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ORIGINAL

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b. Docket No. 050018-WU

In re: Application for increase in water rates for Seven Springs System in Pasco County in Aloha Utilities, Inc.

c. Document being filed on behalf of Office of Public Counsel

d. There are a total of 19 pages.

e. The document attached for electronic filing is the Post Hearing Statement of the Office of Public Counsel.

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Thank you for your attention and cooperation to this request.

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4/7/2005

ORIGINAL

BEFORE THE PUBLIC SERVICE COMMISSION

In re: Application for Increase in Water Rates for Seven Springs System in Pasco County by Aloha Utilities Inc.	)	Docket No. 010503-WU Filed April 7, 2005

POST HEARING STATEMENT
OF THE OFFICE OF PUBLIC COUNSEL

Pursuant to the provisions of the Prehearing Order issued March 2, 2005, the Office of Public Counsel submits this post-hearing statement of issues and positions.

Issue 1: Should the reference to sulfide in "finished water" in the proposed agency action order be stated as a maximum contaminant level for total sulfides of 0.1 mg per liter of delivered water at the point of its entry into the domestic system at the domestic plumbing?

Position: Yes, the reference to sulfide in "finished water" in the proposed agency action order should be stated as a maximum containment level for total sulfides of 0.1 mg per liter of delivered water at the point of its entry into the domestic system at the domestic meter.

Discussion: Dr. V. Abraham Kurien provided testimony on behalf of customers on all of the issues in this proceeding. Although Dr. Kurien is not an engineer, he brings to the Commission a stellar background in scientific method.

Dr. Kurien received a cum laude Batchelor of Science degree in chemistry from the University of Mysore in India in 1954 and taught analytical chemistry at college level. In addition, he received a Summa Cum Laude M.D. degree from the University of Edinburgh in Scotland in 1963 and graduated as the most distinguished graduate of the year. He was awarded the Gold Medal for Medicine. A major part of his medical training consisted of the understanding of bacteriology and therapeutics. He undertook postgraduate research into human circulation and is a Fellow of the Royal College of Physicians of Edinburgh. Dr. Kurien was an Assistant Professor at the University of Edinburgh between 1968-1970. He practiced Internal Medicine and Cardiology for twenty years in Connecticut and was on the staff of the University of Connecticut as a Clinical Instructor. He also published many articles in various peer-reviewed journals. *See* Dr. Kurien, Tr. 338 - 339. Few if any witnesses bring such impressive credentials to water and wastewater proceedings before the Florida Public Service Commission.

The attorneys for Aloha wrongly sought to impugn Dr. Kurien's credentials with the following series of questions and statements:

> "Q Sir, are you aware that there is a Florida statute that no person in Florida may claim either orally and

in writing to possess an academic degree, unless the person has in fact been awarded a degree from an institution that is, and the choice that would apply to you is a school, institute, college or university chartered outside the United States, the academic degree from which has been validated by an accrediting agency approved by the United States Department of Education?

A I'm not aware of that. But there is an equal opportunity rights law which says that you cannot be discriminated on the basis of your education from abroad.

Q **As we sit here today, sir, do you know whether** the University of Mysore is accredited by an accrediting agency approved by the United States Department of Education?

A I don't know that.

Q Would it surprise you to learn that when we contacted the United States Department of Education they indicated that it was not?

MR. BECK: Objection. Counsel is, first of all, referring to matters that are not in evidence. And second of all, what the relevancy of this is because he's not contesting the truth of the matters contained that Dr. Kurien has testified to. He's testified to where his degree is and it's accurate.

MR. WHARTON: And all I'm saying, Mr. Chairman, is that if you're going to find that this individual has the qualifications to be an expert in chemistry, do it understanding that he cannot say he even has an undergraduate degree in chemistry under Florida law." Tr. 131 – 132.

