are assumed to connect to the system.

## ALTERNATIVES CONSIDERED

Because the LCWSD will purchase all its water from surrounding communities, alternatives are related to source of supply. The district will be connected to the City of Whitesburg, the City of Blackey, and possibly the Knott County Water and Sewer District in the northern portion of the system. A future source of supply is the proposed water treatment plant on Carr Fork Lake. Water lines for the current project have been sized for this eventuality. For those areas in the southern part of the system, there are no alternative sources of supply at the present time other than those assumed in this report. Selection of the best alternative depends on the water available from each source and the number and kinds of tanks and pump stations required for the project.

## PROPOSED PROJECT AND AREAS OF SERVICE

The proposed project will entail the construction of approximately 152 miles of mostly 4, 6, and 8-inch water lines, to serve approximately 2,500 customers. The area breakdown is shown in the following table. The general layout is shown on the project maps. There will be master meter connections with the City of Whitesburg, the Knott County Water and Sewer District, the City of Cumberland, and the Green Hills Water District. There will also be new pump stations and ground storage tanks. The projected water demand for Areas 1 and 2 is 294,000 gallons per day.

AREA	POTENTIAL CUSTOMERS	APPROXIMATE WATERLINE LENGTH FEET
1	1,074	301,350
2	885	237,200
3	190	110,400
4	347	154,700
TOTAL	2,496	803,650*

\* Approximately 152 miles

Water lines should be located on private property. Kentucky State Highway Department encroachment permits will be required only for bores and short sections where the topography makes it impractical to construct on private lands. Normal

utility easements will be obtained to gain access for construction. All water and stream crossing permits will be obtained from the Kentucky Natural Resources and Environmental Protection Cabinet Division of Water.

The project will be designed in accordance with "Recommended Standards for Water Works" (10 States Standards) and additional requirements as specified by the Kentucky Public Service Commission regulations.

## STORAGE

Storage for the system is provided by ground storage tanks. The volume of storage was calculated based on providing 150 gallons per day for each customer in the area served by the tank. The tanks and volumes are listed below and their locations are shown on the project map.

Project Storage Tank Summary

Tank Number*	Capacity Gallons	Location
T-6	30,000	Area 3
T-7	60,000	Area 4
T-8	200,000	Area 1
T-9	10,000	Area 2
T-10	40,000	Area 2
T-11	20,000	Area 1
T-12	10,000	Area 4
T-13	10,000	Area 4

\*Tanks T1 through T5 are existing.



## PUMP STATIONS

The pump stations are listed in the table below, the locations are shown on the project map. The pumps are sized such that they will run no more than one-third of the time.

Pump Station Summary					
Pump Station	Location	Capacity GPM	Total Head Feet	Horsepower	Annual Operating Cost*
1	Area 4	8.4	236	0.5	\$87
2	Area 4	9.7	122	0.3	\$52
3	Area 4	110	286	8	\$1,384
4	Area 3	54	294	4	\$698
6	Area 2	8	260	0.5	\$87
7	Area 2	63	82	1.3	\$227
8 Alternate 1	Area 1	350	269	24	\$4,142
8 Alternate 2	Area 1	350	285	25	\$4,388
8 Alternate 3	Area 1	350	402	35	\$6,189
9	Area 1	43	275	3	\$520

\*Based on \$.06 per KWH and 33% service factor

## HYDRAULIC ANALYSIS

A hydraulic analysis of the system was performed using KYPIPE 2000 computer software. The analysis was performed for the normal and peak demands. A flushing analysis was also performed to show that all the water lines can be flushed at 2.5 feet per second as required by the regulations. The system is sized based on the average customer demand of 4,500 gallons per month. A computer simulation is provided for the normal demand case and is marked normal demand on the printout. A schematic is also provided. The computer printout is included in Appendix 1.

Peak demands for the system are based on the equation  $Q=10 \times N^5$ , where N is the number of customers on the system. The total customers are 2,496 which result in a system demand of 500 gpm during periods of peak demand. A KYPIPE 2000 computer output is attached for the peak demand and is marked peak demand. System pressures remain above 30 psi for this case.

A simulated demand of 400 gpm, 225 gpm and 98 gpm was imposed at the end of the new 8-inch, 6-inch, and 4-inch lines respectively in order to achieve the required 2.5 fps through the new lines. System pressures remain above 20 psi during the simulated flushing. Computer outputs for the flushing analysis are not included because of the large volume of printout required to demonstrate this result.

## **OPINION OF PROBABLE COSTS**

A summary of the detailed opinion of probable construction costs by area is provided in the following table. The detailed opinion of probable construction costs is shown in Appendix 2.

**Opinion of Probable Cost**

Area	Cost
Area 1 (Alternate 1 and Alternate 2) Construction Costs	\$6,770,525.00
35% Engineering/ Administration/Development Cost and Contingency	\$2,369,683.75
TOTAL AREA 1( ALT. 1 AND ALT. 2)	\$9,140,208.75
Area 1 (Alternate 3) Construction Costs	\$7,813,825.00
35% Engineering/ Administration/Development Cost and Contingency	\$2,734,838.75
TOTAL AREA 1 (ALT. 3)	\$10,548,663.75
Area 2 Construction Costs	\$5,340,000.00
35% Engineering/ Administration/Development Cost and Contingency	\$1,869,000.00
TOTAL AREA 2	\$7,209,000.00
Area 3 Construction Costs	\$1,850,950.00
35% Engineering/ Administration/Development Cost and Contingency	\$647,832.50
TOTAL AREA 3	\$2,498,782.50
Area 4 Construction Costs	\$2,869,000.00
35% Engineering/ Administration/Development Cost and Contingency	\$1,004,150.00
TOTAL AREA 4	\$3,873,150.00

# ANNUAL OPERATING BUDGET

The annual operating budget has been calculated for each of the project areas and is listed in the following tables. The assumptions for each of the areas are listed in the table for that area.

**Annual Operating Budget  
Area 1**

**Income**

**Average Customer**

Monthly water use	4500 gallons	
Monthly bill		
\$20.54 1st 2000 gallons		\$20.54
\$4.75 each additional 1000 gal		\$11.88
Total billings per month per customer .		\$32.42

**Area Total**

1,074 Potential Customers  
806 Actual connections (75% hookup)

Total Income for area per month \$26,110

<b>Total Income per year</b>	<b>Area 1</b>	<b>\$313,323</b>
------------------------------	---------------	------------------

**Expenses**

Water Purchased @	\$2.00 per 1000 gal	
Monthly water use per customer		4,500 gallons
90 percent accountable		5,000 gallons
Monthly water use		4,027,500 gallons
Water purchased per month		\$8,055

**Total Water purchased per year \$96,660**

**Operation and Management**

Area 1	Installed	Water line length	301,350 feet
Distribution O&M @		\$0.22 per foot	\$66,297
Administration			
Manager		\$20.00 per hour	Existing
Clerk		\$10.00 per hour	Existing
Operator		\$12.00 per hour	\$24,960
Benefits		30 percent	\$7,488

Office (Rent, supplies, telephone etc)		
Meter reading @	\$0.60 per customer	\$5,800
Billing supplies		\$806
Insurance		\$4,028
Transportation		\$9,666
Misc training and professional fees		\$4,833

**Total Expenses \$123,877**

<b>Total annual Expenses</b>	<b>Area 1</b>	<b>\$220,537</b>
------------------------------	---------------	------------------

Amount available for loan service and depreciation \$92,787

**Annual Operating Budget  
Area 2**

**Income**

Average Customer

Monthly water use	4500 gallons
Monthly bill	
\$20.54 1st 2000 gallons	\$20.54
\$4.75 each additional 1000 gal	\$11.88
Total billings per month per customer .	\$32.42

Area Total

885 Potential Customers  
664 Actual connections (75% hookup)

Total Income for area per month                   \$21,515

---

**Total Income per year                   Area 2                   \$258,185**

---

**Expenses**

Water Purchased @           \$2.00 per 1000 gal	
Monthly water use per customer	4,500 gallons
90 percent accountable	5,000 gallons
Monthly water use	3,318,750 gallons
Water purchased per month	\$6,638

**Total Water purchased per year                   \$79,650**

Operation and Management

Area 1    Installed    Water line length	237,200 feet
Distribution O&M @       \$0.22 per foot	\$52,184
Administration	
Manager           \$20.00 per hour	Existing
Clerk             \$10.00 per hour	Existing
Operator          \$12.00 per hour	\$24,960
Benefits           30 percent	\$7,488

Office    (Rent, supplies, telephone etc)	
Meter reading @        \$0.60 per customer	\$4,779
Billing supplies	\$664
Insurance	\$3,319
Transportation	\$7,965
Misc training and professional fees	\$3,983

**Total Expenses                                   \$105,341**

---

**Total annual Expenses Area 2                   \$184,991**

---

Amount available for loan service and depreciation           \$73,194

**Annual Operating Budget  
Area 3**

**Income**

Average Customer		
Monthly water use		4500 gallons
Monthly bill		
\$20.54 1st 2000 gallons		\$20.54
\$4.75 each additional 1000 gal		\$11.88
Total billings per month per customer .		\$32.42
Area Total		
190 Potential Customers		
143 Actual connections (75% hookup)		
Total Income for area per month		\$4,619

<b>Total Income per year</b>	<b>Area 3</b>	<b>\$55,430</b>
------------------------------	---------------	-----------------

**Expenses**

Water Purchased @	\$2.00 per 1000 gal	
Monthly water use per customer		4,500 gallons
90 percent accountable		5,000 gallons
Monthly water use		712,500 gallons
Water purchased per month		\$1,425

<b>Total Water purchased per year</b>	<b>\$17,100</b>
---------------------------------------	-----------------

Operation and Management

Area 1	Installed	Water line length	110,400 feet
Distribution O&M @		\$0.22 per foot	\$24,288
Administration			
Manager	\$20.00 per hour	Existing	
Clerk	\$10.00 per hour	Existing	
Operator	\$12.00 per hour	Existing	
Benefits	30 percent		\$0

Office (Rent, supplies, telephone etc)		
Meter reading @	\$0.60 per custo	\$1,026
Billing supplies		\$143
Insurance		\$713
Transportaton		\$1,710
Misc traing and professional fees		\$855

<b>Total Expenses</b>	<b>\$28,734</b>
-----------------------	-----------------

<b>Total annual Expenses Area 3</b>	<b>\$45,834</b>
-------------------------------------	-----------------

Amount available for loan service and depreciati	\$9,596
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**Annual Operating Budget  
Area 4**

**Income**

Average Customer

Monthly water use	4500 gallons
Monthly bill	
\$20.54 1st 2000 gallons	\$20.54
\$4.75 each additional 1000 gal	\$11.88
Total billings per month per customer .	\$32.42

Area Total

347 Potential Customers  
260 Actual connections (75% hookup)

Total Income for area per month \$8,436

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<b>Total Income per year</b>	<b>Area 4</b>	<b>\$101,232</b>
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**Expenses**

Water Purchased @	\$2.00 per 1000 gal	
Monthly water use per customer		4,500 gallons
90 percent accountable		5,000 gallons
Monthly water use		1,301,250 gallons
Water purchased per month		\$2,603

**Total Water purchased per year \$31,230**

Operation and Management

<u>Area 4</u> Installed	Water line length	154,700 feet
Distribution O&M @	\$0.22 per foot	\$34,034
Administration		
Manager	\$20.00 per hour	Existing
Clerk	\$10.00 per hour	Existing
Operator	\$8.00 per hour	\$16,640
Benefits	30 percent	\$4,992

Office (Rent, supplies, telephone etc)		
Meter reading @	\$0.60 per customer	\$1,874
Billing supplies		\$260
Insurance		\$1,301
Transportaton		\$3,123
Misc traing and professional fees		\$1,562

**Total Expenses \$63,786**

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<b>Total annual Expenses</b>	<b>Area 4</b>	<b>\$95,016</b>
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Amount available for loan service and depreciation \$6,216



## **DEBT REPAYMENT**

An analysis of financing options for this project will be completed after the completion of the review of the report. This will be included as an amendment to this report.

## **CONCLUSIONS**

The choice of alternates for this project depends of the availability of water from the various suppliers. The source for Alternate 1 is the Knott County Water and Sewer District, the source for Alternate 2 is the City of Blackey and the source for Alternate 3 is the City of Whitesburg. The opinion of probable construction costs for Alternates 1 and 2 are the same. The opinion of probable construction cost for Alternate 3 is greater than for Alternates 1 and 2 because of the need for construction of the water line along KY 931 from the City of Whitesburg to the tank location. The water line along KY 931 would normally be a part of the Area 2 construction phase.

A fourth alternative that has great flexibility would be to construct all the alternate pump stations. This option would allow the water district to draw water from any of the sources as they become available.

**APPENDIX 1**

**KYPIPE 2000**

**HYDRAULIC ANALYSIS**

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* * * * * K Y P I P E 4 * * * * *
*
* University of Kentucky Network Modeling Software *
*
* Copyrighted by KPFS 1998 *
* Version 1.200 - 01/26/2000 *
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* * * * *

```

**Normal Demand**

Date & Time: Tue Jul 15 13:58:18 2003

INPUT DATA FILENAME ----- I:\COMMON\RMW\Letcher\kyp\per1.DT2  
 TABULATED OUTPUT FILENAME ----- I:\COMMON\RMW\Letcher\kyp\per1.OT2  
 POSTPROCESSOR RESULTS FILENAME --- I:\COMMON\RMW\Letcher\kyp\per1.RS2

```

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

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U N I T S S P E C I F I E D

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

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E N A M E	N O D E N A M E S		L E N G T H (ft)	D I A M E T E R (in)	R O U G H N E S S C O E F F .	M I N O R L O S S C O E F F .
	#1	#2				
P-1	J-225	J-1	6344.71	8.07	120.0000	0.00
P-10	J-11	J-91	4506.50	8.07	120.0000	0.00
P-100	J-97	J-98	904.75	4.03	120.0000	0.00
P-101	J-99	J-13	2184.93	8.07	120.0000	0.00
P-102	J-99	J-100	1244.97	4.03	120.0000	0.00
P-103	J-101	J-105	2128.77	8.07	120.0000	0.00
P-104	J-101	J-102	1193.18	4.03	120.0000	0.00
P-105	J-102	J-103	559.23	4.03	120.0000	0.00
P-106	J-102	J-104	644.56	4.03	120.0000	0.00
P-107	J-105	J-30	2886.48	8.07	120.0000	0.00
P-108	J-105	J-106	1279.87	4.03	120.0000	0.00
P-109	J-107	J-111	2680.57	6.07	120.0000	0.00
P-11	J-13	J-101	1575.44	8.07	120.0000	0.00
P-110	J-107	J-108	1133.33	4.03	120.0000	0.00
P-111	J-109	J-107	3310.57	6.07	120.0000	0.00
P-112	J-109	J-110	1681.12	4.03	120.0000	0.00
P-113-XX	J-111	J-14	3690.22	6.07	120.0000	0.00
P-114	J-111	J-112	2221.75	4.03	120.0000	0.00
P-115	J-109	J-114	1282.73	8.07	120.0000	0.00
P-116	J-114	J-116	980.74	8.07	120.0000	0.00
P-117	J-114	J-115	1297.58	4.03	120.0000	0.00
P-118	J-116	J-118	747.58	8.07	120.0000	0.00
P-119	J-116	J-117	811.80	4.03	120.0000	0.00
P-12	J-13	J-172	3016.78	8.07	120.0000	0.00
P-120	J-118	J-120	891.26	8.07	120.0000	0.00
P-121	J-118	J-119	2346.98	4.03	120.0000	0.00
P-122	J-120	J-113	1012.28	8.07	120.0000	0.00
P-123	J-120	J-121	1315.80	4.03	120.0000	0.00
P-124	J-113	J-122	1600.55	4.03	120.0000	0.00

P-125	J-113	J-123	2187.04	8.07	120.0000	0.00
P-126	J-123	J-124	1407.64	4.03	120.0000	0.00
P-127	J-123	J-125	907.82	8.07	120.0000	0.00
P-128	J-125	J-126	737.76	8.07	120.0000	0.00
P-129	J-125	J-127	903.23	4.03	120.0000	0.00
P-13	J-15	J-23	1502.35	4.03	120.0000	0.00
P-130	J-126	J-128	713.81	4.03	120.0000	0.00
P-131	J-126	J-134	3355.27	8.07	120.0000	0.00
P-132	J-130	J-136	1051.05	8.07	120.0000	0.00
P-133	J-130	J-131	3086.60	4.03	120.0000	0.00
P-134	J-132	J-130	771.48	8.07	120.0000	0.00
P-135	J-132	J-133	1972.73	4.03	120.0000	0.00
P-136	J-134	Pump-8	1171.05	8.07	120.0000	0.00
P-137	J-134	J-135	3698.01	4.03	120.0000	0.00
P-138	J-136	J-129	2359.41	4.03	120.0000	0.00
P-139	J-136	J-140	1775.17	8.07	120.0000	0.00
P-14	J-15	J-89	6147.87	8.07	120.0000	0.00
P-140	J-138	J-142	1514.96	8.07	120.0000	0.00
P-141	J-138	J-139	1060.82	4.03	120.0000	0.00
P-142	J-140	J-138	1240.55	8.07	120.0000	0.00
P-143	J-140	J-141	3465.04	4.03	120.0000	0.00
P-144	J-142	J-137	2193.00	4.03	120.0000	0.00
P-145	J-142	J-143	1593.61	8.07	120.0000	0.00
P-146	J-144	Pump-7	971.60	6.07	120.0000	0.00
P-147	J-145	J-148	2996.93	6.07	120.0000	0.00
P-148	J-145	J-147	3416.75	4.03	120.0000	0.00
P-149	J-148	J-150	1004.04	6.07	120.0000	0.00
P-15	J-14	J-15	1837.72	8.07	120.0000	0.00
P-150	J-148	J-149	3866.43	4.03	120.0000	0.00
P-151	J-150	J-146	2021.25	6.07	120.0000	0.00
P-152	J-150	J-151	4575.17	4.03	120.0000	0.00
P-153	J-146	J-152	1205.19	4.03	120.0000	0.00
P-154	J-146	J-153	1671.28	6.07	120.0000	0.00
P-155	J-153	J-154	3306.79	4.03	120.0000	0.00
P-156	J-153	J-160	679.88	6.07	120.0000	0.00
P-157	J-156	J-155	1123.80	4.03	120.0000	0.00
P-158	J-156	J-157	1074.93	4.03	120.0000	0.00
P-159	J-156	J-158	1101.16	4.03	120.0000	0.00
P-16	J-14	J-81	2831.60	8.07	120.0000	0.00
P-160	J-156	J-159	816.92	4.03	120.0000	0.00
P-161	J-160	J-156	1984.84	4.03	120.0000	0.00
P-162	J-160	J-37	974.14	6.07	120.0000	0.00
P-163	J-161	J-162	4660.85	4.03	120.0000	0.00
P-164	J-161	J-163	2554.71	6.07	120.0000	0.00
P-165	J-163	J-164	3169.43	4.03	120.0000	0.00
P-166	J-163	Pump-6	3507.35	6.07	120.0000	0.00
P-167	J-166	J-165	3378.38	4.03	120.0000	0.00
P-168	J-166	J-167	6039.06	6.07	120.0000	0.00
P-169	J-165	J-168	2178.86	4.03	120.0000	0.00
P-17	J-19	J-254	1443.17	6.07	120.0000	0.00
P-170	J-165	J-169	1662.33	4.03	120.0000	0.00
P-171	J-167	J-170	1125.68	4.03	120.0000	0.00
P-172	J-167	J-38	1851.12	6.07	120.0000	0.00
P-173	J-172	J-196	3518.71	8.07	120.0000	0.00
P-174	J-172	J-173	2459.67	4.03	120.0000	0.00
P-175	J-173	J-174	1728.71	4.03	120.0000	0.00
P-176	J-173	J-175	1529.24	4.03	120.0000	0.00
P-177	J-176	J-16	1827.59	8.07	120.0000	0.00
P-178	J-176	J-177	1855.05	4.03	120.0000	0.00
P-179-XX	J-179	J-176	3387.95	8.07	120.0000	0.00
P-18	J-19	J-49	6793.73	8.07	120.0000	0.00
P-180	J-178	J-179	1291.33	8.07	120.0000	0.00
P-181	J-179	J-180	2793.33	4.03	120.0000	0.00
P-182	J-178	J-181	1740.33	4.03	120.0000	0.00
P-183	J-182	J-178	1316.68	8.07	120.0000	0.00
P-184	J-182	J-183	1678.46	4.03	120.0000	0.00
P-185	J-184	J-182	3990.53	8.07	120.0000	0.00
P-186	J-184	J-185	1880.80	4.03	120.0000	0.00
P-187	J-186	J-184	3733.69	8.07	120.0000	0.00

P-188	J-186	J-187	1485.22	4.03	120.0000	0.00
P-189	J-188	J-186	2975.76	8.07	120.0000	0.00
P-19	J-20	J-18	2456.08	6.07	120.0000	0.00
P-190	J-188	J-189	1590.27	4.03	120.0000	0.00
P-191	J-190	J-188	4684.63	8.07	120.0000	0.00
P-192	J-190	J-191	1570.34	4.03	120.0000	0.00
P-193	J-193	J-190	1039.89	8.07	120.0000	0.00
P-194	J-192	J-193	2198.77	8.07	120.0000	0.00
P-195	J-193	J-194	1882.05	4.03	120.0000	0.00
P-196	J-192	J-195	1079.85	4.03	120.0000	0.00
P-197	J-196	J-192	1717.04	8.07	120.0000	0.00
P-198	J-196	J-197	1076.35	4.03	120.0000	0.00
P-2	J-3	J-222	1035.93	6.07	120.0000	0.00
P-20	J-20	J-45	1981.50	4.03	120.0000	0.00
P-200	J-198	J-199	5529.72	4.03	120.0000	0.00
P-201	J-198	J-200	3155.80	4.03	120.0000	0.00
P-202	J-201	J-11	1392.25	8.07	120.0000	0.00
P-203	J-201	J-202	2198.31	4.03	120.0000	0.00
P-204	J-202	J-31	4599.50	4.03	120.0000	0.00
P-205	J-202	J-204	2115.95	4.03	120.0000	0.00
P-206	J-8	J-205	2003.60	4.03	120.0000	0.00
P-207	J-205	J-206	1911.88	4.03	120.0000	0.00
P-208	J-205	J-32	6735.35	4.03	120.0000	0.00
P-209	J-38	T-9	2257.31	6.07	120.0000	0.00
P-21	J-22	J-51	4189.75	6.07	120.0000	0.00
P-210	J-37	J-161	974.14	6.07	120.0000	0.00
P-211	J-210	J-8	5296.47	8.07	120.0000	0.00
P-212	J-210	J-34	7071.67	4.03	120.0000	0.00
P-213	J-37	T-10	1056.08	6.07	120.0000	0.00
P-214 -XX	J-78	J-203	3709.71	6.07	120.0000	0.00
P-215	J-214	J-210	6925.60	8.07	120.0000	0.00
P-216	J-214	J-215	2360.75	6.07	120.0000	0.00
P-217	@-Pump-8	J-132	1121.60	8.07	120.0000	0.00
P-218	J-215	J-217	2161.75	4.03	120.0000	0.00
P-219	J-214	J-218	1326.15	8.07	120.0000	0.00
P-22	Pump-1	J-250	1007.38	6.07	120.0000	0.00
P-220	J-218	J-219	4787.48	8.07	120.0000	0.00
P-221	J-36	J-203	9663.83	6.07	120.0000	0.00
P-222	J-39	J-36	7865.81	6.07	120.0000	0.00
P-223	J-222	J-223	1907.35	6.07	120.0000	0.00
P-225	J-223	J-2	2337.22	6.07	120.0000	0.00
P-226	J-223	J-226	4529.76	4.03	120.0000	0.00
P-227	J-2	J-227	3235.97	4.03	120.0000	0.00
P-228	J-225	J-3	4027.25	8.07	120.0000	0.00
P-229	J-225	J-229	3340.42	4.03	120.0000	0.00
P-23	J-24	J-248	7288.15	6.07	120.0000	0.00
P-230	J-1	J-228	1936.29	8.07	120.0000	0.00
P-231	J-1	J-230	2399.96	4.03	120.0000	0.00
P-232	J-4	J-234	2199.23	4.03	120.0000	0.00
P-233	J-232	J-231	7410.74	4.03	120.0000	0.00
P-234	J-232	J-233	2012.24	4.03	120.0000	0.00
P-235	J-234	J-232	822.99	6.07	120.0000	0.00
P-236	J-234	J-235	1518.53	4.03	120.0000	0.00
P-237	J-2	J-236	3583.91	6.07	120.0000	0.00
P-238	J-236	J-238	2765.69	4.03	120.0000	0.00
P-239	J-7	J-6	3973.62	4.03	120.0000	0.00
P-24	J-24	T-7	1684.85	4.03	120.0000	0.00
P-240	J-7	J-239	2367.57	6.07	120.0000	0.00
P-241	J-242	J-171	3438.27	6.07	120.0000	0.00
P-242	J-244	J-243	5226.93	6.07	120.0000	0.00
P-243	J-244	J-240	5848.50	4.03	120.0000	0.00
P-244	J-244	J-245	6215.76	6.07	120.0000	0.00
P-245	J-245	J-246	9830.89	4.03	120.0000	0.00
P-246	J-245	J-207	11161.75	6.07	120.0000	0.00
P-247	J-248	J-247	4122.81	6.07	120.0000	0.00
P-248	J-248	@-Pump-1	5810.29	6.07	120.0000	0.00
P-249	J-250	J-249	7374.15	4.03	120.0000	0.00
P-25	@-Pump-2	J-25	1.00	4.03	120.0000	0.00
P-250	J-250	J-26	3950.94	4.03	120.0000	0.00

