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ORIGINAL

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JOHNNIE BYRD
Speaker

Charles J. Beck
Deputy Public Counsel

November 18, 2004

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COMMISSION
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Blanca S. Bayo, Director
Division of the Commission Clerk
and Administrative Services
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, FL 32399-0850

Re: Docket No. 010503-WU (place in 020896-WS)

Dear Ms. Bayo:

Enclosed for filing, on behalf of the Petitioners, are the original and 15 copies of the Direct Testimony of Dr. V. Abrham Kurien in Docket No. 010503-WU, Protest of Order No. PSC-04-0712-PAA-WS.

Please indicate the time and date of receipt on the enclosed duplicate of this letter and return it to our office.

Sincerely,

Charles J. Beck
Deputy Public Counsel

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ORIGINAL

BEFORE THE FLORIDA 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: November 18, 2004

DIRECT TESTIMONY

OF

DR. V. ABRAHAM KURIEN

DOCKET NO. 010503-WU

Protest of Order No. PSC-04-0712-PAA-WS

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

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DIRECT TESTIMONY

OF

V. ABRAHAM KURIEN

Q. PLEASE STATE YOUR NAME AND ADDRESS.

A. My name is V. Abraham Kurien. I live at 1822 Orchardgrove Avenue, New Port Richey, Florida 34655.

Q. HAVE YOU SUBMITTED A PROTEST OF PROPOSED AGENCY ACTION PSC- 04-0712-PAA-WS AND REQUESTED A HEARING PURSUANT TO SECTION 120.57(1), FLORIDA STATUTES?

A. Yes, I have.

Q. ON WHAT BASIS HAVE YOU PROTESTED THE PROPOSED AGENCY ACTION?

A. On the basis that the Order affects my substantial interest because I believe the Order would adversely affect the quality of potable water that I receive from Aloha Utilities, Inc.

Q. PLEASE EXPLAIN YOUR POSITION IN GREATER DETAIL.

A. In April, 2002, the Florida Public Service Commission in its Order No. PSC-02-0593-FOF-WU, for the specific purpose of significantly reducing the incidence of "black water" and related complaints, required Aloha Utilities to remove 98% of hydrogen sulfide in the raw water from its underground wells from which water is pumped and processed using chlorination as the sole method. Aloha appealed this Order, but the First District Court of Appeals upheld the Order in June 2003.

On October 18, 2002 Aloha requested modification of the Order, because it was felt "that achieving the 98% removal standard was at best very expensive and at worst impossible". After due consideration, Aloha Utilities' Citizens' Advisory Committee forwarded to the Office of Public Counsel a no objection statement (Exhibit VAK -1), concurring with Aloha in this matter and recommending that performance standard of the Western Coast Regional Water Supply Authority for the water it supplies to its member governments be accepted instead of the 98% removal standard. On July 23, 2003, the Office of Public Counsel submitted a letter stating that "the Citizens agree that 98% removal should be replaced with other standards". In the same letter, OPC had stated, "Additional standards may also be appropriate depending on the final audit findings". (Exhibit VAK-2).

In his motion to the Public Service Commission on June 9th , 2004, to modify requirements of Order No. PSC 02-0593-FOF-WU, Aloha Attorney Marshall F. Deterding stated the Commission should simply modify the Order "to eliminate the 98% removal requirement as unreasonable and/or inappropriate, and that the standard provided by the Tampa Bay Water Authority (f/k/a West County Regional Water Supply Authority) should be adopted in its place, including the testing requirements required to maintain such compliance". Attached to the motion was Appendix D, Supplemental Water Quality Parameters of the Tampa Bay Water Authority (TBWA). Aloha desired a modification of the order and proposed the following language for the revision of Order No. PSC-0200593-FOF-WU:

"Ordered that Aloha Utilities, Inc., shall make improvements to its wells 8 and 9 and then to all of its wells as needed to meet a goal of 0.1mg/l of sulfides in its finished water as that water leaves the treatment facilities of the Utility. Compliance with such requirement shall be determined based upon samples taken annually from a point of connection just after all treatment systems and before entry of such water into the transmission and distribution system of the Utility. Aloha should implement this standard no later than February 12, 2005".

The customers felt that the Order to remove 98% of hydrogen sulfide in raw

water might contribute to the attainment of the goal of significant reduction in black water and related complaints, but that it was non-attainable under certain circumstances and therefore inappropriate. The Citizens recommended the regional standard adopted by Tampa Bay Water Authority as an appropriate substitute standard. Water chemistry experts who know what is achievable and what is not were responsible for that standard.

The language proposed by Aloha imposes a bias in its favor on a much simpler and effectively very different standard of the TBWA that states according to Exhibit D, **Water supplied from the Authority's system shall be sampled, annually at a minimum, at the Point(s) of Connection for the following parameters. The Water Quality definition and the supplemental parameters listed below define the water quality to be provided by the Authority.**

Contaminant	Goal
Sulfides	**0.1 mg/l**
.....	.....
.....	.....
..... etc.	

