

JAN 23 2004

ANSWERS TO EIGHTH SET DATA REQUESTS FROM MO
AMERICAN WATER COMPANY TO STAFF

Missouri Public
Service Commission

CONCERNING THE DIRECT TESTIMONY OF JAMES A. MERCIEL (all answers provided by James A. Merciel):

111. Does the Direct Testimony of Mr. Merciel represent only his opinions, or is it the result of the analysis, research and opinions of other Staff members? If the answer is that some or all of Mr. Merciel's Direct Testimony is the result of the analysis, research and opinions of other Staff members, please provide a list of all such Staff members and their positions who so participated, and a list of each corresponding adjustment in Mr. Merciel's Direct Testimony that is the result of such other Staff member's analysis, research and opinions.

A - The Direct Testimony represents Merciel's opinion, and is a result of analysis done only by Merciel.

112. Does the Staff believe that the Commission gave some direction in its Report and Order in MAWC's most recent rate case, WR-2000-281, as to what the Commission believes the appropriate standard of capacity for design and construction of future water treatment facilities should be? If so, what does Staff believe that standard is?

A - The Staff does not believe the Commission addressed any design criteria or standard of plant capacity. Rather, the Staff believes that the disallowance was specific to the St. Joseph treatment plant.

113. Does Mr. Merciel believe that the appropriate responsible criteria under appropriate engineering principles for designing the capacity of new water treatment facilities should be the same criteria for determining whether or not such constructed plant should be included in rate base, or are there two different standards?

A - Merciel believes that reasonable design capacity criteria should be the same as that for determination of rate base.

If there are two different standards, please explain how those standards are or should be different?

MAWC Exhibit No. 136
Case No(s) WR-2003-0500
Date 1/12/04 Rptr JL

114. What does Mr. Merciel believe is the appropriate standard of capacity for design and construction of future water treatment facilities? By "appropriate" this question asks for that standard, the application of which would assure that Mr. Merciel would not testify that a reduction from rate base due to excess capacity would be appropriate. Specifically for example, is a function maximum day pumpage, average day pumpage or some other measure to be used and for what time frame in the future (number of years) is such calculation to be made?

A - The standard is to design for maximum day, for a point in the future considering future needs and customer projections. The future point depends on the design of plant components, and the ability to further expand or add units.

a. With respect to the foregoing question, does Mr. Merciel believe that this standard should be different depending on the size of the company involved? For example, should the standard for a company with the capacity to serve ten customers that anticipates the possible addition of one new customers be the same as a Company with the capacity to serve 10,000 customers that anticipates the possible addition of one new customer? If such standard should be different, please explain how the calculations should be made?

A. - Yes, the design standards are different depending on the size of the system, type of system, and components used in the system, which make a difference with respect to the size of expansion increments. For example for a small system using a single well and a single tank, the entire simple system may have to be designed for many years of growth into the future; whereas a large system with multiple component units can be designed with a reasonable number of spare units for greater reliability, and can also be designed to add units at a later time, and/or to be expandable. Phasing of plant construction may also be different for rapidly growing versus slow growing service areas.

b. With respect to the foregoing question, does Mr. Merciel believe that this standard should be different depending on the composition of the company's customer base? For example, should the standard for two companies with a comparable number of customers be identical if one company has a service area that anticipates and encourages economic development through industrial and other large users, and the other company is largely a bedroom community? If such standard should be different, please explain how the respective calculations should differ?

A. - The standard is not necessarily different, but growth potential is a variable that

should be a consideration as to capacity design and expansion/addition/phasing considerations.

115. Commissioner Murray, in a dissenting opinion in WR-2000-281, stated the following:

“The Company was not imprudent in designing and sizing the St. Joseph plant to meet anticipated needs of the district until the year 2009. To the contrary, it would seem imprudent *not* to design and size a new plant to meet the needs of the district beyond the immediate time period.”

Please explain whether Mr. Merciel believes this statement to be correct or incorrect, and explain the reasons for that agreement or disagreement.

A. – Merciel agrees that the statement itself is correct, however the argument is whether certain plant components are oversized for foreseeable growth, as opposed to be added at some timely point in the future.