P-251	J-250	J-25	12634.45	4.03	120.0000	0.00
P-252	J-41	J-39	19034.44	6.07	120.0000	0.00
P-253	J-254	J-19	1443.17	6.07	120.0000	0.00
P-254	J-42	J-29	13768.10	6.07	120.0000	0.00
P-255	Pump-4	J-78	4846.68	6.07	120.0000	0.00
P-256	J-243	Pump-3	1527.00	6.07	120.0000	0.00
P-257	J-171	J-42	9747.33	6.07	120.0000	0.00
P-258	J-50	T-2	2695.51	8.00	120.0000	0.00
P-259	J-255	J-237	1699.89	4.03	120.0000	0.00
P-26	J-26	J-252	4182.33	4.03	120.0000	0.00
P-260	J-5	T-1	1713.70	8.07	120.0000	0.00
P-261	J-10	J-50	3044.43	8.07	120.0000	0.00
P-262	J-50	J-9	4076.44	8.07	120.0000	0.00
P-263	J-50	J-143	1905.19	8.07	120.0000	0.00
P-264	J-16	J-256	7809.76	8.07	120.0000	0.00
P-265	J-256	J-258	8579.63	8.07	120.0000	0.00
P-266	J-144	J-258	1724.49	8.07	120.0000	0.00
P-267	J-144	J-257	2113.44	8.07	120.0000	0.00
P-268	J-257	J-260	4788.71	8.07	120.0000	0.00
P-269	J-259	J-9	4036.95	8.07	120.0000	0.00
P-27	J-26	T-12	1364.05	4.03	120.0000	0.00
P-270	J-259	T-3	1929.41	8.00	120.0000	0.00
P-271	J-260	J-259	1592.57	8.07	120.0000	0.00
P-272	J-260	T-5	3167.23	8.00	120.0000	0.00
P-273-XX	J-228	T-4	13000.00	8.07	120.0000	0.00
P-274	J-78	R-5	3390.53	6.07	120.0000	0.00
P-275	J-207	J-208	7934.30	6.07	120.0000	0.00
P-276	J-208	J-24	8369.13	6.07	120.0000	0.00
P-277	@-Pump-7	J-145	1522.93	6.07	120.0000	0.00
P-278	Pump-9	J-4	963.05	6.07	120.0000	0.00
P-28	Pump-2	J-28	1076.67	4.03	120.0000	0.00
P-29	J-27	R-3	13490.00	10.14	120.0000	0.00
P-3	J-236	@-Pump-9	1153.03	6.07	120.0000	0.00
P-30	@-Pump-3	J-27	1104.70	6.07	120.0000	0.00
P-31	J-28	T-13	487.34	4.03	120.0000	0.00
P-32	J-29	J-41	3548.35	6.07	120.0000	0.00
P-33	J-29	T-6	2331.73	6.07	120.0000	0.00
P-34	@-Pump-4	R-2	3892.57	6.07	120.0000	0.00
P-35	J-66	J-124	2549.35	4.03	120.0000	0.00
P-36	J-30	J-109	779.71	8.07	120.0000	0.00
P-37	J-30	T-8	925.74	8.07	120.0000	0.00
P-38	J-255	J-35	5036.88	6.07	120.0000	0.00
P-4	J-7	J-35	8924.23	6.07	120.0000	0.00
P-40	J-35	T-11	713.82	4.03	120.0000	0.00
P-41	J-21	J-43	3074.80	4.03	120.0000	0.00
P-42	@-Pump-6	J-166	1535.66	6.07	120.0000	0.00
P-43	J-21	J-44	1575.94	4.03	120.0000	0.00
P-44	J-45	J-47	1787.33	4.03	120.0000	0.00
P-45	J-45	J-46	1339.20	4.03	120.0000	0.00
P-46	J-47	J-21	1635.52	4.03	120.0000	0.00
P-47	J-47	J-48	1311.56	4.03	120.0000	0.00
P-48	J-49	J-22	1878.21	8.07	120.0000	0.00
P-49-XX	J-49	J-77	13723.24	6.07	120.0000	0.00
P-5	J-4	J-255	2869.33	6.07	120.0000	0.00
P-50	J-51	J-20	5203.64	6.07	120.0000	0.00
P-51	J-51	J-52	2589.05	4.03	120.0000	0.00
P-52	J-52	J-55	3473.72	4.03	120.0000	0.00
P-53	J-52	J-54	1687.17	4.03	120.0000	0.00
P-54	J-53	J-79	2738.53	8.07	120.0000	0.00
P-55	J-53	J-57	2121.70	8.07	120.0000	0.00
P-56	J-57	J-56	2053.46	4.03	120.0000	0.00
P-57	J-57	J-59	2770.86	8.07	120.0000	0.00
P-58	J-58	J-65	2353.13	6.07	120.0000	0.00
P-59	J-58	J-63	1357.44	4.03	120.0000	0.00
P-6	J-3	J-219	2002.16	8.07	120.0000	0.00
P-60	J-60	J-61	2579.08	4.03	120.0000	0.00
P-61	J-60	J-62	1555.68	4.03	120.0000	0.00
P-62	J-63	J-60	1269.25	4.03	120.0000	0.00
P-63	J-63	J-64	1346.35	4.03	120.0000	0.00

P-64	J-65	J-53	4291.00	6.07	120.0000	0.00
P-65-XX	J-65	J-75	4290.83	4.03	120.0000	0.00
P-66	J-67	J-66	3913.75	4.03	120.0000	0.00
P-67	J-67	J-68	919.71	4.03	120.0000	0.00
P-68	J-69	J-67	813.09	4.03	120.0000	0.00
P-69	J-69	J-70	1590.26	4.03	120.0000	0.00
P-7	J-201	J-8	7325.30	8.07	120.0000	0.00
P-70	J-70	J-71	1245.08	4.03	120.0000	0.00
P-71	J-70	J-72	1094.91	4.03	120.0000	0.00
P-72	J-68	J-73	675.24	4.03	120.0000	0.00
P-73	J-68	J-74	1855.91	4.03	120.0000	0.00
P-74	J-75	J-69	2843.32	4.03	120.0000	0.00
P-75	J-75	J-76	1528.01	4.03	120.0000	0.00
P-76	J-77	J-58	5438.72	6.07	120.0000	0.00
P-77	J-77	J-40	7817.36	6.07	120.0000	0.00
P-78	J-79	J-10	3302.06	8.07	120.0000	0.00
P-79	J-79	J-80	4139.95	4.03	120.0000	0.00
P-8	J-5	J-81	4335.24	8.07	120.0000	0.00
P-80-XX	J-77	J-86	5591.45	6.07	120.0000	0.00
P-81	J-81	J-19	1375.52	8.07	120.0000	0.00
P-82	J-82	J-5	2405.05	6.07	120.0000	0.00
P-83	J-82	J-83	4313.44	4.03	120.0000	0.00
P-84	J-83	J-84	2885.18	4.03	120.0000	0.00
P-85	J-83	J-85	1413.35	4.03	120.0000	0.00
P-86	J-86	J-82	1177.58	6.07	120.0000	0.00
P-87	J-86	J-87	1135.44	4.03	120.0000	0.00
P-88	J-17	J-18	4057.14	6.07	120.0000	0.00
P-89	J-17	J-88	1872.39	4.03	120.0000	0.00
P-9	J-11	J-198	2215.65	8.07	120.0000	0.00
P-90-XX	J-89	J-17	4286.71	6.07	120.0000	0.00
P-91	J-89	J-91	3912.89	8.07	120.0000	0.00
P-92	J-91	J-93	2767.58	8.07	120.0000	0.00
P-93	J-90	J-99	1592.75	8.07	120.0000	0.00
P-94	J-90	J-92	3563.18	4.03	120.0000	0.00
P-95	J-93	J-95	1184.66	8.07	120.0000	0.00
P-96	J-93	J-94	1884.86	4.03	120.0000	0.00
P-97	J-95	J-90	1256.70	8.07	120.0000	0.00
P-98	J-95	J-97	1422.11	4.03	120.0000	0.00
P-99	J-97	J-96	2645.85	4.03	120.0000	0.00

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

THERE IS A PUMP AT NODE      Pump-1; USEFUL POWER =      0.50 (Efficiency = 75.00%)

THERE IS A PUMP AT NODE      Pump-2; USEFUL POWER =      0.30 (Efficiency = 75.00%)

THERE IS A PUMP AT NODE      Pump-3; USEFUL POWER =      8.00 (Efficiency = 75.00%)

THERE IS A PUMP AT NODE      Pump-4; USEFUL POWER =      4.00 (Efficiency = 0.75%)

THERE IS A PUMP AT NODE      Pump-6; USEFUL POWER =      0.50 (Efficiency = 0.75%)

THERE IS A PUMP AT NODE      Pump-7; USEFUL POWER =      1.30 (Efficiency = 0.75%)

THERE IS A PUMP AT NODE      Pump-8; USEFUL POWER =     34.00 (Efficiency = 0.75%)

THERE IS A PUMP AT NODE      Pump-9; USEFUL POWER =      3.00 (Efficiency = 75.00%)

E N D   N O D E   D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
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J-1	0.90	1400.00
J-10	1.80	0.00
J-100	0.00	1210.00
J-101	1.20	1220.00
J-102	0.00	1240.00
J-103	0.20	1280.00
J-104	0.20	1280.00
J-105	1.40	1360.00
J-106	0.60	1400.00
J-107	0.00	1650.00
J-108	0.00	1600.00
J-109	0.60	1600.00
J-11	1.40	1160.00
J-110	0.10	1640.00
J-111	0.00	1400.00
J-112	0.00	1440.00
J-113	0.60	1400.00
J-114	0.70	1440.00
J-115	0.10	1660.00
J-116	0.60	1440.00
J-117	0.30	1520.00
J-118	0.30	1440.00
J-119	0.10	1660.00
J-120	0.40	1400.00
J-121	0.10	1480.00
J-122	0.00	1480.00
J-123	0.50	1320.00
J-124	0.20	1360.00
J-125	0.00	1280.00
J-126	0.60	1280.00
J-127	0.00	1400.00
J-128	0.00	1400.00
J-129	0.20	1280.00
J-13	0.30	1240.00
J-130	0.60	1220.00
J-131	0.30	1240.00
J-132	0.80	1220.00
J-133	0.50	1290.00
J-134	1.30	1220.00
J-135	0.90	1400.00
J-136	0.50	1220.00
J-137	0.30	1280.00
J-138	0.50	1200.00
J-139	0.20	1240.00
J-14	1.40	1280.00
J-140	0.00	1200.00
J-141	0.00	1280.00
J-142	0.60	1160.00
J-143	0.50	0.00
J-144	1.40	1150.00
J-145	1.70	1173.00
J-146	1.30	1200.00
J-147	1.10	1360.00
J-148	0.30	1200.00
J-149	0.00	1400.00
J-15	0.00	1320.00
J-150	2.90	1200.00
J-151	2.00	1400.00
J-152	0.70	1280.00
J-153	1.70	1200.00
J-154	1.20	1400.00
J-155	0.50	1360.00
J-156	0.40	1280.00
J-157	0.50	1360.00
J-158	0.50	1400.00
J-159	0.50	1360.00
J-16	2.80	1220.00
J-160	1.30	1200.00



J-161	2.90	1230.00
J-162	0.70	1360.00
J-163	3.30	1240.00
J-164	0.60	1320.00
J-165	0.80	1480.00
J-166	3.00	1320.00
J-167	0.90	1480.00
J-168	0.70	1520.00
J-169	0.80	1520.00
J-17	0.50	1180.00
J-170	0.90	1520.00
J-171	3.30	1164.00
J-172	2.90	1240.00
J-173	0.00	1320.00
J-174	1.40	1380.00
J-175	1.40	1440.00
J-176	2.80	1228.00
J-177	1.40	1280.00
J-178	2.90	1280.00
J-179	2.80	1250.00
J-18	5.00	0.00
J-180	0.60	1420.00
J-181	0.20	1360.00
J-182	1.60	1280.00
J-183	0.00	1400.00
J-184	1.60	1320.00
J-185	0.30	1400.00
J-186	1.60	1400.00
J-187	0.30	1400.00
J-188	1.50	1440.00
J-189	0.00	1520.00
J-19	1.80	1200.00
J-190	1.90	1400.00
J-191	0.50	1520.00
J-192	1.80	1320.00
J-193	2.20	1400.00
J-194	0.80	1540.00
J-195	0.50	1400.00
J-196	2.00	1320.00
J-197	0.40	1440.00
J-198	1.20	1200.00
J-199	0.20	1400.00
J-2	0.90	1320.00
J-20	4.80	1120.00
J-200	0.60	1320.00
J-201	1.50	1160.00
J-202	0.80	1200.00
J-203	3.60	1543.00
J-204	0.50	1280.00
J-205	0.60	1200.00
J-206	0.30	1400.00
J-207	4.20	1585.00
J-208	1.20	1590.00
J-21	0.00	1280.00
J-210	2.40	1200.00
J-214	0.80	1240.00
J-215	0.20	1280.00
J-217	0.00	1240.00
J-218	0.80	1240.00
J-219	0.90	1240.00
J-22	3.80	1106.00
J-222	1.20	1260.00
J-223	1.50	1260.00
J-225	0.90	1320.00
J-226	0.70	1440.00
J-227	0.30	1400.00
J-228	0.90	1400.00
J-229	0.50	1400.00
J-23	0.00	1450.00

J-230	1.00	1440.00
J-231	0.80	1600.00
J-232	0.50	1440.00
J-233	0.20	1640.00
J-234	0.60	1440.00
J-235	0.20	1520.00
J-236	1.50	1400.00
J-237	0.30	1520.00
J-238	1.00	1450.00
J-239	0.10	1440.00
J-24	3.40	1618.00
J-240	1.90	1800.00
J-242	1.40	1240.00
J-243	2.00	1600.00
J-244	1.70	1560.00
J-245	2.70	1550.00
J-246	2.00	1800.00
J-247	1.40	1700.00
J-248	3.40	1640.00
J-249	0.40	2000.00
J-25	1.40	2070.00
J-250	1.80	1700.00
J-252	1.30	2080.00
J-254	2.90	1400.00
J-255	0.00	1480.00
J-256	0.00	0.00
J-257	0.00	0.00
J-258	0.00	0.00
J-259	0.00	0.00
J-26	0.00	1753.00
J-260	0.00	0.00
J-27	0.00	1590.00
J-28	1.50	2200.00
J-29	3.40	1309.00
J-3	0.90	1260.00
J-30	0.00	1600.00
J-31	0.00	1360.00
J-32	0.00	1370.00
J-34	0.00	1300.00
J-35	0.00	1800.00
J-36	1.40	1600.00
J-37	0.00	1220.00
J-38	0.00	1650.00
J-39	2.50	1550.00
J-4	1.00	1380.00
J-40	0.00	0.00
J-41	5.30	1360.00
J-42	1.90	1200.00
J-43	0.00	1360.00
J-44	0.00	1360.00
J-45	2.20	1200.00
J-46	0.00	1240.00
J-47	0.00	1214.00
J-48	0.00	1320.00
J-49	11.70	1160.00
J-5	0.00	0.00
J-50	0.40	0.00
J-51	1.60	1160.00
J-52	3.90	1160.00
J-53	1.40	1120.00
J-54	0.00	1200.00
J-55	0.00	1280.00
J-56	1.00	1200.00
J-57	1.00	1120.00
J-58	1.00	1200.00
J-59	1.00	0.00
J-6	0.40	1680.00
J-60	0.40	1280.00
J-61	0.40	1310.00

J-62	0.40	1315.00	
J-63	0.40	1280.00	
J-64	0.40	1315.00	
J-65	1.60	1185.00	
J-66	0.60	1400.00	
J-67	2.40	1320.00	
J-68	0.40	1360.00	
J-69	1.60	1280.00	
J-7	1.00	1480.00	
J-70	0.00	1360.00	
J-71	0.30	1480.00	
J-72	0.30	1400.00	
J-73	0.30	1400.00	
J-74	0.30	1480.00	
J-75	1.50	1240.00	
J-76	0.40	1440.00	
J-77	2.80	1240.00	
J-78	0.00	2000.00	
J-79	0.60	1200.00	
J-8	2.80	1200.00	
J-80	0.20	1320.00	
J-81	5.60	1240.00	
J-82	2.10	1320.00	
J-83	1.00	1400.00	
J-84	0.70	1440.00	
J-85	0.40	1440.00	
J-86	0.80	1340.00	
J-87	0.10	1320.00	
J-88	0.50	1240.00	
J-89	0.00	1180.00	
J-9	2.00	0.00	
J-90	1.50	1190.00	
J-91	1.70	1166.00	
J-92	1.20	1360.00	
J-93	0.80	1200.00	
J-94	0.20	1280.00	
J-95	0.70	1250.00	
J-96	0.40	1320.00	
J-97	0.50	1300.00	
J-98	0.20	1320.00	
J-99	0.30	1200.00	
Pump-1	0.00	1702.00	
Pump-2	0.00	2078.00	
Pump-3	0.00	1600.00	
Pump-4	0.00	1760.00	
Pump-6	0.00	1300.00	
Pump-7	0.00	1170.00	
Pump-8	0.00	1220.00	
Pump-9	0.00	1400.00	
R-2	----	1760.00	1790.00
R-3	----	1560.00	1670.00
R-5	----	2000.00	2070.00
T-1	----	1506.00	1527.00
T-10	----	1400.00	1470.00
T-11	----	1800.00	1875.00
T-12	----	2080.00	2150.00
T-13	----	2200.00	2270.00
T-2	----	1363.00	1394.00
T-3	----	1364.00	1394.00
T-4	----	1490.00	1520.00
T-5	----	1337.00	1394.00
T-6	----	1400.00	1680.00
T-7	----	1840.00	1910.00
T-8	----	1690.00	1730.00
T-9	----	1680.00	1730.00

OUTPUT OPTION DATA

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT  
 MAXIMUM AND MINIMUM PRESSURES = 20

S U P P L Y Z O N E D A T A

THIS SYSTEM HAS MULTIPLE SUPPLY ZONES

ZONE NO. 1 IS SUPPLIED THROUGH THE FOLLOWING PIPES:  
 ~@R-2

ZONE NO. 2 IS SUPPLIED THROUGH THE FOLLOWING PIPES:

ZONE NO. 3 IS SUPPLIED THROUGH THE FOLLOWING PIPES:

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

NUMBER OF PIPES .....(p) = 275  
 NUMBER OF END NODES .....(j) = 255  
 NUMBER OF PRIMARY LOOPS .....(l) = 7  
 NUMBER OF SUPPLY NODES .....(f) = 16  
 NUMBER OF SUPPLY ZONES .....(z) = 3

=====  
 Case: 0

RESULTS OBTAINED AFTER 17 TRIALS: ACCURACY = 0.00265

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 / 1000 (ft/ft)
	#1	#2					
P-1	J-225	J-1	2.80	0.00	0.00	0.02	0.00
P-10	J-11	J-91	-72.37	0.71	0.00	0.45	0.16
P-100	J-97	J-98	0.20	0.00	0.00	0.01	0.00
P-101	J-99	J-13	-542.06	14.27	0.00	3.40	6.53
P-102	J-99	J-100	0.00	0.00	0.00	0.00	0.00
P-103	J-101	J-105	-573.16	15.41	0.00	3.59	7.24
P-104	J-101	J-102	0.40	0.00	0.00	0.01	0.00
P-105	J-102	J-103	0.20	0.00	0.00	0.01	0.00
P-106	J-102	J-104	0.20	0.00	0.00	0.01	0.00
P-107	J-105	J-30	-575.16	21.03	0.00	3.61	7.29
P-108	J-105	J-106	0.60	0.00	0.00	0.02	0.00
P-109	J-107	J-111	0.00	0.00	0.00	0.00	0.00
P-11	J-13	J-101	-571.56	11.35	0.00	3.58	7.20
P-110	J-107	J-108	0.00	0.00	0.00	0.00	0.00
P-111	J-109	J-107	0.00	0.00	0.00	0.00	0.00
P-112	J-109	J-110	0.10	0.00	0.00	0.00	0.00

P-113-XX	J-111	J-14					
P-114	J-111	J-112	0.00	0.00	0.00	0.00	0.00
P-115	J-109	J-114	-318.49	3.13	0.00	2.00	2.44
P-116	J-114	J-116	-319.29	2.40	0.00	2.00	2.45
P-117	J-114	J-115	0.10	0.00	0.00	0.00	0.00
P-118	J-116	J-118	-320.19	1.84	0.00	2.01	2.46
P-119	J-116	J-117	0.30	0.00	0.00	0.01	0.00
P-12	J-13	J-172	29.20	0.09	0.00	0.18	0.03
P-120	J-118	J-120	-320.59	2.20	0.00	2.01	2.47
P-121	J-118	J-119	0.10	0.00	0.00	0.00	0.00
P-122	J-120	J-113	-321.09	2.51	0.00	2.01	2.48
P-123	J-120	J-121	0.10	0.00	0.00	0.00	0.00
P-124	J-113	J-122	0.00	0.00	0.00	0.00	0.00
P-125	J-113	J-123	-321.69	5.43	0.00	2.02	2.48
P-126	J-123	J-124	8.30	0.12	0.00	0.21	0.08
P-127	J-123	J-125	-330.49	2.37	0.00	2.07	2.61
P-128	J-125	J-126	-330.49	1.93	0.00	2.07	2.61
P-129	J-125	J-127	0.00	0.00	0.00	0.00	0.00
P-13	J-15	J-23	0.00	0.00	0.00	0.00	0.00
P-130	J-126	J-128	0.00	0.00	0.00	0.00	0.00
P-131	J-126	J-134	-331.09	8.79	0.00	2.08	2.62
P-132	J-130	J-136	-335.49	2.82	0.00	2.10	2.69
P-133	J-130	J-131	0.30	0.00	0.00	0.01	0.00
P-134	J-132	J-130	-334.59	2.06	0.00	2.10	2.67
P-135	J-132	J-133	0.50	0.00	0.00	0.01	0.00
P-136	J-134	Pump-8	-333.29	3.11	0.00	2.09	2.65
P-137	J-134	J-135	0.90	0.01	0.00	0.02	0.00
P-138	J-136	J-129	0.20	0.00	0.00	0.01	0.00
P-139	J-136	J-140	-336.19	4.78	0.00	2.11	2.70
P-14	J-15	J-89	-462.18	29.88	0.00	2.90	4.86
P-140	J-138	J-142	-336.89	4.10	0.00	2.11	2.71
P-141	J-138	J-139	0.20	0.00	0.00	0.01	0.00
P-142	J-140	J-138	-336.19	3.34	0.00	2.11	2.70
P-143	J-140	J-141	0.00	0.00	0.00	0.00	0.00
P-144	J-142	J-137	0.30	0.00	0.00	0.01	0.00
P-145	J-142	J-143	-337.79	4.33	0.00	2.12	2.72
P-146	J-144	Pump-7	62.29	0.46	0.00	0.69	0.48
P-147	J-145	J-148	59.49	1.31	0.00	0.66	0.44
P-148	J-145	J-147	1.10	0.01	0.00	0.03	0.00
P-149	J-148	J-150	59.19	0.44	0.00	0.66	0.43
P-15	J-14	J-15	-462.18	8.93	0.00	2.90	4.86
P-150	J-148	J-149	0.00	0.00	0.00	0.00	0.00
P-151	J-150	J-146	54.29	0.75	0.00	0.60	0.37
P-152	J-150	J-151	2.00	0.03	0.00	0.05	0.01
P-153	J-146	J-152	0.70	0.00	0.00	0.02	0.00
P-154	J-146	J-153	52.29	0.58	0.00	0.58	0.35
P-155	J-153	J-154	1.20	0.01	0.00	0.03	0.00
P-156	J-153	J-160	49.39	0.21	0.00	0.55	0.31
P-157	J-156	J-155	0.50	0.00	0.00	0.01	0.00
P-158	J-156	J-157	0.50	0.00	0.00	0.01	0.00
P-159	J-156	J-158	0.50	0.00	0.00	0.01	0.00
P-16	J-14	J-81	460.78	13.68	0.00	2.89	4.83
P-160	J-156	J-159	0.50	0.00	0.00	0.01	0.00
P-161	J-160	J-156	2.40	0.02	0.00	0.06	0.01
P-162	J-160	J-37	45.69	0.26	0.00	0.51	0.27
P-163	J-161	J-162	0.70	0.00	0.00	0.02	0.00
P-164	J-161	J-163	11.51	0.05	0.00	0.13	0.02
P-165	J-163	J-164	0.60	0.00	0.00	0.02	0.00
P-166	J-163	Pump-6	7.61	0.03	0.00	0.08	0.01
P-167	J-166	J-165	2.30	0.03	0.00	0.06	0.01
P-168	J-166	J-167	2.31	0.01	0.00	0.03	0.00
P-169	J-165	J-168	0.70	0.00	0.00	0.02	0.00
P-17	J-19	J-254	1.45	0.00	0.00	0.02	0.00
P-170	J-165	J-169	0.80	0.00	0.00	0.02	0.00
P-171	J-167	J-170	0.90	0.00	0.00	0.02	0.00
P-172	J-167	J-38	0.51	0.00	0.00	0.01	0.00
P-173	J-172	J-196	23.50	0.07	0.00	0.15	0.02
P-174	J-172	J-173	2.80	0.03	0.00	0.07	0.01
P-175	J-173	J-174	1.40	0.01	0.00	0.04	0.00

P-176	J-173	J-175	1.40	0.00	0.00	0.04	0.00
P-177	J-176	J-16	-4.20	0.00	0.00	0.03	0.00
P-178	J-176	J-177	1.40	0.01	0.00	0.04	0.00
P-179-XX	J-179	J-176					
P-18	J-19	J-49	34.00	0.26	0.00	0.21	0.04
P-180	J-178	J-179	3.40	0.00	0.00	0.02	0.00
P-181	J-179	J-180	0.60	0.00	0.00	0.02	0.00
P-182	J-178	J-181	0.20	0.00	0.00	0.01	0.00
P-183	J-182	J-178	6.50	0.00	0.00	0.04	0.00
P-184	J-182	J-183	0.00	0.00	0.00	0.00	0.00
P-185	J-184	J-182	8.10	0.01	0.00	0.05	0.00
P-186	J-184	J-185	0.30	0.00	0.00	0.01	0.00
P-187	J-186	J-184	10.00	0.01	0.00	0.06	0.00
P-188	J-186	J-187	0.30	0.00	0.00	0.01	0.00
P-189	J-188	J-186	11.90	0.02	0.00	0.07	0.01
P-19	J-20	J-18	6.00	0.02	0.00	0.07	0.01
P-190	J-188	J-189	0.00	0.00	0.00	0.00	0.00
P-191	J-190	J-188	13.40	0.03	0.00	0.08	0.01
P-192	J-190	J-191	0.50	0.00	0.00	0.01	0.00
P-193	J-193	J-190	15.80	0.01	0.00	0.10	0.01
P-194	J-192	J-193	18.80	0.03	0.00	0.12	0.01
P-195	J-193	J-194	0.80	0.00	0.00	0.02	0.00
P-196	J-192	J-195	0.50	0.00	0.00	0.01	0.00
P-197	J-196	J-192	21.10	0.03	0.00	0.13	0.02
P-198	J-196	J-197	0.40	0.00	0.00	0.01	0.00
P-2	J-3	J-222	52.27	0.36	0.00	0.58	0.35
P-20	J-20	J-45	2.20	0.01	0.00	0.06	0.01
P-200	J-198	J-199	0.20	0.00	0.00	0.01	0.00
P-201	J-198	J-200	0.60	0.00	0.00	0.02	0.00
P-202	J-201	J-11	-68.97	0.20	0.00	0.43	0.14
P-203	J-201	J-202	1.30	0.01	0.00	0.03	0.00
P-204	J-202	J-31	0.00	0.00	0.00	0.00	0.00
P-205	J-202	J-204	0.50	0.00	0.00	0.01	0.00
P-206	J-8	J-205	0.90	0.00	0.00	0.02	0.00
P-207	J-205	J-206	0.30	0.00	0.00	0.01	0.00
P-208	J-205	J-32	0.00	0.00	0.00	0.00	0.00
P-209	J-38	T-9	0.51	0.00	0.00	0.01	0.00
P-21	J-22	J-51	18.50	0.21	0.00	0.21	0.05
P-210	J-37	J-161	15.11	0.03	0.00	0.17	0.03
P-211	J-210	J-8	-62.47	0.63	0.00	0.39	0.12
P-212	J-210	J-34	0.00	0.00	0.00	0.00	0.00
P-213	J-37	T-10	30.58	0.14	0.00	0.34	0.13
P-214-XX	J-78	J-203					
P-215	J-214	J-210	-60.07	0.77	0.00	0.38	0.11
P-216	J-214	J-215	0.20	0.00	0.00	0.00	0.00
P-217	Pump-8	J-132	-333.29	2.98	0.00	2.09	2.65
P-218	J-215	J-217	0.00	0.00	0.00	0.00	0.00
P-219	J-214	J-218	59.07	0.14	0.00	0.37	0.11
P-22	Pump-1	J-250	8.53	0.01	0.00	0.09	0.01
P-220	J-218	J-219	58.27	0.50	0.00	0.37	0.10
P-221	J-36	J-203	3.60	0.02	0.00	0.04	0.00
P-222	J-39	J-36	5.00	0.04	0.00	0.06	0.00
P-223	J-222	J-223	51.07	0.63	0.00	0.57	0.33
P-225	J-223	J-2	48.87	0.71	0.00	0.54	0.30
P-226	J-223	J-226	0.70	0.00	0.00	0.02	0.00
P-227	J-2	J-227	0.30	0.00	0.00	0.01	0.00
P-228	J-225	J-3	-4.20	0.00	0.00	0.03	0.00
P-229	J-225	J-229	0.50	0.00	0.00	0.01	0.00
P-23	J-24	J-248	13.33	0.20	0.00	0.15	0.03
P-230	J-1	J-228	0.90	0.00	0.00	0.01	0.00
P-231	J-1	J-230	1.00	0.00	0.00	0.03	0.00
P-232	J-4	J-234	2.30	0.02	0.00	0.06	0.01
P-233	J-232	J-231	0.80	0.01	0.00	0.02	0.00
P-234	J-232	J-233	0.20	0.00	0.00	0.01	0.00
P-235	J-234	J-232	1.50	0.00	0.00	0.02	0.00
P-236	J-234	J-235	0.20	0.00	0.00	0.01	0.00
P-237	J-2	J-236	47.67	1.04	0.00	0.53	0.29
P-238	J-236	J-238	1.00	0.00	0.00	0.03	0.00
P-239	J-7	J-6	0.40	0.00	0.00	0.01	0.00

