

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF SOUTHERN MADISON WATER)
DISTRICT FOR CERTIFICATE OF PUBLIC)
CONVENIENCE AND NECESSITY TO CONSTRUCT) CASE NO. 90-305
STORAGE FACILITIES)

O R D E R

IT IS ORDERED that Southern Madison Water District ("Southern Madison") shall file an original and 10 copies (two copies of engineering-related materials) of the following information with the Commission, with a copy to all parties of record within 14 days from the date of this Order. If the information cannot be provided by this date, Southern Madison 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. Southern Madison 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. Provide a copy of the input data used in the computer-generated hydraulic analyses filed in this case on an IBM compatible 5 1/4-inch floppy disk.

2. Southern Madison indicated that computer hydraulic analyses for the existing and proposed water distribution systems were filed with the Commission on November 30, 1989. Upon review

of this information, only computer hydraulic analyses of the proposed water distribution system were included. Based on this, provide hydraulic analyses, supported by computations and actual field measurements, of typical operational sequences of the existing water distribution system as presently configured and operated. 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, wells, and sea level elevations of key points, as well as allocations of actual customer demands. Flows used in the analyses shall be identified as to whether they are 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 proposed water distribution system to facilitate comparison.)

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

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. At a minimum this should include average and maximum water consumption periods, as well as "fire flow" situations and 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. The computer hydraulic analyses filed in this case are based on two different customer demands. The average demand appears to be approximately .08 gallons per minute per customer, and the peak demand appears to be approximately .24 gallons per minute per customer.

Most engineering references state that instantaneous customer demands can peak at 3 to 15 times the 24-hour average demand. In addition, most engineering references also state that a water distribution system should be designed to meet at least the maximum hourly demand of its customers.

Based on the above information, state exactly what measurements were made of Southern Madison's maximum hourly usage. If the maximum hourly usage was not measured directly, state why it was not.

In addition, state exactly how the diurnal pattern for Southern Madison's system was determined. Also detail how the

diurnal demand multipliers for the computer model were determined. This response should be documented by appropriate field measurements.

6. Provide a pressure recording chart showing the actual 24-hour continuously measured pressure available at the locations listed below on Southern Madison's system. 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.

a. In the vicinity of the proposed tank site.

b. On the suction and discharge sides of all pump stations not previously filed.

7. The computer hydraulic analyses for the proposed water distribution system depict the 100,000 gallon water storage tank out of service. State why this tank was out of service, and if it is still out of service. If it is in service, provide revised hydraulic analyses reflecting the operation of this tank. If the tank is out of service, explain why it has not been placed back in service.

8. Provide the criteria used in determining the location, size, overflow elevation, and head range for the proposed water storage tank. In addition, state what other sites were considered and why they were not selected.

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 (existing and proposed) 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. The computer hydraulic analyses filed in this case for the proposed water distribution system indicate that the potential exists for the system to experience high pressure (more than 150 psig) at Nodes 1, 2, 53, 116, and 187. Pressures at this level are in violation of PSC regulation 807 KAR 5:066, Section 6 (1). Provide details of any preventive measures or additional construction Southern Madison intends to perform to protect against this type of occurrence. Details should be documented by hydraulic analyses and field measurements.

11. Provide a highway map at a scale of at least one inch equals two miles marked to show Southern Madison's water distribution system. The map of the system shall show pipeline sizes, location, and connections as well as pumps, water storage tanks, and sea level elevations of key points.

12. Provide a copy of the final summation of the total cost of construction and funding arrangements referred to as the Final Engineering Report.

13. Provide a list of each of Southern Madison'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 Southern Madison's existing pumps. Identify each curve as to the particular pump and pump station to which it applies. Also state if pump is in use, will remain in use, will be abandoned, or will be replaced.

14. Provide the daily master meter readings for the month of September. Also provide the total monthly water sales and purchases for each of the last 12 months.

Done at Frankfort, Kentucky, this 21st day of November, 1990.

PUBLIC SERVICE COMMISSION


For the Commission

ATTEST:


Executive Director