Florida law has no such prohibition against a person accurately representing his or her credentials. Aloha bases its claim on section 817.567, Florida Statutes, but cases construing this statute make it abundantly clear that

Dr. Kurien may truthfully state he has a degree in chemistry from the University of Mysore. One case construed the statute to apply only to intentional misstatements. *Long v. State*, 622 So.2d 536 (Fla. 1st D.C.A. 1993), *review denied*, 629 So.2d 133 (Fla. 1993). Another case found that the statute prohibiting people from claiming to hold academic degrees or titles unless such degrees or titles were conferred by accredited institutions violated the First Amendment in that it was not narrowly tailored to achieve a substantial government interest. *Strang v. Satz*, 884 F. Supp. 504 (S.D. Fla. 1995). Not only did Aloha fail to disclose these cases; the statement by Aloha that Dr. Kurien "cannot say he has an undergraduate degree in chemistry under Florida law" is completely contradicted by the case law construing the statute. Aloha did not discredit Dr. Kurien with its series of questions and statements; Aloha discredited itself.

With respect specifically to issue 1, Aloha has repeatedly claimed that according to Florida Administrative Code, Section 25-30.210, the point of delivery of processed water to the customer is the outlet side of the water meter and that its responsibility for the quality of water ends at that point. The distribution system as far as the outlet of the domestic meter is owned by the Aloha Utilities. Therefore, the responsibility of the utility to maintain the quality of the product it delivers to the customer, by all common sense standards and the norms of commercial transactions, rests squarely on the shoulders of the seller of the product. Dr. Kurien, Tr. 155-156.

The obvious purpose of testing at the point of connection between Aloha's system and the customer is to determine the quality of the product delivered to customers. Aloha's proposal to test its water only at the entrance to its distribution system does nothing to verify whether the product meets quality standards at the point of delivery. Given the long history of complaints by customers, the Commission should require Aloha to test its water at the point at which it delivers its product to customers.

The need to test the water after it has traveled through the distribution system is confirmed by research conducted by Dr. Audrey Levine. The Phase II Report of the Technical Review undertaken by Dr. Levine recognized as a major conclusion the finding that sulfide re-formation occurred within the transmission system of Aloha Utilities. Exhibit 5. With Aloha's present processing method of the sole use of chlorination, which merely oxidizes rather than removes the hydrogen sulfide present in the raw water, such re-formation of hydrogen sulfide is an ever-present danger due to the presence of sulfur reducing bacteria in the water. The conditions that allow the re-formation of hydrogen sulfide in the distribution and transmission system of Aloha may not be clearly understood at the present time, but may be related to turbidity induced by colloidal sulfur which has already been identified by Mr. Porter, the consulting engineer of Aloha, as a possible source for lowered disinfection efficiency. Exhibit 6. Dr. Levine also indicated, "Control of hydrogen sulfide in drinking water is widely practiced in

groundwater systems to prevent odor complaints and to help control sulfur induced corrosion and associated black water problem in distribution systems" Exhibit 7.

The audit conducted by Dr. Levine documented the presence of hydrogen sulfide in the transmission system of Aloha contrary to the claim of Mr. Porter previously that there was no hydrogen sulfide in the transmission and distribution system of the Utility.

Dr. Levine addressed this matter in her testimony by saying, "the only location in which detectable hydrogen sulfide was observed was at the inflow to the ground storage tank which is not in the "transmission" or distribution system." Dr. Levine, Tr. 193. Mr. Porter addressed the same finding by saying, "A slight hydrogen sulfide concentration (of 0.12mg/l) was found in the partially treated water flowing in a pipeline connecting two treatment plants with the main ground storage tank. This water does not flow into the distribution system". Porter, Tr. 291. Both concluded that Dr. Kurien was mistaken in maintaining that hydrogen sulfide was detected at a level of 0.12mg/l in Aloha's "transmission" system.

The accuracy of Dr. Kurien's statement depends on how one defines transmission and distribution system. "Transmission system" is the system of pipes that transmits water from the wells to the storage tank. "Distribution

system" is the system of pipes that distributes water from the wells or the storage tank to the customers.

The water in which hydrogen sulfide was detected above the 0.1mg/l level suggested as a standard had already been processed at the wells with the sole use of chlorination and was recorded to have only 0.01 mg/l of hydrogen sulfide when it was delivered into the "transmission" system. Further down in its travel in the "transmission" system a water sample was taken and found to have 0.12 mg/l of hydrogen sulfide. There are only two possible conclusions as to why this happened. Mr. Porter prefers the explanation that the water was only "partially treated" at the wells and needed "final treatment" and the latter was undertaken at the storage tank and that the water in the outflow from the storage tank the same day contained no hydrogen sulfide when it was pumped into the "distribution system". Dr. Levine's explanation implies that this was an isolated finding. "This sample site was re-sampled several times in succession and did not have detectable hydrogen sulfide upon re-sampling." Dr. Levine, Tr. 193.

