November 1, 2006

Case No. 2006-00437

Mr. George Wakim
Public Service Commission
P.O. Box 615
Frankfort, KY 40601

RE: Breathitt County Water District – "Certificate of Convenience and Necessity for Utility Construction" for the KY 541-205 Waterline Extension Project

Dear Mr. Wakim:

As a result of our telephone conversation yesterday, I am providing the following information for your consideration; 1) a revised project description, 2) a discussion related to 2-inch piping, 3) a discussion of the system hydraulics and 4) the estimated additional operation and maintenance costs for the proposed project. During our phone conversation you mentioned that KRS 023 which the project was submitted under was discussed internally and it was deemed that the application should have been submitted under KRS 020 due to the determination that Community Development Block Grant (CDBG) funds are State Funds instead of Federal Funds. If Federal Funds are included in the project the application should be submitted under KRS 023. Because of this determination, a different Public Service Commission checklist is used and thus the need for the additional information.

1) In addition to the footages of pipe as indicated in the original submission, the project also includes two ground storage tanks (48,000 and 88,000) and one 130 gallon per minute (gpm) pump station. The 48,000 gallon ground storage tank with a diameter of 14-feet, height of 42-feet and a base elevation of approximately 900-feet is shown on the attached KY Pipe Node Map as Tank -5. Also located at this site is a duplex pump station (PS) with 130 gpm/140 TDH pumps and 7.5 HP motors. This PS pumps water from the 48,000 gallon tank to the 88,000 gallon ground storage tank with a diameter of 25-feet, height of 24-feet and a base elevation of approximately 1030-feet is shown on the attached KY Pipe Node Map as Tank -6.

2) I have attached the Division of Water Approval letter dated 8/29/06, and page 4 of the DOW Facility Requirements (see Condition No. L-3) as well as Bid Addendum # 1 (see item # 10). The 2-inch lines were eliminated from the project as I indicated could be seen by looking at the Certified Bid Tabulation (Appendix B – 1) of the previously filed Final Engineering Report.

3) A copy of the KYPipe2000 Average Day Demand computer run for the proposed project is attached for your information. A generalized hydraulic description of the proposed project is the water from the existing system (shown in red on the Node Map) flows by gravity into Tank-5 and is controlled by an altitude valve and telemetering. The 130 gpm pump then draws water from this tank thru a separate line and then pumps it to Tank-6 located on KY 205.

   Even though the maximum pressure in the main line is greater than 150 pounds per square inch (psi), the District has a guideline that whenever the location of a meter is in an area of the main line that would have greater than 90 psi, an individual pressure reducing valve will be installed on the customers service line. It is not uncommon in Eastern Kentucky with the inherent topography for the main line pressure to exceed 150 psi. This is taken into account in the design phase with the designation of the pressure class of the pipe.

There are six nodes that show a pressure of less than 30 psi. As I explained to you on the phone if a tank is not 70-feet in height, you will not have 30 psi at the base of the tank. This is the case for Tanks 4, 5 & 6 as shown in the computer run. Pump-4 node is on the separate suction line into Tank 5 , which is 42 feet tall. Node numbers B-124A and B-8A are located at the same elevation as the base of the tanks. There are no houses within the system that would have a pressure of less than 30 psi.

4) A calculation of the estimated operation, maintenance & replacement (OM&R) cost of the proposed system is presented on an attached sheet. There is a field counted approximately 200 homes in the proposed project area. The District has experienced two widely varying customer sign-up rates on prior projects from 30 % to 70 %. The hydraulic analysis was done based on 100 % sign-up to be conservative and to insure that it would function properly if in the future there were 200 homes connected. I estimate that for this project and this calculation there will be 75 % sign-ups resulting in 150 connections. U.S. Census data indicates 2.61 people/household which results in 390 individuals. Using the conservative 100 gallons per person per day equals a total average day of 39,000 gallons. Based on this amount and a pump with a 130 gpm capacity, the pump would operate for 300 minutes (or ~ 5 hours) to supply this demand.

   The power company serving the pump station area is Licking Valley Rural Electric Coop. The resultant OM&R factor in $/1000 gallons is less than the variable cost factor as determined in the District's existing rate. The calculated value of $1.49/1000 gallons is slightly greater than one third of the $4.24/1000 gallons included in the District's current rates. Therefore the existing rates should provide ample funds to meet the projected OM& R costs of the proposed project.

I have placed my professional engineer's seal (signed and dated) on this letter and all attachments generated by Nesbitt Engineering, Inc. I hope this additional information permits you to approve this project and issue a "Certificate of Convenience and Necessity for Construction". It is imperative to be able to move this project to the construction phase as soon as possible to avoid as much inclement weather as possible.

Thank you for all of your efforts and assistance on this project.