116. Commissioner Drainer, in a dissenting opinion in WR-2000-281, stated the following:

“The evidence in the record clearly showed that MAWC management has built in less than a 10 percent growth rate for the new plant and that it will reach full capacity in fewer than 10 years. MAWC management would have been imprudent had they not built in some minimum level of growth. It would indeed have been both imprudent and economically inefficient to construct two 750,000-gallon-clearwell units only to replace them in fewer than ten years with two 1,000,000-gallon-clearwell units as suggested by Staff.”

Please explain whether Mr. Merciel believes this statement to be correct or incorrect, and explain the reasons for that agreement or disagreement.

A. – Merciel disagrees with the concept of “replacing” smaller sized clearwell units. Rather, one or more clearwell units would be added in the future, with the original units remaining in service.

117. How does Mr. Merciel believe that the Commission calculated the MGD capacity of the St. Joseph Treatment Plant that should be allowed in rate base? This question requests a “number” of MGD that was deemed allowable, as it appears to have been the 23 MGD recommended by Mr. Merciel.

A – 23 MGD is a nominal capacity. Some components, notably filters and clarifiers,

have a "prescribed" capacity, meaning there is a maximum recommended flow rate which could be, if necessary, be exceeded for short periods of time, such as for unusual peak days. This was discussed with respect to sand filters in Merciel Rebuttal Testimony in Case No. WR-2000-281 filed on May 4, 2000. However, to arrive at the 23 MGD only certain types of plant components were disallowed from rate base treatment, which were those that could be added or expanded as future projects. The central treatment plant structure, designed as ultimately a 45 MGD facility, had no disallowance.

- a. Does this allowance assume that 23 MGD is available for distribution to customers? If not, how much is available for distribution for customers? If so, what are the plant's needs for internal water use, and how are those needs to be addressed when customer demand reaches 23 MGD?

A. - No, total production is not all available for distribution to customers. There is some allowance for in-plant use, 1.5 MGD was assumed for design. However the 23 MGD number is reflective of historical total plant production, which includes in-plant use.

- b. With respect to the foregoing question and answer, if and when the Company experiences a maximum day usage of the foregoing amount, does Mr. Merciel believe that the construction of additional capacity would be appropriate (again "appropriate" means allowable in rate base) and if so, how much capacity would be appropriate?

A. - If St. Joseph were to regularly exceed production of 23 MGD, or if it were reasonably anticipated such will actually be the case by the addition of customers, then appropriate components, of appropriate reasonable size, would need to be added. The plant, as a nominal 23 MGD facility is capable of supplying greater quantity to meet unusual peaks, as discussed, similar to those that have occurred during a few years in the past, which were handled by the old 20.8MGD facility.

- c. With respect to the foregoing questions, if and when the Company experiences a maximum day usage of 28.5 MGD, does Mr. Merciel believe that the construction of additional capacity would be appropriate (again "appropriate" means allowable in rate base) and if so, how much capacity would be appropriate?

A - In the future, when the demand regularly exceeds 28.5 MGD, as opposed to perhaps one or two unusual events every few years, components may need to be added. The plant, as constructed, is a 30 MGD facility (total production, including in-

plant use) however the design has the provision to add an additional clarifier, add additional sand filter units onto the rear of the facility, and add one high service pump to become a 45 MGD facility. Well units and clearwell volume could also be added as necessary.

- d. With respect to Mr. Merciel's answer to the foregoing question, given Mr. Merciel's intimate knowledge of those facilities that comprise the current plant, what facilities could be added to produce the amount of capacity, and only the amount of capacity, that Mr. Merciel deems would be appropriate?

A.- see above

118. On Page 4 of Mr. Merciel's Direct Testimony, he states, "The Joplin wells ["two additional wells to meet increased water demand"] are necessary because demand has reached the capabilities of the existing water supply on peak days." Please state 1) the capacity of the Joplin facility prior to the construction of the two new wells; 2) the amount of usage that qualified as "reached the capabilities of the existing water supply"; 3) the amount of additional capacity that will be added by the two new wells; and 4) Mr. Merciel's calculation of how much excess capacity, both in GPM and percent of previous GPM, will be available for growth in Joplin following the construction of the two new wells.