Q. DID YOU BRING THIS MATTER TO THE ATTENTION OF THE PUBLIC SERVICE COMMISSION?

A. Through the Office of the Public Counsel, I communicated with the PSC staff to indicate to the Commission that, "In view of pertinent findings and discussions arising from the audit reports, we need to add some qualifiers to our previous statement (July 23, 2003) to ensure that any modification made to the Order does not negatively affect the ability of Aloha Utilities to improve water quality as demanded by the Corporation's customers". Three qualifiers were proposed to the language proposed by Aloha with clear explanations as to why they were necessary for the revision of the fourth ordering paragraph of Order No. PSC-02-0593-FOF-WU. (Exhibit VAK-3).

"It was recommended that any modification to the rate case order should be qualified to include the following language:

1. The reference to sulfide in "finished water" should 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 meter.

2. The improvements should be such that the sulfide present in raw water or generated during treatment will 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; and

3. Compliance with such requirements shall 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 shall be rotated to provide the greatest likelihood of detecting any departure from the maximum levels permitted".

It appeared to the PSC staff that qualifiers Nos. 1 and 3 as outlined by me in response to Aloha's motion to modify the rate case order were reasonable and should be included in the modification. (Exhibit VAK-4). "However, qualifier No.2, the requirement that the improvements must result in removal as opposed to conversion of sulfides not to exceed the 0.1mg/l standard, would have the effect of eliminating any treatment process that oxidizes rather than removes, hydrogen sulfide". Therefore staff did not recommend the inclusion of that qualifier in modifying the rate case order.

Q. WILL YOU PLEASE ELABORATE ON YOUR REASONS FOR INCLUDING THESE QUALIFIERS?

A. 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. As I understand it, the distribution system as far as the outlet of the domestic meter is owned by the Aloha Utilities now, even

though initially the customers through the developers paid for the development and installation of significant parts of that distribution system. 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 in this country, rests squarely on the shoulders of the seller of the product, and not on the back of the buyer. Any responsibility to "make whole" the product and correct any defect or deficiency found in the product on delivery belongs to the seller and not the buyer. In fact, the concept of product liability even extends further than that and may include sequential damages caused by the product, if it can be established that the nature of the defect was well known to the producer and it was within the power of the producer to correct the defect before delivery.

Phase II Report of the Technical Review undertaken by Dr. Audrey A. Levine of the University of South Florida recognized as a major conclusion the finding that sulfide re-formation occurred within the transmission system of Aloha Utilities. (Exhibit VAK-5). In the 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 VAK-6). Dr. Levine has 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 VAK-7). Whatever the reason for the re-generation of hydrogen sulfide documented by Dr. Levine, it has serious consequence when such occurrences in Aloha's distribution system or in the domestic plumbing. Hence it is imperative that the Utility demonstrates to the customers that the product delivered to them does not exceed the performance standard that the Utility is prepared to accept. What the Exhibit D of the TBWA shows is 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.

The conclusion that I have drawn is that 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. All that I had requested in **Qualifier No. 1** was that Aloha should provide the same standard, if it wanted to claim that it is agreeable to meeting the TBWA standard.

Qualifier No. 3 requested a different compliance requirement than is mentioned in the TBWA Exhibit D and Aloha's revision language, to take into account the reality that Aloha's distribution system consists of a common manifold in which water from 8 different wells and a reservoir that stores water from four of its wells is co-mingled without adequate mixing and appropriate blending so that the water delivered does not have uniform or consistent characteristics. In fact the hydraulics of the common manifold can be considered to be extremely and unpredictably variable because water demands in different parts of the total service area fluctuate constantly. This must result in constant variation of water chemistry. Add to this the fact that Aloha in the near future will be forced to purchase water from Pasco County Utilities to meet its short fall in water resources. As Aloha itself has admitted, Pasco County Utility has not undertaken to provide water that meets the performance standard of 0.1mg/l of total sulfides. Therefore, even if all the wells of Aloha were able to meet the 0.1mg/l total sulfide standard, addition of Pasco County Utility water to the common manifold will now result in unpredictable fluctuations of total sulfide levels. The pH of Pasco County

Utility water is significantly different from that of the water that Aloha produces and may have an effect on the dissolved sulfide ion content of Aloha water when they mix. In the absence of a proper blending program, this addition will only increase the inconsistency of water chemistry. Inconsistency of water chemistry denies an opportunity for the pipes to become acclimatized to a narrow range of water constituents in which the likelihood of corrosion can be handled more effectively.

