COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE APPLICATION OF CRITTENDEN-LIVINGSTON COUNTY WATER DISTRICT, OF CRITTENDEN AND LIVINGSTON COUNTIES, KENTUCKY, FOR APPROVAL OF CONSTRUCTION OF PHASE II PROJECT OF DISTRICT, INCLUDING FINANCING AND INCREASED RATES	))))))	CASE NO. 10285

O R D E R

IT IS ORDERED that Crittenden-Livingston County Water District ("Crittenden-Livingston") shall file an original and 7 copies of the following information with the Commission with a copy to all parties of record no later than July 20, 1988. If the information cannot be provided by this date, Crittenden-Livingston should submit a motion for an extension of time stating the reason a delay is necessary and include a date by which it will be furnished. Such motion will be considered by the Commission. Crittenden-Livingston shall furnish with each response the name of the witness who will be available at the public hearing for responding to questions concerning each item of information requested.

1. A complete evaluation of Crittenden-Livingston's proposed construction requires more comprehensive hydraulic information. The additional hydraulic information for existing facilities should depict the operation of existing pumps, the "empty-fill" cycles of existing tanks, etc. Crittenden-Livingston

should provide hydraulic analyses, supported by computations and actual field measurements, of typical operational sequences of the existing water distribution system. These hydraulic analyses should demonstrate the operation of all pump stations and the "empty-fill" cycle of all water storage tanks. Computations are to be documented by a labeled schematic map of the system that shows pipeline sizes, lengths, connections, pumps, water storage tanks, and sea level elevations of all junctions, as well as allocations of actual customer demands. Flows used in the analyses shall be identified as those based on average instantaneous flows, peak instantaneous flows, or any combination or variation thereof. The flows used in the analyses shall be documented by actual field measurements and customer usage records. Any assumptions used in the analyses are to be fully justified.

2. Provide a summary of any operational deficiencies of the existing water system that are indicated by the hydraulic analyses or that are known.

3. The results of hydraulic analyses based on the proposed facilities being fully operational with existing facilities are essential to a demonstration that the new facilities can be adequately supported by the existing facilities. The information filed should depict pump operations, the "empty-fill" cycles of the water storage tanks, etc. Based on this, provide hydraulic analyses, supported by computations and actual field measurements, of typical operational sequences of the existing water distribution system. These hydraulic analyses should demonstrate

the operation of all pump stations and the "empty-fill" cycle of all water storage tanks. Computations are to be documented by a labeled schematic map of the system that shows pipeline sizes, lengths, connections, pumps, water storage tanks, and sea level elevations of all junctions, as well as allocations of actual customer demands. Flows used in the analyses shall be identified as those based on average instantaneous flows, peak instantaneous flows, or any combination or variation thereof. The flows used in the analyses shall be documented by actual field measurements and customer use records. Justify fully any assumptions used in the analyses. (Note - these analyses should use the same schematic as the analyses of the existing water distribution system to facilitate comparison).

4. In order to obtain realistic results when utilizing computer hydraulic analyses to predict a water distribution system's performance, engineering references stress the importance of calibrating the results predicted to actual hydraulic conditions. This calibration process should include matching field measurements to the results predicted by the computer over a wide range of actual operating conditions. As a minimum this should include average and maximum water consumption periods, as well as "fire flow" or very high demand periods.

Based on the above, explain the procedures used to verify the computer hydraulic analyses filed in this case. This explanation should be documented by field measurements, hydraulic calculations, etc.

5. Provide a pressure recording chart showing the actual 24-hour continuously measured pressure available near the tank's pump stations, and several other representative locations on Crittenden-Livingston. Identify the 24-hour period recorded, the exact location of the pressure recorder, and the sea level elevation of the recorder. Also state the schematic junction number nearest the location of the pressure recorder.

6. Provide a list of Crittenden-Livingston's water storage tanks. Give the location, capacity, and overflow elevation of each tank. Explain how water is supplied to each tank.

7. Provide a list of Crittenden-Livingston's existing pump stations. Give the location, number of pumps and their rated capacities, and the purpose of each pump station. Explain how the operation of each pump station is controlled. Provide a copy of the pump manufacturer's characteristic (head/capacity) curve for each of Crittenden-Livingston's existing pumps. Identify each curve as to the particular pump and pump station to which it applies. Also state whether the pump is in use, and whether it will remain in use, be abandoned or replaced.

8. Provide a copy of the pump manufacturer's characteristic (head/capacity) curve on which the design of the proposed pump station is based.

9. Provide a narrative description of the proposed daily operational sequences of the water system. Documentation should include the methods and mechanisms proposed to provide positive control of all storage tank water levels. The description should also include an hourly summary of how all tanks will "work"

(expected inflow or outflow of water) and how all pumps will function. The description should be fully supported by appropriate field measurements and hydraulic calculations.

10. Provide a copy of the approval letter from the Natural Resources and Environmental Protection Cabinet for the proposed construction.

11. The application shows that 685 customers are served by the existing system. What is the average and the maximum demand imposed on the system by these 685 customers?

12. The application shows that 211 customers are to be added by the new construction. What will be the average and maximum demand imposed on the system by these 211 customers? What will be the average and maximum demand imposed on the system at the time both existing and new customers (896 total customers) are being served after completion of construction?

13. Provide a copy of bid tabulation whenever the bids are received.

14. Provide a copy of the final summation of the cost of construction and funding arrangements referred to as Final Engineering Report after the bids are received.

15. The engineering information submitted with the application indicates that Crittenden-Livingston is proposing to install one fire hydrant as part of this project. KRS Chapter 227, the "Recommended Standards For Water Works" by the Great Lakes - Upper Mississippi River Board of State Sanitary Engineers ("Ten States Standards") and the Insurance Services Office ("ISO") have requirements for providing fire protection. All of these

references require fire hydrant installation on a minimum of six-inch diameter water lines. For residential construction, the ISO requires the capability to deliver between 500 to 1500 gallons per minute at a residual pressure of 20 pounds per square inch for a minimum of 2 hours from any fire hydrant. The Ten States Standards allow a fire hydrant on dead-end mains for flushing only if flow and pressure are sufficient. Otherwise an approved flushing hydrant or blow-off valve should be used. Based on the above, provide information as to the purpose of the proposed fire hydrant. If the purpose of the proposed fire hydrant is to provide fire protection, provide hydraulic analyses demonstrating the capability of Crittenden-Livingston system to comply with the requirements of KRS Chapter 227, the ISO and the Ten States Standards. If the fire hydrant is proposed for reasons other than fire protection state why was other equipment not considered (e.g., blow-off valves, drain valves, etc.)?

Done at Frankfort, Kentucky, this 29th day of June, 1988.

PUBLIC SERVICE COMMISSION

For the Commission

ATTEST:

Executive Director