P-24	J-24	T-7	74.76	8.30	0.00	1.88	4.93
P-240	J-7	J-239	0.10	0.00	0.00	0.00	0.00
P-241	J-242	J-171	-1.40	0.00	0.00	0.02	0.00
P-242	J-244	J-243	-105.20	6.59	0.00	1.17	1.26
P-243	J-244	J-240	1.90	0.03	0.00	0.05	0.01
P-244	J-244	J-245	101.60	7.34	0.00	1.13	1.18
P-245	J-245	J-246	2.00	0.06	0.00	0.05	0.01
P-246	J-245	J-207	96.90	12.08	0.00	1.08	1.08
P-247	J-248	J-247	1.40	0.00	0.00	0.02	0.00
P-248	J-248	Pump-1	8.53	0.07	0.00	0.09	0.01
P-249	J-250	J-249	0.40	0.00	0.00	0.01	0.00
P-25	Pump-2	J-25	-9.72	0.00	0.00	0.24	0.11
P-250	J-250	J-26	-4.78	0.12	0.00	0.12	0.03
P-251	J-250	J-25	11.12	1.82	0.00	0.28	0.14
P-252	J-41	J-39	7.50	0.18	0.00	0.08	0.01
P-253	J-254	J-19	-1.45	0.00	0.00	0.02	0.00
P-254	J-42	J-29	-6.60	0.10	0.00	0.07	0.01
P-255	Pump-4	J-78	53.79	1.76	0.00	0.60	0.36
P-256	J-243	Pump-3	-107.20	1.99	0.00	1.19	1.31
P-257	J-171	J-42	-4.70	0.04	0.00	0.05	0.00
P-258	J-50	T-2	-234.54	3.89	0.00	1.50	1.44
P-259	J-255	J-237	0.30	0.00	0.00	0.01	0.00
P-26	J-26	J-252	1.30	0.01	0.00	0.03	0.00
P-260	J-5	T-1	411.38	6.71	0.00	2.58	3.92
P-261	J-10	J-50	-14.40	0.02	0.00	0.09	0.01
P-262	J-50	J-9	-118.56	1.59	0.00	0.74	0.39
P-263	J-50	J-143	338.29	5.19	0.00	2.12	2.73
P-264	J-16	J-256	-7.00	0.02	0.00	0.04	0.00
P-265	J-256	J-258	-7.00	0.02	0.00	0.04	0.00
P-266	J-144	J-258	7.00	0.00	0.00	0.04	0.00
P-267	J-144	J-257	-70.69	0.32	0.00	0.44	0.15
P-268	J-257	J-260	-70.69	0.72	0.00	0.44	0.15
P-269	J-259	J-9	120.56	1.63	0.00	0.76	0.40
P-27	J-26	T-12	-6.08	0.06	0.00	0.15	0.05
P-270	J-259	T-3	-108.68	0.67	0.00	0.69	0.35
P-271	J-260	J-259	11.88	0.01	0.00	0.07	0.01
P-272	J-260	T-5	-82.57	0.66	0.00	0.53	0.21
P-273-XX	J-228	T-4					
P-274	J-78	R-5	53.79	1.23	0.00	0.60	0.36
P-275	J-207	J-208	92.70	7.91	0.00	1.03	1.00
P-276	J-208	J-24	91.50	8.15	0.00	1.02	0.97
P-277	Pump-7	J-145	62.29	0.73	0.00	0.69	0.48
P-278	Pump-9	J-4	45.17	0.25	0.00	0.50	0.26
P-28	Pump-2	J-28	9.72	0.12	0.00	0.24	0.11
P-29	J-27	R-3	-107.20	1.44	0.00	0.43	0.11
P-3	J-236	Pump-9	45.17	0.30	0.00	0.50	0.26
P-30	Pump-3	J-27	-107.20	1.44	0.00	1.19	1.31
P-31	J-28	T-13	8.22	0.04	0.00	0.21	0.08
P-32	J-29	J-41	12.80	0.09	0.00	0.14	0.03
P-33	J-29	T-6	-22.80	0.17	0.00	0.25	0.07
P-34	Pump-4	R-2	-53.79	1.42	0.00	0.60	0.36
P-35	J-66	J-124	-8.10	0.20	0.00	0.20	0.08
P-36	J-30	J-109	-317.79	1.89	0.00	1.99	2.43
P-37	J-30	T-8	-257.36	1.52	0.00	1.61	1.64
P-38	J-255	J-35	41.57	1.14	0.00	0.46	0.23
P-4	J-7	J-35	-1.50	0.00	0.00	0.02	0.00
P-40	J-35	T-11	40.07	1.11	0.00	1.01	1.55
P-41	J-21	J-43	0.00	0.00	0.00	0.00	0.00
P-42	Pump-6	J-166	7.61	0.01	0.00	0.08	0.01
P-43	J-21	J-44	0.00	0.00	0.00	0.00	0.00
P-44	J-45	J-47	0.00	0.00	0.00	0.00	0.00
P-45	J-45	J-46	0.00	0.00	0.00	0.00	0.00
P-46	J-47	J-21	0.00	0.00	0.00	0.00	0.00
P-47	J-47	J-48	0.00	0.00	0.00	0.00	0.00
P-48	J-49	J-22	22.30	0.03	0.00	0.14	0.02
P-49-XX	J-49	J-77					
P-5	J-4	J-255	41.87	0.66	0.00	0.46	0.23
P-50	J-51	J-20	13.00	0.14	0.00	0.14	0.03
P-51	J-51	J-52	3.90	0.05	0.00	0.10	0.02

P-52	J-52	J-55	0.00	0.00	0.00	0.00	0.00
P-53	J-52	J-54	0.00	0.00	0.00	0.00	0.00
P-54	J-53	J-79	-11.80	0.01	0.00	0.07	0.01
P-55	J-53	J-57	3.00	0.00	0.00	0.02	0.00
P-56	J-57	J-56	1.00	0.00	0.00	0.03	0.00
P-57	J-57	J-59	1.00	0.00	0.00	0.01	0.00
P-58	J-58	J-65	-5.80	0.01	0.00	0.06	0.01
P-59	J-58	J-63	2.00	0.01	0.00	0.05	0.01
P-6	J-3	J-219	-57.37	0.20	0.00	0.36	0.10
P-60	J-60	J-61	0.40	0.00	0.00	0.01	0.00
P-61	J-60	J-62	0.40	0.00	0.00	0.01	0.00
P-62	J-63	J-60	1.20	0.00	0.00	0.03	0.00
P-63	J-63	J-64	0.40	0.00	0.00	0.01	0.00
P-64	J-65	J-53	-7.40	0.04	0.00	0.08	0.01
P-65-XX	J-65	J-75					
P-66	J-67	J-66	-7.50	0.27	0.00	0.19	0.07
P-67	J-67	J-68	1.00	0.00	0.00	0.03	0.00
P-68	J-69	J-67	-4.10	0.02	0.00	0.10	0.02
P-69	J-69	J-70	0.60	0.00	0.00	0.02	0.00
P-7	J-201	J-8	66.17	0.97	0.00	0.41	0.13
P-70	J-70	J-71	0.30	0.00	0.00	0.01	0.00
P-71	J-70	J-72	0.30	0.00	0.00	0.01	0.00
P-72	J-68	J-73	0.30	0.00	0.00	0.01	0.00
P-73	J-68	J-74	0.30	0.00	0.00	0.01	0.00
P-74	J-75	J-69	-1.90	0.02	0.00	0.05	0.01
P-75	J-75	J-76	0.40	0.00	0.00	0.01	0.00
P-76	J-77	J-58	-2.80	0.01	0.00	0.03	0.00
P-77	J-77	J-40	0.00	0.00	0.00	0.00	0.00
P-78	J-79	J-10	-12.60	0.02	0.00	0.08	0.01
P-79	J-79	J-80	0.20	0.00	0.00	0.01	0.00
P-8	J-5	J-81	-416.48	17.37	0.00	2.61	4.01
P-80-XX	J-77	J-86					
P-81	J-81	J-19	38.70	0.07	0.00	0.24	0.05
P-82	J-82	J-5	-5.10	0.01	0.00	0.06	0.00
P-83	J-82	J-83	2.10	0.03	0.00	0.05	0.01
P-84	J-83	J-84	0.70	0.00	0.00	0.02	0.00
P-85	J-83	J-85	0.40	0.00	0.00	0.01	0.00
P-86	J-86	J-82	-0.90	0.00	0.00	0.01	0.00
P-87	J-86	J-87	0.10	0.00	0.00	0.00	0.00
P-88	J-17	J-18	-1.00	0.00	0.00	0.01	0.00
P-89	J-17	J-88	0.50	0.00	0.00	0.01	0.00
P-9	J-11	J-198	2.00	0.00	0.00	0.01	0.00
P-90-XX	J-89	J-17					
P-91	J-89	J-91	-462.18	19.02	0.00	2.90	4.86
P-92	J-91	J-93	-536.26	17.71	0.00	3.36	6.40
P-93	J-90	J-99	-541.76	10.39	0.00	3.40	6.52
P-94	J-90	J-92	1.20	0.01	0.00	0.03	0.00
P-95	J-93	J-95	-537.26	7.61	0.00	3.37	6.42
P-96	J-93	J-94	0.20	0.00	0.00	0.01	0.00
P-97	J-95	J-90	-539.06	8.12	0.00	3.38	6.46
P-98	J-95	J-97	1.10	0.00	0.00	0.03	0.00
P-99	J-97	J-96	0.40	0.00	0.00	0.01	0.00

P U M P / L O S S   E L E M E N T   R E S U L T S

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	HEAD CHANGE (ft)	EFFIC- ENCY (%)	USEFUL POWER (Hp)	INCREMTL COST (\$)	TOTAL COST (\$)
Pump-1	8.53	216.03	447.83	231.8	----	-----	---	----
Pump-2	9.72	69.99	192.16	122.2	----	-----	---	----
Pump-3	107.20	67.12	362.36	295.2	----	-----	---	----
Pump-4	53.79	28.58	322.76	294.2	----	-----	---	----
Pump-6	7.61	170.01	430.02	260.0	----	-----	---	----
Pump-7	62.29	221.84	304.41	82.6	----	-----	---	----



Pump-8	333.29	140.49	544.08	403.6	----	-----	----	-----
Pump-9	45.17	215.42	478.16	262.7	----	-----	----	-----

END NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
J-1		0.90	1618.46	1400.00	218.46	94.67
J-10		1.80	1390.08			
J-100		0.00	1666.42	1210.00	456.42	197.78
J-101		1.20	1692.04	1220.00	472.04	204.55
J-102		0.00	1692.04	1240.00	452.04	195.88
J-103		0.20	1692.04	1280.00	412.04	178.55
J-104		0.20	1692.04	1280.00	412.04	178.55
J-105		1.40	1707.45	1360.00	347.45	150.56
J-106		0.60	1707.45	1400.00	307.45	133.23
J-107		0.00	1730.37	1650.00	80.37	34.83
J-108		0.00	1730.37	1600.00	130.37	56.49
J-109		0.60	1730.37	1600.00	130.37	56.49
J-11		1.40	1621.89	1160.00	461.89	200.15
J-110		0.10	1730.37	1640.00	90.37	39.16
J-111		0.00	1730.37	1400.00	330.37	143.16
J-112		0.00	1730.37	1440.00	290.37	125.83
J-113		0.60	1742.45	1400.00	342.45	148.39
J-114		0.70	1733.50	1440.00	293.50	127.18
J-115		0.10	1733.50	1660.00	73.50	31.85
J-116		0.60	1735.90	1440.00	295.90	128.22
J-117		0.30	1735.90	1520.00	215.90	93.56
J-118		0.30	1737.74	1440.00	297.74	129.02
J-119		0.10	1737.74	1660.00	77.74	33.69
J-120		0.40	1739.94	1400.00	339.94	147.31
J-121		0.10	1739.94	1480.00	259.94	112.64
J-122		0.00	1742.45	1480.00	262.45	113.73
J-123		0.50	1747.88	1320.00	427.88	185.42
J-124		0.20	1747.76	1360.00	387.76	168.03
J-125		0.00	1750.25	1280.00	470.25	203.78
J-126		0.60	1752.18	1280.00	472.18	204.61
J-127		0.00	1750.25	1400.00	350.25	151.78
J-128		0.00	1752.18	1400.00	352.18	152.61
J-129		0.20	1368.35	1280.00	88.35	38.29
J-13		0.30	1680.69	1240.00	440.69	190.97
J-130		0.60	1365.53	1220.00	145.53	63.06
J-131		0.30	1365.53	1240.00	125.53	54.40
J-132		0.80	1363.47	1220.00	143.47	62.17
J-133		0.50	1363.47	1290.00	73.47	31.84
J-134		1.30	1760.97	1220.00	540.97	234.42
J-135		0.90	1760.97	1400.00	360.97	156.42
J-136		0.50	1368.35	1220.00	148.35	64.29
J-137		0.30	1380.58	1280.00	100.58	43.58
J-138		0.50	1376.48	1200.00	176.48	76.47
J-139		0.20	1376.48	1240.00	136.48	59.14
J-14		1.40	1564.77	1280.00	284.77	123.40
J-140		0.00	1373.14	1200.00	173.14	75.03
J-141		0.00	1373.14	1280.00	93.14	40.36
J-142		0.60	1380.58	1160.00	220.58	95.58
J-143		0.50	1384.91			
J-144		1.40	1392.30	1150.00	242.30	105.00
J-145		1.70	1473.68	1173.00	300.68	130.30
J-146		1.30	1471.19	1200.00	271.19	117.51
J-147		1.10	1473.68	1360.00	113.68	49.26
J-148		0.30	1472.37	1200.00	272.37	118.03
J-149		0.00	1472.37	1400.00	72.37	31.36
J-15		0.00	1573.70	1320.00	253.70	109.94
J-150		2.90	1471.93	1200.00	271.93	117.84
J-151		2.00	1471.91	1400.00	71.91	31.16

J-152	0.70	1471.18	1280.00	191.18	82.85
J-153	1.70	1470.61	1200.00	270.61	117.26
J-154	1.20	1470.60	1400.00	70.60	30.59
J-155	0.50	1470.38	1360.00	110.38	47.83
J-156	0.40	1470.38	1280.00	190.38	82.50
J-157	0.50	1470.38	1360.00	110.38	47.83
J-158	0.50	1470.38	1400.00	70.38	30.50
J-159	0.50	1470.38	1360.00	110.38	47.83
J-16	2.80	1392.26	1220.00	172.26	74.65
J-160	1.30	1470.40	1200.00	270.40	117.17
J-161	2.90	1470.10	1230.00	240.10	104.04
J-162	0.70	1470.10	1360.00	110.10	47.71
J-163	3.30	1470.05	1240.00	230.05	99.69
J-164	0.60	1470.05	1320.00	150.05	65.02
J-165	0.80	1729.98	1480.00	249.98	108.32
J-166	3.00	1730.01	1320.00	410.01	177.67
J-167	0.90	1730.00	1480.00	250.00	108.33
J-168	0.70	1729.98	1520.00	209.98	90.99
J-169	0.80	1729.98	1520.00	209.98	90.99
J-17	0.50	1550.36	1180.00	370.36	160.49
J-170	0.90	1730.00	1520.00	210.00	91.00
J-171	3.30	1679.69	1164.00	515.69	223.46
J-172	2.90	1680.60	1240.00	440.60	190.93
J-173	0.00	1680.57	1320.00	360.57	156.25
J-174	1.40	1680.57	1380.00	300.57	130.25
J-175	1.40	1680.57	1440.00	240.57	104.25
J-176	2.80	1392.26	1228.00	164.26	71.18
J-177	1.40	1392.26	1280.00	112.26	48.64
J-178	2.90	1680.39	1280.00	400.39	173.50
J-179	2.80	1680.39	1250.00	430.39	186.50
J-18	5.00	1550.36			
J-180	0.60	1680.39	1420.00	260.39	112.83
J-181	0.20	1680.39	1360.00	320.39	138.84
J-182	1.60	1680.39	1280.00	400.39	173.50
J-183	0.00	1680.39	1400.00	280.39	121.50
J-184	1.60	1680.40	1320.00	360.40	156.17
J-185	0.30	1680.40	1400.00	280.40	121.51
J-186	1.60	1680.42	1400.00	280.42	121.51
J-187	0.30	1680.42	1400.00	280.42	121.51
J-188	1.50	1680.43	1440.00	240.43	104.19
J-189	0.00	1680.43	1520.00	160.43	69.52
J-19	1.80	1551.02	1200.00	351.02	152.11
J-190	1.90	1680.47	1400.00	280.47	121.54
J-191	0.50	1680.47	1520.00	160.47	69.54
J-192	1.80	1680.51	1320.00	360.51	156.22
J-193	2.20	1680.48	1400.00	280.48	121.54
J-194	0.80	1680.47	1540.00	140.47	60.87
J-195	0.50	1680.50	1400.00	280.50	121.55
J-196	2.00	1680.53	1320.00	360.53	156.23
J-197	0.40	1680.53	1440.00	240.53	104.23
J-198	1.20	1621.89	1200.00	421.89	182.82
J-199	0.20	1621.89	1400.00	221.89	96.15
J-2	0.90	1616.76	1320.00	296.76	128.60
J-20	4.80	1550.37	1120.00	430.37	186.50
J-200	0.60	1621.89	1320.00	301.89	130.82
J-201	1.50	1621.69	1160.00	461.69	200.07
J-202	0.80	1621.68	1200.00	421.68	182.73
J-203	3.60	1679.50	1543.00	136.50	59.15
J-204	0.50	1621.68	1280.00	341.68	148.06
J-205	0.60	1620.71	1200.00	420.71	182.31
J-206	0.30	1620.71	1400.00	220.71	95.64
J-207	4.20	1934.36	1585.00	349.36	151.39
J-208	1.20	1926.45	1590.00	336.45	145.79
J-21	0.00	1550.36	1280.00	270.36	117.16
J-210	2.40	1620.08	1200.00	420.08	182.04
J-214	0.80	1619.31	1240.00	379.31	164.37
J-215	0.20	1619.31	1280.00	339.31	147.04
J-217	0.00	1619.31	1240.00	379.31	164.37
J-218	0.80	1619.17	1240.00	379.17	164.31

J-219	0.90	1618.67	1240.00	378.67	164.09
J-22	3.80	1550.72	1106.00	444.72	192.71
J-222	1.20	1618.11	1260.00	358.11	155.18
J-223	1.50	1617.48	1260.00	357.48	154.91
J-225	0.90	1618.46	1320.00	298.46	129.33
J-226	0.70	1617.47	1440.00	177.47	76.90
J-227	0.30	1616.76	1400.00	216.76	93.93
J-228	0.90	1618.46	1400.00	218.46	94.67
J-229	0.50	1618.46	1400.00	218.46	94.67
J-23	0.00	1573.70	1450.00	123.70	53.60
J-230	1.00	1618.45	1440.00	178.45	77.33
J-231	0.80	1877.88	1600.00	277.88	120.41
J-232	0.50	1877.88	1440.00	437.88	189.75
J-233	0.20	1877.88	1640.00	237.88	103.08
J-234	0.60	1877.88	1440.00	437.88	189.75
J-235	0.20	1877.88	1520.00	357.88	155.08
J-236	1.50	1615.72	1400.00	215.72	93.48
J-237	0.30	1877.24	1520.00	357.24	154.81
J-238	1.00	1615.72	1450.00	165.72	71.81
J-239	0.10	1876.10	1440.00	436.10	188.98
J-24	3.40	1918.30	1618.00	300.30	130.13
J-240	1.90	1953.75	1800.00	153.75	66.63
J-242	1.40	1679.68	1240.00	439.68	190.53
J-243	2.00	1960.37	1600.00	360.37	156.16
J-244	1.70	1953.78	1560.00	393.78	170.64
J-245	2.70	1946.44	1550.00	396.44	171.79
J-246	2.00	1946.38	1800.00	146.38	63.43
J-247	1.40	1918.10	1700.00	218.10	94.51
J-248	3.40	1918.10	1640.00	278.10	120.51
J-249	0.40	2149.81	2000.00	149.81	64.92
J-25	1.40	2147.99	2070.00	77.99	33.80
J-250	1.80	2149.82	1700.00	449.82	194.92
J-252	1.30	2149.92	2080.00	69.92	30.30
J-254	2.90	1551.02	1400.00	151.02	65.44
J-255	0.00	1877.25	1480.00	397.25	172.14
J-256	0.00	1392.28			
J-257	0.00	1392.62			
J-258	0.00	1392.30			
J-259	0.00	1393.33			
J-26	0.00	2149.94	1753.00	396.94	172.01
J-260	0.00	1393.34			
J-27	0.00	1668.56	1590.00	78.56	34.04
J-28	1.50	2270.04	2200.00	70.04	30.35
J-29	3.40	1679.83	1309.00	370.83	160.69
J-3	0.90	1618.46	1260.00	358.46	155.33
J-30	0.00	1728.48	1600.00	128.48	55.67
J-31	0.00	1621.68	1360.00	261.68	113.40
J-32	0.00	1620.71	1370.00	250.71	108.64
J-34	0.00	1620.08	1300.00	320.08	138.70
J-35	0.00	1876.11	1800.00	76.11	32.98
J-36	1.40	1679.52	1600.00	79.52	34.46
J-37	0.00	1470.14	1220.00	250.14	108.39
J-38	0.00	1730.00	1650.00	80.00	34.67
J-39	2.50	1679.56	1550.00	129.56	56.14
J-4	1.00	1877.90	1380.00	497.90	215.76
J-40	0.00	1389.99			
J-41	5.30	1679.74	1360.00	319.74	138.55
J-42	1.90	1679.72	1200.00	479.72	207.88
J-43	0.00	1550.36	1360.00	190.36	82.49
J-44	0.00	1550.36	1360.00	190.36	82.49
J-45	2.20	1550.36	1200.00	350.36	151.82
J-46	0.00	1550.36	1240.00	310.36	134.49
J-47	0.00	1550.36	1214.00	336.36	145.76
J-48	0.00	1550.36	1320.00	230.36	99.82
J-49	11.70	1550.76	1160.00	390.76	169.33
J-5	0.00	1533.71			
J-50	0.40	1390.11			
J-51	1.60	1550.51	1160.00	390.51	169.22
J-52	3.90	1550.46	1160.00	390.46	169.20

J-53	1.40	1390.05	1120.00	270.05	117.02
J-54	0.00	1550.46	1200.00	350.46	151.86
J-55	0.00	1550.46	1280.00	270.46	117.20
J-56	1.00	1390.04	1200.00	190.04	82.35
J-57	1.00	1390.05	1120.00	270.05	117.02
J-58	1.00	1389.99	1200.00	189.99	82.33
J-59	1.00	1390.05			
J-6	0.40	1876.10	1680.00	196.10	84.98
J-60	0.40	1389.98	1280.00	109.98	47.66
J-61	0.40	1389.98	1310.00	79.98	34.66
J-62	0.40	1389.98	1315.00	74.98	32.49
J-63	0.40	1389.99	1280.00	109.99	47.66
J-64	0.40	1389.99	1315.00	74.99	32.49
J-65	1.60	1390.01	1185.00	205.01	88.84
J-66	0.60	1747.56	1400.00	347.56	150.61
J-67	2.40	1747.29	1320.00	427.29	185.16
J-68	0.40	1747.29	1360.00	387.29	167.82
J-69	1.60	1747.27	1280.00	467.27	202.48
J-7	1.00	1876.10	1480.00	396.10	171.64
J-70	0.00	1747.27	1360.00	387.27	167.82
J-71	0.30	1747.27	1480.00	267.27	115.82
J-72	0.30	1747.27	1400.00	347.27	150.48
J-73	0.30	1747.29	1400.00	347.29	150.49
J-74	0.30	1747.29	1480.00	267.29	115.82
J-75	1.50	1747.25	1240.00	507.25	219.81
J-76	0.40	1747.25	1440.00	307.25	133.14
J-77	2.80	1389.99	1240.00	149.99	64.99
J-78	0.00	2081.00	2000.00	81.00	35.10
J-79	0.60	1390.06	1200.00	190.06	82.36
J-8	2.80	1620.72	1200.00	420.72	182.31
J-80	0.20	1390.06	1320.00	70.06	30.36
J-81	5.60	1551.09	1240.00	311.09	134.80
J-82	2.10	1533.70	1320.00	213.70	92.60
J-83	1.00	1533.67	1400.00	133.67	57.93
J-84	0.70	1533.67	1440.00	93.67	40.59
J-85	0.40	1533.67	1440.00	93.67	40.59
J-86	0.80	1533.70	1340.00	193.70	83.94
J-87	0.10	1533.70	1320.00	213.70	92.60
J-88	0.50	1550.36	1240.00	310.36	134.49
J-89	0.00	1603.58	1180.00	423.58	183.55
J-9	2.00	1391.70			
J-90	1.50	1656.04	1190.00	466.04	201.95
J-91	1.70	1622.59	1166.00	456.59	197.86
J-92	1.20	1656.03	1360.00	296.03	128.28
J-93	0.80	1640.31	1200.00	440.31	190.80
J-94	0.20	1640.31	1280.00	360.31	156.13
J-95	0.70	1647.92	1250.00	397.92	172.43
J-96	0.40	1647.91	1320.00	327.91	142.10
J-97	0.50	1647.91	1300.00	347.91	150.76
J-98	0.20	1647.91	1320.00	327.91	142.10
J-99	0.30	1666.42	1200.00	466.42	202.12
Pump-1	0.00	2149.83	1702.00	447.83	194.06
Pump-2	0.00	2270.16	2078.00	192.16	83.27
Pump-3	0.00	1962.36	1600.00	362.36	157.02
Pump-4	0.00	2082.76	1760.00	322.76	139.86
Pump-6	0.00	1470.01	1300.00	170.01	73.67
Pump-7	0.00	1391.84	1170.00	221.84	96.13
Pump-8	0.00	1764.08	1220.00	544.08	235.77
Pump-9	0.00	1878.16	1400.00	478.16	207.20
R-2	----	1790.00	1760.00	30.00	13.00
R-3	----	1670.00	1560.00	110.00	47.67
R-5	----	2070.00	2000.00	70.00	30.33
T-1	----	1527.00	1506.00	21.00	9.10
T-10	----	1470.00	1400.00	70.00	30.33
T-11	----	1875.00	1800.00	75.00	32.50
T-12	----	2150.00	2080.00	70.00	30.33
T-13	----	2270.00	2200.00	70.00	30.33
T-2	----	1394.00	1363.00	31.00	13.43
T-3	----	1394.00	1364.00	30.00	13.00