The detection in the "transmission system" of Aloha Utilities of hydrogen sulfide above the level recommended as a standard is of serious concern to the customers. Science is no respecter of persons or locations. Where conditions are suitable, reactions take place. If significant concentration of hydrogen sulfide was found in one location of Aloha's system after the water left the treatment plant at a well, then the same event could occur at other sites in the

"transmission" and "distribution" system into which finished water is introduced after using the same processing method. The concern is that the method of treatment at the well is either inadequate to completely remove hydrogen sulfide from raw water or that the processing method used is easily reversible during the transport of water in Aloha's system from one location to another. This raises the serious possibility that hydrogen sulfide may intermittently be delivered into the domestic plumbing and thereby cause corrosion. Customers have reported black water in the pipes between the domestic meter and before delivered water enters their homes. This is well before any water softener or conditioner systems and therefore does not conform to Mr. Porter's complaints about such installations being responsible for re-formation of hydrogen sulfide in water the Utility has previously claimed was adequately treated.

Source water is only partially treated at first pass at the wells and requires further treatment. In reports submitted by Aloha's own technical staff during flushing procedures carried out by them, there is documented evidence of black and discolored water in Aloha's distribution system even when fire hydrants are flushed on a daily basis and large volumes of finished water were removed from the distribution system to raise free chlorine residual levels to 1.5 mgs/l. Exhibit 19. The following narrative from a flushing schedule dated November 19, 1999, graphically demonstrates the point:

> "yellowish water from hydrant, flushed 20 min. per Tony. Did not clear. Advised by Tony to go to hose bib at well. Water still yellowish w/ small

> particles in water. Same at all hydrants. Tony said to check Friday for next schedule to see if still discolored." Exhibit 23, VAK-19, page 39. *See also* Exhibit 23, VAK-19, at 35, 40, 45, 47, 54, and 59.

These documents provide corroboration that finished water is not adequately treated before discharge into the distribution system or that the processing method is easily reversible. Dr. Levine's proposal that there is no significance to an isolated finding is also not valid because when the degradation of water quality is intermittent, one does not expect to find evidence for it all the time. Dr. Kurien, Tr. 341-345.

Most of the water that Aloha supplies to its customers flows directly from wells to domestic plumbing without receiving a second "final treatment prior to its being pumped into the distribution system" Porter. Tr. 292. Such re-treatment is provided only when water is distributed from the storage tank. If a chlorine booster is necessary to treat water further in the ground storage tank (which has no water softener or water conditioner) before the water left the same day to travel along the distribution system to the customers, it would suggest that the chlorine decay in Aloha water is much higher than documented by monthly operation reports (MOR) submitted to the FDEP. Kurien, Tr. 345 – 346. Dr. Levine conceded that the treatment method at each of the wells is comparable. Dr. Levine, Tr. 214.

When Dr. Kurien used the words "standard" and "MCL", he was using the terminology the way it is used almost interchangeably in Exhibit D of the TBWA such as maximum contaminant level, goal, standard, compliance level and action level. Exhibit 23, VAK-26. The important point is that TBWA requires action if the level of total sulfides exceeds 0.1mg/l and that action is to be taken by the TBWA and its member governments that are utilities and not allow customers to suffer the consequences that may arise. It has been demonstrated by a number of utilities that black water and rotten egg smell can be significantly reduced by methodologies without strict measurement and conformity with standards for total sulfide and elemental sulfur levels, such as membrane technologies (Dunedin Municipal Utility) and aeration and biological oxidation (Pasco County Utility), manganese green sand and potassium permanganate oxidation (Port Richey Utility) along with more appropriate adjustment of pH levels. These methods obviously address the issues of black water and rotten egg smell through other effective interventions. Aloha does not use any of these methods now and did turn down the suggestion of increasing the pH of delivered water.