A. - Production capacity at Joplin was approximately 19.6 MGD with the treatment plant and five in-service wells. However considering in-plant use and meeting production with the largest well out of service, firm capacity was approximately 17.7 MGD, with pump capacity is absolute, not a prescribed limit as are filters and clarifiers as discussed in No. 117 above. Joplin has consistently delivered between 16 and 17 MGD during peak days of the year, and has delivered over 18 MGD (over 19 MGD total production), meaning it is bumping at the absolute capacity limit of the pumping facilities. The Staff does not have actual production numbers for the two new wells, but assumes they are similar to existing wells, which produce between 0.5 and 1 MGD each. Merciel's current direct testimony is based on a need to have enough pumping capacity available with the largest unit (well) out of service, and also to allow for growth that is occurring in Joplin. Joplin appears to be growing on the order of 200 customers per year, or 1%, translating to an increase in peak day delivery of about 0.16 MGD. This projected increase in customers and water use suggests a new well is required about every 2 to 5 years depending on capacity of a particular new well and depending on how many new customers may be large industrial water users.

119. In Mr. Merciel's judgment, following completion of the two new wells, is any additional capacity necessary in Joplin? If so, why? and If so, how much new capacity would be

“appropriate” and be allowable in rate base upon completion?

A - Additional capacity would not be appropriate immediately following construction of the two new wells. At present growth rate an additional well or other source of supply could be needed within approximately 5 years.

120. On Page 4 of Mr. Merciel’s Direct Testimony, he states that the new St. Joseph Treatment plant “is capable today of 30 MGD production.” Is this amount available for distribution to the Company’s customers, or is the net system delivery capacity 28.5 MGD or some amount less than 30 MGD? Why?

A - 30 MGD is total production, not all is available for distribution.

a. Is it Mr. Merciel’s belief that the 1.5 MGD of capacity reserved for internal purposes is an appropriate amount? If not, please explain?

A - Yes.

b. Is it Mr. Merciel’s belief that the capacity reserved for internal purposes can and/or should be available for distribution to the customers on a peak day?

A - No.

121. On page 4 of Mr. Merciel’s Direct Testimony, he states that, “My opinion in the Company’s last rate case, WR-2000-281, was that a 23 MGD production capacity would have been adequate, based on historical production data...”

a. Does Mr. Merciel make any allocation of capacity for internal purposes, or is the assumption that all the allowed 23 MGD capacity is available for distribution to customers? (“Internal purposes” means water that is used to backwash (i.e., clean) the filters; water used in laboratory, sampling taps, some of which operate continuously to give ongoing readouts of water quality; and chemical feed dilution.)

A - 23 MGD is a nominal total production number, which could be exceeded somewhat if necessary. Not all total production is available for distribution, for the reasons stated in the above question.

b. If so, what should be the reserved amount? If not, how should the Company manage internal water needs when demand reaches 23 MGD?

A - The nominal 23 MGD is intended as a production number, not a delivery number. When, someday, actual production exceeds 23 MGD it may be time for the company to increase capacity beyond that amount, or perhaps more accurately for the given situation, the Staff would recognize the need to include plant items in rate base that are presently recommended to be disallowed.

122. Had the Company constructed the plant with 23 MGD as Mr. Merciel recommends, given Mr. Merciel's knowledge of the components of the system as-built and as-buildable, what usage characteristics would justify the Company adding capacity to the hypothesized 23 MGD plant, and what components would it have been appropriate to add at what increments of experienced maximum day usage?

A - If the company were consistently exceeding 23 MGD production, and/or substantial growth were occurring in St. Joseph, then additional high-service pump, clarifier, clearwell, and wellfield capacity should be added, or included in rate base.

123. Based on Mr. Merciel's Direct Testimony, and the associated Schedule 1, had the Company constructed the 23 MGD plant as recommended, how much capacity would responsibly be available for the Company to offer to prospective customers, and in particular to proposed industrial or large user customers? The term "responsibly" means that amount that would not jeopardize safe and adequate service to all of the Company's customers.

A - Since the stated 23 MGD capacity need is based on a flat growth curve, there is no "reserve capacity" held for potential future large industrial customers. The addition of such large customers, perhaps even as few as one such customer, could create the need for plant capacity beyond the 23 MGD that what included in rate base. Lead time would be necessary to construct plant additions, therefore the company would have to assure potential customers that adequate capacity can be available within a reasonable time.