T-4	----	1520.00	1490.00	30.00	13.00
T-5	----	1394.00	1337.00	57.00	24.70
T-6	----	1680.00	1400.00	280.00	121.33
T-7	----	1910.00	1840.00	70.00	30.33
T-8	----	1730.00	1690.00	40.00	17.33
T-9	----	1730.00	1680.00	50.00	21.67
Pump-1	0.00	1918.03	1702.00	216.03	93.61
Pump-2	0.00	2147.99	2078.00	69.99	30.33
Pump-3	0.00	1667.12	1600.00	67.12	29.08
Pump-4	0.00	1788.58	1760.00	28.58	12.39
Pump-6	0.00	1730.02	1300.00	430.02	186.34
Pump-7	0.00	1474.41	1170.00	304.41	131.91
Pump-8	0.00	1360.49	1220.00	140.49	60.88
Pump-9	0.00	1615.42	1400.00	215.42	93.35

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
Pump-8	235.77	T-1	9.10
J-134	234.42	Pump-4	12.39
J-171	223.46	R-2	13.00
J-75	219.81	T-3	13.00
J-4	215.76	T-4	13.00
J-42	207.88	T-2	13.43
Pump-9	207.20	T-8	17.33
J-126	204.61	T-9	21.67
J-101	204.55	T-5	24.70
J-125	203.78	Pump-3	29.08
J-69	202.48	J-252	30.30
J-99	202.12	Pump-2	30.33
J-90	201.95	R-5	30.33
J-11	200.15	T-10	30.33
J-201	200.07	T-12	30.33
J-91	197.86	T-13	30.33
J-100	197.78	T-7	30.33
J-102	195.88	J-28	30.35
J-250	194.92	J-80	30.36
Pump-1	194.06	J-158	30.50

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
R-2	53.79	
R-3	107.20	
R-5	-53.79	
T-1	-411.38	
T-10	-30.58	
T-11	-40.07	
T-12	6.08	
T-13	-8.22	
T-2	234.54	
T-3	108.68	
T-4	0.00	
T-5	82.57	

T-6	22.80
T-7	-74.76
T-8	257.36
T-9	-0.51

NET SYSTEM INFLOW	=	873.02
NET SYSTEM OUTFLOW	=	-619.32
NET SYSTEM DEMAND	=	253.70

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

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**Peak Demand**

Date & Time: Tue Jul 15 14:00:21 2003

INPUT DATA FILENAME ----- I:\COMMON\RMW\Letcher\kyp\peak1.DT2  
 TABULATED OUTPUT FILENAME ----- I:\COMMON\RMW\Letcher\kyp\peak1.OT2  
 POSTPROCESSOR RESULTS FILENAME --- I:\COMMON\RMW\Letcher\kyp\peak1.RS2

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*****
SUMMARY OF ORIGINAL DATA
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U N I T S   S P E C I F I E D

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

P I P E L I N E   D A T A

STATUS CODE:    XX -CLOSED PIPE    CV -CHECK VALVE

PIPE NAME	NODE NAMES		LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
	#1	#2				
P-1	J-225	J-1	6344.71	8.07	120.0000	0.00
P-10	J-11	J-91	4506.50	8.07	120.0000	0.00
P-100	J-97	J-98	904.75	4.03	120.0000	0.00
P-101	J-99	J-13	2184.93	8.07	120.0000	0.00
P-102	J-99	J-100	1244.97	4.03	120.0000	0.00
P-103	J-101	J-105	2128.77	8.07	120.0000	0.00
P-104	J-101	J-102	1193.18	4.03	120.0000	0.00
P-105	J-102	J-103	559.23	4.03	120.0000	0.00
P-106	J-102	J-104	644.56	4.03	120.0000	0.00
P-107	J-105	J-30	2886.48	8.07	120.0000	0.00
P-108	J-105	J-106	1279.87	4.03	120.0000	0.00
P-109	J-107	J-111	2680.57	6.07	120.0000	0.00
P-11	J-13	J-101	1575.44	8.07	120.0000	0.00
P-110	J-107	J-108	1133.33	4.03	120.0000	0.00
P-111	J-109	J-107	3310.57	6.07	120.0000	0.00
P-112	J-109	J-110	1681.12	4.03	120.0000	0.00
P-113-XX	J-111	J-14	3690.22	6.07	120.0000	0.00
P-114	J-111	J-112	2221.75	4.03	120.0000	0.00
P-115	J-109	J-114	1282.73	8.07	120.0000	0.00
P-116	J-114	J-116	980.74	8.07	120.0000	0.00
P-117	J-114	J-115	1297.58	4.03	120.0000	0.00
P-118	J-116	J-118	747.58	8.07	120.0000	0.00
P-119	J-116	J-117	811.80	4.03	120.0000	0.00
P-12	J-13	J-172	3016.78	8.07	120.0000	0.00
P-120	J-118	J-120	891.26	8.07	120.0000	0.00
P-121	J-118	J-119	2346.98	4.03	120.0000	0.00
P-122	J-120	J-113	1012.28	8.07	120.0000	0.00
P-123	J-120	J-121	1315.80	4.03	120.0000	0.00
P-124	J-113	J-122	1600.55	4.03	120.0000	0.00

P-125	J-113	J-123	2187.04	8.07	120.0000	0.00
P-126	J-123	J-124	1407.64	4.03	120.0000	0.00
P-127	J-123	J-125	907.82	8.07	120.0000	0.00
P-128	J-125	J-126	737.76	8.07	120.0000	0.00
P-129	J-125	J-127	903.23	4.03	120.0000	0.00
P-13	J-15	J-23	1502.35	4.03	120.0000	0.00
P-130	J-126	J-128	713.81	4.03	120.0000	0.00
P-131	J-126	J-134	3355.27	8.07	120.0000	0.00
P-132	J-130	J-136	1051.05	8.07	120.0000	0.00
P-133	J-130	J-131	3086.60	4.03	120.0000	0.00
P-134	J-132	J-130	771.48	8.07	120.0000	0.00
P-135	J-132	J-133	1972.73	4.03	120.0000	0.00
P-136	J-134	Pump-8	1171.05	8.07	120.0000	0.00
P-137	J-134	J-135	3698.01	4.03	120.0000	0.00
P-138	J-136	J-129	2359.41	4.03	120.0000	0.00
P-139	J-136	J-140	1775.17	8.07	120.0000	0.00
P-14	J-15	J-89	6147.87	8.07	120.0000	0.00
P-140	J-138	J-142	1514.96	8.07	120.0000	0.00
P-141	J-138	J-139	1060.82	4.03	120.0000	0.00
P-142	J-140	J-138	1240.55	8.07	120.0000	0.00
P-143	J-140	J-141	3465.04	4.03	120.0000	0.00
P-144	J-142	J-137	2193.00	4.03	120.0000	0.00
P-145	J-142	J-143	1593.61	8.07	120.0000	0.00
P-146	J-144	Pump-7	971.60	6.07	120.0000	0.00
P-147	J-145	J-148	2996.93	6.07	120.0000	0.00
P-148	J-145	J-147	3416.75	4.03	120.0000	0.00
P-149	J-148	J-150	1004.04	6.07	120.0000	0.00
P-15	J-14	J-15	1837.72	8.07	120.0000	0.00
P-150	J-148	J-149	3866.43	4.03	120.0000	0.00
P-151	J-150	J-146	2021.25	6.07	120.0000	0.00
P-152	J-150	J-151	4575.17	4.03	120.0000	0.00
P-153	J-146	J-152	1205.19	4.03	120.0000	0.00
P-154	J-146	J-153	1671.28	6.07	120.0000	0.00
P-155	J-153	J-154	3306.79	4.03	120.0000	0.00
P-156	J-153	J-160	679.88	6.07	120.0000	0.00
P-157	J-156	J-155	1123.80	4.03	120.0000	0.00
P-158	J-156	J-157	1074.93	4.03	120.0000	0.00
P-159	J-156	J-158	1101.16	4.03	120.0000	0.00
P-16	J-14	J-81	2831.60	8.07	120.0000	0.00
P-160	J-156	J-159	816.92	4.03	120.0000	0.00
P-161	J-160	J-156	1984.84	4.03	120.0000	0.00
P-162	J-160	J-37	974.14	6.07	120.0000	0.00
P-163	J-161	J-162	4660.85	4.03	120.0000	0.00
P-164	J-161	J-163	2554.71	6.07	120.0000	0.00
P-165	J-163	J-164	3169.43	4.03	120.0000	0.00
P-166	J-163	Pump-6	3507.35	6.07	120.0000	0.00
P-167	J-166	J-165	3378.38	4.03	120.0000	0.00
P-168	J-166	J-167	6039.06	6.07	120.0000	0.00
P-169	J-165	J-168	2178.86	4.03	120.0000	0.00
P-17	J-19	J-254	1443.17	6.07	120.0000	0.00
P-170	J-165	J-169	1662.33	4.03	120.0000	0.00
P-171	J-167	J-170	1125.68	4.03	120.0000	0.00
P-172	J-167	J-38	1851.12	6.07	120.0000	0.00
P-173	J-172	J-196	3518.71	8.07	120.0000	0.00
P-174	J-172	J-173	2459.67	4.03	120.0000	0.00
P-175	J-173	J-174	1728.71	4.03	120.0000	0.00
P-176	J-173	J-175	1529.24	4.03	120.0000	0.00
P-177	J-176	J-16	1827.59	8.07	120.0000	0.00
P-178	J-176	J-177	1855.05	4.03	120.0000	0.00
P-179-XX	J-179	J-176	3387.95	8.07	120.0000	0.00
P-18	J-19	J-49	6793.73	8.07	120.0000	0.00
P-180	J-178	J-179	1291.33	8.07	120.0000	0.00
P-181	J-179	J-180	2793.33	4.03	120.0000	0.00
P-182	J-178	J-181	1740.33	4.03	120.0000	0.00
P-183	J-182	J-178	1316.68	8.07	120.0000	0.00
P-184	J-182	J-183	1678.46	4.03	120.0000	0.00
P-185	J-184	J-182	3990.53	8.07	120.0000	0.00
P-186	J-184	J-185	1880.80	4.03	120.0000	0.00
P-187	J-186	J-184	3733.69	8.07	120.0000	0.00



P-188	J-186	J-187	1485.22	4.03	120.0000	0.00
P-189	J-188	J-186	2975.76	8.07	120.0000	0.00
P-19	J-20	J-18	2456.08	6.07	120.0000	0.00
P-190	J-188	J-189	1590.27	4.03	120.0000	0.00
P-191	J-190	J-188	4684.63	8.07	120.0000	0.00
P-192	J-190	J-191	1570.34	4.03	120.0000	0.00
P-193	J-193	J-190	1039.89	8.07	120.0000	0.00
P-194	J-192	J-193	2198.77	8.07	120.0000	0.00
P-195	J-193	J-194	1882.05	4.03	120.0000	0.00
P-196	J-192	J-195	1079.85	4.03	120.0000	0.00
P-197	J-196	J-192	1717.04	8.07	120.0000	0.00
P-198	J-196	J-197	1076.35	4.03	120.0000	0.00
P-2	J-3	J-222	1035.93	6.07	120.0000	0.00
P-20	J-20	J-45	1981.50	4.03	120.0000	0.00
P-200	J-198	J-199	5529.72	4.03	120.0000	0.00
P-201	J-198	J-200	3155.80	4.03	120.0000	0.00
P-202	J-201	J-11	1392.25	8.07	120.0000	0.00
P-203	J-201	J-202	2198.31	4.03	120.0000	0.00
P-204	J-202	J-31	4599.50	4.03	120.0000	0.00
P-205	J-202	J-204	2115.95	4.03	120.0000	0.00
P-206	J-8	J-205	2003.00	4.03	120.0000	0.00
P-207	J-205	J-206	1911.88	4.03	120.0000	0.00
P-208	J-205	J-32	6735.35	4.03	120.0000	0.00
P-209	J-38	T-9	2257.31	6.07	120.0000	0.00
P-21	J-22	J-51	4189.75	6.07	120.0000	0.00
P-210	J-37	J-161	974.14	6.07	120.0000	0.00
P-211	J-210	J-8	5296.47	8.07	120.0000	0.00
P-212	J-210	J-34	7071.67	4.03	120.0000	0.00
P-213	J-37	T-10	1056.08	6.07	120.0000	0.00
P-214-XX	J-78	J-203	3709.71	6.07	120.0000	0.00
P-215	J-214	J-210	6925.60	8.07	120.0000	0.00
P-216	J-214	J-215	2360.75	6.07	120.0000	0.00
P-217	@-Pump-8	J-132	1121.60	8.07	120.0000	0.00
P-218	J-215	J-217	2161.75	4.03	120.0000	0.00
P-219	J-214	J-218	1326.15	8.07	120.0000	0.00
P-22	Pump-1	J-250	1007.38	6.07	120.0000	0.00
P-220	J-219	J-219	4787.48	8.07	120.0000	0.00
P-221	J-36	J-203	9663.83	6.07	120.0000	0.00
P-222	J-39	J-36	7865.81	6.07	120.0000	0.00
P-223	J-222	J-223	1907.35	6.07	120.0000	0.00
P-225	J-223	J-2	2337.22	6.07	120.0000	0.00
P-226	J-223	J-226	4529.76	4.03	120.0000	0.00
P-227	J-2	J-227	3235.97	4.03	120.0000	0.00
P-228	J-225	J-3	4027.25	8.07	120.0000	0.00
P-229	J-225	J-229	3340.42	4.03	120.0000	0.00
P-23	J-24	J-248	7288.15	6.07	120.0000	0.00
P-230	J-1	J-228	1936.29	8.07	120.0000	0.00
P-231	J-1	J-230	2399.96	4.03	120.0000	0.00
P-232	J-4	J-234	2199.23	4.03	120.0000	0.00
P-233	J-232	J-231	7410.74	4.03	120.0000	0.00
P-234	J-232	J-233	2012.24	4.03	120.0000	0.00
P-235	J-234	J-232	822.99	6.07	120.0000	0.00
P-236	J-234	J-235	1518.53	4.03	120.0000	0.00
P-237	J-2	J-236	3583.91	6.07	120.0000	0.00
P-238	J-236	J-238	2765.69	4.03	120.0000	0.00
P-239	J-7	J-6	3973.62	4.03	120.0000	0.00
P-24	J-24	T-7	1684.85	4.03	120.0000	0.00
P-240	J-7	J-239	2367.57	6.07	120.0000	0.00
P-241	J-242	J-171	3438.27	6.07	120.0000	0.00
P-242	J-244	J-243	5226.93	6.07	120.0000	0.00
P-243	J-244	J-240	5848.50	4.03	120.0000	0.00
P-244	J-244	J-245	6215.76	6.07	120.0000	0.00
P-245	J-245	J-246	9830.89	4.03	120.0000	0.00
P-246	J-245	J-207	11161.75	6.07	120.0000	0.00
P-247	J-248	J-247	4122.81	6.07	120.0000	0.00
P-248	J-248	@-Pump-1	5810.29	6.07	120.0000	0.00
P-249	J-250	J-249	7374.15	4.03	120.0000	0.00
P-25	@-Pump-2	J-25	1.00	4.03	120.0000	0.00
P-250	J-250	J-26	3950.94	4.03	120.0000	0.00

P-251	J-250	J-25	12634.45	4.03	120.0000	0.00
P-252	J-41	J-39	19034.44	6.07	120.0000	0.00
P-253	J-254	J-19	1443.17	6.07	120.0000	0.00
P-254	J-42	J-29	13768.10	6.07	120.0000	0.00
P-255	Pump-4	J-78	4846.68	6.07	120.0000	0.00
P-256	J-243	Pump-3	1527.00	6.07	120.0000	0.00
P-257	J-171	J-42	9747.33	6.07	120.0000	0.00
P-258	J-50	T-2	2695.51	8.00	120.0000	0.00
P-259	J-255	J-237	1699.89	4.03	120.0000	0.00
P-26	J-26	J-252	4182.33	4.03	120.0000	0.00
P-260	J-5	T-1	1713.70	8.07	120.0000	0.00
P-261	J-10	J-50	3044.43	8.07	120.0000	0.00
P-262	J-50	J-9	4076.44	8.07	120.0000	0.00
P-263	J-50	J-143	1905.19	8.07	120.0000	0.00
P-264	J-16	J-256	7809.76	8.07	120.0000	0.00
P-265	J-256	J-258	8579.63	8.07	120.0000	0.00
P-266	J-144	J-258	1724.49	8.07	120.0000	0.00
P-267	J-144	J-257	2113.44	8.07	120.0000	0.00
P-268	J-257	J-260	4788.71	8.07	120.0000	0.00
P-269	J-259	J-9	4036.95	8.07	120.0000	0.00
P-27	J-26	T-12	1364.05	4.03	120.0000	0.00
P-270	J-259	T-3	1929.41	8.00	120.0000	0.00
P-271	J-260	J-259	1592.57	8.07	120.0000	0.00
P-272	J-260	T-5	3167.23	8.00	120.0000	0.00
P-273-XX	J-228	T-4	13000.00	8.07	120.0000	0.00
P-274	J-78	R-5	3390.53	6.07	120.0000	0.00
P-275	J-207	J-208	7934.30	6.07	120.0000	0.00
P-276	J-208	J-24	8369.13	6.07	120.0000	0.00
P-277	@-Pump-7	J-145	1522.93	6.07	120.0000	0.00
P-278	Pump-9	J-4	963.05	6.07	120.0000	0.00
P-28	Pump-2	J-28	1076.67	4.03	120.0000	0.00
P-29	J-27	R-3	13490.00	10.14	120.0000	0.00
P-3	J-236	@-Pump-9	1153.03	6.07	120.0000	0.00
P-30	@-Pump-3	J-27	1104.70	6.07	120.0000	0.00
P-31	J-28	T-13	487.34	4.03	120.0000	0.00
P-32	J-29	J-41	3548.35	6.07	120.0000	0.00
P-33	J-29	T-6	2331.73	6.07	120.0000	0.00
P-34	@-Pump-4	R-2	3892.57	6.07	120.0000	0.00
P-35	J-66	J-124	2549.35	4.03	120.0000	0.00
P-36	J-30	J-109	779.71	8.07	120.0000	0.00
P-37	J-30	T-8	925.74	8.07	120.0000	0.00
P-38	J-255	J-35	5036.88	6.07	120.0000	0.00
P-4	J-7	J-35	8924.23	6.07	120.0000	0.00
P-40	J-35	T-11	713.82	4.03	120.0000	0.00
P-41	J-21	J-43	3074.80	4.03	120.0000	0.00
P-42	@-Pump-6	J-166	1535.66	6.07	120.0000	0.00
P-43	J-21	J-44	1575.94	4.03	120.0000	0.00
P-44	J-45	J-47	1787.33	4.03	120.0000	0.00
P-45	J-45	J-46	1339.20	4.03	120.0000	0.00
P-46	J-47	J-21	1635.52	4.03	120.0000	0.00
P-47	J-47	J-48	1311.56	4.03	120.0000	0.00
P-48	J-49	J-22	1878.21	8.07	120.0000	0.00
P-49-XX	J-49	J-77	13723.24	6.07	120.0000	0.00
P-5	J-4	J-255	2869.33	6.07	120.0000	0.00
P-50	J-51	J-20	5203.64	6.07	120.0000	0.00
P-51	J-51	J-52	2589.05	4.03	120.0000	0.00
P-52	J-52	J-55	3473.72	4.03	120.0000	0.00
P-53	J-52	J-54	1687.17	4.03	120.0000	0.00
P-54	J-53	J-79	2738.53	8.07	120.0000	0.00
P-55	J-53	J-57	2121.70	8.07	120.0000	0.00
P-56	J-57	J-56	2053.46	4.03	120.0000	0.00
P-57	J-57	J-59	2770.86	8.07	120.0000	0.00
P-58	J-58	J-65	2353.13	6.07	120.0000	0.00
P-59	J-58	J-63	1357.44	4.03	120.0000	0.00
P-6	J-3	J-219	2002.16	8.07	120.0000	0.00
P-60	J-60	J-61	2579.08	4.03	120.0000	0.00
P-61	J-60	J-62	1555.68	4.03	120.0000	0.00
P-62	J-63	J-60	1269.25	4.03	120.0000	0.00
P-63	J-63	J-64	1346.35	4.03	120.0000	0.00

P-64	J-65	J-53	4291.00	6.07	120.0000	0.00
P-65-XX	J-65	J-75	4290.83	4.03	120.0000	0.00
P-66	J-67	J-66	3913.75	4.03	120.0000	0.00
P-67	J-67	J-68	919.71	4.03	120.0000	0.00
P-68	J-69	J-67	813.09	4.03	120.0000	0.00
P-69	J-69	J-70	1590.26	4.03	120.0000	0.00
P-7	J-201	J-8	7325.30	8.07	120.0000	0.00
P-70	J-70	J-71	1245.08	4.03	120.0000	0.00
P-71	J-70	J-72	1094.91	4.03	120.0000	0.00
P-72	J-68	J-73	675.24	4.03	120.0000	0.00
P-73	J-68	J-74	1855.91	4.03	120.0000	0.00
P-74	J-75	J-69	2843.32	4.03	120.0000	0.00
P-75	J-75	J-76	1528.01	4.03	120.0000	0.00
P-76	J-77	J-58	5438.72	6.07	120.0000	0.00
P-77	J-77	J-40	7817.36	6.07	120.0000	0.00
P-78	J-79	J-10	3302.06	8.07	120.0000	0.00
P-79	J-79	J-80	4139.95	4.03	120.0000	0.00
P-8	J-5	J-81	4335.24	8.07	120.0000	0.00
P-80-XX	J-77	J-86	5591.45	6.07	120.0000	0.00
P-81	J-81	J-19	1375.52	8.07	120.0000	0.00
P-82	J-82	J-5	2405.05	6.07	120.0000	0.00
P-83	J-82	J-83	4313.44	4.03	120.0000	0.00
P-84	J-83	J-84	2885.18	4.03	120.0000	0.00
P-85	J-83	J-85	1413.35	4.03	120.0000	0.00
P-86	J-86	J-82	1177.58	6.07	120.0000	0.00
P-87	J-86	J-87	1135.44	4.03	120.0000	0.00
P-88	J-17	J-18	4057.14	6.07	120.0000	0.00
P-89	J-17	J-88	1872.39	4.03	120.0000	0.00
P-9	J-11	J-198	2215.65	8.07	120.0000	0.00
P-90-XX	J-89	J-17	4286.71	6.07	120.0000	0.00
P-91	J-89	J-91	3912.89	8.07	120.0000	0.00
P-92	J-91	J-93	2767.58	8.07	120.0000	0.00
P-93	J-90	J-99	1592.75	8.07	120.0000	0.00
P-94	J-90	J-92	3568.18	4.03	120.0000	0.00
P-95	J-93	J-95	1184.66	8.07	120.0000	0.00
P-96	J-93	J-94	1884.86	4.03	120.0000	0.00
P-97	J-95	J-90	1256.70	8.07	120.0000	0.00
P-98	J-95	J-97	1422.11	4.03	120.0000	0.00
P-99	J-97	J-96	2645.85	4.03	120.0000	0.00

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

THERE IS A PUMP AT NODE      Pump-1; USEFUL POWER =      0.50 (Efficiency = 75.00%)  
THERE IS A PUMP AT NODE      Pump-2; USEFUL POWER =      0.30 (Efficiency = 75.00%)  
THERE IS A PUMP AT NODE      Pump-3; USEFUL POWER =      8.00 (Efficiency = 75.00%)  
THERE IS A PUMP AT NODE      Pump-4; USEFUL POWER =      4.00 (Efficiency = 0.75%)  
THERE IS A PUMP AT NODE      Pump-6; USEFUL POWER =      0.50 (Efficiency = 0.75%)  
THERE IS A PUMP AT NODE      Pump-7; USEFUL POWER =      1.30 (Efficiency = 0.75%)  
THERE IS A PUMP AT NODE      Pump-8; USEFUL POWER =     34.00 (Efficiency = 0.75%)  
THERE IS A PUMP AT NODE      Pump-9; USEFUL POWER =      3.00 (Efficiency = 75.00%)

E N D   N O D E   D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
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J-1	1.78	1400.00
J-10	3.56	0.00
J-100	0.00	1210.00
J-101	2.38	1220.00
J-102	0.00	1240.00
J-103	0.40	1280.00
J-104	0.40	1280.00
J-105	2.77	1360.00
J-106	1.19	1400.00
J-107	0.00	1650.00
J-108	0.00	1600.00
J-109	1.19	1600.00
J-11	2.77	1160.00
J-110	0.20	1640.00
J-111	0.00	1400.00
J-112	0.00	1440.00
J-113	1.19	1400.00
J-114	1.39	1440.00
J-115	0.20	1660.00
J-116	1.19	1440.00
J-117	0.59	1520.00
J-118	0.59	1440.00
J-119	0.20	1660.00
J-120	0.79	1400.00
J-121	0.20	1480.00
J-122	0.00	1480.00
J-123	0.99	1320.00
J-124	0.40	1360.00
J-125	0.00	1280.00
J-126	1.19	1280.00
J-127	0.00	1400.00
J-128	0.00	1400.00
J-129	0.40	1280.00
J-13	0.59	1240.00
J-130	1.19	1220.00
J-131	0.59	1240.00
J-132	1.58	1220.00
J-133	0.99	1290.00
J-134	2.57	1220.00
J-135	1.78	1400.00
J-136	0.99	1220.00
J-137	0.59	1280.00
J-138	0.99	1200.00
J-139	0.40	1240.00
J-14	2.77	1280.00
J-140	0.00	1200.00
J-141	0.00	1280.00
J-142	1.19	1160.00
J-143	0.99	0.00
J-144	2.77	1150.00
J-145	3.37	1173.00
J-146	2.57	1200.00
J-147	2.18	1360.00
J-148	0.59	1200.00
J-149	0.00	1400.00
J-15	0.00	1320.00
J-150	5.74	1200.00
J-151	3.96	1400.00
J-152	1.39	1280.00
J-153	3.37	1200.00
J-154	2.38	1400.00
J-155	0.99	1360.00
J-156	0.79	1280.00
J-157	0.99	1360.00
J-158	0.99	1400.00
J-159	0.99	1360.00
J-16	5.54	1220.00
J-160	2.57	1200.00