Such being the case, at a minimum, it is reasonable to attempt to establish that the fluctuations and inconsistencies in water chemistry are manageable and have been dealt with while the delivered water is within the transmission and distribution system of Aloha and before it reaches the customers' domestic plumbing. Since the Aloha transmission and distribution systems do not contain copper, regeneration or fluctuation of hydrogen sulfide within that system is of no major consequence, except in terms of consumption of the free chlorine residuals with which the water leaves the treatment facility. We have evidence provided by the significant difference between the free chlorine residual at the treatment facility and at the remote sampling point that there is significant consumption of free chlorine residual within the transmission and distribution system. (Exhibit VAK-8). While Dr. Levine has not identified the reason for this except to suggest that dissipation of chlorine may occur due to changes in ambient temperature, especially during summer months, and

stagnation of water the possibility that at least part of the chlorine consumption is due to the re-formation of hydrogen sulfide cannot be excluded. Therefore the only method by which compliance with the standard can be established is by measuring hydrogen sulfide levels at the outlet of the domestic meter in the distribution area of each well and also frequently enough and on a rotation basis to obtain the maximum probability of not missing departures from the standard. The customer is entitled to a product whose claim to meet a set standard can be demonstrated at the point of delivery.

I realize that this is a time consuming, labor intensive and therefore financially expensive protocol that I have included for compliance. In the absence of a centralized processing and blending system which confers uniform characteristics on the finished water, such unfortunately is the demand that one has to make on a system which is effectively 9 different inputs (8 Aloha wells and purchased Pasco County Utility water) into a common manifold from which water is being drawn in a very unpredictable manner. In the absence of corrosion of pipes and production of black water, wider latitude to the standard might have been considered. **Otherwise it will be no different from the present situation in which the degree of corrosion varies both geographically and temporally in such a chaotic manner that there appears to be no rhyme or reason behind the phenomena about which**

customers have complained for over a decade.

Q. WHAT IS YOUR JUSTIFICATION FOR QUALIFIER NO. 2 THAT BY ITS NON-INCLUSION IN THE PSC STAFF RECOMMENDATION OF JUNE 17TH, 2004 MAY BE CONSIDERED TO HAVE BEEN UNREASONABLE?

A. The PSC Staff concluded that "qualifier no. 2, the requirements for the improvements must result in removal, as opposed to conversion, of sulfides not to exceed the 0.1 mg/L standard, would have the effect of eliminating any treatment process which oxidizes rather than removes, hydrogen sulfide". "Staff does not recommend that the Commission prescribe the treatment methodology that Aloha should use in order to comply with the requisite treatment standard. This is a business decision that should be made by Aloha's engineering experts. Therefore, Staff does not recommend the inclusion of that qualifier in modifying the rate case order". (Exhibit VAK-4).

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 VAK-9).

The method that Aloha is contemplating to use, and has been feverishly working to adapt to its needs in the Seven Springs Service Area to meet the chloramination deadline of January, 2005, 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. So 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. While I understand that efforts will be made to convert all hydrogen sulfide to sulfate by pH adjustment more towards alkalinity, 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 VAK-3). As indicated already, elemental sulfur has been implicated in the lowering of disinfection efficiency, increased chance for bacterial contamination and growths in the distribution system (Exhibits VAK- 5 & 6), all of which needs to be avoided in all drinking water carrying pipes including the domestic plumbing.

Q. WHAT HAPPENED AT THE AGENDA CONFERENCE ON JUNE 29, 2004 WHERE THIS MATTER WAS DISCUSSED?

A. At the very last minute, the PSC Staff revised its recommendations on the

basis of concerns raised by Aloha's engineer and its attorney. The Commissioners approved the version of the Staff recommendation that stated: "The fourth ordering paragraph of the rate case order should be modified to read that 'Aloha shall make improvements to its wells 8 and 9 and then to all its wells as needed to meet a goal of 0.1mg/l of sulfides in the finished water as the water leaves the treatment facilities of the Utility. Compliance with such requirement shall be determined based upon samples taken at least annually from a point of connection just after all treatment systems and before entry of such water into the transmission and distribution system of the utility. Aloha shall implement this standard no later than February 12, 2005. The Commission should direct Aloha to use the treatment process that Aloha concludes will achieve this level of treatment in the most cost effective manner. Additionally Aloha should be required to file comments within 60days from the date of the Commission's vote on this item regarding the feasibility of collecting and testing monthly samples at domestic meters as proposed by Dr. Kurien. Finally, the Commission should require monthly progress reports, as set forth in the staff analysis". (Exhibit VAK-10)

On July 6, I wrote to the Chairman of the Public Service Commission to indicate that the Memorandum submitted by Mr. Devlin to Dr. Mary Bane, Director of Economic Regulation of the PSC, while insisting that "the hydrogen sulfide standard should be consistent with the TBW standard",

misquoted it as "involving testing at the well site". (Exhibit VAK-11). I had contacted Mr. Devlin on July 2, 2004 by e-mail and his reply stated, "As I understand, TBW does not provide water to retail end use customers. TBW is a wholesale provider. They test water at the point of entry (metered point of connection) with the distribution systems for various public entities. Similarly we recommend that Aloha test at the treatment facility as its treated water enters its retail distribution system". (Exhibit VAK-12).