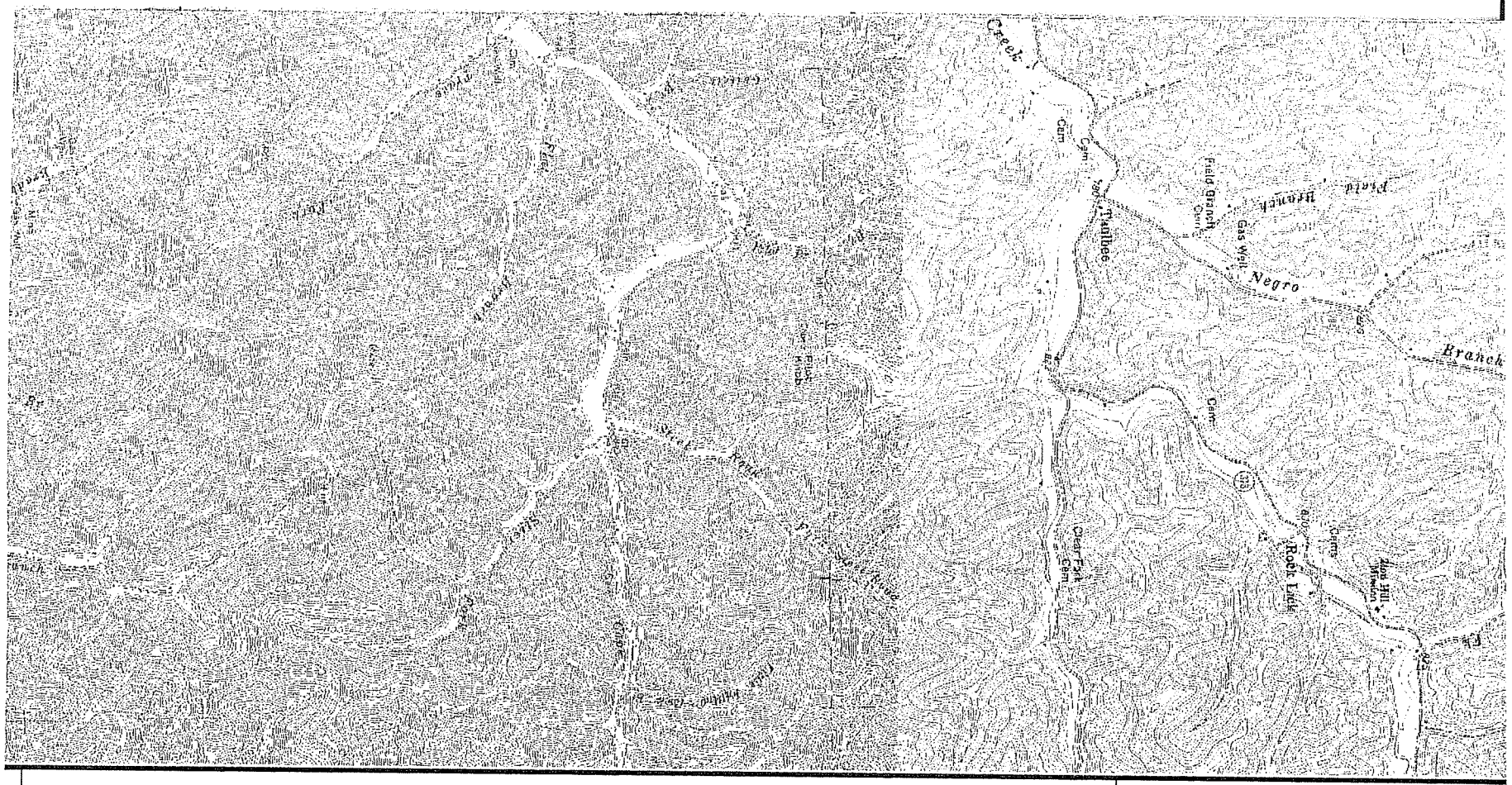
Sincerely,

P.E.

Ora C. Main, PE, MBA
Project Manager

Encls:

c: Lewis H. Warrix, Judge Executive, Breathitt County
John L. Smith, Chairman BCWD
Brendon Miller, Attorney for BCWD
Bryan Kirby, CEDA
Shannon Moore, BCWD
Ken Reid, NEI
Carlos Maggard, NEI



BREATHITT COUNTY WATER DISTRICT
BREATHITT COUNTY, KENTUCKY
WATER DISTRIBUTION SYSTEM EXPANSION
KY 205 WATERLINE PROJECT

PIPE2000 NODE MAP

REVISIONS:

08-04-06 kr – REVISED P

Case No. 2006-00137

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

Ernie Fletcher
Governor

Frankfort Office Park
14 Reilly Road
Frankfort, Kentucky 40601
www.kentucky.gov

LaJuana S. Wilcher
Secretary

August 29, 2006

John Lester Smith, Chairman
Breathitt County Water District
1137 Main Street
Jackson, KY 41339

RE: Breathitt County
AI No: 45303
DW No: 0131012-06-001
KY 541 & KY 205 Water Line project
Activities ID: APE 20060001

Dear Mr. Smith:

We have reviewed the plans and specifications for the above referenced project. The plans include the construction of approximately 52,000 feet of 8-inch PVC, 10,700 feet of 6-inch PVC, and 7,000 feet of 4-inch PVC and 1,100 feet of 2-inch PVC water line. It also consists of a 130 gpm booster pump station and 48,000 gallon ground water storage tank on KY 541 and 88,000 gallon ground storage water tank on KY 205. This is to advise that plans and specifications for the above referenced project are APPROVED with respect to sanitary features of design, as of this date with the requirements contained in the attached construction permit.

If you have any questions concerning this project, please contact Solitha Dharman, P.E., at (502) 564-2225, extension 572.

Sincerely,

for Donna S. Marlin, Manager
Drinking Water Branch
Division of Water

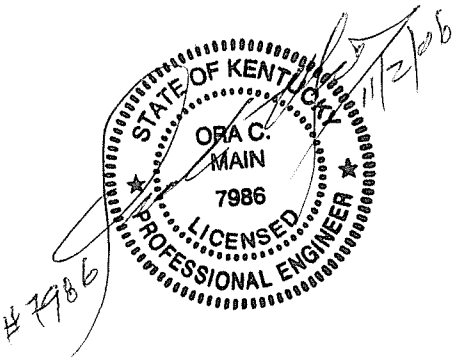
DSM: SWD
Enclosures
C: Honorable Michael D. Miller, Mayor, City of Jackson
Lewis H. Warrix, County Judge Executive
Ora C. Main, P.E., Nesbitt Engineering Inc.
Brethitt County Health Department
Public service Commission

PORT6 (Water Line Extension) 52,000 feet of 8-inch PVC, 10,700 feet of 6-inch PVC, 7,000 feet of 4-inch PVC and 1,100 feet of 2-inch PVC:

Limitation Requirements:

Condition No.	Parameter	Condition
L-1	Depth	A continuous and uniform bedding shall be provided in the trench for all buried pipe. Backfill material shall be tamped in layers around the pipe and to a sufficient height above the pipe to adequately support and protect the pipe. Stones found in the trench shall be removed for a Depth >= 6 in below the bottom of the pipe. [Recommended Standards for Water Works 8.5.2] This requirement is applicable during the following months: All Year. Statistical basis: Not applicable.
L-2	Depth	All water lines shall be covered to a Depth >= 30 in to prevent freezing. [Recommended Standards for Water Works 8.5.3, 401 KAR 8:100 Section 1(7)] This requirement is applicable during the following months: All Year. Statistical basis: Minimum.
L-3	Diameter	All water lines shall have Diameter >= 3 in. [Recommended Standards for Water Works 8.1.4] This requirement is applicable during the following months: All Year. Statistical basis: Minimum.
L-4	Diameter	Water lines with Diameter < 6 in shall not have fire hydrants. [Recommended Standards for Water Works 8.1.5] This requirement is applicable during the following months: All Year. Statistical basis: Minimum.
L-5	Diameter	All new and existing water lines serving fire hydrants or where fire protection is provided shall have Diameter >= 6 in. [Recommended Standards for Water Works 8.1.2] This requirement is applicable during the following months: All Year. Statistical basis: Minimum.
L-6	Distance	Water lines shall have a sufficient quantity of valves so that inconvenience and sanitary hazards will be minimized during repairs. A valve spacing Distance <= 1.0 mi should be utilized. [Recommended Standards for Water Works 8.2] This requirement is applicable during the following months: All Year. Statistical basis: Not applicable.
L-7	Distance	Hydrant drains shall not be connected to sanitary sewers or storm drains and shall be located a Distance > 10 ft from sanitary sewers and storm drains. [Recommended Standards for Water Works 8.3.4] This requirement is applicable during the following months: All Year. Statistical basis: Not applicable.
L-8	Distance	Except when not practical, water lines shall be laid a horizontal Distance >= 10 ft from any existing or proposed sewer. The distance shall be measured edge to edge. In cases where it is not practical to maintain a 10 foot separation, water lines may be installed closer to a sewer provided that the water lines shall be laid in a separate trench or on an undisturbed shelf located on one side of the sewer at such an elevation that the bottom of the water line is at least 18 inches above the top of the sewer. [Recommended Standards for Water Works 8.6.2] This requirement is applicable during the following months: All Year. Statistical basis: Not applicable.