J-161	5.74	1230.00
J-162	1.39	1360.00
J-163	6.53	1240.00
J-164	1.19	1320.00
J-165	1.58	1480.00
J-166	5.94	1320.00
J-167	1.78	1480.00
J-168	1.39	1520.00
J-169	1.58	1520.00
J-17	0.99	1180.00
J-170	1.78	1520.00
J-171	6.53	1164.00
J-172	5.74	1240.00
J-173	0.00	1320.00
J-174	2.77	1380.00
J-175	2.77	1440.00
J-176	5.54	1228.00
J-177	2.77	1280.00
J-178	5.74	1280.00
J-179	5.54	1250.00
J-18	9.90	0.00
J-180	1.19	1420.00
J-181	0.40	1360.00
J-182	3.17	1280.00
J-183	0.00	1400.00
J-184	3.17	1320.00
J-185	0.59	1400.00
J-186	3.17	1400.00
J-187	0.59	1400.00
J-188	2.97	1440.00
J-189	0.00	1520.00
J-19	3.56	1200.00
J-190	3.76	1400.00
J-191	0.99	1520.00
J-192	3.56	1320.00
J-193	4.36	1400.00
J-194	1.58	1540.00
J-195	0.99	1400.00
J-196	3.96	1320.00
J-197	0.79	1440.00
J-198	2.38	1200.00
J-199	0.40	1400.00
J-2	1.78	1320.00
J-20	9.90	1120.00
J-200	1.19	1320.00
J-201	2.97	1160.00
J-202	1.58	1200.00
J-203	7.13	1543.00
J-204	0.99	1280.00
J-205	1.19	1200.00
J-206	0.59	1400.00
J-207	8.32	1585.00
J-208	2.38	1590.00
J-21	0.00	1280.00
J-210	4.75	1200.00
J-214	1.58	1240.00
J-215	0.40	1280.00
J-217	0.00	1240.00
J-218	1.58	1240.00
J-219	1.78	1240.00
J-22	7.52	1106.00
J-222	2.38	1260.00
J-223	2.97	1260.00
J-225	1.78	1320.00
J-226	1.39	1440.00
J-227	0.59	1400.00
J-228	1.78	1400.00
J-229	0.99	1400.00
J-23	0.00	1450.00

J-230	1.98	1440.00
J-231	1.58	1600.00
J-232	0.99	1440.00
J-233	0.40	1640.00
J-234	1.19	1440.00
J-235	0.40	1520.00
J-236	2.97	1400.00
J-237	0.59	1520.00
J-238	1.98	1450.00
J-239	0.20	1440.00
J-24	6.73	1618.00
J-240	3.76	1800.00
J-242	2.77	1240.00
J-243	3.96	1600.00
J-244	3.37	1560.00
J-245	5.35	1550.00
J-246	3.96	1800.00
J-247	2.77	1700.00
J-248	6.73	1640.00
J-249	0.79	2000.00
J-25	2.77	2070.00
J-250	3.56	1700.00
J-252	2.57	2080.00
J-254	5.74	1400.00
J-255	0.00	1480.00
J-256	0.00	0.00
J-257	0.00	0.00
J-258	0.00	0.00
J-259	0.00	0.00
J-26	0.00	1753.00
J-260	0.00	0.00
J-27	0.00	1590.00
J-28	2.97	2200.00
J-29	6.73	1309.00
J-3	1.78	1260.00
J-30	0.00	1600.00
J-31	0.00	1360.00
J-32	0.00	1370.00
J-34	0.00	1300.00
J-35	0.00	1800.00
J-36	2.77	1600.00
J-37	0.00	1220.00
J-38	0.00	1650.00
J-39	4.95	1550.00
J-4	1.98	1380.00
J-40	0.00	0.00
J-41	10.49	1360.00
J-42	3.76	1200.00
J-43	0.00	1360.00
J-44	0.00	1360.00
J-45	4.36	1200.00
J-46	0.00	1240.00
J-47	0.00	1214.00
J-48	0.00	1320.00
J-49	23.17	1160.00
J-5	0.00	0.00
J-50	0.79	0.00
J-51	3.17	1160.00
J-52	7.72	1160.00
J-53	2.77	1120.00
J-54	0.00	1200.00
J-55	0.00	1280.00
J-56	1.98	1200.00
J-57	1.98	1120.00
J-58	1.98	1200.00
J-59	1.98	0.00
J-6	0.79	1680.00
J-60	0.79	1280.00
J-61	0.79	1310.00

J-62	0.79	1315.00	
J-63	0.79	1280.00	
J-64	0.79	1315.00	
J-65	3.17	1185.00	
J-66	1.19	1400.00	
J-67	4.75	1320.00	
J-68	0.79	1360.00	
J-69	3.17	1280.00	
J-7	1.98	1480.00	
J-70	0.00	1360.00	
J-71	0.59	1480.00	
J-72	0.59	1400.00	
J-73	0.59	1400.00	
J-74	0.59	1480.00	
J-75	2.97	1240.00	
J-76	0.79	1440.00	
J-77	5.54	1240.00	
J-78	0.00	2000.00	
J-79	1.19	1200.00	
J-8	5.54	1200.00	
J-80	0.40	1320.00	
J-81	11.09	1240.00	
J-82	4.16	1320.00	
J-83	1.98	1400.00	
J-84	1.39	1440.00	
J-85	0.79	1440.00	
J-86	1.58	1340.00	
J-87	0.20	1320.00	
J-88	0.99	1240.00	
J-89	0.00	1180.00	
J-9	3.96	0.00	
J-90	2.97	1190.00	
J-91	3.37	1166.00	
J-92	2.38	1360.00	
J-93	1.58	1200.00	
J-94	0.40	1280.00	
J-95	1.39	1250.00	
J-96	0.79	1320.00	
J-97	0.99	1300.00	
J-98	0.40	1320.00	
J-99	0.59	1200.00	
Pump-1	0.00	1702.00	
Pump-2	0.00	2078.00	
Pump-3	0.00	1600.00	
Pump-4	0.00	1760.00	
Pump-6	0.00	1300.00	
Pump-7	0.00	1170.00	
Pump-8	0.00	1220.00	
Pump-9	0.00	1400.00	
R-2	----	1760.00	1790.00
R-3	----	1560.00	1670.00
R-5	----	2000.00	2070.00
T-1	----	1506.00	1527.00
T-10	----	1400.00	1470.00
T-11	----	1800.00	1875.00
T-12	----	2080.00	2150.00
T-13	----	2200.00	2270.00
T-2	----	1363.00	1394.00
T-3	----	1364.00	1394.00
T-4	----	1490.00	1520.00
T-5	----	1337.00	1394.00
T-6	----	1400.00	1680.00
T-7	----	1840.00	1910.00
T-8	----	1690.00	1730.00
T-9	----	1680.00	1730.00

OUTPUT OPTION DATA

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT  
 MAXIMUM AND MINIMUM PRESSURES = 20

S U P P L Y Z O N E D A T A

THIS SYSTEM HAS MULTIPLE SUPPLY ZONES

ZONE NO. 1 IS SUPPLIED THROUGH THE FOLLOWING PIPES:  
 ~@R-2

ZONE NO. 2 IS SUPPLIED THROUGH THE FOLLOWING PIPES:

ZONE NO. 3 IS SUPPLIED THROUGH THE FOLLOWING PIPES:

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

NUMBER OF PIPES ..... (p) = 275  
 NUMBER OF END NODES ..... (j) = 255  
 NUMBER OF PRIMARY LOOPS ..... (l) = 7  
 NUMBER OF SUPPLY NODES ..... (f) = 16  
 NUMBER OF SUPPLY ZONES ..... (z) = 3

=====  
 Case: 0

RESULTS OBTAINED AFTER 17 TRIALS: ACCURACY = 0.00253

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 / 1 0 0 0 (ft/ft)
	#1	#2					
P-1	J-225	J-1	5.54	0.01	0.00	0.03	0.00
P-10	J-11	J-91	-96.99	1.22	0.00	0.61	0.27
P-100	J-97	J-98	0.40	0.00	0.00	0.01	0.00
P-101	J-99	J-13	-557.95	15.05	0.00	3.50	6.89
P-102	J-99	J-100	0.00	0.00	0.00	0.00	0.00
P-103	J-101	J-105	-619.53	17.80	0.00	3.88	8.36
P-104	J-101	J-102	0.79	0.00	0.00	0.02	0.00
P-105	J-102	J-103	0.40	0.00	0.00	0.01	0.00
P-106	J-102	J-104	0.40	0.00	0.00	0.01	0.00
P-107	J-105	J-30	-623.49	24.42	0.00	3.91	8.46
P-108	J-105	J-106	1.19	0.00	0.00	0.03	0.00
P-109	J-107	J-111	0.00	0.00	0.00	0.00	0.00
P-11	J-13	J-101	-616.36	13.05	0.00	3.86	8.28
P-110	J-107	J-108	0.00	0.00	0.00	0.00	0.00
P-111	J-109	J-107	0.00	0.00	0.00	0.00	0.00
P-112	J-109	J-110	0.20	0.00	0.00	0.00	0.00



P-113-XX	J-111	J-14					
P-114	J-111	J-112	0.00	0.00	0.00	0.00	0.00
P-115	J-109	J-114	-304.87	2.88	0.00	1.91	2.25
P-116	J-114	J-116	-306.46	2.23	0.00	1.92	2.27
P-117	J-114	J-115	0.20	0.00	0.00	0.00	0.00
P-118	J-116	J-118	-308.24	1.72	0.00	1.93	2.30
P-119	J-116	J-117	0.59	0.00	0.00	0.01	0.00
P-12	J-13	J-172	57.82	0.31	0.00	0.36	0.10
P-120	J-118	J-120	-309.03	2.06	0.00	1.94	2.31
P-121	J-118	J-119	0.20	0.00	0.00	0.00	0.00
P-122	J-120	J-113	-310.02	2.35	0.00	1.94	2.32
P-123	J-120	J-121	0.20	0.00	0.00	0.00	0.00
P-124	J-113	J-122	0.00	0.00	0.00	0.00	0.00
P-125	J-113	J-123	-311.21	5.11	0.00	1.95	2.34
P-126	J-123	J-124	16.43	0.42	0.00	0.41	0.30
P-127	J-123	J-125	-328.63	2.35	0.00	2.06	2.58
P-128	J-125	J-126	-328.63	1.91	0.00	2.06	2.58
P-129	J-125	J-127	0.00	0.00	0.00	0.00	0.00
P-13	J-15	J-23	0.00	0.00	0.00	0.00	0.00
P-130	J-126	J-128	0.00	0.00	0.00	0.00	0.00
P-131	J-126	J-134	-329.82	8.73	0.00	2.07	2.60
P-132	J-130	J-136	-338.53	2.87	0.00	2.12	2.73
P-133	J-130	J-131	0.59	0.00	0.00	0.01	0.00
P-134	J-132	J-130	-336.75	2.09	0.00	2.11	2.70
P-135	J-132	J-133	0.99	0.00	0.00	0.02	0.00
P-136	J-134	Pump-8	-334.18	3.12	0.00	2.10	2.67
P-137	J-134	J-135	1.78	0.02	0.00	0.04	0.00
P-138	J-136	J-129	0.40	0.00	0.00	0.01	0.00
P-139	J-136	J-140	-339.92	4.88	0.00	2.13	2.75
P-14	J-15	J-89	-446.11	27.98	0.00	2.80	4.55
P-140	J-138	J-142	-341.31	4.20	0.00	2.14	2.77
P-141	J-138	J-139	0.40	0.00	0.00	0.01	0.00
P-142	J-140	J-138	-339.92	3.41	0.00	2.13	2.75
P-143	J-140	J-141	0.00	0.00	0.00	0.00	0.00
P-144	J-142	J-137	0.59	0.00	0.00	0.01	0.00
P-145	J-142	J-143	-343.09	4.46	0.00	2.15	2.80
P-146	J-144	Pump-7	62.65	0.47	0.00	0.70	0.48
P-147	J-145	J-148	57.10	1.22	0.00	0.63	0.41
P-148	J-145	J-147	2.13	0.02	0.00	0.05	0.01
P-149	J-148	J-150	56.51	0.40	0.00	0.63	0.40
P-15	J-14	J-15	-446.11	8.36	0.00	2.80	4.55
P-150	J-148	J-149	0.00	0.00	0.00	0.00	0.00
P-151	J-150	J-146	46.81	0.57	0.00	0.52	0.28
P-152	J-150	J-151	3.96	0.10	0.00	0.10	0.02
P-153	J-146	J-152	1.39	0.00	0.00	0.03	0.00
P-154	J-146	J-153	42.85	0.40	0.00	0.48	0.24
P-155	J-153	J-154	2.38	0.03	0.00	0.06	0.01
P-156	J-153	J-160	37.11	0.12	0.00	0.41	0.18
P-157	J-156	J-155	0.99	0.00	0.00	0.02	0.00
P-158	J-156	J-157	0.99	0.00	0.00	0.02	0.00
P-159	J-156	J-158	0.99	0.00	0.00	0.02	0.00
P-16	J-14	J-81	443.34	12.74	0.00	2.78	4.50
P-160	J-156	J-159	0.99	0.00	0.00	0.02	0.00
P-161	J-160	J-156	4.75	0.06	0.00	0.12	0.03
P-162	J-160	J-37	29.78	0.12	0.00	0.33	0.12
P-163	J-161	J-162	1.39	0.01	0.00	0.03	0.00
P-164	J-161	J-163	15.32	0.09	0.00	0.17	0.04
P-165	J-163	J-164	1.19	0.01	0.00	0.03	0.00
P-166	J-163	Pump-6	7.60	0.03	0.00	0.08	0.01
P-167	J-166	J-165	4.55	0.09	0.00	0.11	0.03
P-168	J-166	J-167	-2.89	0.01	0.00	0.03	0.00
P-169	J-165	J-168	1.39	0.01	0.00	0.03	0.00
P-17	J-19	J-254	2.87	0.00	0.00	0.03	0.00
P-170	J-165	J-169	1.58	0.01	0.00	0.04	0.00
P-171	J-167	J-170	1.78	0.01	0.00	0.04	0.00
P-172	J-167	J-38	-6.46	0.01	0.00	0.07	0.01
P-173	J-172	J-196	46.53	0.24	0.00	0.29	0.07
P-174	J-172	J-173	5.54	0.10	0.00	0.14	0.04
P-175	J-173	J-174	2.77	0.02	0.00	0.07	0.01

P-176	J-173	J-175	2.77	0.02	0.00	0.07	0.01
P-177	J-176	J-16	-8.32	0.01	0.00	0.05	0.00
P-178	J-176	J-177	2.77	0.02	0.00	0.07	0.01
P-179-XX	J-179	J-176					
P-18	J-19	J-49	67.32	0.93	0.00	0.42	0.14
P-180	J-178	J-179	6.73	0.00	0.00	0.04	0.00
P-181	J-179	J-180	1.19	0.01	0.00	0.03	0.00
P-182	J-178	J-181	0.40	0.00	0.00	0.01	0.00
P-183	J-182	J-178	12.87	0.01	0.00	0.08	0.01
P-184	J-182	J-183	0.00	0.00	0.00	0.00	0.00
P-185	J-184	J-182	16.04	0.04	0.00	0.10	0.01
P-186	J-184	J-185	0.59	0.00	0.00	0.01	0.00
P-187	J-186	J-184	19.80	0.05	0.00	0.12	0.01
P-188	J-186	J-187	0.59	0.00	0.00	0.01	0.00
P-189	J-188	J-186	23.56	0.06	0.00	0.15	0.02
P-19	J-20	J-18	11.88	0.05	0.00	0.13	0.02
P-190	J-188	J-189	0.00	0.00	0.00	0.00	0.00
P-191	J-190	J-188	26.53	0.11	0.00	0.17	0.02
P-192	J-190	J-191	0.99	0.00	0.00	0.02	0.00
P-193	J-193	J-190	31.28	0.03	0.00	0.20	0.03
P-194	J-192	J-193	37.22	0.10	0.00	0.23	0.05
P-195	J-193	J-194	1.58	0.01	0.00	0.04	0.00
P-196	J-192	J-195	0.99	0.00	0.00	0.02	0.00
P-197	J-196	J-192	41.78	0.10	0.00	0.26	0.06
P-198	J-196	J-197	0.79	0.00	0.00	0.02	0.00
P-2	J-3	J-222	57.19	0.42	0.00	0.64	0.41
P-20	J-20	J-45	4.36	0.05	0.00	0.11	0.03
P-200	J-198	J-199	0.40	0.00	0.00	0.01	0.00
P-201	J-198	J-200	1.19	0.01	0.00	0.03	0.00
P-202	J-201	J-11	-90.26	0.33	0.00	0.57	0.24
P-203	J-201	J-202	2.57	0.02	0.00	0.06	0.01
P-204	J-202	J-31	0.00	0.00	0.00	0.00	0.00
P-205	J-202	J-204	0.99	0.00	0.00	0.02	0.00
P-206	J-8	J-205	1.78	0.01	0.00	0.04	0.00
P-207	J-205	J-206	0.59	0.00	0.00	0.01	0.00
P-208	J-205	J-32	0.00	0.00	0.00	0.00	0.00
P-209	J-38	T-9	-6.46	0.02	0.00	0.07	0.01
P-21	J-22	J-51	36.63	0.75	0.00	0.41	0.18
P-210	J-37	J-161	22.45	0.07	0.00	0.25	0.07
P-211	J-210	J-8	-77.39	0.94	0.00	0.49	0.18
P-212	J-210	J-34	0.00	0.00	0.00	0.00	0.00
P-213	J-37	T-10	7.33	0.01	0.00	0.08	0.01
P-214-XX	J-78	J-203					
P-215	J-214	J-210	-72.63	1.09	0.00	0.46	0.16
P-216	J-214	J-215	0.40	0.00	0.00	0.00	0.00
P-217	Pump-8	J-132	-334.18	2.99	0.00	2.10	2.67
P-218	J-215	J-217	0.00	0.00	0.00	0.00	0.00
P-219	J-214	J-218	70.65	0.20	0.00	0.44	0.15
P-22	Pump-1	J-250	8.41	0.01	0.00	0.09	0.01
P-220	J-218	J-219	69.07	0.69	0.00	0.43	0.14
P-221	J-36	J-203	7.13	0.08	0.00	0.08	0.01
P-222	J-39	J-36	9.90	0.12	0.00	0.11	0.02
P-223	J-222	J-223	54.81	0.72	0.00	0.61	0.38
P-225	J-223	J-2	50.46	0.76	0.00	0.56	0.32
P-226	J-223	J-226	1.39	0.01	0.00	0.03	0.00
P-227	J-2	J-227	0.59	0.00	0.00	0.01	0.00
P-228	J-225	J-3	-8.32	0.01	0.00	0.05	0.00
P-229	J-225	J-229	0.99	0.01	0.00	0.02	0.00
P-23	J-24	J-248	17.91	0.35	0.00	0.20	0.05
P-230	J-1	J-228	1.78	0.00	0.00	0.01	0.00
P-231	J-1	J-230	1.98	0.01	0.00	0.05	0.01
P-232	J-4	J-234	4.55	0.06	0.00	0.11	0.03
P-233	J-232	J-231	1.58	0.03	0.00	0.04	0.00
P-234	J-232	J-233	0.40	0.00	0.00	0.01	0.00
P-235	J-234	J-232	2.97	0.00	0.00	0.03	0.00
P-236	J-234	J-235	0.40	0.00	0.00	0.01	0.00
P-237	J-2	J-236	48.08	1.06	0.00	0.53	0.30
P-238	J-236	J-238	1.98	0.02	0.00	0.05	0.01
P-239	J-7	J-6	0.79	0.00	0.00	0.02	0.00

P-24	J-24	T-7	54.69	4.65	0.00	1.38	2.76
P-240	J-7	J-239	0.20	0.00	0.00	0.00	0.00
P-241	J-242	J-171	-2.77	0.01	0.00	0.03	0.00
P-242	J-244	J-243	-106.46	6.73	0.00	1.18	1.29
P-243	J-244	J-240	3.76	0.11	0.00	0.09	0.02
P-244	J-244	J-245	99.33	7.04	0.00	1.10	1.13
P-245	J-245	J-246	3.96	0.21	0.00	0.10	0.02
P-246	J-245	J-207	90.02	10.54	0.00	1.00	0.94
P-247	J-248	J-247	2.77	0.01	0.00	0.03	0.00
P-248	J-248	Pump-1	8.41	0.07	0.00	0.09	0.01
P-249	J-250	J-249	0.79	0.01	0.00	0.02	0.00
P-25	Pump-2	J-25	-9.66	0.00	0.00	0.24	0.11
P-250	J-250	J-26	-8.39	0.34	0.00	0.21	0.09
P-251	J-250	J-25	12.43	2.24	0.00	0.31	0.18
P-252	J-41	J-39	14.85	0.64	0.00	0.16	0.03
P-253	J-254	J-19	-2.87	0.00	0.00	0.03	0.00
P-254	J-42	J-29	-13.07	0.36	0.00	0.15	0.03
P-255	Pump-4	J-78	53.79	1.76	0.00	0.60	0.36
P-256	J-243	Pump-3	-110.42	2.11	0.00	1.23	1.38
P-257	J-171	J-42	-9.31	0.14	0.00	0.10	0.01
P-258	J-50	T-2	-249.01	4.35	0.00	1.59	1.61
P-259	J-255	J-237	0.59	0.00	0.00	0.01	0.00
P-26	J-26	J-252	2.57	0.04	0.00	0.06	0.01
P-260	J-5	T-1	345.53	4.86	0.00	2.17	2.84
P-261	J-10	J-50	-28.51	0.09	0.00	0.18	0.03
P-262	J-50	J-9	-124.38	1.74	0.00	0.78	0.43
P-263	J-50	J-143	344.08	5.36	0.00	2.16	2.81
P-264	J-16	J-256	-13.86	0.06	0.00	0.09	0.01
P-265	J-256	J-258	-13.86	0.06	0.00	0.09	0.01
P-266	J-144	J-258	13.86	0.01	0.00	0.09	0.01
P-267	J-144	J-257	-79.28	0.39	0.00	0.50	0.19
P-268	J-257	J-260	-79.28	0.89	0.00	0.50	0.19
P-269	J-259	J-9	128.34	1.83	0.00	0.80	0.45
P-27	J-26	T-12	-10.96	0.19	0.00	0.28	0.14
P-270	J-259	T-3	-117.86	0.78	0.00	0.75	0.40
P-271	J-260	J-259	10.47	0.01	0.00	0.07	0.00
P-272	J-260	T-5	-89.75	0.77	0.00	0.57	0.24
P-273-XX	J-228	T-4					
P-274	J-78	R-5	53.79	1.23	0.00	0.60	0.36
P-275	J-207	J-208	81.71	6.26	0.00	0.91	0.79
P-276	J-208	J-24	79.33	6.25	0.00	0.88	0.75
P-277	Pump-7	J-145	62.65	0.73	0.00	0.70	0.48
P-278	Pump-9	J-4	43.13	0.23	0.00	0.48	0.24
P-28	Pump-2	J-28	9.66	0.12	0.00	0.24	0.11
P-29	J-27	R-3	-110.42	1.52	0.00	0.44	0.11
P-3	J-236	Pump-9	43.13	0.28	0.00	0.48	0.24
P-30	Pump-3	J-27	-110.42	1.52	0.00	1.23	1.38
P-31	J-28	T-13	6.69	0.03	0.00	0.17	0.06
P-32	J-29	J-41	25.34	0.32	0.00	0.28	0.09
P-33	J-29	T-6	-45.14	0.61	0.00	0.50	0.26
P-34	Pump-4	R-2	-53.79	1.42	0.00	0.60	0.36
P-35	J-66	J-124	-16.04	0.73	0.00	0.40	0.28
P-36	J-30	J-109	-303.49	1.74	0.00	1.90	2.23
P-37	J-30	T-8	-320.00	2.28	0.00	2.01	2.46
P-38	J-255	J-35	36.00	0.87	0.00	0.40	0.17
P-4	J-7	J-35	-2.97	0.02	0.00	0.03	0.00
P-40	J-35	T-11	33.03	0.77	0.00	0.83	1.09
P-41	J-21	J-43	0.00	0.00	0.00	0.00	0.00
P-42	Pump-6	J-166	7.60	0.01	0.00	0.08	0.01
P-43	J-21	J-44	0.00	0.00	0.00	0.00	0.00
P-44	J-45	J-47	0.00	0.00	0.00	0.00	0.00
P-45	J-45	J-46	0.00	0.00	0.00	0.00	0.00
P-46	J-47	J-21	0.00	0.00	0.00	0.00	0.00
P-47	J-47	J-48	0.00	0.00	0.00	0.00	0.00
P-48	J-49	J-22	44.15	0.12	0.00	0.28	0.06
P-49-XX	J-49	J-77					
P-5	J-4	J-255	36.60	0.51	0.00	0.41	0.18
P-50	J-51	J-20	25.74	0.48	0.00	0.29	0.09
P-51	J-51	J-52	7.72	0.19	0.00	0.19	0.07

P-52	J-52	J-55	0.00	0.00	0.00	0.00	0.00
P-53	J-52	J-54	0.00	0.00	0.00	0.00	0.00
P-54	J-53	J-79	-23.36	0.05	0.00	0.15	0.02
P-55	J-53	J-57	5.94	0.00	0.00	0.04	0.00
P-56	J-57	J-56	1.98	0.01	0.00	0.05	0.01
P-57	J-57	J-59	1.98	0.00	0.00	0.01	0.00
P-58	J-58	J-65	-11.48	0.05	0.00	0.13	0.02
P-59	J-58	J-63	3.96	0.03	0.00	0.10	0.02
P-6	J-3	J-219	-67.29	0.27	0.00	0.42	0.14
P-60	J-60	J-61	0.79	0.00	0.00	0.02	0.00
P-61	J-60	J-62	0.79	0.00	0.00	0.02	0.00
P-62	J-63	J-60	2.38	0.01	0.00	0.06	0.01
P-63	J-63	J-64	0.79	0.00	0.00	0.02	0.00
P-64	J-65	J-53	-14.65	0.14	0.00	0.16	0.03
P-65-XX	J-65	J-75					
P-66	J-67	J-66	-14.85	0.97	0.00	0.37	0.25
P-67	J-67	J-68	1.98	0.01	0.00	0.05	0.01
P-68	J-69	J-67	-8.12	0.07	0.00	0.20	0.08
P-69	J-69	J-70	1.19	0.00	0.00	0.03	0.00
P-7	J-201	J-8	84.71	1.54	0.00	0.53	0.21
P-70	J-70	J-71	0.59	0.00	0.00	0.01	0.00
P-71	J-70	J-72	0.59	0.00	0.00	0.01	0.00
P-72	J-68	J-73	0.59	0.00	0.00	0.01	0.00
P-73	J-68	J-74	0.59	0.00	0.00	0.01	0.00
P-74	J-75	J-69	-3.76	0.06	0.00	0.09	0.02
P-75	J-75	J-76	0.79	0.00	0.00	0.02	0.00
P-76	J-77	J-58	-5.54	0.03	0.00	0.06	0.01
P-77	J-77	J-40	0.00	0.00	0.00	0.00	0.00
P-78	J-79	J-10	-24.95	0.07	0.00	0.16	0.02
P-79	J-79	J-80	0.40	0.00	0.00	0.01	0.00
P-8	J-5	J-81	-355.63	12.97	0.00	2.23	2.99
P-80-XX	J-77	J-86					
P-81	J-81	J-19	76.63	0.24	0.00	0.48	0.17
P-82	J-82	J-5	-10.10	0.04	0.00	0.11	0.02
P-83	J-82	J-83	4.16	0.10	0.00	0.10	0.02
P-84	J-83	J-84	1.39	0.01	0.00	0.03	0.00
P-85	J-83	J-85	0.79	0.00	0.00	0.02	0.00
P-86	J-86	J-82	-1.78	0.00	0.00	0.02	0.00
P-87	J-86	J-87	0.20	0.00	0.00	0.00	0.00
P-88	J-17	J-18	-1.98	0.00	0.00	0.02	0.00
P-89	J-17	J-88	0.99	0.00	0.00	0.02	0.00
P-9	J-11	J-198	3.96	0.00	0.00	0.02	0.00
P-90-XX	J-89	J-17					
P-91	J-89	J-91	-446.11	17.81	0.00	2.80	4.55
P-92	J-91	J-93	-546.47	18.34	0.00	3.43	6.63
P-93	J-90	J-99	-557.36	10.95	0.00	3.49	6.87
P-94	J-90	J-92	2.38	0.03	0.00	0.06	0.01
P-95	J-93	J-95	-548.45	7.90	0.00	3.44	6.67
P-96	J-93	J-94	0.40	0.00	0.00	0.01	0.00
P-97	J-95	J-90	-552.01	8.49	0.00	3.46	6.75
P-98	J-95	J-97	2.18	0.01	0.00	0.05	0.01
P-99	J-97	J-96	0.79	0.00	0.00	0.02	0.00