124. In Case No. WR-2000-281, Mr. Young testified as follows:

Q. IT SEEMS DIFFICULT TO ACCURATELY PROJECT A MAXIMUM DAY DEMAND SEVERAL YEARS INTO THE FUTURE. PLEASE BRIEFLY EXPLAIN HOW PEAK DAY PROJECTIONS ARE MADE.

A. Yes, it is difficult to project future peak day demands, but it is essential for proper planning of large capital projects like the St. Joseph Water

Treatment Plant. The American Water System employs a methodology based on accepted water utility industry practice. First, average day demands are projected based on a number of factors including historical trends, population projections, input from large users, and local and regional trends. Then, a statistical analysis of historic peak day to average day demands is performed over a 20-year period. A maximum to average day ratio is selected using a 95% confidence level. Said another way, the selected maximum to average day ratio allows for a 5% chance of actually exceeding the projected demand in any one year. The selected maximum to average day demand ratio is then multiplied by the average day demands to produce a "design" peak day demand.

In this way, the water system will be prepared to meet system demands during most hot, dry summers, which can occur in any year. The maximum day projection using this methodology must not be thought of as the prediction of maximum day demand in a given year. Rather, it represents the demand for which there is a 5% chance that it will be exceeded in that year. Therefore, a direct comparison of maximum day projections to actual maximum day demands in any year has little significance. This is a crucial concept because the Company's facilities must be adequate to meet customer's needs not only in the average year, but also in a hot, dry summer.

Please explain which of these statements are incorrect, or inapplicable, and why.

A - The maximum from the company's records is 1.6 occurring in 1983, and the ratio for several other years approaches this figure. However these high peak ratios seem to be caused by unusually high peak days and/or unusually low average day usage for the year, and as such the 1.6 figure seems to be somewhat high as applicable to all average day projections.

125. In Case No. WR-2000-281, Mr. Young testified as follows:

Q. WHAT MAXIMUM DAY TO AVERAGE DAY RATIO WAS DERIVED FOR THE ST. JOSEPH SYSTEM IN THE DEMAND PROJECTIONS.

A. A maximum day to average day ratio of 1.60 was determined for St. Joseph in the 1994 CPS. This value is further validated by subsequent analysis of data through 1998 which produces a 95% confidence level peak to average day value of 1.57. These values agree within two percent.

External support for the 1.60 maximum to average day ratio is provided by Mr. Gary M. Lee's absolute agreement with the 1.60 value in his review of the Company's demand projections in Case No. WA-97-46 and Case No. WF-97-241 (the Certificate Case) in 1997 for the Office of Public Counsel. Mr. Lee also explicitly agreed with the Company's 2009 demand projection.

Please explain which of these statements are incorrect, or inapplicable, and why.

A - Please see the above response to # 124.

126. In Case No. WR-2000-281, Mr. Young testified as follows:

Mr. Merciel makes the argument that additional facilities could have been constructed in the future to increase the plant capacity from an initial rating of 22-23 mgd. He argues that in addition to the horizontal collector well, only five vertical wells instead of seven are needed at present. Five vertical wells would not be adequate to meet average day demands when the collector well is out of service for maintenance or inspection. Five vertical wells have a maximum capacity of 18.0 mgd when the wells and pumps are new, but when the normal reduction in well output due to mutual interference, low water level, gradual clogging of the gravel pack and well screen, and wear on the pump is recognized, the combined delivery of five vertical wells could be reduced by twenty percent to approximately 14 mgd. When compared to average day demands of 16 mgd, excluding including in-plant use, five vertical wells are inadequate to meet average day demands and perform normal maintenance and service on the horizontal collector well.

Please explain which of these statements are incorrect, or inapplicable, and why.

A - The statements are generally correct (actually, by observed flows, five vertical wells produce 19 MGD). Reduced production could be a reason to add one or more horizontal wells at some point in the future. If and when production is reduced by gravel-pack and wear, it may be necessary to go ahead with an additional well. Similarly, if and when the horizontal well needs to be taken out of service for scheduled maintenance and the vertical wells cannot provide adequate volume while the horizontal is down.

127. In Case No. WR-2000-281, Mr. Young testified as follows:

Items like distributive pumps can be readily added if space, electrical supply, and hydraulic capacity are anticipated correctly. However, the installation of additional filters, clarifiers, clearwells, and vertical wells to a more limited extent, requires a major construction project that involves significant time and expense for planning, design, permitting, and construction.