BREATHITT COUNTY WATER DISTRICT
Contract # 1
BID ADDENDUM NO.1



PROJECT NAME: KY541/KY205 WATERLINE PROJECT
PROJECT LOCATION: BREATHITT COUNTY, KENTUCKY
NEI PROJECT NO.: 998-16
Date: September 11, 2006

Following are revisions, clarifications and responses to inquiries, which have been made since release of bid documents for the KY541/KY205 Waterline Project on August 22, 2006. This document and its attachments constitute Addendum No.1.

1. **Certificate of Good Standing from the Secretary of State's (SOS) Office** - A printed copy from the web site of the SOS at the following web address (http://www.sos.state.ky.us/corporate2/entityname.asp), which indicates the corporation/partnership, has a Standing of **Good** shall be submitted with the bid.

2. **Connection at Tank** – Connection between Contract 1 (Line) and Contract 2 (Tank) is the responsibility of the contractor awarded **Contract 2**.

3. **Pipe Cover** - All lines constructed within KY State Right-of-Way (ROW), shall have a minimum cover of 42" above the top of the pipe. Also, the boring pit shall be constructed according to KTC requirements. In areas off the KTC ROW the minimum cover shall be thirty inches (30") unless specifically shown otherwise on the plan sheets.

4. **Encroachment Permit Bond** – The Contractor will acquire the KTC Encroachment Bond and be reimbursed by the Owner upon submittal of a copy of the Bond and the check to KTC.

5. **Trench Width** – The trench width shall be as shown in the standard details, except in rock. In rock the minimum distance from the pipe OD to the trench wall shall be between four to six inches (4 – 6").

6. **Electric Power to the Pump Station** – The Contractor will be responsible for the cost of and getting the power from the closest adequate power line to the service pole, setting the service pole and installing the disconnects, meter base and other necessary electrical components to make the pump station operatable, in accordance with the Supplying Power Company's requirements. The Owner shall pay any costs related to a connection fee or deposit for setting the meter by the Power Co.

7. **Wage rates** – The prevailing State Wage Rates, as shown in the specifications, are determination number 013-H-00039-05-2 and shall be used on this project.

8. **Stored Materials** – If the Contractor requests payment for Stored Materials on his Partial Pay Estimate, he must submit proof of payment from that supplier, less retainage, of such stored materials with his following months Partial Pay Estimate before it will be processed for payment.

9. **Occupational Tax/License** - Breathitt County has an occupational tax consisting of 1 % of the Gross Payroll and 1 % of the Net Profits made in Breathitt County. The County also has a Business License Requirement of approximately $100.

10. **Revised Bid Schedule** – The Bid Schedule has been revised and is attached. The two-inch pipe diameter has been increased to three-inch diameter. Bidder's attention is directed to the fact that there are four (4) Deductive Alternates (DA) on this project. The unit cost used in the DA's shall be the same as in the Base Bid. The low bidder will be determined based on the lowest Base Bid. The District can select any DA or combination of DA's that they choose.

The Bid Opening Date remains the same as advertised **September 19, 2006** at **11:00 AM** local time in the **Breathitt County Fiscal Court Room**, Breathitt County Court House, 1137 Main Street, Jackson, KY 41339.

Attachments;
Revised Bid Schedule

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+ - + - + - + - + - + - + - + - + - + - + - + - + - + - + - + - + - + - + - + - +
*                                                                             *
*                          K Y P I P E 4                                      *
*                                                                             *
*       University of Kentucky Network Modeling Software                      *
*                                                                             *
*                    Copyrighted by KPFS 1998                                 *
*                  Version 2.000 - 04/24/2003                                 *
*                                                                             *
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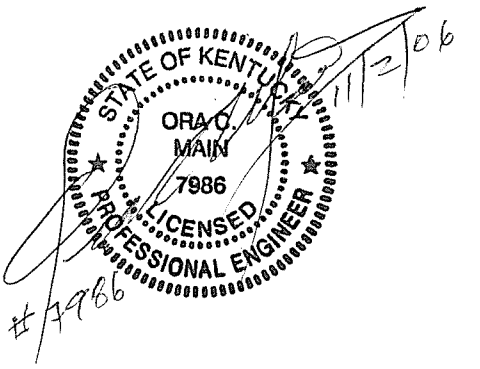

Date & Time: Fri Aug 11 06:10:09 2006

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POSTPROCESSOR RESULTS FILENAME --- P:\B6XCB5~K\998-16\HLQW4R~J\KY205_ON.RS2

S U M M A R Y O F O R I G I N A L D A T A

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

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

R E G U L A T I N G V A L V E D A T A

VALVE LABEL	VALVE TYPE	VALVE SETTING (ft or gpm)
RV-2	PRV-1	955.38
RV-3	PRV-1	1125.38
RV-4	PRV-1	998.46
RV-5	PRV-1	954.62

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

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	NODE NAMES #2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-001	R-1	BCWD-MM2	10.00	6.00	120.0000	0.00
P-10	B-103	@-RV-4	2495.00	8.00	120.0000	0.00
P-100	BCWD-MM2	Pump-3	10.00	8.00	120.0000	0.00
P-11	@-RV-5	B-108W	3016.42	8.00	120.0000	0.00
P-12	RV-4	B-104W	5.00	8.00	120.0000	0.00
P-2	J-900	B-120W	1123.57	8.00	120.0000	0.00
P-200	B-116W	TANK-5	1400.00	8.00	120.0000	0.00
P-201	TANK-5	@-Pump-4	402.12	8.00	120.0000	0.00
P-202	Pump-4	B-117	597.88	8.00	120.0000	0.00
P-3	J-902	J-903W	697.49	6.00	120.0000	0.00
P-301	B-200	B-300W	491.16	6.00	120.0000	0.00
P-302	B-300W	B-301	2188.81	6.00	120.0000	0.00
P-303	B-301	B-302	558.23	6.00	120.0000	0.00
P-34	@-Pump-3	B-2	1428.40	8.00	120.0000	0.00
P-35	B-2	B-3	1354.01	8.00	120.0000	0.00
P-36	B-3	B-3W	93.10	8.00	120.0000	0.00
P-37	B-3W	B-4W	806.00	8.00	120.0000	0.00
P-38	B-4W	B-5W	1858.30	8.00	120.0000	0.00
P-39	B-5W	B-6W	1462.96	8.00	120.0000	0.00