P U M P / L O S S   E L E M E N T   R E S U L T S

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	HEAD CHANGE (ft)	EFFIC- ENCY (%)	USEFUL POWER (Hp)	INCREMTL COST (\$)	TOTAL COST (\$)
Pump-1	8.41	212.24	447.48	235.2	----	-----	---	----
Pump-2	9.66	69.23	192.15	122.9	----	-----	---	----
Pump-3	110.42	66.95	353.59	286.6	----	-----	---	----
Pump-4	53.79	28.58	322.76	294.2	----	-----	---	----
Pump-6	7.60	169.81	429.98	260.2	----	-----	---	----
Pump-7	62.65	221.48	303.57	82.1	----	-----	---	----

Pump-8	334.18	139.39	541.91	402.5	----	-----	---	----
Pump-9	43.13	202.21	477.39	275.2	----	-----	---	----

END NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
J-1		1.78	1605.43	1400.00	205.43	89.02
J-10		3.56	1389.56			
J-100		0.00	1657.40	1210.00	447.40	193.87
J-101		2.38	1685.50	1220.00	465.50	201.72
J-102		0.00	1685.50	1240.00	445.50	193.05
J-103		0.40	1685.50	1280.00	405.50	175.72
J-104		0.40	1685.50	1280.00	405.50	175.72
J-105		2.77	1703.30	1360.00	343.30	148.76
J-106		1.19	1703.30	1400.00	303.30	131.43
J-107		0.00	1729.46	1650.00	79.46	34.43
J-108		0.00	1729.46	1600.00	129.46	56.10
J-109		1.19	1729.46	1600.00	129.46	56.10
J-11		2.77	1610.51	1160.00	450.51	195.22
J-110		0.20	1729.46	1640.00	89.46	38.77
J-111		0.00	1729.46	1400.00	329.46	142.77
J-112		0.00	1729.46	1440.00	289.46	125.43
J-113		1.19	1740.69	1400.00	340.69	147.63
J-114		1.39	1732.35	1440.00	292.35	126.68
J-115		0.20	1732.35	1660.00	72.35	31.35
J-116		1.19	1734.57	1440.00	294.57	127.65
J-117		0.59	1734.57	1520.00	214.57	92.98
J-118		0.59	1736.29	1440.00	296.29	128.59
J-119		0.20	1736.29	1660.00	76.29	33.06
J-120		0.79	1738.34	1400.00	338.34	146.62
J-121		0.20	1738.34	1480.00	258.34	111.95
J-122		0.00	1740.69	1480.00	260.69	112.97
J-123		0.99	1745.80	1320.00	425.80	184.51
J-124		0.40	1745.38	1360.00	385.38	167.00
J-125		0.00	1748.15	1280.00	468.15	202.86
J-126		1.19	1750.05	1280.00	470.05	203.69
J-127		0.00	1748.15	1400.00	348.15	150.86
J-128		0.00	1750.05	1400.00	350.05	151.69
J-129		0.40	1367.33	1280.00	87.33	37.84
J-13		0.59	1672.45	1240.00	432.45	187.40
J-130		1.19	1364.46	1220.00	144.46	62.60
J-131		0.59	1364.46	1240.00	124.46	53.93
J-132		1.58	1362.38	1220.00	142.38	61.70
J-133		0.99	1362.37	1290.00	72.37	31.36
J-134		2.57	1758.78	1220.00	538.78	233.47
J-135		1.78	1758.77	1400.00	358.77	155.47
J-136		0.99	1367.33	1220.00	147.33	63.84
J-137		0.59	1379.83	1280.00	99.83	43.26
J-138		0.99	1375.63	1200.00	175.63	76.11
J-139		0.40	1375.63	1240.00	135.63	58.77
J-14		2.77	1557.57	1280.00	277.57	120.28
J-140		0.00	1372.22	1200.00	172.22	74.63
J-141		0.00	1372.22	1280.00	92.22	39.96
J-142		1.19	1379.83	1160.00	219.83	95.26
J-143		0.99	1384.29			
J-144		2.77	1391.95	1150.00	241.95	104.84
J-145		3.37	1472.84	1173.00	299.84	129.93
J-146		2.57	1470.65	1200.00	270.65	117.28
J-147		2.18	1472.81	1360.00	112.81	48.89
J-148		0.59	1471.62	1200.00	271.62	117.70
J-149		0.00	1471.62	1400.00	71.62	31.04
J-15		0.00	1565.93	1320.00	245.93	106.57
J-150		5.74	1471.22	1200.00	271.22	117.53
J-151		3.96	1471.12	1400.00	71.12	30.82

J-152	1.39	1470.65	1280.00	190.65	82.61
J-153	3.37	1470.25	1200.00	270.25	117.11
J-154	2.38	1470.22	1400.00	70.22	30.43
J-155	0.99	1470.07	1360.00	110.07	47.70
J-156	0.79	1470.07	1280.00	190.07	82.36
J-157	0.99	1470.07	1360.00	110.07	47.70
J-158	0.99	1470.07	1400.00	70.07	30.36
J-159	0.99	1470.07	1360.00	110.07	47.70
J-16	5.54	1391.81	1220.00	171.81	74.45
J-160	2.57	1470.13	1200.00	270.13	117.06
J-161	5.74	1469.94	1230.00	239.94	103.97
J-162	1.39	1469.92	1360.00	109.92	47.63
J-163	6.53	1469.85	1240.00	229.85	99.60
J-164	1.19	1469.84	1320.00	149.84	64.93
J-165	1.58	1729.87	1480.00	249.87	108.28
J-166	5.94	1729.96	1320.00	409.96	177.65
J-167	1.78	1729.97	1480.00	249.97	108.32
J-168	1.39	1729.86	1520.00	209.86	90.94
J-169	1.58	1729.86	1520.00	209.86	90.94
J-17	0.99	1542.25	1180.00	362.25	156.97
J-170	1.78	1729.96	1520.00	209.96	90.98
J-171	6.53	1678.88	1164.00	514.88	223.12
J-172	5.74	1672.14	1240.00	432.14	187.26
J-173	0.00	1672.04	1320.00	352.04	152.55
J-174	2.77	1672.02	1380.00	292.02	126.54
J-175	2.77	1672.03	1440.00	232.03	100.54
J-176	5.54	1391.81	1228.00	163.81	70.98
J-177	2.77	1391.79	1280.00	111.79	48.44
J-178	5.74	1671.39	1280.00	391.39	169.60
J-179	5.54	1671.39	1250.00	421.39	182.60
J-18	9.90	1542.25			
J-180	1.19	1671.38	1420.00	251.38	108.93
J-181	0.40	1671.39	1360.00	311.39	134.94
J-182	3.17	1671.40	1280.00	391.40	169.61
J-183	0.00	1671.40	1400.00	271.40	117.61
J-184	3.17	1671.44	1320.00	351.44	152.29
J-185	0.59	1671.44	1400.00	271.44	117.62
J-186	3.17	1671.49	1400.00	271.49	117.65
J-187	0.59	1671.49	1400.00	271.49	117.65
J-188	2.97	1671.55	1440.00	231.55	100.34
J-189	0.00	1671.55	1520.00	151.55	65.67
J-19	3.56	1544.59	1200.00	344.59	149.32
J-190	3.76	1671.67	1400.00	271.67	117.72
J-191	0.99	1671.66	1520.00	151.66	65.72
J-192	3.56	1671.80	1320.00	351.80	152.45
J-193	4.36	1671.70	1400.00	271.70	117.74
J-194	1.58	1671.69	1540.00	131.69	57.07
J-195	0.99	1671.80	1400.00	271.80	117.78
J-196	3.96	1671.90	1320.00	351.90	152.49
J-197	0.79	1671.90	1440.00	231.90	100.49
J-198	2.38	1610.51	1200.00	410.51	177.89
J-199	0.40	1610.50	1400.00	210.50	91.22
J-2	1.78	1603.55	1320.00	283.55	122.87
J-20	9.50	1542.31	1120.00	422.31	183.00
J-200	1.19	1610.50	1320.00	290.50	125.88
J-201	2.97	1610.18	1160.00	450.18	195.08
J-202	1.58	1610.16	1200.00	410.16	177.74
J-203	7.13	1678.22	1543.00	135.22	58.60
J-204	0.99	1610.15	1280.00	330.15	143.07
J-205	1.19	1608.63	1200.00	408.63	177.07
J-206	0.59	1608.63	1400.00	208.63	90.41
J-207	8.32	1927.17	1585.00	342.17	148.27
J-208	2.38	1920.91	1590.00	330.91	143.39
J-21	0.00	1542.25	1280.00	262.25	113.64
J-210	4.75	1607.70	1200.00	407.70	176.67
J-214	1.58	1606.61	1240.00	366.61	158.86
J-215	0.40	1606.61	1280.00	326.61	141.53
J-217	0.00	1606.61	1240.00	366.61	158.86
J-218	1.58	1606.41	1240.00	366.41	158.78

J-219	1.78	1605.72	1240.00	365.72	158.48
J-22	7.52	1543.54	1106.00	437.54	189.60
J-222	2.38	1605.02	1260.00	345.02	149.51
J-223	2.97	1604.31	1260.00	344.31	149.20
J-225	1.78	1605.44	1320.00	285.44	123.69
J-226	1.39	1604.29	1440.00	164.29	71.19
J-227	0.59	1603.55	1400.00	203.55	88.20
J-228	1.78	1605.43	1400.00	205.43	89.02
J-229	0.99	1605.43	1400.00	205.43	89.02
J-23	0.00	1565.93	1450.00	115.93	50.24
J-230	1.98	1605.41	1440.00	165.41	71.68
J-231	1.58	1877.07	1600.00	277.07	120.06
J-232	0.99	1877.10	1440.00	437.10	189.41
J-233	0.40	1877.09	1640.00	237.09	102.74
J-234	1.19	1877.10	1440.00	437.10	189.41
J-235	0.40	1877.10	1520.00	357.10	154.74
J-236	2.97	1602.49	1400.00	202.49	87.75
J-237	0.59	1876.64	1520.00	356.64	154.55
J-238	1.98	1602.47	1450.00	152.47	66.07
J-239	0.20	1875.76	1440.00	435.76	188.83
J-24	6.73	1914.65	1618.00	296.65	128.55
J-240	3.76	1944.64	1800.00	144.64	62.68
J-242	2.77	1678.88	1240.00	438.88	190.18
J-243	3.96	1951.49	1600.00	351.49	152.31
J-244	3.37	1944.75	1560.00	384.75	166.73
J-245	5.35	1937.71	1550.00	387.71	168.01
J-246	3.96	1937.50	1800.00	137.50	59.58
J-247	2.77	1914.30	1700.00	214.30	92.86
J-248	6.73	1914.30	1640.00	274.30	118.87
J-249	0.79	2149.46	2000.00	149.46	64.77
J-25	2.77	2147.23	2070.00	77.23	33.46
J-250	3.56	2149.47	1700.00	449.47	194.77
J-252	2.57	2149.77	2080.00	69.77	30.23
J-254	5.74	1544.58	1400.00	144.58	62.65
J-255	0.00	1876.65	1480.00	396.65	171.88
J-256	0.00	1391.87			
J-257	0.00	1392.34			
J-258	0.00	1391.93			
J-259	0.00	1393.22			
J-26	0.00	2149.81	1753.00	396.81	171.95
J-260	0.00	1393.23			
J-27	0.00	1668.48	1590.00	78.48	34.01
J-28	2.97	2270.03	2200.00	70.03	30.35
J-29	6.73	1679.39	1309.00	370.39	160.50
J-3	1.78	1605.45	1260.00	345.45	149.69
J-30	0.00	1727.72	1600.00	127.72	55.35
J-31	0.00	1610.16	1360.00	250.16	108.40
J-32	0.00	1608.63	1370.00	238.63	103.41
J-34	0.00	1607.70	1300.00	307.70	133.34
J-35	0.00	1875.77	1800.00	75.77	32.84
J-36	2.77	1678.30	1600.00	78.30	33.93
J-37	0.00	1470.01	1220.00	250.01	108.34
J-38	0.00	1729.98	1650.00	79.98	34.66
J-39	4.95	1678.43	1550.00	128.43	55.65
J-4	1.98	1877.16	1380.00	497.16	215.44
J-40	0.00	1389.22			
J-41	10.49	1679.07	1360.00	319.07	138.26
J-42	3.76	1679.02	1200.00	479.02	207.58
J-43	0.00	1542.25	1360.00	182.25	78.98
J-44	0.00	1542.25	1360.00	182.25	78.98
J-45	4.36	1542.25	1200.00	342.25	148.31
J-46	0.00	1542.25	1240.00	302.25	130.98
J-47	0.00	1542.25	1214.00	328.25	142.24
J-48	0.00	1542.25	1320.00	222.25	96.31
J-49	23.17	1543.66	1160.00	383.66	166.25
J-5	0.00	1531.86			
J-50	0.79	1389.65			
J-51	3.17	1542.79	1160.00	382.79	165.88
J-52	7.72	1542.60	1160.00	382.60	165.79

J-53	2.77	1389.44	1120.00	269.44	116.76
J-54	0.00	1542.60	1200.00	342.60	148.46
J-55	0.00	1542.60	1280.00	262.60	113.79
J-56	1.98	1389.42	1200.00	189.42	82.08
J-57	1.98	1389.44	1120.00	269.44	116.76
J-58	1.98	1389.25	1200.00	189.25	82.01
J-59	1.98	1389.44			
J-6	0.79	1875.76	1680.00	195.76	84.83
J-60	0.79	1389.21	1280.00	109.21	47.32
J-61	0.79	1389.21	1310.00	79.21	34.32
J-62	0.79	1389.21	1315.00	74.21	32.16
J-63	0.79	1389.22	1280.00	109.22	47.33
J-64	0.79	1389.22	1315.00	74.22	32.16
J-65	3.17	1389.30	1185.00	204.30	88.53
J-66	1.19	1744.66	1400.00	344.66	149.35
J-67	4.75	1743.69	1320.00	423.69	183.60
J-68	0.79	1743.69	1360.00	383.69	166.26
J-69	3.17	1743.63	1280.00	463.63	200.90
J-7	1.98	1875.76	1480.00	395.76	171.50
J-70	0.00	1743.62	1360.00	383.62	166.24
J-71	0.59	1743.62	1480.00	263.62	114.24
J-72	0.59	1743.62	1400.00	343.62	148.90
J-73	0.59	1743.69	1400.00	343.69	148.93
J-74	0.59	1743.68	1480.00	263.68	114.26
J-75	2.97	1743.57	1240.00	503.57	218.21
J-76	0.79	1743.57	1440.00	303.57	131.55
J-77	5.54	1389.22	1240.00	149.22	64.66
J-78	0.00	2081.00	2000.00	81.00	35.10
J-79	1.19	1389.49	1200.00	189.49	82.11
J-8	5.54	1608.64	1200.00	408.64	177.08
J-80	0.40	1389.49	1320.00	69.49	30.11
J-81	11.09	1544.83	1240.00	304.83	132.09
J-82	4.16	1531.82	1320.00	211.82	91.79
J-83	1.98	1531.72	1400.00	131.72	57.08
J-84	1.39	1531.71	1440.00	91.71	39.74
J-85	0.79	1531.72	1440.00	91.72	39.74
J-86	1.58	1531.82	1340.00	191.82	83.12
J-87	0.20	1531.82	1320.00	211.82	91.79
J-88	0.99	1542.24	1240.00	302.24	130.97
J-89	0.00	1593.91	1180.00	413.91	179.36
J-9	3.96	1391.39			
J-90	2.97	1646.45	1190.00	456.45	197.80
J-91	3.37	1611.72	1166.00	445.72	193.15
J-92	2.38	1646.43	1360.00	286.43	124.12
J-93	1.58	1630.06	1200.00	430.06	186.36
J-94	0.40	1630.06	1280.00	350.06	151.69
J-95	1.39	1637.97	1250.00	387.97	168.12
J-96	0.79	1637.96	1320.00	317.96	137.78
J-97	0.99	1637.96	1300.00	337.96	146.45
J-98	0.40	1637.96	1320.00	317.96	137.78
J-99	0.59	1657.40	1200.00	457.40	198.21
Pump-1	0.00	2149.48	1702.00	447.48	193.91
Pump-2	0.00	2270.15	2078.00	192.15	83.26
Pump-3	0.00	1953.59	1600.00	353.59	153.22
Pump-4	0.00	2082.76	1760.00	322.76	139.86
Pump-6	0.00	1469.81	1300.00	169.81	73.59
Pump-7	0.00	1391.48	1170.00	221.48	95.97
Pump-8	0.00	1761.91	1220.00	541.91	234.83
Pump-9	0.00	1877.39	1400.00	477.39	206.87
R-2	----	1790.00	1760.00	30.00	13.00
R-3	----	1670.00	1560.00	110.00	47.67
R-5	----	2070.00	2000.00	70.00	30.33
T-1	----	1527.00	1506.00	21.00	9.10
T-10	----	1470.00	1400.00	70.00	30.33
T-11	----	1875.00	1800.00	75.00	32.50
T-12	----	2150.00	2080.00	70.00	30.33
T-13	----	2270.00	2200.00	70.00	30.33
T-2	----	1394.00	1363.00	31.00	13.43
T-3	----	1394.00	1364.00	30.00	13.00



T-4	----	1520.00	1490.00	30.00	13.00
T-5	----	1394.00	1337.00	57.00	24.70
T-6	----	1680.00	1400.00	280.00	121.33
T-7	----	1910.00	1840.00	70.00	30.33
T-8	----	1730.00	1690.00	40.00	17.33
T-9	----	1730.00	1680.00	50.00	21.67
Pump-1	0.00	1914.24	1702.00	212.24	91.97
Pump-2	0.00	2147.23	2078.00	69.23	30.00
Pump-3	0.00	1666.95	1600.00	66.95	29.01
Pump-4	0.00	1788.58	1760.00	28.58	12.39
Pump-6	0.00	1729.98	1300.00	429.98	186.32
Pump-7	0.00	1473.57	1170.00	303.57	131.55
Pump-8	0.00	1359.39	1220.00	139.39	60.40
Pump-9	0.00	1602.21	1400.00	202.21	87.63

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
Pump-8	234.83	T-1	9.10
J-134	233.47	Pump-4	12.39
J-171	223.12	R-2	13.00
J-75	218.21	T-3	13.00
J-4	215.44	T-4	13.00
J-42	207.58	T-2	13.43
Pump-9	206.87	T-8	17.33
J-126	203.69	T-9	21.67
J-125	202.86	T-5	24.70
J-101	201.72	Pump-3	29.01
J-69	200.90	Pump-2	30.00
J-99	198.21	J-80	30.11
J-90	197.80	J-252	30.23
J-11	195.22	R-5	30.33
J-201	195.08	T-10	30.33
J-250	194.77	T-12	30.33
Pump-1	193.91	T-13	30.33
J-100	193.87	T-7	30.33
J-91	193.15	J-28	30.35
J-102	193.05	J-158	30.36

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
R-2	53.79	
R-3	110.42	
R-5	-53.79	
T-1	-345.53	
T-10	-7.33	
T-11	-33.03	
T-12	10.96	
T-13	-6.69	
T-2	249.01	
T-3	117.86	
T-4	0.00	
T-5	89.75	

T-6	45.14
T-7	-54.69
T-8	320.00
T-9	6.46

NET SYSTEM INFLOW	=	1003.39
NET SYSTEM OUTFLOW	=	-501.06
NET SYSTEM DEMAND	=	502.33

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

**APPENDIX 2**  
**DETAILED OPINION OF**  
**PROBABLE COST**

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "A-1" – Start of project on KY 7 and Daniels Branch to Low Gap Road and KY 7 Intersection					
1.	6-Inch Class 250 (SDR 17) PVC Pipe	9,000	L.F.	\$10.50	\$94,500.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	3,200	L.F.	\$8.00	\$25,600.00
3.	Stream Crossing: 4, 6, & 8-Inch Class 265 (DR 7) Polyethylene Pipe	1	Each	\$4,500.00	\$4,500.00
4.	Railroad Crossing: Including 12" x 0.250" Steel Cover Pipe and Bore	1	Each	\$15,000.00	\$15,000.00
5.	12-Inch x 0.250 Inch Steel Cover Pipe	40	L.F.	\$50.00	\$2,000.00
6.	Extra for Boring or jacking for 12-Inch Steel Cover Pipe	40	L.F.	\$150.00	\$6,000.00
7.	6-Inch Mechanical Joint Resilient Seated Gate Valve and Box	4	Each	\$600.00	\$2,400.00
8.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	2	Each	\$500.00	\$1,000.00
9.	6-Inch Fire Hydrant	2	Each	\$2,000.00	\$4,000.00
10.	Blow-Off Assembly	1	Each	\$1,100.00	\$1,100.00
11.	Concrete Line Marker	2	Each	\$150.00	\$300.00
12.	6" Tapping Sleeve and Valve	1	Each	\$2,000.00	\$2,000.00
13.	3/4-Inch Service Pipe	525	L.F.	\$5.00	\$2,625.00
14.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	21	Each	\$650.00	\$13,650.00
15.	Crushed Rock on Trench Surface	400	Ton	\$20.00	\$8,000.00
16.	2-Inch Thickness Bituminous Surface Replacement	210	L.F.	\$20.00	\$4,200.00
17.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	20	L.F.	\$25.00	\$500.00
Construction Cost					\$187,375.00
Project Cost					\$252,956.25

CONTRACT 519-03A  
Area 1

Letcher County  
Opinion of Probable Cost  
Proposed Water Facilities  
Letcher County, Kentucky

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "A-2" - On KY 7 from Low Gap Road to KY 931					
1.	8-Inch Class 250 (SDR 17) PVC Pipe	4,320	L.F.	\$12.00	\$51,840.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	530	L.F.	\$8.00	\$4,240.00
3.	Stream Crossing: 4, 6, & 8-Inch Class 265 (DR 7) Polyethylene Pipe	2	Each	\$4,500.00	\$9,000.00
4.	Railroad Crossing: Including 16" x 0.250" Steel Cover Pipe and Bore	2	Each	\$20,000.00	\$40,000.00
5.	8-Inch Mechanical Joint Resilient Seated Gate Valve and Box	5	Each	\$700.00	\$3,500.00
6.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	2	Each	\$500.00	\$1,000.00
7.	6-Inch Fire Hydrant	3	Each	\$2,000.00	\$6,000.00
8.	Concrete Line Marker	2	Each	\$150.00	\$300.00
9.	3/4-Inch Service Pipe	225	L.F.	\$5.00	\$1,125.00
10.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	9	Each	\$650.00	\$5,850.00
11.	Crushed Rock on Trench Surface	71	Ton	\$20.00	\$1,420.00
12.	2-Inch Thickness Bituminous Surface Replacement	50	L.F.	\$20.00	\$1,000.00
13.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	25	L.F.	\$25.00	\$625.00
Construction Cost					\$125,900.00
Project Cost					\$169,965.00

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "A-3" - On KY 7 from KY931 to KY 1410					
1.	8-Inch Class 250 (SDR 17) PVC Pipe	4,600	L.F.	\$12.00	\$55,200.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	2,700	L.F.	\$8.00	\$21,600.00
3.	Railroad Crossing: Including 16" x 0.250" Steel Cover Pipe and Bore	2	Each	\$20,000.00	\$40,000.00
4.	8-Inch Mechanical Joint Resilient Seated Gate Valve and Box	3	Each	\$700.00	\$2,100.00
5.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	2	Each	\$500.00	\$1,000.00
6.	6-Inch Fire Hydrant	1	Each	\$2,000.00	\$2,000.00
7.	Blow-Off Assembly	1	Each	\$1,100.00	\$1,100.00
8.	Concrete Line Marker	2	Each	\$150.00	\$300.00
9.	3/4-Inch Service Pipe	525	L.F.	\$5.00	\$2,625.00
10.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	21	Each	\$650.00	\$13,650.00
11.	Crushed Rock on Trench Surface	305	Ton	\$20.00	\$6,100.00
12.	2-Inch Thickness Bituminous Surface Replacement	1,600	L.F.	\$20.00	\$32,000.00
13.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	25	L.F.	\$25.00	\$625.00
Construction Cost					\$178,300.00
Project Cost					\$240,705.00

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION " A -4" - On KY 7 from KY 1410 to KY 317 @ Deane					
1.	8-Inch Class 250 (SDR 17) PVC Pipe	30,000	L.F.	\$12.00	\$360,000.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	40,200	L.F.	\$8.00	\$321,600.00
3.	Stream Crossing: 4, 6, & 8-Inch Class 265 (DR 7) Polyethylene Pipe	2	Each	\$4,500.00	\$9,000.00
4.	Railroad Crossing: Including 16" x 0.250" Steel Cover Pipe and Bore	2	Each	\$20,000.00	\$40,000.00
5.	12-Inch x 0.250 Inch Steel Cover Pipe	150	L.F.	\$50.00	\$7,500.00
6.	Extra for Boring or Jacking for 12-Inch Steel Cover Pipe	150	L.F.	\$150.00	\$22,500.00
7.	10-Inch x 0.250 Inch Steel Cover Pipe,	350	L.F.	\$50.00	\$17,500.00
8.	Extra for Boring or Jacking for 10-Inch Steel Cover Pipe	350	L.F.	\$150.00	\$52,500.00
9.	8-Inch Mechanical Joint Resilient Seated Gate Valve and Box	10	Each	\$700.00	\$7,000.00
10.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	15	Each	\$500.00	\$7,500.00
11.	6-Inch Fire Hydrant	4	Each	\$2,000.00	\$8,000.00
12.	Blow-Off Assembly	6	Each	\$1,100.00	\$6,600.00
13.	Test Meter/Tap Assembly	2	Each	\$1,000.00	\$2,000.00
14.	Concrete Line Marker	8	Each	\$150.00	\$1,200.00
15.	3/4-Inch Service Pipe	5,725	L.F.	\$5.00	\$28,625.00
16.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	229	Each	\$650.00	\$148,850.00
17.	Crushed Rock on Trench Surface	4,600	Ton	\$20.00	\$92,000.00
18.	2-Inch Thickness Bituminous Surface Replacement	2,225	L.F.	\$20.00	\$44,500.00
Construction Cost					\$1,176,875.00
Project Cost					\$1,588,781.25