Please explain which of these statements are incorrect, or inapplicable, and why.

A - Correct statements.

128. Is the use of a 1.60 maximum to average day demand ratio when applied to future projections reasonable and prudent? If not, what ratio would be reasonable and prudent.

A - Based on water records since 1977, 1.45 appears to Merciel to be a reasonable peak ratio to use. Please see also the response to Nos. 124 and 125 above.

129. Is it now and was it Mr. Merciel's recommendation in Case No. WR-2000-281 that certain facilities not included in rate base by the Commission in WR-2000-281 should have been delayed until a later time? If so, please describe whether you considered 1) construction costs, 2) incremental costs and 3) economies of scale that could reasonably be associated with subsequent construction, and please provide an estimate of what such costs could be reasonably determined?

A - It is Merciel's opinion such items could be constructed at a later time. No construction estimates are available. It is likely that such future construction project costs would be higher than constructing the components along with the entire plant project as was actually done, both because of increased costs over time, and being separate or stand-alone construction projects.

130. What does the term "margin of safety" mean when applied to design of plant capacity? Please explain the appropriate application of this principle to your design capacity allowance determinations for the St. Joseph Treatment Plant.

A - "Margin of safety" is taken by Merciel to mean the plant should meet peaks with the largest major mechanical components out of service. This means, for example, with

a well pump failure or a high service pump failure. Some components, such as the clearwell tanks, are sufficiently reliable such that sudden failure is unlikely, although they may need to be taken down for repairs at a scheduled time, which is usually not during peak-use periods. This principle was taken into consideration for high service pumps, and vertical wells. Clarifiers were studied with this idea in mind as well. Although at 23 MGD only one of the two includable clarifiers would be operating beyond its prescribed limit.

131. What does the term "planning horizon" mean when applied to design of plant capacity? Please explain the appropriate application of this principle to Mr. Merciel design capacity allowance determinations for the St. Joseph Treatment Plant.

A - "Planning horizon" is taken by Merciel to mean a time frame into the future for which plant capacity needs are studied. For St. Joseph, the disallowance is based on the present low customer growth, however it is important for the company to have considered long term growth which was done. The Staff's recommended disallowance of rate base does not hinder the company's ability to expand the plant to handle future growth.

132. Mr. Young testified in Case No. WR-2000-281 that, "For the MAWC treatment plant, the in-plant usage will be approximately 5%." Do you agree or disagree with this statement? If you disagree, please explain why.

A - Agree.

133. Do you agree or disagree with the statement that, "A water utility's first objective must be that when a customer turns on a tap, adequate water suitable for human consumption is delivered." If you disagree, please explain why.

A - Agree.

134. Is it your belief that water allocation among customers on peak days is an acceptable demand management tool that the Company should consider implementing? If so, it is Staff's position that this principle is consistent with the principle of "safe and adequate service?"

A - A need for "water allocations" or sprinkling restrictions may be used, but

acceptability among customers is difficult unless it is caused by an unusually high peak demand, or some other emergency or unusual event. Merciel's opinion is that such restrictions are acceptable unless they are regularly required, such as every year during peak days.

135. a. Do you agree that, The Missouri Department of Natural Resources Public Drinking Water Program's "Design Guide For Community Public Water Supplies" states in Section 2.1 - Design Basis that "The system shall be designed for maximum day demand at the design year"?

A - Yes.

- b. If so, do you agree that this is the appropriate criteria to be used in designing treatment plant capacity?

A - Yes.

- c. What do you believe should have been the appropriate design year for planning the St. Joseph Treatment Plant?

A - The plant was designed for a growth projection for a ten year period to 2009, with capability of further expansion beyond that time. I agree this was reasonable, however the argument is really over the extremely low growth rate taking place at present, meaning immediate needs can be met with less capacity than what would be needed in ten years, or perhaps less, if and when actual growth along with an increase in demand actually occurs.

- d. What do you believe should have been the appropriate maximum day demand for that year? Please explain your calculations.

A - Production capability of 30 MGD is a reasonable figure for long term planning; however immediate needs with current low growth rate seem to hover around the 23 MGD production requirement, based on historical peak days, with very few exceptions that have occurred in the past and are years apart.