P-40	B-6W	B-7	1457.18	8.00	120.0000	0.00
P-41	B-7	B-8	117.86	8.00	120.0000	0.00
P-42	B-8A	TANK-4	5.00	8.00	120.0000	0.00
P-43	B-8	B-8A	2000.00	8.00	120.0000	0.00
P-44	B-8	B-9W	144.10	8.00	120.0000	0.00
P-45	B-9W	B-10W	2539.00	8.00	120.0000	0.00
P-46	B-10W	B-11W	207.00	8.00	120.0000	0.00
P-47	B-11W	B-12W	568.00	8.00	120.0000	0.00
P-48	B-12W	B-13	2826.00	8.00	120.0000	0.00
P-49	B-13	RV-2	81.38	8.00	120.0000	0.00
P-50	0~RV-2	B-14W	2719.38	6.00	120.0000	0.00
P-500	B-117	J-900	1696.58	8.00	120.0000	0.00
P-501	B-120W	B-121W	9028.62	8.00	120.0000	0.00
P-502	B-121W	B-122W	4671.38	8.00	120.0000	0.00
P-503	B-122W	B-123W	3429.67	8.00	120.0000	0.00
P-505	B-123W	B-124	3138.61	8.00	120.0000	0.00
P-506	B-124	B-124W	476.58	8.00	120.0000	0.00
P-507	B-124W	B-125	3140.72	8.00	120.0000	0.00
P-508	B-125	B-125W	3760.57	8.00	120.0000	0.00
P-509	B-125W	B-126	4997.16	8.00	120.0000	0.00
P-51	B-14W	B-15W	1898.30	6.00	120.0000	0.00
P510	B-126	W-1W	4156.69	8.00	120.0000	0.00
P-52	B-15W	B-16	2589.01	6.00	120.0000	0.00
P-53	B-16	B-17W	476.38	6.00	120.0000	0.00
P-54	B-17W	B-18W	107.46	6.00	120.0000	0.00
P-55	B-18W	B-19W	1183.61	6.00	120.0000	0.00
P-56	B-19W	B-20W	242.96	6.00	120.0000	0.00
P-57	B-20W	B-21W	620.37	6.00	120.0000	0.00
P-58	B-21W	B-22	1181.65	6.00	120.0000	0.00
P-59	B-22	B-23W	1772.66	6.00	120.0000	0.00
P-60	B-23W	B-24W	1145.85	6.00	120.0000	0.00
P-601	B-124W	B-600W	2931.34	4.00	120.0000	0.00
P-602	B-600W	B601W	4575.13	4.00	120.0000	0.00
P-603	B601W	B-602W	1544.33	2.00	120.0000	0.00
P-61	B-24W	B-25W	1012.89	6.00	120.0000	0.00
P-62	B-25W	B-26W	532.66	6.00	120.0000	0.00
P-63	B-26W	B-27W	2771.49	6.00	120.0000	0.00
P-64	B-27W	B-28	2441.49	6.00	120.0000	0.00
P-65	B-28	B-29W	791.71	6.00	120.0000	0.00
P-650	B-124	B-124A	2261.98	8.00	120.0000	0.00
P-652	TANK-6	B-124A	412.58	8.00	120.0000	0.00
P-66	B-29W	B-30W	420.51	6.00	120.0000	0.00
P-67	B-30W	B-31W	1007.91	6.00	120.0000	0.00
P-68	B-31W	B-32	1535.73	6.00	120.0000	0.00
P-69	B-13	RV-3	46.78	8.00	120.0000	0.00
P-70	B-99W	B-100W	135.63	8.00	120.0000	0.00
P-700	B-126	B-700W	3100.00	4.00	120.0000	0.00
P-701	B-700W	B-701	2500.00	4.00	120.0000	0.00
P-702	B-701	B-702	500.00	4.00	120.0000	0.00
P-703	B-701	B703W	1100.00	2.00	120.0000	0.00
P-704	B-702	B-704W	1100.00	2.00	120.0000	0.00
P-71	B-100W	B-101W	2064.76	8.00	120.0000	0.00
P-72	B-101W	B-102	1654.00	8.00	120.0000	0.00
P-73	B-102	B-103	95.35	8.00	120.0000	0.00
P-75	B-104W	B-105	1866.93	8.00	120.0000	0.00
P-76	B-105	B-106W	185.43	8.00	120.0000	0.00
P-77	B-107	B-106W	1198.45	8.00	120.0000	0.00
P-78	B-107W	RV-5	1742.66	8.00	120.0000	0.00
P-79	B-108W	B-109W	1297.82	8.00	120.0000	0.00
P-8	0~RV-3	B-99W	787.22	8.00	120.0000	0.00
P-80	B-109W	B-110	2295.44	8.00	120.0000	0.00
P-800	B-125	B-800W	2800.00	4.00	120.0000	0.00
P-801	B-800W	B-801W	400.00	2.00	120.0000	0.00
P-81	B-110	B-200	1270.66	8.00	120.0000	0.00
P-82	B-200	B-201W	2394.57	8.00	120.0000	0.00
P-83	B-201W	B-111	872.75	8.00	120.0000	0.00
P-84	B-111	B-111A	839.11	8.00	120.0000	0.00
P-85	B-111A	B-112	2940.20	8.00	120.0000	0.00
P-89	B-112	B-112W	2093.69	8.00	120.0000	0.00
P-9	B-107	B-107W	1253.50	8.00	120.0000	0.00
P-90	B-112W	B-113	2877.22	8.00	120.0000	0.00
P-900	J-900	J-901	2308.73	8.00	120.0000	0.00

P-901	J-901	J-902	1349.03	6.00	120.0000	0.00
P-91	B-113	B-113W	3584.72	8.00	120.0000	0.00
P-92	B-113W	B-114W	1913.72	8.00	120.0000	0.00
P-93	B-114W	B-115W	777.12	8.00	120.0000	0.00
P-94	B-115W	B-116W	1145.05	8.00	120.0000	0.00

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

THERE IS A DEVICE AT NODE Pump-3 DESCRIBED BY THE FOLLOWING DATA: (ID= 30)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
463.00	0.00	0.00
400.00	207.00	78.00
285.00	293.00	70.00