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "A-5" – On KY7 from KY 317 @ Deane to Knott County Line					
1.	8-Inch Class 250 (SDR 17) PVC Pipe	13,200	L.F.	\$12.00	\$158,400.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	6,700	L.F.	\$8.00	\$53,600.00
3.	Stream Crossing: 4, 6, & 8-Inch Class 265 (DR 7) Polyethylene Pipe	2	Each	\$4,500.00	\$9,000.00
4.	Railroad Crossing: Including 16" x 0.250" Steel Cover Pipe and Bore	2	Each	\$20,000.00	\$40,000.00
5.	10-Inch x 0.250 Inch Steel Cover Pipe	120	L.F.	\$50.00	\$6,000.00
6.	Extra for Boring or Jacking for 10-Inch Steel Cover Pipe	120	L.F.	\$150.00	\$18,000.00
7.	8-Inch Mechanical Joint Resilient Seated Gate Valve and Box	4	Each	\$700.00	\$2,800.00
8.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	4	Each	\$500.00	\$2,000.00
9.	6-Inch Fire Hydrant	4	Each	\$2,000.00	\$8,000.00
10.	Blow-Off Assembly	6	Each	\$1,100.00	\$6,600.00
11.	Test Meter/Tap Assembly	2	Each	\$1,000.00	\$2,000.00
12.	Concrete Line Marker	5	Each	\$150.00	\$750.00
13.	3/4-Inch Service Pipe	1,725	L.F.	\$5.00	\$8,625.00
14.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	69	Each	\$650.00	\$44,850.00
15.	Cut-in to existing 12" Line at Knott County	1	Each	\$2,000.00	\$2,000.00
16.	Booster Pump Station	1	Each	\$150,000.00	\$150,000.00
17.	Crushed Rock on Trench Surface	6,100	Ton	\$20.00	\$122,000.00
18.	2-Inch Thickness Bituminous Surface Replacement	2,640	L.F.	\$20.00	\$52,800.00
19.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	25	L.F.	\$25.00	\$625.00
Construction Cost					\$688,050.00
Project Cost					\$928,867.50



CONTRACT 519-03A  
Area 1

Letcher County  
Opinion of Probable Cost  
Proposed Water Facilities  
Letcher County, Kentucky

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION " B " - On KY 317 from KY 7 to Existing Tank at Jack Horn area					
1.	6-Inch Class 250 (SDR 17) PVC Pipe	21,900	L.F.	\$10.50	\$229,950.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	15,400	L.F.	\$8.00	\$123,200.00
3.	Stream Crossing: 4, 6, & 8-Inch Class 265 (DR 7) Polyethylene Pipe	4	Each	\$4,500.00	\$18,000.00
4.	10-Inch x 0.250 Inch Steel Cover Pipe, Furnish	240	L.F.	\$50.00	\$12,000.00
5.	Extra for Boring or Jacking for 10-Inch Steel Cover Pipe	240	L.F.	\$150.00	\$36,000.00
6.	6-Inch Mechanical Joint Resilient Seated Gate Valve and Box	5	Each	\$600.00	\$3,000.00
7.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	6	Each	\$500.00	\$3,000.00
8.	6-Inch Fire Hydrant	2	Each	\$2,000.00	\$4,000.00
9.	Blow-Off Assembly	1	Each	\$1,100.00	\$1,100.00
10.	Test Meter/Tap Assembly	2	Each	\$1,000.00	\$2,000.00
11.	Concrete Line Marker	4	Each	\$150.00	\$600.00
12.	3/4-Inch Service Pipe	2,800	L.F.	\$5.00	\$14,000.00
13.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	112	Each	\$650.00	\$72,800.00
14.	Master Pressure Reducing Valves	2	Each	\$12,500.00	\$25,000.00
15.	Air Release Assembly	1	Each	\$500.00	\$500.00
16.	Booster Pump Station	1	Each	\$100,000.00	\$100,000.00
17.	Ground Storage Tank	1	Each	\$75,000.00	\$75,000.00
18.	Crushed Rock on Trench Surface	1,700	Ton	\$20.00	\$34,000.00
19.	2-Inch Thickness Bituminous Surface Replacement	1,100	L.F.	\$20.00	\$22,000.00
20.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	50	L.F.	\$25.00	\$1,250.00
Construction Cost					\$777,400.00
Project Cost					\$1,049,490.00

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "C " - On KY 1469 from KY 317 to end of line					
1.	6-Inch Class 250 (SDR 17) PVC Pipe	5,300	L.F.	\$10.50	\$55,650.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	4,800	L.F.	\$8.00	\$38,400.00
3.	Stream Crossing: 4, 6, & 8-Inch Class 265 (DR 7) Polyethylene Pipe	2	Each	\$4,500.00	\$9,000.00
4.	12-Inch x 0.250 Inch Steel Cover Pipe	100	L.F.	\$50.00	\$5,000.00
5.	Extra for Boring or Jacking for 12-Inch Steel Cover Pipe	100	L.F.	\$150.00	\$15,000.00
6.	6-Inch Mechanical Joint Resilient Seated Gate Valve and Box	2	Each	\$600.00	\$1,200.00
7.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	3	Each	\$500.00	\$1,500.00
8.	6-Inch Fire Hydrant	1	Each	\$2,000.00	\$2,000.00
9.	Blow-Off Assembly	1	Each	\$1,100.00	\$1,100.00
10.	Test Meter/Tap Assembly	1	Each	\$1,000.00	\$1,000.00
11.	Concrete Line Marker	2	Each	\$150.00	\$300.00
12.	3/4-Inch Service Pipe	675	L.F.	\$5.00	\$3,375.00
13.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	27	Each	\$650.00	\$17,550.00
14.	Crushed Rock on Trench Surface	550	Ton	\$20.00	\$11,000.00
15.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	50	L.F.	\$25.00	\$1,250.00
Construction Cost					\$163,325.00
Project Cost					\$220,488.75

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "D" - On KY 1410 from KY 7 to Knott County Line at top of mountain					
1.	8-Inch Class 250 (SDR 17) PVC Pipe	7,100	L.F.	\$12.00	\$85,200.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	11,000	L.F.	\$8.00	\$88,000.00
3.	Stream Crossing: 4, 6, & 8-Inch Class 265 (DR 7) Polyethylene Pipe	4	Each	\$4,500.00	\$18,000.00
4.	16-Inch x 0.250 Inch Steel Cover Pipe	120	L.F.	\$50.00	\$6,000.00
5.	Extra for Boring or Jacking for 16-Inch Steel Cover Pipe	120	L.F.	\$150.00	\$18,000.00
6.	10-Inch x 0.250 Inch Steel Cover Pipe	80	L.F.	\$50.00	\$4,000.00
7.	Extra for Boring or Jacking for 10-Inch Steel Cover Pipe	80	L.F.	\$150.00	\$12,000.00
8.	Master Meter Vault Assembly	1	L.F.	\$25,000.00	\$25,000.00
9.	8-Inch Mechanical Joint Resilient Seated Gate Valve and Box	2	Each	\$700.00	\$1,400.00
10.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	2	Each	\$500.00	\$1,000.00
11.	6-Inch Fire Hydrant	1	Each	\$2,000.00	\$2,000.00
12.	Blow-Off Assembly	1	Each	\$1,100.00	\$1,100.00
13.	Test Meter/Tap Assembly	2	Each	\$1,000.00	\$2,000.00
14.	Concrete Line Marker	4	Each	\$150.00	\$600.00
15.	3/4-Inch Service Pipe	1,300	L.F.	\$5.00	\$6,500.00
16.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	52	Each	\$650.00	\$33,800.00
17.	Master Pressure Reducing Valves	2	Each	\$12,500.00	\$25,000.00
18.	Residential Booster Pump Station	2	Each	\$3,000.00	\$6,000.00
19.	Cut-in to Existing Line	1	Each	\$2,000.00	\$2,000.00
20.	Crushed Rock on Trench Surface	1,200	Ton	\$20.00	\$24,000.00
21.	2-Inch Thickness Bituminous Surface Replacement	6,000	L.F.	\$20.00	\$120,000.00
22.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	50	L.F.	\$25.00	\$1,250.00
Construction Cost					\$482,850.00
Project Cost					\$651,847.50

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "E" - On KY931 from KY 7 to KY 1862					
1.	8-Inch Class 250 (SDR 17) PVC Pipe	9,300	L.F.	\$12.00	\$111,600.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	10,200	L.F.	\$8.00	\$81,600.00
3.	Stream Crossing: 4, 6, & 8-Inch Class 265 (DR 7) Polyethylene Pipe	4	Each	\$4,500.00	\$18,000.00
4.	Railroad Crossing: Including 16" x 0.250" Steel Cover Pipe and Bore	3	Each	\$20,000.00	\$60,000.00
5.	10-Inch x 0.250 Inch Steel Cover Pipe	100	L.F.	\$50.00	\$5,000.00
6.	Extra for Boring or Jacking for 10-Inch Steel Cover Pipe	100	L.F.	\$150.00	\$15,000.00
7.	8-Inch Mechanical Joint Resilient Seated Gate Valve and Box	5	Each	\$700.00	\$3,500.00
8.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	5	Each	\$500.00	\$2,500.00
9.	6-Inch Fire Hydrant	3	Each	\$2,000.00	\$6,000.00
10.	Blow-Off Assembly	2	Each	\$1,100.00	\$2,200.00
11.	Test Meter/Tap Assembly	3	Each	\$1,000.00	\$3,000.00
12.	Concrete Line Marker	4	Each	\$150.00	\$600.00
13.	3/4-Inch Service Pipe	2,900	L.F.	\$5.00	\$14,500.00
14.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	116	Each	\$650.00	\$75,400.00
15.	Crushed Rock on Trench Surface	1,200	Ton	\$20.00	\$24,000.00
16.	2-Inch Thickness Bituminous Surface Replacement	3,200	L.F.	\$20.00	\$64,000.00
17.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	200	L.F.	\$25.00	\$5,000.00
Construction Cost					\$491,900.00
Project Cost					\$664,065.00

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "F" – On KY 931 from KY 1862 to KY 1148					
1.	8-Inch Class 250 (SDR 17) PVC Pipe	8,100	L.F.	\$12.00	\$97,200.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	4,800	L.F.	\$8.00	\$38,400.00
3.	Stream Crossing: 4, 6, & 8-Inch Class 265 (DR 7) Polyethylene Pipe	2	Each	\$4,500.00	\$9,000.00
4.	16-Inch x 0.250 Inch Steel Cover Pipe	100	L.F.	\$50.00	\$5,000.00
5.	Extra for Boring or Jacking for 16-Inch Steel Cover Pipe, Unclassified Excavation	100	L.F.	\$150.00	\$15,000.00
6.	10-Inch x 0.250 Inch Steel Cover Pipe	100	L.F.	\$50.00	\$5,000.00
7.	Extra for Boring or Jacking for 10-Inch Steel Cover Pipe	100	L.F.	\$150.00	\$15,000.00
8.	8-Inch Mechanical Joint Resilient Seated Gate Valve and Box	3	Each	\$700.00	\$2,100.00
9.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	4	Each	\$500.00	\$2,000.00
10.	6-Inch Fire Hydrant	1	Each	\$2,000.00	\$2,000.00
11.	Blow-Off Assembly	1	Each	\$1,100.00	\$1,100.00
12.	Test Meter/Tap Assembly	1	Each	\$1,000.00	\$1,000.00
13.	Concrete Line Marker	4	Each	\$150.00	\$600.00
14.	3/4-Inch Service Pipe	1,075	L.F.	\$5.00	\$5,375.00
15.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	43	Each	\$650.00	\$27,950.00
16.	Master Pressure Reducing Valves	1	Each	\$12,500.00	\$12,500.00
17.	Ground Storage Tank, Complete	1	Each	\$200,000.00	\$200,000.00
18.	Crushed Rock on Trench Surface	600	Ton	\$20.00	\$12,000.00
19.	2-Inch Thickness Bituminous Surface Replacement	1,100	L.F.	\$20.00	\$22,000.00
20.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	50	L.F.	\$25.00	\$1,250.00
Construction Cost					\$474,475.00
Project Cost					\$640,541.25

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "G" - On KY 1148 from KY 931 to Allan K Hollow					
1.	8-Inch Class 250 (SDR 17) PVC Pipe	7,200	L.F.	\$12.00	\$86,400.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	1,600	L.F.	\$8.00	\$12,800.00
3.	10-Inch x 0.250 Inch Steel Cover Pipe	100	L.F.	\$50.00	\$5,000.00
4.	Extra for Boring or Jacking for 10-Inch Steel Cover Pipe	100	L.F.	\$150.00	\$15,000.00
5.	8-Inch Mechanical Joint Resilient Seated Gate Valve and Box	2	Each	\$700.00	\$1,400.00
6.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	2	Each	\$500.00	\$1,000.00
7.	6-Inch Fire Hydrant	1	Each	\$2,000.00	\$2,000.00
8.	Concrete Line Marker	4	Each	\$150.00	\$600.00
9.	3/4-Inch Service Pipe	550	L.F.	\$5.00	\$2,750.00
10.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	22	Each	\$650.00	\$14,300.00
11.	Master Pressure Reducing Valves	2	Each	\$12,500.00	\$25,000.00
12.	Air Release Assembly	1	Each	\$500.00	\$500.00
13.	Cut-in to Existing Line	1	Each	\$2,000.00	\$2,000.00
14.	Crushed Rock on Trench Surface	200	Ton	\$20.00	\$4,000.00
15.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	50	L.F.	\$25.00	\$1,250.00
Construction Cost					\$174,000.00
Project Cost					\$234,900.00

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "H" - On KY 1862 from KY 931 to Thornton Post Office					
1.	8-Inch Class 250 (SDR 17) PVC Pipe	35,100	L.F.	\$12.00	\$421,200.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	30,100	L.F.	\$8.00	\$240,800.00
3.	Stream Crossing: 4, 6, & 8-Inch Class 265 (DR 7) Polyethylene Pipe	6	Each	\$4,500.00	\$27,000.00
4.	16-Inch x 0.250 Inch Steel Cover Pipe	500	L.F.	\$50.00	\$25,000.00
5.	Extra for Boring or Jacking for 16-Inch Steel Cover Pipe	500	L.F.	\$150.00	\$75,000.00
6.	10-Inch x 0.250 Inch Steel Cover Pipe	600	L.F.	\$50.00	\$30,000.00
7.	Extra for Boring or Jacking for 10-Inch Steel Cover Pipe	600	L.F.	\$150.00	\$90,000.00
8.	8-Inch Mechanical Joint Resilient Seated Gate Valve and Box	13	Each	\$700.00	\$9,100.00
9.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	20	Each	\$500.00	\$10,000.00
10.	6-Inch Fire Hydrant	5	Each	\$2,000.00	\$10,000.00
11.	Blow-Off Assembly	5	Each	\$1,100.00	\$5,500.00
12.	Test Meter/Tap Assembly	4	Each	\$1,000.00	\$4,000.00
13.	Concrete Line Marker	6	Each	\$150.00	\$900.00
14.	3/4-Inch Service Pipe	7,300	L.F.	\$5.00	\$36,500.00
15.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	292	Each	\$650.00	\$189,800.00
16.	Residential Booster Pump Station	2	Each	\$3,000.00	\$6,000.00
17.	Air Release Assembly	1	Each	\$500.00	\$500.00
18.	Crushed Rock on Trench Surface	3,500	Ton	\$20.00	\$70,000.00
19.	2-Inch Thickness Bituminous Surface Replacement	12,700	L.F.	\$20.00	\$254,000.00
20.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	100	L.F.	\$25.00	\$2,500.00
Construction Cost					\$1,507,800.00
Project Cost					\$2,035,530.00

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "J" - On KY 1862 from KY 119 Fire Station to Thornton Post Office & On KY 119 from Fire Station to B.P. Station					
1.	8-Inch Class 250 (SDR 17) PVC Pipe	10,700	L.F.	\$12.00	\$128,400.00
2.	Stream Crossing: 4, 6, & 8-Inch Class 265 (DR 7) Polyethylene Pipe	2	Each	\$4,500.00	\$9,000.00
3.	16-Inch x 0.250 Inch Steel Cover Pipe	200	L.F.	\$50.00	\$10,000.00
4.	Extra for Boring or Jacking for 16-Inch Steel Cover Pipe	200	L.F.	\$150.00	\$30,000.00
5.	8-Inch Mechanical Joint Resilient Seated Gate Valve and Box	4	Each	\$700.00	\$2,800.00
6.	6-Inch Fire Hydrant	2	Each	\$2,000.00	\$4,000.00
7.	Test Meter/Tap Assembly	2	Each	\$1,100.00	\$2,200.00
8.	Concrete Line Marker	4	Each	\$150.00	\$600.00
9.	3/4-Inch Service Pipe	775	L.F.	\$5.00	\$3,875.00
10.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meier	31	Each	\$650.00	\$20,150.00
11.	Cut-in to Existing Line	1	Each	\$2,000.00	\$2,000.00
12.	Air Release Assembly	1	Each	\$500.00	\$500.00
13.	Crushed Rock on Trench Surface	100	Ton	\$20.00	\$2,000.00
14.	2-Inch Thickness Bituminous Surface Replacement	300	L.F.	\$20.00	\$6,000.00
15.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	200	L.F.	\$25.00	\$5,000.00
Construction Cost					\$226,525.00
Project Cost					\$305,808.75



Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "K" - Low Gap - from KY 7 & Low Gap Intersection to Existing Line					
1.	8-Inch Class 250 (SDR 17) PVC Pipe	2,500	L.F.	\$12.00	\$30,000.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	1,800	L.F.	\$8.00	\$14,400.00
3.	Stream Crossing: 4, 6, & 8-Inch Class 265 (DR 7) Polyethylene Pipe	1	Each	\$4,500.00	\$4,500.00
4.	Railroad Crossing: Including 16" x 0.250" Steel Cover Pipe and Bore	1	Each	\$20,000.00	\$20,000.00
5.	10-Inch x 0.250 Inch Steel Cover Pipe	40	L.F.	\$50.00	\$2,000.00
6.	Extra for Boring or Jacking for 10-Inch Steel Cover Pipe	40	L.F.	\$150.00	\$6,000.00
7.	8-Inch Mechanical Joint Resilient Seated Gate Valve and Box	3	Each	\$700.00	\$2,100.00
8.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	1	Each	\$500.00	\$500.00
9.	6-Inch Fire Hydrant	1	Each	\$2,000.00	\$2,000.00
10.	Test Meter/Tap Assembly	1	Each	\$1,100.00	\$1,100.00
11.	Concrete Line Marker	2	Each	\$150.00	\$300.00
12.	3/4-Inch Service Pipe	750	L.F.	\$5.00	\$3,750.00
13.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	30	Each	\$650.00	\$19,500.00
14.	Air Release Assembly	1	Each	\$500.00	\$500.00
15.	Crushed Rock on Trench Surface	230	Ton	\$20.00	\$4,600.00
16.	2-Inch Thickness Bituminous Surface Replacement	100	L.F.	\$20.00	\$2,000.00
17.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	100	L.F.	\$25.00	\$2,500.00
Construction Cost					\$115,750.00
Project Cost					\$156,262.50
AREA 1 TOTAL CONSTRUCTION COST					\$6,770,525.00
AREA 1 TOTAL PROJECT COST					\$9,140,208.75

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "A-1" - KY 15 - Start of Project at Cut into Existing Line at Peppermint Dr. and KY 15 to Intersection of KY 15 and KY 931 (South) at Existing Line					
1.	8-Inch Class 250 (SDR 17) PVC Pipe	6,500	L.F.	\$12.00	\$78,000.00
2.	6-Inch Class 250 (SDR 17) PVC Pipe	22,000	L.F.	\$10.50	\$231,000.00
3.	4-Inch Class 250 (SDR 17) PVC Pipe	10,500	L.F.	\$8.00	\$84,000.00
4.	16-Inch x 0.250 Inch Steel Cover Pipe	200	L.F.	\$50.00	\$10,000.00
5.	Extra for Boring or Jacking for 16-Inch Steel Cover Pipe	200	L.F.	\$150.00	\$30,000.00
6.	12-Inch x 0.250 Inch Steel Cover Pipe	200	L.F.	\$50.00	\$10,000.00
7.	Extra for Boring or Jacking for 12-Inch Steel Cover Pipe	200	L.F.	\$150.00	\$30,000.00
8.	8-Inch Mechanical Joint Resilient Seated Gate Valve and Box	3	Each	\$700.00	\$2,100.00
9.	6-Inch Mechanical Joint Resilient Seated Gate Valve and Box	4	Each	\$600.00	\$2,400.00
10.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	6	Each	\$500.00	\$3,000.00
11.	Master Meter Vault Assembly	1	Each	\$25,000.00	\$25,000.00
12.	6-Inch Fire Hydrant	6	Each	\$2,000.00	\$12,000.00
13.	Blow-Off Assembly	5	Each	\$1,100.00	\$5,500.00
14.	Concrete Line Marker	13	Each	\$150.00	\$1,950.00
15.	3/4-Inch Service Pipe	1,750	L.F.	\$5.00	\$8,750.00
16.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	70	Each	\$650.00	\$45,500.00
17.	Air Release Assembly	1	Each	\$500.00	\$500.00
18.	Crushed Rock on Trench Surface	1,800	Ton	\$20.00	\$36,000.00
19.	2-Inch Thickness Bituminous Surface Replacement	6,000	L.F.	\$20.00	\$120,000.00
20.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	1,000	L.F.	\$25.00	\$25,000.00
21.	Cut- in to Existing Line	2	Each	\$2,000.00	\$4,000.00
Construction Cost					\$764,700.00
Project Cost					\$1,032,345.00

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "A-2" - KY 160/KY 15 Intersection to Beetree Rd Area					
1.	6-Inch Class 250 (SDR 17) PVC Pipe	8,000	L.F.	\$10.50	\$84,000.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	6,500	L.F.	\$8.00	\$52,000.00
3.	10-Inch x 0.250 Inch Steel Cover Pipe	75	L.F.	\$50.00	\$3,750.00
4.	Extra for Boring or Jacking for 10-Inch Steel Cover Pipe	75	L.F.	\$150.00	\$11,250.00
5.	6-Inch Mechanical Joint Resilient Seated Gate Valve and Box	3	Each	\$600.00	\$1,800.00
6.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	2	Each	\$500.00	\$1,000.00
7.	6-Inch Fire Hydrant	2	Each	\$2,000.00	\$4,000.00
8.	Blow-Off Assembly	2	Each	\$1,100.00	\$2,200.00
9.	Concrete Line Marker	4	Each	\$150.00	\$600.00
10.	3/4-Inch Service Pipe	950	L.F.	\$5.00	\$4,750.00
11.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	40	Each	\$650.00	\$26,000.00
12.	Crushed Rock on Trench Surface	550	Ton	\$20.00	\$11,000.00
13.	2-Inch Thickness Bituminous Surface Replacement	4,400	L.F.	\$20.00	\$88,000.00
14.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	1,000	L.F.	\$25.00	\$25,000.00
Construction Cost					\$315,350.00
Project Cost					\$425,722.50

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "A-3" - KY 3401/KY 15 Intersection to Junction 588					
1.	8-Inch Class 250 (SDR 17) PVC Pipe	4,800	L.F.	\$12.00	\$57,600.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	5,400	L.F.	\$8.00	\$43,200.00
3.	10-Inch x 0.250 Inch Steel Cover Pipe	200	L.F.	\$50.00	\$10,000.00
4.	Extra for Boring or Jacking for 10-Inch Steel Cover Pipe	200	L.F.	\$150.00	\$30,000.00
5.	8-Inch Mechanical Joint Resilient Seated Gate Valve and Box	5	Each	\$700.00	\$3,500.00
6.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	4	Each	\$500.00	\$2,000.00
7.	6-Inch Fire Hydrant	2	Each	\$2,000.00	\$4,000.00
8.	Blow-Off Assembly	2	Each	\$1,100.00	\$2,200.00
9.	Test Meter/Tap Assembly	1	Each	\$1,000.00	\$1,000.00
10.	Concrete Line Marker	3	Each	\$150.00	\$450.00
11.	Concrete Cap	1	Each	\$1,250.00	\$1,250.00
12.	3/4-Inch Service Pipe	1,500	L.F.	\$5.00	\$7,500.00
13.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	60	Each	\$650.00	\$39,000.00
14.	Crushed Rock on Trench Surface	400	Ton	\$20.00	\$8,000.00
15.	2-Inch Thickness Bituminous Surface Replacement	2,400	L.F.	\$20.00	\$48,000.00
16.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	100	L.F.	\$25.00	\$2,500.00
Construction Cost					\$260,200.00
Project Cost					\$351,270.00

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "A-4" - KY 1811 (Smoot Creek)/KY 15 Intersection to Existing /Proposed Tank by others on top of mountain					
1.	6-Inch Class 250 (SDR 17) PVC Pipe	12,000	L.F.	\$10.50	\$126,000.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	6,000	L.F.	\$8.00	\$48,000.00
3.	12-Inch x 0.250 Inch Steel Cover Pipe	100	L.F.	\$50.00	\$5,000.00
4.	Extra for Boring or Jacking for 12-Inch Steel Cover Pipe	100	L.F.	\$150.00	\$15,000.00
5.	10-Inch x 0.250 Inch Steel Cover Pipe	40	L.F.	\$50.00	\$2,000.00
6.	Extra for Boring or Jacking for 10-Inch Steel Cover Pipe	40	L.F.	\$150.00	\$6,000.00
7.	6-Inch Mechanical Joint Resilient Seated Gate Valve and Box	4	Each	\$600.00	\$2,400.00
8.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	4	Each	\$500.00	\$2,000.00
9.	6-Inch Fire Hydrant	3	Each	\$2,000.00	\$6,000.00
10.	Blow-Off Assembly	3	Each	\$1,100.00	\$3,300.00
11.	Test Meter/Tap Assembly	2	Each	\$1,000.00	\$2,000.00
12.	Concrete Line Marker	8	Each	\$150.00	\$1,200.00
13.	Concrete Cap	2	Each	\$1,250.00	\$2,500.00
14.	3/4-Inch Service Pipe	1,300	L.F.	\$5.00	\$6,500.00
15.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	60	Each	\$650.00	\$39,000.00
16.	Master Pressure Reducing Valves for Water Service Lines	2	Each	\$20,000.00	\$40,000.00
17.	Air Release Assembly	1	Each	\$500.00	\$500.00
18.	Crushed Rock on Trench Surface	675	Ton	\$20.00	\$13,500.00
19.	2-Inch Thickness Bituminous Surface Replacement	3,000	L.F.	\$20.00	\$60,000.00
20.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	100	L.F.	\$25.00	\$2,500.00
Construction Cost					\$383,400.00
Project Cost					\$517,590.00

CONTRACT 519-03A  
Area 2

Letcher County  
Opinion of Probable Cost  
Proposed Water Facilities  
Letcher County, Kentucky

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "A-5" - KY 3402/ Dry Fork Rd					
1.	6-Inch Class 250 (SDR 17) PVC Pipe	9,000	L.F.	\$10.50	\$94,500.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	26,000	L.F.	\$8.00	\$208,000.00
3.	12-Inch x 0.250 Inch Steel Cover Pipe	100	L.F.	\$50.00	\$5,000.00
4.	Extra for Boring or Jacking for 12-Inch Steel Cover Pipe	100	L.F.	\$150.00	\$15,000.00
5.	6-Inch Mechanical Joint Resilient Seated Gate Valve and Box	4	Each	\$600.00	\$2,400.00
6.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	4	Each	\$500.00	\$2,000.00
7.	6-Inch Fire Hydrant	3	Each	\$2,000.00	\$6,000.00
8.	Blow-Off Assembly	4	Each	\$1,100.00	\$4,400.00
9.	Test Meter/Tap Assembly	2	Each	\$1,000.00	\$2,000.00
10.	Concrete Line Marker	8	Each	\$150.00	\$1,200.00
11.	Concrete Cap	1	Each	\$1,250.00	\$1,250.00
12.	3/4-Inch Service Pipe	2,400	L.F.	\$5.00	\$12,000.00
13.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	100	Each	\$650.00	\$65,000.00
14.	Crushed Rock on Trench Surface	900	Ton	\$20.00	\$18,000.00
15.	2-Inch Thickness Bituminous Surface Replacement	4,000	L.F.	\$20.00	\$80,000.00
16.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	200	L.F.	\$25.00	\$5,000.00
Construction Cost					\$521,750.00
Project Cost					\$704,362.50