The new processing method using hydrogen peroxide that is being considered by Aloha utility as well as the current processing method of the sole use of chlorination are reversible oxidative methods that can result in re-formation of hydrogen sulfide and the production of elemental sulfur. In the absence of the use of more successful methods for reducing copper corrosion, strict adherence to more stringent standards that lower the levels of these

substances that have been considered to be significant factors in the production of black water and rotten–egg smell are necessary to improve water quality in certain areas of Aloha's territory. The directive given by the PSC to the Utility in April, 2002, was to implement a method that ensures a significant reduction of black water and rotten egg smell in domestic plumbing. Dr. Kurien, Tr. 352 – 354.

Exhibit D of the TBWA agreement shows that the authority is prepared to meet the goal of 0.1mg/l of total sulfide at the point(s) of connection. In fact, that exhibit does not mention the treatment facility at all, the point at which Aloha wants to meet the performance standard. TBWA has the same standard at the treatment facility, but samples the water at least four times annually. Dr. Kurien, Tr. 156-158.

TBWA has the same standard at the treatment facility and at the point(s) of connection with its customers (member government utilities), thereby taking responsibility for maintaining the standard of quality throughout its transmission and distribution system. Aloha should provide the same standard, if it wanted to claim that it is agreeable to meeting the TBWA standard. Dr. Kurien, Tr. 158.

Issue 2: Should the improvements be such that sulfide present in raw water or generated during treatment and transmission be removed, not converted, to a

level not to exceed 0.1mg/l in finished water delivered at the point of entry into the domestic system?

Position: **Yes, the improvements should be such that sulfide present in raw** water or generated during treatment and transmission be removed, not converted, to a level not to exceed 0.1 mg/L, in finished water delivered at the point of entry into the domestic system, if this can be done economically.

Discussion: Staff sponsored the testimony of John R. Sowerby, an engineer with the Department of Environmental Protection. According to Mr. Sowerby, the Department of Environmental Protection recently adopted rule 62-555.315 applicable to new wells after August 28, 2003. Sowerby, Tr. 247, 249, 252. The rule requires, among other things, that if the total sulfides from a new well equal or exceed.3 mg/L, the utility must provide aeration or other appropriate treatment to remove total sulfide as necessary. Further, the rule provides that direct chlorination shall not be used to remove (i.e. oxidize) .3mg/L or more total sulfide unless the elemental sulfur formed during chlorination is removed.

The concern addressed by this rule is that elemental sulfur can be converted back to hydrogen sulfide, leading to potential problems in black water. Sowerby, Tr. 253 - 254. Thus, the issue of removing sulfides, as opposed to only converting sulfides through oxidation, is one that is recognized by the Department of Environmental Services. Although the Department of

Environmental Protection rule applies only to new wells going into service, and thus does not apply to Aloha's existing wells, the concern remains the same. Failure to remove sulfides, and only using oxidation as Aloha does, can lead to black water. The existence of this rule lends great support to the concerns expressed by Dr. Kurien about removal of sulfides.

According to testimony provided by Dr. Kurien, at the time the PSC Order No. 02-0593-FOF-WU was issued in April, 2002, the two methods that were being considered for use to significantly reduce black water and associated complaints were packed tower aeration and the MIEX resin method. Both were capable of removing hydrogen sulfide by expelling it or extracting it out of the source water, thereby reducing the total sulfur load in the finished water. The sole use of chlorination as a method of converting hydrogen sulfide to sulfate by oxidation does not reduce the total sulfur load, but merely changes the form in which sulfur remains in the finished water. Evidence has accumulated since 1991 that the production of one form of oxidized hydrogen sulfide, namely elemental sulfur, is associated with black water and hence must be removed from finished water as a preventive measure towards control of black water and copper corrosion. Exhibit 9.