THERE IS A DEVICE AT NODE Pump-4 DESCRIBED BY THE FOLLOWING DATA: (ID= 20)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
165.00	0.00	0.00
150.00	100.00	70.00
100.00	190.00	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)
B-100W	Gross Valley	1.06	835.00	
B-101W		3.18	890.00	
B-102		0.00	1015.00	
B-103		0.00	1015.00	
B-104W	Walnut Frk	2.12	889.00	
B-105		0.00	855.00	
B-106W	James Gross	6.88	852.00	
B-107		0.00	840.00	
B-107W	Gross Frk Rd	5.56	815.00	
B-108W	Rode Frk Rd	3.44	760.00	
B-109W	Forrest Brya	2.12	760.00	
B-10W	Eddieville D	0.53	900.00	
B-110		0.00	730.00	
B-111	High Point	0.00	810.00	
B-111A		0.00	705.00	
B-112		0.00	689.00	
B-112W		6.35	720.00	
B-113	Lawson	0.00	775.00	
B-113W		7.41	700.00	
B-114W	White Oak Cr	6.35	700.00	
B-115W	KMBC Dr	12.70	720.00	
B-116W		2.12	720.00	
B-117		0.00	720.00	
B-11W	Buzzard Holw	2.12	900.00	
B-120W		2.40	849.00	
B-121W		6.00	720.00	
B-122W		4.20	849.00	
B-123W		1.30	780.00	
B-124		0.00	765.00	
B-124A		0.00	1030.00	
B-124W		3.80	770.00	
B-125		0.00	783.00	
B-125W		6.90	810.00	
B-126		0.00	849.00	
B-12W	Chenowee Br	2.38	890.00	

B-13		0.00	840.00	
B-14W		3.70	802.00	
B-15W	Brewer FRK	1.06	795.00	
B-16		0.00	778.00	
B-17W		3.97	780.00	
B-18W	Bertha LN	0.79	795.00	
B-19W	Keen FRK	0.26	785.00	
B-2		0.00	820.00	
B-200		0.00	760.00	
B-201W		3.44	715.00	
B-20W	Bowman FRK R	1.59	779.00	
B-21W	Clover FRK	2.91	770.00	
B-22		0.00	760.00	
B-23W		2.91	800.00	
B-24W	Spicer BR Rd	0.53	760.00	
B-25W	Burcham Frk	4.50	752.00	
B-26W	IK Crawford	0.53	750.00	
B-27W		2.12	760.00	
B-28		0.00	725.00	
B-29W	Tolar Rd	2.65	730.00	
B-3		0.00	865.00	
B-300W	Rock Lick Rd	1.32	715.00	
B-301		0.00	785.00	
B-302		0.00	789.00	
B-30W	Upper Frk -	4.76	740.00	
B-31W		3.97	740.00	
B-32		0.00	780.00	
B-3W	Hurricane Br	1.85	865.00	
B-4W	Yeadon BR	0.79	880.00	
B-5W	Dan Derek Dr	0.26	921.00	
B-600W		5.30	790.00	
B601W		1.60	815.00	
B-602W		1.50	810.00	
B-6W	Lockard Holw	0.79	950.00	
B-7		0.00	1000.00	
B-700W		3.22	880.00	
B-701		0.00	890.00	
B-702		0.00	900.00	
B703W		0.27	920.00	
B-704W		0.81	940.00	
B-8		0.00	1000.00	
B-800W		1.30	850.00	
B-801W		0.25	880.00	
B-8A		0.00	1240.00	
B-99W		0.53	835.00	
B-9W	Gabbard Hill	1.59	1020.00	
BCWD-MM2		0.79	800.00	
J-900		0.00	720.00	
J-901		0.00	750.00	
J-902		0.00	738.00	
J-903W		2.42	735.00	
Pump-3		0.00	805.00	
Pump-4		0.00	900.00	
R-1		----	800.00	960.00
RV-2	KY52 #1	0.00	840.00	
RV-3	KY541 #1	0.00	860.00	
RV-4	KY541 #2	----	890.00	998.46
RV-5	KY541 #3	0.00	800.00	
TANK-4	P-42	----	1240.00	1267.90
TANK-5		----	900.00	940.90
TANK-6		----	1034.00	1056.90
W-1W		13.56	905.00	

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

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT
MAXIMUM AND MINIMUM PRESSURES = 15
MAXIMUM AND MINIMUM VELOCITIES = 15
MAXIMUM AND MINIMUM HEAD LOSS/1000 = 15

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

NUMBER OF PIPES .....(p) = 96
NUMBER OF END NODES .....(j) = 93
NUMBER OF PRIMARY LOOPS .....(l) = 0
NUMBER OF SUPPLY NODES .....(s) = 4
NUMBER OF SUPPLY ZONES .....(z) = 1

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ase: 0

RESULTS OBTAINED AFTER 11 TRIALS: ACCURACY = 0.00000

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

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

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL+ML/ 1000 (ft/ft)	HL/ 1000 (ft/ft)
P-001	R-1	BCWD-MM2	270.48	0.08	0.00	3.07	7.64	7.64
P-10	B-103	RV-4	157.07	1.72	0.00	1.00	0.69	0.69
P-100	BCWD-MM2	Pump-3	269.69	0.02	0.00	1.72	1.87	1.87
P-11	RV-5	B-108W	142.51	1.73	0.00	0.91	0.57	0.57
P-12	RV-4	B-104W	157.07	0.00	0.00	1.00	0.69	0.69
P-2	J-900	B-120W	139.71	0.62	0.00	0.89	0.55	0.55
P-200	B-116W	TANK-5	97.26	0.40	0.00	0.62	0.28	0.28
P-201	TANK-5	Pump-4	142.13	0.23	0.00	0.91	0.57	0.57
P-202	Pump-4	B-117	142.13	0.34	0.00	0.91	0.57	0.57
P-3	J-902	J-903W	2.42	0.00	0.00	0.03	0.00	0.00
P-301	B-200	B-300W	1.32	0.00	0.00	0.01	0.00	0.00
P-302	B-300W	B-301	0.00	0.00	0.00	0.00	0.00	0.00
P-303	B-301	B-302	0.00	0.00	0.00	0.00	0.00	0.00
P-34	Pump-3	B-2	269.69	2.67	0.00	1.72	1.87	1.87
P-35	B-2	B-3	269.69	2.53	0.00	1.72	1.87	1.87
P-36	B-3	B-3W	269.69	0.17	0.00	1.72	1.87	1.87
P-37	B-3W	B-4W	267.84	1.49	0.00	1.71	1.85	1.85
P-38	B-4W	B-5W	267.05	3.41	0.00	1.70	1.84	1.84
P-39	B-5W	B-6W	266.79	2.68	0.00	1.70	1.83	1.83
P-40	B-6W	B-7	266.00	2.66	0.00	1.70	1.82	1.82
P-41	B-7	B-8	266.00	0.21	0.00	1.70	1.82	1.82
P-42	B-8A	TANK-4	61.30	0.00	0.00	0.39	0.12	0.12
P-43	B-8	B-8A	61.30	0.24	0.00	0.39	0.12	0.12
P-44	B-8	B-9W	204.71	0.16	0.00	1.31	1.12	1.12
P-45	B-9W	B-10W	203.12	2.81	0.00	1.30	1.11	1.11
P-46	B-10W	B-11W	202.59	0.23	0.00	1.29	1.10	1.10
P-47	B-11W	B-12W	200.47	0.61	0.00	1.28	1.08	1.08
P-48	B-12W	B-13	198.09	2.99	0.00	1.26	1.06	1.06
P-49	B-13	RV-2	36.25	0.00	0.00	0.23	0.05	0.05
P-50	RV-2	B-14W	36.25	0.50	0.00	0.41	0.18	0.18
P-500	B-117	J-900	142.13	0.97	0.00	0.91	0.57	0.57
P-501	B-120W	B-121W	137.31	4.34	0.00	0.88	0.54	0.54
P-502	B-121W	B-122W	131.31	2.30	0.00	0.84	0.49	0.49
P-503	B-122W	B-123W	127.11	1.59	0.00	0.81	0.46	0.46
P-505	B-123W	B-124	125.81	1.43	0.00	0.80	0.46	0.46
P-506	B-124	B-124W	39.13	0.02	0.00	0.25	0.05	0.05
P-507	B-124W	B-125	26.93	0.08	0.00	0.17	0.03	0.03
P-508	B-125	B-125W	14.78	0.08	0.00	0.16	0.02	0.02
P-509	B-125W	B-126	17.88	0.06	0.00	0.11	0.01	0.01
P-51	B-14W	B-15W	32.55	0.29	0.00	0.37	0.15	0.15