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "B" - KY 931 Starting at Existing Whitesburg Systems Line and Running to Intersection of KY 1148					
1.	8-Inch Class 250 (SDR 17) PVC Pipe	26,000	L.F.	\$12.00	\$312,000.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	17,500	L.F.	\$8.00	\$140,000.00
3.	16-Inch x 0.250 Inch Steel Cover Pipe	375	L.F.	\$50.00	\$18,750.00
4.	Extra for Boring or Jacking for 16-Inch Steel Cover Pipe	375	L.F.	\$150.00	\$56,250.00
5.	8-Inch Mechanical Joint Resilient Seated Gate Valve and Box	10	Each	\$700.00	\$7,000.00
6.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	6	Each	\$500.00	\$3,000.00
7.	Master Meter Assembly	1	Each	\$25,000.00	\$25,000.00
8.	6-Inch Fire Hydrant	6	Each	\$2,000.00	\$12,000.00
9.	Blow-Off Assembly	8	Each	\$1,100.00	\$8,800.00
10.	Test Meter/Tap Assembly	2	Each	\$1,000.00	\$2,000.00
11.	Concrete Line Marker	10	Each	\$150.00	\$1,500.00
12.	Concrete Cap	4	Each	\$1,250.00	\$5,000.00
13.	3/4-Inch Service Pipe	5,300	L.F.	\$5.00	\$26,500.00
14.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	210	Each	\$650.00	\$136,500.00
15.	Cut-in to Existing Line	2	Each	\$2,000.00	\$4,000.00
16.	Master Pressure Reducing Valves for Water Service Lines	2	Each	\$20,000.00	\$40,000.00
17.	Air Release Assembly	1	Each	\$500.00	\$500.00
18.	Crushed Rock on Trench Surface	2,100	Ton	\$20.00	\$42,000.00
19.	2-Inch Thickness Bituminous Surface Replacement	10,000	L.F.	\$20.00	\$200,000.00
20.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	100	L.F.	\$25.00	\$2,500.00
Construction Cost					\$1,043,300.00
Project Cost					\$1,408,455.00

Item No.	Item	Quantity	Unit	Unit Price	Total
DIVISION "C" - KY 2034 / Craft Colly Rd starting at Ermine Post Office to Proposed Ground Storage Tank at End of Craft Colly Rd.					
1.	6-Inch Class 250 (SDR 17) PVC Pipe	30,000	L.F.	\$10.50	\$315,000.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	39,000	L.F.	\$8.00	\$312,000.00
3.	12-Inch x 0.250 Inch Steel Cover Pipe	600	L.F.	\$50.00	\$30,000.00
4.	Extra for Boring or Jacking for 12-Inch Steel Cover Pipe	600	L.F.	\$150.00	\$90,000.00
5.	6-Inch Mechanical Joint Resilient Seated Gate Valve and Box	5	Each	\$600.00	\$3,000.00
6.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	8	Each	\$500.00	\$4,000.00
7.	6-Inch Fire Hydrant	6	Each	\$2,000.00	\$12,000.00
8.	Blow-Off Assembly	8	Each	\$1,100.00	\$8,800.00
9.	Test Meter/Tap Assembly	2	Each	\$1,000.00	\$2,000.00
10.	Concrete Line Marker	10	Each	\$150.00	\$1,500.00
11.	Concrete Cap	4	Each	\$1,250.00	\$5,000.00
12.	3/4-Inch Service Pipe	8,700	L.F.	\$5.00	\$43,500.00
13.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	350	Each	\$650.00	\$227,500.00
14.	Booster Pump Station	1	Each	\$150,000.00	\$150,000.00
15.	Booster Pump Station	1	Each	\$100,000.00	\$100,000.00
16.	Booster Pump Station	1	Each	\$75,000.00	\$75,000.00
17.	Ground Storage Tank	1	Each	\$100,000.00	\$100,000.00
18.	Ground Storage Tank	1	Each	\$75,000.00	\$75,000.00
19.	Crushed Rock on Trench Surface	4,600	Ton	\$20.00	\$92,000.00
20.	2-Inch Thickness Bituminous Surface Replacement	20,000	L.F.	\$20.00	\$400,000.00
21.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	200	L.F.	\$25.00	\$5,000.00
Construction Cost					\$2,051,300.00
Project Cost					\$2,769,255.00
TOTAL AREA 2 CONSTRUCTION COST					\$5,340,000.00
TOTAL AREA 2 PROJECT COST					\$7,209,000.00



Item No.	Item	Quantit	Unit	Unit Price	Total
AREA "3" Starting at Cut-in to existing line at Letcher and Harlan County Line, Laying to KY 463, at Hurricane Gap, onto Gordon and ending at Camp Branch Road on KY 160.					
1.	6-Inch Class 250 (SDR 17) PVC Pipe	75,000	L.F.	\$10.50	\$787,500.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	35,400	L.F.	\$8.00	\$283,200.00
3.	6-Inch River Crossing Class 265 (DR 7) Polyethylene Pipe	1	Each	\$25,000.00	\$25,000.00
4.	12-Inch x 0.250 Inch Steel Cover Pipe	500	L.F.	\$50.00	\$25,000.00
5.	Extra for Boring or Jacking for 12-Inch Steel Cover Pipe	500	L.F.	\$150.00	\$75,000.00
6.	10-Inch x 0.250 Inch Steel Cover Pipe	500	L.F.	\$50.00	\$25,000.00
7.	Extra for Boring or Jacking for 10-Inch Steel Cover Pipe	500	L.F.	\$150.00	\$75,000.00
8.	6-Inch Mechanical Joint Resilient Seated Gate Valve and Box	21	Each	\$600.00	\$12,600.00
9.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	13	Each	\$500.00	\$6,500.00
10.	6-Inch Fire Hydrant	8	Each	\$2,000.00	\$16,000.00
11.	Blow-Off Assembly	11	Each	\$1,100.00	\$12,100.00
12.	Test Meter/Tap Assembly	6	Each	\$1,000.00	\$6,000.00
13.	Concrete Line Marker	2	Each	\$150.00	\$300.00
14.	Concrete Cap	5	Each	\$1,250.00	\$6,250.00
15.	Cut-in to Existing Line	1	Each	\$2,000.00	\$2,000.00
16.	Master Meter Vault Assembly	1	Each	\$25,000.00	\$25,000.00
17.	Booster Pump Station	1	Each	\$100,000.00	\$100,000.00
18.	Ground Storage Tank	1	Each	\$100,000.00	\$100,000.00
19.	3/4-Inch Service Pipe	6,000	L.F.	\$5.00	\$30,000.00
20.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	190	Each	\$650.00	\$123,500.00
21.	Crushed Rock on Trench Surface	2,500	Ton	\$20.00	\$50,000.00
22.	2-Inch Thickness Bituminous Surface Replacement	2,000	L.F.	\$20.00	\$40,000.00
23.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	1,000	L.F.	\$25.00	\$25,000.00
Construction Cost					\$1,850,950.00
Project Cost					\$2,498,782.50

Item No.	Item	Quantity	Unit	Unit Price	Total
AREA "4"- On KY 119 at Letcher/Harlan County Line going to KY 806 Community of EOLIA					
1.	6-Inch Class 250 (SDR 17) PVC Pipe	69,100	L.F.	\$10.50	\$725,550.00
2.	4-Inch Class 250 (SDR 17) PVC Pipe	85,600	L.F.	\$8.00	\$684,800.00
3.	6-Inch River Crossing Class 265 (DR 7) Polyethylene Pipe	1	Each	\$25,000.00	\$25,000.00
4.	4-Inch River Crossing Class 265 (DR 7) Polyethylene Pipe	3	Each	\$22,500.00	\$67,500.00
5.	Railroad Crossing: Including 12" x 0.250" Steel Cover Pipe and Bore	3	Each	\$15,000.00	\$45,000.00
6.	12-Inch x 0.250 Inch Steel Cover Pipe	100	L.F.	\$50.00	\$5,000.00
7.	Extra for Boring or Jacking for 12-Inch Steel Cover Pipe	100	L.F.	\$150.00	\$15,000.00
8.	10-Inch x 0.250 Inch Steel Cover Pipe	1,000	L.F.	\$50.00	\$50,000.00
9.	Extra for Boring or Jacking for 10-Inch Steel Cover Pipe	1,000	L.F.	\$150.00	\$150,000.00
10.	6-Inch Mechanical Joint Resilient Seated Gate Valve and Box	15	Each	\$600.00	\$9,000.00
11.	4-Inch Mechanical Joint Resilient Seated Gate Valve and Box	25	Each	\$500.00	\$12,500.00
12.	6-Inch Fire Hydrant	12	Each	\$2,000.00	\$24,000.00
13.	Blow-Off Assembly	21	Each	\$1,100.00	\$23,100.00
14.	Test Meter/Tap Assembly	8	Each	\$1,000.00	\$8,000.00
15.	Concrete Line Marker	40	Each	\$150.00	\$6,000.00
16.	Concrete Cap	8	Each	\$1,250.00	\$10,000.00
17.	Cut-in to Existing Line	1	Each	\$2,000.00	\$2,000.00
18.	Master Meter Vault Assembly	1	Each	\$25,000.00	\$25,000.00
19.	Booster Pump Station	1	Each	\$125,000.00	\$125,000.00
20.	Booster Pump Station	2	Each	\$75,000.00	\$150,000.00
21.	Ground Storage Tank	1	Each	\$100,000.00	\$100,000.00
22.	Ground Storage Tank	2	Each	\$75,000.00	\$150,000.00
23.	3/4-Inch Service Pipe	11,000	L.F.	\$5.00	\$55,000.00
24.	5/8-Inch x 3/4-Inch Service Meter Assembly, with Touch Read Meter	347	Each	\$650.00	\$225,550.00

CONTRACT 519-03A  
Area 4

Letcher County  
Opinion of Probable Cost  
Proposed Water Facilities  
Letcher County, Kentucky

Item No.	Item	Quantity	Unit	Unit Price	Total
25.	Air Release Assembly	2	Each	\$500.00	\$1,000.00
26.	Crushed Rock on Trench Surface	5,000	Ton	\$20.00	\$100,000.00
27.	2-Inch Thickness Bituminous Surface Replacement	2,500	L.F.	\$20.00	\$50,000.00
28.	2-Inch Thickness Bituminous Paving with Concrete Base Surface Replacement	1,000	L.F.	\$25.00	\$25,000.00
				Construction Cost	\$2,869,000.00
				Project Cost	\$3,873,150.00

**APPENDIX 3**

**PRELIMINARY ENGINEERING REPORT  
CITY OF WHITESBURG  
WATER TREATMENT PLANT**

## APPENDIX 3

# PRELIMINARY ENGINEERING REPORT WATER TREATMENT PLANT EXPANSION CITY OF WHITESBURG LETCHER COUNTY, KENTUCKY

May, 2003

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## APPENDIX 3

# PRELIMINARY ENGINEERING REPORT WATER TREATMENT PLANT EXPANSION CITY OF WHITESBURG LETCHER COUNTY, KENTUCKY

May, 2003

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## APPENDIX 3

# PRELIMINARY ENGINEERING REPORT WATER TREATMENT PLANT EXPANSION CITY OF WHITESBURG LETCHER COUNTY, KENTUCKY

May, 2003

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## APPENDIX 3

### PRELIMINARY ENGINEERING REPORT WATER TREATMENT PLANT EXPANSION CITY OF WHITESBURG MAY, 2003

#### I PURPOSE

Letcher County Water District has authorized a study of various unserved areas of Letcher County. The study is presented as "Letcher County Water and Sewer District Preliminary Engineering Report Water System Improvements". A supplement of that report, this report addresses how the Whitesburg water treatment plant could be expanded to provide water for these unserved areas.

#### II GENERAL

The City of Whitesburg owns its raw water supply system, water treatment plant, and distribution system. U.S. Filter, Inc. operates the water supply, treatment, and distribution systems.

The Whitesburg Water Treatment Plant is a conventional surface water treatment plant using rapid mixing, flocculation, sedimentation and dual media filtration. The plant is designed for an initial capacity of 600 gpm (gallons per minute) or 0.864 MGD (million gallons per day). See attachment for location of the facility on a USGS quadrangle map (Attachment No. 1).

The water treatment plant capacity needs to be expanded to meet the increasing demand described in the "Letcher County Water and Sewer District Preliminary Engineering Report Water System Improvements". The recommended solution would be the modification of the current facility. The proposed expanded plant would be capable of 1.152 MGD in the future, an increase of 33 percent of the current capabilities, as described in the section on proposed improvements.

#### III ANALYSIS OF FLOW PROJECTIONS AND POPULATION TRENDS

The 2000 census population of Letcher County was 25,277, representing a 6.4 percent decrease in population since 1990. In 2001, it was estimated that the population had further dropped to 25,018. This downward trend is expected to continue. The average number of persons per housing unit for Letcher County was 2.48 persons per unit. Potential areas to be served have approximately 1900 possible connections. Based on experience with other systems, seventy-five percent or fewer of potential customers will actually connect to this system. Assuming 150 gallons per connection per day, increased demand would be about 214,000 gallons per day. Adding this demand to current peak



usage would cause demands in excess of the plant capacity. See Attachment No. 2 for a chart describing total plant production.

#### **IV RAW WATER SOURCE**

The North Fork of the Kentucky River is the source of raw water for the Whitesburg water treatment plant. The water is relatively free of pollution or impurities except for periods of high turbidity and byproducts of strip mining. The main concern with the North Fork of Kentucky River as a raw water source is the river's capacity during drought periods. During periods of drought, the Division of Water has the authority to apportion available water.

Whitesburg Municipal Water Works has a Permit to Withdraw Public Water from the state of Kentucky's Natural Resources and Environmental Protection Cabinet, from the location of river mile 406.3R of the North Fork of the Kentucky River in Letcher County; latitude 37°06'55" and longitude 82°48'50". Withdrawal allowed is 435,000 gallons per day (gpd) for June, July, August, and October. All other months are allowed 412,000 gpd. In 2002, the daily average withdrawal was 383,000 gpd. This is within the withdrawal limit. However, the plant exceeded the limit in January, November, and December of 2002.

The permit states that the Division of Water can restrict withdrawal from the river to keep downstream flow at 2.5 cfs. In previous dry periods, plant personnel have measured stream flow at the dam downstream from the plant and have found the flow to be marginally acceptable. An additional water source will be necessary to serve the potential customers.

##### **A. Source Water Analysis**

The water from the North Fork of the Kentucky River is subject to high turbidity and is very hard. No data was available on TOC levels. Because of the "straight pipes" in the area, bacterial contamination is also a concern. The source is an existing source; therefore a detailed analysis is on record at Frankfort.

##### **B. Finished Water Quality**

The water treatment plant is currently meeting the finished water quality standards. However, coming regulations will increase restrictions on requirements for the system. The disinfectant/disinfection by-products (D/DBP) rule has requirements for total organic carbon (TOC) removal through the treatment plant. TOC

removal is determined from monthly samples of the raw and finished water and calculated each quarter as a 12-month running average. The sample results are then compared to minimum removal percentages. The plant will have to start monitoring TOC the first quarter of 2004. Normally TOC removals can be obtained by proper coagulation and clarification.

The Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) applies to public water systems that use surface water or ground water under the direct influence of surface water and that serve fewer than 10,000 people. The purposes of the LT1ESWTR are to improve control of microbial pathogens, specifically the protozoan *Cryptosporidium*, in drinking water, and address risk trade-offs with disinfection byproducts. The rule will require certain public water systems to meet strengthened filtration requirements. It will also require systems to calculate levels of microbial inactivation to ensure that microbial protection is not jeopardized if systems make changes to comply with requirements of the Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1-DBPR). Whitesburg will need to maintain a CFE turbidity of less than or equal to 0.3 ninety-five percent of the time starting January 1, 2004. Preliminary results indicate treatment modifications will be needed to meet Long Term 1. Whitesburg will need to conduct TTHM and HAA<sub>5</sub> monitoring once before July 1, 2003. Disinfection profiling must begin prior to the effective date of January 1, 2005.

## **V DESCRIPTION OF CURRENT FACILITIES**

### **A. Raw Water Intake and Pumps**

Water is collected from the North Fork of the Kentucky River into a concrete raw water intake through a stainless steel screen with 1/8-inch openings. Two (2) submersible raw water pumps, nominally rated at 600 gpm each, pump the river water to the chemical feed tank. The pumps are started and stopped manually at the main control panel. Currently the only way to modify flow is through manual valves. Under some conditions, the raw water pumps discharge more than the FWB pumps can send to the clearwell, causing filter overflow.

### **B. Rapid Mix**

Prior to the rapid mix, DelPac 2020 (polyaluminum chloride) and prechlorine solution are added. The water then flows into the rapid mix, which provides for rapid dispersion of chemicals throughout the water by violent agitation. The rapid

mix provides a 28-second detention time at the plant operating rate of 600 gpm.

### **C. Flocculation Basins**

The water then flows into two flocculation basins, which provide mixing at low velocities in order to help develop floc. To enhance floc formation, the mechanical flocculators provide tapered flocculation by decreasing rotation speed as the water flows through the three chambers in each basin. Detention time in the flocculation basins is 59 minutes at 600 gpm.

### **D. Settling Basins**

The velocity of the water in the piping to the sedimentation basins is designed to stay low enough to minimize shear conditions for the floc. A stilling wall with removable plugs was constructed near the entrance of each basin. These walls are designed to help distribute the flow evenly across the flow path. Flow distribution may be adjusted by adding, removing, or relocating the plugs. The sedimentation basins provide 3.83 hours of settling time with a plug flow through velocity of .43 foot per minute at 600 gpm. As the flocculated water flows through the sedimentation basins, the floc settles by gravity to the floor of the basin. Water is collected near the end of the sedimentation basin by effluent troughs with v-notch weirs. These weirs are adjustable to allow uniform distribution of effluent overflow velocity into the troughs. Mechanical sludge removal equipment is used to periodically remove this settled sludge. Each basin has a traveling header pipe connected to a flexible sludge hose. Upon opening a gate valve on a DIP (ductile iron pipes) discharge connected to the end of the flexible hose, the force of water head in the basin above the header pipe forces the sludge into the header as it moves along a track on the basin floor. Sludge discharge is to a 2-cell backwash waste/sedimentation basin sludge lagoon.

### **E. Filters**

From the sedimentation basin collection troughs the water is piped onto dual media filters. At 600 gpm, the rate of filtration is 1.97 gpm/ft<sup>2</sup>. Each filter is provided with continuous turbidity monitoring equipment. Circular chart recorders (2) provide a continuous record of filter effluent turbidity.

Filter rate is regulated by electro-pneumatic rate-of-flow controllers. Solenoid valves are used to direct compressed air to either open or close butterfly valves for throttling the flow to a given rate. Control may be set for either manual or

automatic operation. In the manual mode the butterfly valves are positioned to maintain a set valve opening and rate of flow through the filter will be reduced as the filter becomes dirty and head loss increases. Filter water level will begin to rise. In the automatic mode, as the filter becomes dirty, the flow meter for each filter effluent will signal the controller to open the butterfly valve to maintain a set rate-of-flow.

Other electro-pneumatically operated valves include two (2) backwash influent butterfly valves, two (2) backwash waste butterfly valves and two (2) filter influent slide gate valves.

Filtered water from each filter flows by gravity into a 10,370 gallon filtered water basin (FWB). Post chlorination and fluoride are injected into the filter effluent line prior to entering the FWB.

Filter backwash is initiated when the head loss reaches about 3.5 feet. One filter is backwashed at a time by gravity flow using water from the clearwell tank. Backwash rate is set to operate in a range of 15 to 20 gpm per square foot of filter surface area (2284 gpm to 3045 gpm). Backwash wastewater is piped to a 2-cell lagoon for settling and decanting. Each filter has a rotary-type surface wash agitator to enhance the back wash cleaning process.

#### **F. Filtered Water Basin Pumps**

Water is pumped from the filtered water basin into the clearwell tank by one (1) or two (2) FWB pumps nominally rated at 600 gpm each. These pumps may be operated manually or automatically. They are normally left in the automatic mode whereby they are controlled by water level in the clearwell and have automatic sequence of operation. The FWB has high and low water alarms, low water cutoff and restore after rise to preset level.

#### **G. Clear Well**

The 210,500 above ground clearwell tank provides a reservoir for chlorine contact time before the finished water is pumped into the distribution system. This tank also serves as a reservoir for filter backwash water and high service pump suction.

#### **H. High Service Pumping**

Two vertical turbine high service pumps with a nominal capacity of 600 gpm

(actually operating at 800 gpm) are used to pump water into the distribution system and gravity storage. Only one pump operates at a time. These pumps may be operated manually or automatically. In the automatic mode the pumps have automatic sequence alternation and are controlled from both the Tunnel Hill Tank and the Industrial Park Tank (tagged "New Tank" on the main control panel).

## I. Chemical Additions

### 1. Disinfection

Sodium hypochlorite is the primary disinfectant used in the water treatment plant, stored in a 2000 gallon bulk storage container. It is fed at two locations; rapid mix and post filter.

### 2. Disinfectant Contact Time (CT)

The Surface Water Treatment Rule designates CT values as a measure of the water treatment plant's performance for removal of waterborne diseases. The plant should be able to easily meet CT requirements.

### 3. Fluoridation

Fluoride is delivered to the finished water in the filter effluent stream and prior to the FWB. Fluoride is provided as hydrofluosilicic ( $H_2SiF_6$ ) acid and is delivered by a diaphragm metering pump. It is fed from 55 gallon drums.

### 4. Polyaluminum Chloride (Coagulant)

Previously using alum and lime, the system now adds polyaluminum chloride, or polyaluminum hydroxychlorosulfate solution. Its trade name is DelPac 2020 and it is an inorganic salt. A liquid, polyaluminum chloride has no odor and a water white to slightly yellow color. Its specific gravity is 1.2 minimum and boiling point is 110°C.

### 5. pH Adjustment

Originally, lime was used for pH adjustment. A lime solution was pumped from the dissolving tank to the chemical feed tank at the rapid mix. Lime was fed from a volumetric feeder with a variable speed feed screw for dry

chemical feed to a 50 gallon dissolving tank with mechanical mixer and diaphragm metering pump.

Although the lime feed system is still at the plant, lime is no longer need for pH adjustment because of the pH and alkalinity of the raw water and the decreased effect on pH in treatment due to the use of polyaluminum chloride instead of alum. The lime feed system was a maintenance problem.

6. Powdered Activated Carbon and Potassium Permanganate

At this time, the plant does not have powdered activated carbon or potassium permanganate feeding equipment. Carbon is effective for taste and odor control and organics removal. Potassium permanganate is used for iron and manganese removal.

## VI DESCRIPTION OF PROPOSED IMPROVEMENTS

### A. Raw Water Source

The Whitesburg water treatment plant is already exceeding the permitted amount of withdrawal on some months of the year. Therefore, the current source without permission to increase withdrawal is unable to provide the needed water for the anticipated increase of customers. A withdrawal increase can be requested. However, due to the currently marginal flow, permission to increase flow is not expected. Therefore, a supplemental source to the river is necessary.

The only source of a significant amount of water is from underground mines. Kentucky Geologic Survey has evaluated numerous mines in the area. BE No. 22 at Crafts Colley has approximately 220 million gallon storage and a recharge rate of 240,000 gallons per day, which is more than adequate to serve the additional customers expected from the expansion of the Letcher County Water District system. The mine is approximately 37,500 feet from the plant. A pump station at the mine and a transmission main will be needed to bring water to the plant.

### B. Raw Water Intake and Pumps

An increase of approximately 1425 customers will increase the needed water production 214,000 gallons per day, which requires a flow of almost 150 gallons per minute. To allow for increased need in the future, the plant capacity should be

upgraded 200 gpm. The two pumps rated now at 600 gpm need to be modified to 800 gpm. Another flow control system in addition to the existing manual valve at the intake is needed for the raw water pumps to avoid filter overflow.

**C. Aeration Basin**

An aeration basin is needed because of iron, manganese, and potential hydrogen sulfide in the water taken from the mine.

**D. Rapid Mix**

The rapid mix does not need to be modified. The detention time for the rapid mix will decrease from 28 seconds at the plant operating rate of 600 gpm, to 21 seconds at 800 gpm. This is still adequate.

**E. Flocculation Basins**

At 800 gpm, the detention time will be 44 minutes, which is more than the Division of Water minimum requirement of 40 minutes. No changes are needed.

**F. Settling Basins**

Plate settlers are recommended to reduce settling time and improve settled water quality. Detention time at 800 gpm will be 2.87 hours, which will be considerably more than the two hours the DOW requires with tube settlers. Experience in other locations indicates that plate settlers are more effective than tube settlers.

**G. Filters**

No changes are needed on the dual media filters. The filter rate will increase to 2.63 gpm/ft<sup>2</sup>, at 800 gpm. Up to 5 gpm/ft<sup>2</sup> is allowed for dual media.

**H. Filtered Water Basin Pumps**

The filtered water basin pumps will be replaced with pumps capable of 800 gpm.

**I. Clearwell**

The state requires the clearwell to have a minimum capacity of 15 percent of the plant's daily output. Since the clearwell will hold more than 18 percent of the

daily output at the increased capacity, it doesn't need modification.

#### **J. High Service Pumping**

The two vertical turbine high service pumps are currently operating at 800 gpm, so no change is needed.

#### **K. Chemical Additions**

##### 1. Disinfection

The current 2000 gallon bulk storage container can hold more than a 30 day supply of sodium hypochlorite, so no change is needed.

##### 2. Disinfectant Contact Time (CT)

The disinfectant contact time will still be adequate with increased flow.

##### 3. Fluoridation

Fluoridation will be adequate with increased flow.

##### 4. Polyaluminum Chloride (Coagulant)

The 500 gallon tank doesn't meet the requirements for a 30 day supply. Supplemental storage will be needed. There is not adequate room in the existing building for additional storage. A chemical feed building is recommended for this chemical and powdered activated carbon.

##### 5. pH Adjustment

The plant needs the ability for pH adjustment to meet design standards. Because of the problems with feeding lime at twenty-five percent, caustic solution is recommended.

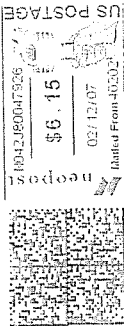
##### 6. Powdered Activated Carbon and Potassium Permanganate

Powdered activated carbon and potassium permanganate are not currently added during treatment and should be added. The adsorption properties of powdered activated carbon are often used for reduction of taste, odor,



AREA 3 & 4 MAPS

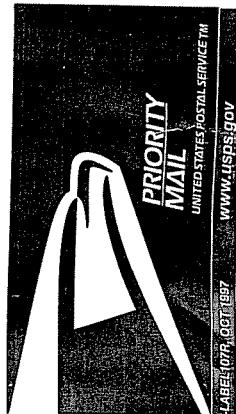
AREA 1 & 2 MAPS



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