The method that Aloha is contemplating to use is a method for attempting to convert hydrogen sulfide to sulfate by oxidation with hydrogen peroxide. This oxidative process is a more complex and sophisticated oxidation method, but it is

still only a method for converting (not removing) hydrogen sulfide from raw water into oxidized forms of sulfur. Therefore, the total sulfur load of the finished water remains the same as that of the source water. One form of sulfur produced by this method is elemental sulfur. The likelihood that elemental sulfur will be formed in the presence of variable levels of hydrogen sulfide from the wells remains a real concern. Unless continuous monitoring of hydrogen sulfide levels are undertaken at all wells and in the water purchased from Pasco County Utility and stoichometrically calculated doses of hydrogen peroxide are injected into the source water, it would appear to be impossible to reduce the concentration of elemental sulfur to minimal levels. Therefore, the insertion of an extremely low level of elemental sulfur as an additional standard, or the inclusion of elemental sulfur within the total sulfide goal of 0.1mg/l as a performance standard becomes mandatory, if Aloha ultimately chooses oxidation by hydrogen peroxide as its new processing method. The request for removal of elemental sulfur from finished water is not a prohibition against the use of hydrogen peroxide as a processing method, but recognizing its limitations also, as indeed that of the sole use of chlorination the current method, and demanding that the technical implementation of the new method must be fine tuned so that the amount of elemental sulfur in the finished water does not exceed a specific limit. Exhibit 3. Elemental sulfur has been implicated in the lowering of disinfection efficiency, increased chance for bacterial contamination and growths in the distribution system (Exhibits 5 & 6), all of which needs to be avoided in all drinking water carrying pipes including the domestic plumbing. Dr. Kurien, Tr. 161 – 163.

The Commission should require removal of sulfides to a level not to exceed 0.1mg/l in finished water delivered at the point of entry into the domestic system if this can be done economically. Unfortunately, there is not enough evidence in the record about the cost which would be incurred to meet this goal. In a previous proceeding, Aloha provided estimates of high cost systems to remove almost all sulfides from its water. *See* staff cross examination of Mr. Porter at Tr. 322 – 326. The Commission should direct Aloha to submit alternative proposals for lower cost methods of removing at least a portion of the sulfides from its water. The proposal should prioritize treatment proposals and indicate where the most improvement could be obtained for the least cost. This would allow the Commission to evaluate the implementation of such improvements.

Issue 3: **Should compliance with such requirements be determined based** upon samples taken at least once a month at a minimum of two sites at domestic meters most distant from each of the multiple treatment facilities. Should sites be rotated to provide the greatest likelihood of detecting any departure from the maximum levels permitted?

Position: **Yes, compliance with such requirements should be determined** based upon samples taken at least once a month at a minimum of two sites at

domestic meters most distant from each of the multiple treatment facilities. Such sites should be rotated to provide the greatest likelihood of detecting any departure from the maximum levels permitted.

Discussion: Exhibit D to the Tampa Bay Water Agreement indicates that the "water quality parameter" will be "sampled annually at a minimum at the Point(s) of Connection". Exhibit 23, VAK-26. The Notes on Exhibit D state that "maximum average= not to exceed average value using a running four quarterly sample average". This represents the way TBWA arrives at the compliance level determination for itself. This means TBWA samples processed water at least four times at its treatment facilities to establish that it has complied with its own standard.

Mr. Porter himself admitted this to be accurate in a document submitted by Aloha's attorney, Mr. Deterding, on March 29, 2004 to the PSC (Exhibit 23, VAK-27). Testing was recommended at a minimum of annually only at the point(s) of connection. The responsibility, if desired or necessary, to sample more frequently at the points of connection was left to the member government utilities. Aloha is requesting that the standard be reduced to an annual sampling at the treatment facility and claiming that such a frequency to be the norm at the TBWA. That is patently incorrect. Dr. Kurien, Tr. 355.

Aloha's witness Dr. Levine essentially agreed with Dr. Kurien about the frequency of testing that is currently being conducted by Tampa Bay Water. She stated that Tampa Bay Water conducts its measurement "a few times a year" (Levine, Tr. 209), and that she thinks it is conducted quarterly (Levine, Tr. 210-211). The frequency of testing for Aloha should be more frequent than Tampa Bay Water because the problems with Aloha's water are far worse. If at some time in the future Aloha demonstrates that it can deliver water comparable in quality to the water provided by Tampa Bay Water, then at that time the Commission could consider reducing the frequency of testing to four times a year.

Respectfully submitted,

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DOCKET NO. 010503-WU
CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a copy of the foregoing has been furnished by U.S. Mail or hand-delivery to the following parties on this 7th day of April, 2005.

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