P510	B-126	W-1W	13.58	0.03	0.00	0.09	0.01	0.01
P-52	B-15W	B-16	31.49	0.37	0.00	0.36	0.14	0.14
P-53	B-16	B-17W	31.49	0.07	0.00	0.36	0.14	0.14
P-54	B-17W	B-18W	27.52	0.31	0.00	0.31	0.11	0.11
P-55	B-18W	B-19W	26.73	0.12	0.00	0.30	0.11	0.11
P-56	B-19W	B-20W	26.47	0.03	0.00	0.30	0.10	0.10
P-57	B-20W	B-21W	24.38	0.06	0.00	0.28	0.09	0.09
P-58	B-21W	B-22	21.97	0.09	0.00	0.25	0.07	0.07
P-59	B-22	B-23W	21.97	0.13	0.00	0.25	0.07	0.07
P-60	B-23W	B-24W	19.06	0.06	0.00	0.22	0.06	0.06
P-601	B-124W	B-600W	8.40	0.26	0.00	0.21	0.09	0.09
P-602	B-600W	B601W	3.10	0.06	0.00	0.08	0.01	0.01
P-603	B601W	B-602W	1.50	0.16	0.00	0.15	0.11	0.11
P-61	B-24W	B-25W	18.53	0.05	0.00	0.21	0.05	0.05
P-62	B-25W	B-26W	14.03	0.02	0.00	0.16	0.03	0.03
P-63	B-26W	B-27W	13.50	0.08	0.00	0.15	0.03	0.03
P-64	B-27W	B-28	11.38	0.05	0.00	0.13	0.02	0.02
P-65	B-28	B-29W	11.38	0.02	0.00	0.13	0.02	0.02
P-650	B-124	B-124A	86.68	0.52	0.00	0.55	0.23	0.23
P-652	TANK-6	B-124A	-86.68	0.09	0.00	0.55	0.23	0.23
P-66	B-29W	B-30W	8.73	0.01	0.00	0.10	0.01	0.01
P-67	B-30W	B-31W	3.97	0.00	0.00	0.05	0.00	0.00
P-68	B-31W	B-32	0.00	0.00	0.00	0.00	0.00	0.00
P-69	B-13	RV-3	161.84	0.03	0.00	1.03	0.73	0.73
P-70	B-99W	B-100W	161.31	0.10	0.00	1.03	0.72	0.72
P-700	B-126	B-700W	4.30	0.08	0.00	0.11	0.03	0.03
P-701	B-700W	B-701	1.08	0.00	0.00	0.03	0.00	0.00
P-702	B-701	B-702	0.81	0.00	0.00	0.02	0.00	0.00
P-703	B-701	B703W	0.27	0.00	0.00	0.03	0.00	0.00
P-704	B-702	B-704W	0.81	0.04	0.00	0.08	0.03	0.03
P-71	B-100W	B-101W	160.25	1.47	0.00	1.02	0.71	0.71
P-72	B-101W	B-102	157.07	1.14	0.00	1.00	0.69	0.69
P-73	B-102	B-103	157.07	0.07	0.00	1.00	0.69	0.69
P-75	B-104W	B-105	154.95	1.25	0.00	0.99	0.67	0.67
P-76	B-105	B-106W	154.95	0.12	0.00	0.99	0.67	0.67
P-77	B-107	B-106W	-148.07	0.74	0.00	0.95	0.62	0.62
P-78	B-107W	RV-5	142.51	1.00	0.00	0.91	0.57	0.57
P-79	B-108W	B-109W	139.07	0.71	0.00	0.89	0.55	0.55
P-8	RV-3	B-99W	161.84	0.57	0.00	1.03	0.73	0.73
P-80	B-109W	B-110	136.95	1.22	0.00	0.87	0.53	0.53
P-800	B-125	B-800W	2.15	0.02	0.00	0.05	0.01	0.01
P-801	B-800W	B-801W	0.25	0.00	0.00	0.03	0.00	0.00
P-81	B-110	B-200	136.95	0.68	0.00	0.87	0.53	0.53
P-82	B-200	B-201W	135.63	1.25	0.00	0.87	0.52	0.52
P-83	B-201W	B-111	132.19	0.44	0.00	0.84	0.50	0.50
P-84	B-111	B-111A	132.19	0.42	0.00	0.84	0.50	0.50
P-85	B-111A	B-112	132.19	1.47	0.00	0.84	0.50	0.50
P-89	B-112	B-112W	132.19	1.05	0.00	0.84	0.50	0.50
P-9	B-107	B-107W	148.07	0.77	0.00	0.95	0.62	0.62
P-90	B-112W	B-113	125.84	1.31	0.00	0.80	0.46	0.46
P-900	J-900	J-901	2.42	0.00	0.00	0.02	0.00	0.00
P-901	J-901	J-902	2.42	0.00	0.00	0.03	0.00	0.00
P-91	B-113	B-113W	125.84	1.63	0.00	0.80	0.46	0.46
P-92	B-113W	B-114W	118.43	0.78	0.00	0.76	0.41	0.41
P-93	B-114W	B-115W	111.08	0.29	0.00	0.72	0.37	0.37
P-94	B-115W	B-116W	99.38	0.34	0.00	0.63	0.29	0.29

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)	PUMP HEAD (ft)	EFFIC- ENCY (%)	USEFUL POWER (Hp)	INCREMTL COST ($)	TOTAL COST ($)	#PUMPS PARALLEL	#PUMPS SERIES	PSH Vail. (ft)

Pump-3	269.69	154.90	478.98	324.1	----	-----	---	----	**	**
38.1										
Pump-4	142.13	40.67	169.61	128.9	----	-----	---	----	**	**
3.9										

E N D N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
B-100W	Gross Valley	1.06	1124.71	835.00	289.71	125.54
B-101W		3.18	1123.24	890.00	233.24	101.07
B-102		0.00	1122.10	1015.00	107.10	46.41
B-103		0.00	1122.04	1015.00	107.04	46.38
B-104W	Walnut Frk	2.12	998.46	889.00	109.46	47.43
B-105		0.00	997.21	855.00	142.21	61.62
B-106W	James Gross	6.88	997.08	852.00	145.08	62.87
B-107		0.00	996.34	840.00	156.34	67.75
B-107W	Gross Frk Rd	5.56	995.57	815.00	180.57	78.25
B-108W	Rode Frk Rd	3.44	952.88	760.00	192.88	83.58
B-109W	Forrest Brya	2.12	952.17	760.00	192.17	83.27
B-10W	Eddieville D	0.53	1265.17	900.00	365.17	158.24
B-110		0.00	950.95	730.00	220.95	95.74
B-111	High Point	0.00	948.58	810.00	138.58	60.05
B-111A		0.00	948.16	705.00	243.16	105.37
B-112		0.00	946.69	689.00	257.69	111.67
B-112W		6.35	945.65	720.00	225.65	97.78
B-113	Lawson	0.00	944.33	775.00	169.33	73.38
B-113W		7.41	942.70	700.00	242.70	105.17
B-114W	White Oak Cr	6.35	941.92	700.00	241.92	104.83
B-115W	KMBC Dr	12.70	941.63	720.00	221.63	96.04
B-116W		2.12	941.30	720.00	221.30	95.90
B-117		0.00	1069.27	720.00	349.27	151.35
B-11W	Buzzard Holw	2.12	1264.94	900.00	364.94	158.14
B-120W		2.40	1067.68	849.00	218.68	94.76
B-121W		6.00	1062.84	720.00	342.84	148.56
B-122W		4.20	1060.54	849.00	211.54	91.67
B-123W		1.30	1058.94	780.00	278.94	120.87
B-124		0.00	1057.51	765.00	292.51	126.75
B-124A		0.00	1056.99	1030.00	26.99	11.70
B-124W		3.80	1057.49	770.00	287.49	124.58
B-125		0.00	1057.40	783.00	274.40	118.91
B-125W		6.90	1057.32	810.00	247.32	107.17
B-126		0.00	1057.26	849.00	208.26	90.25
B-12W	Chenowee Br	2.38	1264.33	890.00	374.33	162.21
B-13		0.00	1261.34	840.00	421.34	182.58
B-14W		3.70	954.88	802.00	152.88	66.25
B-15W	Brewer FRK	1.06	954.60	795.00	159.60	69.16
B-16		0.00	954.23	778.00	176.23	76.37
B-17W		3.97	954.16	780.00	174.16	75.47
B-18W	Bertha LN	0.79	954.15	795.00	159.15	68.96
B-19W	Keen FRK	0.26	954.02	785.00	169.02	73.24
B-2		0.00	1281.31	820.00	461.31	199.90
B-200		0.00	950.27	760.00	190.27	82.45
B-201W		3.44	949.02	715.00	234.02	101.41
B-20W	Bowman FRK R	1.59	954.00	779.00	175.00	75.83
B-21W	Clover FRK	2.91	953.94	770.00	183.94	79.71
B-22		0.00	953.85	760.00	193.85	84.00
B-23W		2.91	953.73	800.00	153.73	66.61
B-24W	Spicer BR Rd	0.53	953.66	760.00	193.66	83.92
B-25W	Burcham Frk	4.50	953.61	752.00	201.61	87.36
B-26W	TK Crawford	0.53	953.59	750.00	203.59	88.22
B-27W		2.12	953.51	760.00	193.51	83.85
B-28		0.00	953.45	725.00	228.45	99.00
B-29W	Tolar Rd	1.65	953.44	730.00	223.44	96.82
B-3		0.00	1278.77	865.00	413.77	179.30
B-300W	Rock Lick Rd	1.32	950.27	715.00	235.27	101.95
B-301		0.00	950.27	785.00	165.27	71.62
B-302		0.00	950.27	789.00	161.27	69.88

B-30W	Upper Frk -	4.76	953.43	740.00	213.43	92.49
B-31W		3.97	953.43	740.00	213.43	92.49
B-32		0.00	953.43	780.00	173.43	75.15
B-3W	Hurricane Br	1.85	1278.60	865.00	413.60	179.23
B-4W	Yeadon BR	0.79	1277.11	880.00	397.11	172.08
B-5W	Dan Derek Dr	0.26	1273.70	921.00	352.70	152.84
B-600W		5.30	1057.23	790.00	367.23	115.80
B601W		1.60	1057.16	815.00	242.16	104.94
B-602W		1.50	1057.00	810.00	247.00	107.03
B-6W	Lockard Holw	0.79	1271.01	950.00	321.01	139.11
B-7		0.00	1268.36	1000.00	268.36	116.29
B-700W		3.22	1057.18	880.00	177.18	76.78
B-701		0.00	1057.17	890.00	167.17	72.44
B-702		0.00	1057.17	900.00	157.17	68.11
B703W		0.27	1057.17	920.00	137.17	59.44
B-704W		0.81	1057.14	940.00	117.14	50.76
B-8		0.00	1268.14	1000.00	268.14	116.19
B-800W		1.90	1057.38	850.00	207.38	89.87
B-801W		0.25	1057.38	880.00	177.38	76.87
B-8A		0.00	1267.90	1240.00	27.90	12.09
B-99W		0.53	1124.81	835.00	289.81	125.59
B-9W	Gabbard Hill	1.59	1267.98	1020.00	247.98	107.46
BCWD-MM2		0.79	959.92	800.00	159.92	69.30
J-900		0.00	1068.30	730.00	338.30	146.60
J-901		0.00	1068.30	750.00	318.30	137.93
J-902		0.00	1068.30	738.00	330.30	143.13
J-903W		2.42	1068.30	735.00	333.30	144.43
Pump-3		0.00	959.90	805.00	154.90	67.13
Pump-4		0.00	1069.61	900.00	169.61	73.50
R-1		----	960.00	800.00	160.00	69.33
RV-2	KY52 #1	0.00	1261.34	840.00	421.34	182.58
RV-3	KY541 #1	0.00	1261.31	860.00	401.31	173.90
RV-4	KY541 #2	----	998.46	890.00	108.46	47.00
RV-5	KY541 #3	0.00	994.57	800.00	194.57	84.31
TANK-4	P-42	----	1267.90	1240.00	27.90	12.09
TANK-5		----	940.90	900.00	40.90	17.72
TANK-6		----	1056.90	1034.00	22.90	9.92
W-1W		13.58	1057.23	905.00	152.23	65.97
Pump-3		0.00	1283.98	805.00	478.98	207.56
Pump-4		0.00	940.67	900.00	40.67	17.62
RV-2		----	955.38	840.00	115.38	50.00
RV-3		----	1125.38	860.00	265.38	115.00
RV-4		0.00	1120.32	890.00	230.32	99.81
RV-5		----	954.62	800.00	154.62	67.00

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

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES (psi)	JUNCTION NUMBER	MINIMUM PRESSURES (psi)
Pump-3	207.56	TANK-6	9.92
B-2	199.90	B-124A	11.70
B-13	182.58	TANK-4	12.09
RV-2	182.58	B-8A	12.09
B-3	179.30	Pump-4	17.62
B-3W	179.23	TANK-5	17.72
RV-3	173.90	B-103	46.38
B-4W	172.08	B-102	46.41
B-12W	162.21	RV-4	47.00
B-10W	158.24	B-104W	47.43
B-11W	156.14	RV-2	50.00
B-5W	152.84	B-704W	50.76
B-117	151.35	B703W	59.44
B-121W	148.56	B-111	60.05
J-900	146.60	B-105	61.62

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-001	3.07	P-301	0.01
P-100	1.72	P-900	0.02
P-34	1.72	P-702	0.02
P-35	1.72	P-801	0.03
P-36	1.72	P-3	0.03
P-37	1.71	P-901	0.03
P-38	1.70	P-701	0.03
P-39	1.70	P-703	0.03
P-40	1.70	P-67	0.05
P-41	1.70	P-800	0.05
P-44	1.31	P-602	0.08
P-45	1.30	P-704	0.08
P-46	1.29	P510	0.09
P-47	1.28	P-66	0.10
P-48	1.26	P-700	0.11

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
P-001	7.64	P-900	0.00
P-100	1.87	P-301	0.00
P-34	1.87	P-702	0.00
P-36	1.87	P-3	0.00
P-35	1.87	P-901	0.00
P-37	1.85	P-701	0.00
P-38	1.84	P-67	0.00
P-39	1.83	P-801	0.00
P-40	1.82	P-703	0.00
P-41	1.82	P-800	0.01
P-44	1.12	P510	0.01
P-45	1.11	P-509	0.01
P-46	1.10	P-66	0.01
P-47	1.08	P-602	0.01
P-48	1.06	P-64	0.02

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-001	7.64	P-900	0.00
P-100	1.87	P-301	0.00
P-34	1.87	P-702	0.00
P-36	1.87	P-3	0.00
P-35	1.87	P-901	0.00
P-37	1.85	P-701	0.00
P-38	1.84	P-67	0.00
P-39	1.83	P-801	0.00
P-40	1.82	P-703	0.00
P-41	1.82	P-800	0.01
P-44	1.12	P510	0.01
P-45	1.11	P-509	0.01
P-46	1.10	P-66	0.01
P-47	1.08	P-602	0.01
P-48	1.06	P-64	0.02

R E G U L A T I N G V A L V E R E P O R T

VALVE LABEL	VALVE TYPE	VALVE SETTING	VALVE STATUS	UPSTREAM PRESSURE	DOWNSTREAM PRESSURE	THROUGH FLOW

		(psi or gpm)		(psi)	(psi)	(gpm)
RV-2	PRV-1	50.00	ACTIVATED	182.58	50.00	36.35
RV-3	PRV-1	115.00	ACTIVATED	173.90	115.00	161.84
RV-4	PRV-1	47.00	ACTIVATED	99.81	47.00	157.07
RV-5	PRV-1	67.00	ACTIVATED	84.31	67.00	142.51

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

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

NODE NAME	FLOWRATE (gpm)	NODE TITLE
P-1	270.48	
TANK-4	-61.30	P-42
TANK-5	44.87	
TANK-6	-86.68	

NET SYSTEM INFLOW = 315.35
NET SYSTEM OUTFLOW = -147.98
NET SYSTEM DEMAND = 167.38

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

Breathitt County Water District
KY 541 - KY 205 Waterline Project

KY 541 Pump Station - Operation, Maintenance and Replacement Costs

nesbitt engineering, inc.
providing proven solutions since 1976
227 North Upper Street
Lexington, KY 40507-1016

Given

Electric rates

Monthly Flat fee	$	45.00	
Cost per Kwh	$	0.050758	per Kwh
Demand Factor	$	6.51000	per Kwh

Average flow rate of pump = 130 gpm
Estimated flow = (200 homes x 75 % x 2.61p/hh x 100 gpcd) = 39,150 Gals/day
Pumping hours/day = (Est flow)/(pump rate x 60) = 5.02 hours/day
2 ~ 7.5 HP pumps, 130 gpm, 140' head, 75 % efficiency

Estimated Operation and Maintenance Costs									
Pumping Costs									
(2 pumps x 7.5 HP x one pump operating at a time x 0.75 x pump hrs/day)/motor efficiency =						Kwh/day			
(2 pumps x 7.5 HP x 1/2 x 0.75 x 5.02 hrs/day)/0.8 efficiency =					35	Kwh/day			
	Kwh/day		x 365 days/yr =			Kwh/yr			
	35	x	365	=		12,883	Kwh/yr		
	12 months at Flat fee x $ 45.00 =							$ 540.00	
	12 months usage Kwh =				12,883		x $ 0.050758 =	$ 304.55	
	Demand Charge - estimated = $100/mo							$ 1,200.00	
Total Pumping Costs =								$ 2,044.55	$ 2,044.55
Equipment Repair									
Parts and repair								$ 1,000.00	
Oil and lubrication								$ 1,000.00	
Total Equipment and Repair Costs =								$ 2,000.00	$ 2,000.00
Labor									
one operator @ $ 40/hr x 7 hrs/week (1 hr/day) x 52 weeks = Total Labor Costs =									$ 14,560.00
Total Estimated Operation and Maintenance Costs									$ 18,604.55

Estimated Replacement Costs					
Replacement Costs	Costs to replace in 12 years	Costs to replace in 18 years	Annual component = RS(i-n), i = 8.0 %		
Pumps	$ 15,000.00		$ 791		
Electrical		$ 8,000.00	$ 214		
Tank surface prep & painting	$ 22,000.00	$ 17,000.00	$ 1,159	$ 454	
Total Replacement Costs				$ 2,617	$ 2,617
Total Estimated Operation, Maintenance and Replacement Costs					$ 21,221.95

Cost per thousand gallons					
Gallons per day	39,150				
Gallons per year	39,150	x 365 days/yr	=	14,289,750	
Thousand gallons per year				14,290	
Total Estimated Operation, Maintenance and Replacement Costs/1000 gallons					$ 1.49