I pointed out the failure of logic between the last two sentences of Mr. Devlin's reply. There is no similarity between testing at the point of metered connection with its customers as TBW does and the recommendation that Aloha test at the treatment facility! **The point of metered connection between Aloha's distribution system and its customers is the outlet of the domestic meter. Aloha must therefore establish compliance by testing delivered water at that point .** (Exhibit VAK-13).

Further I suggested that, "it would be more appropriate for the PSC to consult Tampa Bay Water Authority rather than Aloha Utilities which is a party to this disagreement. A clarification from TBWA must be sought urgently". (Exhibit AK-14). I am pleased to note that Thomas Walden, PSC Engineer has contacted Dr. Christine Owen of TBWA on September 1, 2004 (Exhibit VAK-15), even though no reply has apparently been received yet. In the

meanwhile the PSC has been informed by Aloha that it considers the feasibility of measuring hydrogen sulfide levels at the domestic meter, requested as part of qualifier No. 1, to be very poor. In justification of that conclusion Aloha mentions that measurement at a point in the field, where neither sampling nor testing conditions can be controlled would be highly impractical and would lead to unacceptably low accuracy and precision (Exhibit VAK-16). Yet, it may be precisely those uncontrolled and uncontrollable conditions that determine the quality of water that enters the customers' plumbing and creates degradation of water quality in the customers' homes in the form of black water and rotten egg smell. In the open market the inability of a manufacturer to meet the reasonable expectations of the customer will result in the extremely fast disappearance of the product from the market. The processing method used and the maintenance procedures employed by a water utility, as a producer of a product essential to life, must surmount these difficulties and meet the standard at all points within its service area for it to stay in business, unless of course it is a monopoly utility! I understand how difficult it is to produce good quality drinking water from the Florida Aquifer. Approaching it the way Aloha has done for many years with primitive methods, outdated equipment and inadequate scientific knowledge, coupled with a legalistic attitude towards technical problems is not likely to produce a good quality product. That such has been allowed to persist has been totally unsatisfactory to the customers.

The experiences of the customers of Aloha as they have reported them to the Utility, the DEP and their legislators during the last decade as well as to the PSC during many hearings bear witness to this reality.

Therefore, if it is the intention of the Public Service Commission that the customers of Aloha should receive water of better quality, with reduced incidence of black water and related complaints like most other citizens of the neighborhood do, then these qualifiers are essential for producing a product that is comparable to what neighboring utilities are capable of providing to their customers. That it was the goal of the PSC was my understanding of why the PSC in its Order No. 02-0593-FOF-WU demanded that Aloha remove 98% of hydrogen sulfide in the raw water from its wells. The First District Court of Appeals upheld that Order. To water it down at this juncture in such a way that it might not significantly reduce black water and related complaints is to have wasted another three years in legal jousting while the customers have suffered the consequences of poor quality water in their domestic plumbing.

It is not surprising that the "Only logical option that the customers have" (Exhibit VAK-17) is deletion and transfer to a utility that will address technical problems through meticulous scientific solutions. It is time for Aloha to recognize the demands the complex water chemistry of Floridian

Aquifer places on the Utility and recognize that it is no longer able to make available to their customers the sophisticated processing that is required at reasonable costs. If Aloha's desire is to remain in the water processing business and provide a good quality product, the language that it has used to phrase the modification to the 98% removal standard and the standard it wants to embrace have to be recognized as inadequate to significantly reduce black water and related complaints. It can no longer remain "a mom and pop water processing shop" putting a little chlorine into water, while every other utility has moved on to better options with sophisticated equipment, better scientific personnel and greater co-operation with their customers. The days of horse and buggy are over. One can be nostalgic about simpler days and times and wonderful profits, but water processing in Florida can no longer be at a lower level than it is in what are called third world countries! That some entrepreneurs would like it to be so, is no justification for regulatory agencies to be less than assertive about their role. Citizens today want good quality water and service at comparable prices. If small monopolies cannot provide that, then it is time for them to recognize that and leave the field to those who have a larger customer base, greater governmental financial support and more rapid access to implementation of the latest scientific knowledge.

Three customers who are Official Parties of Record in this matter filed a protest of Order No. PSC-04-0712-PAA-WS on August 10, 2004 (Exhibit

VAK-18) and requested this hearing pursuant to Florida Statutes, Section 120.57 (1), to make it possible for the citizens of Seven Springs to have better quality water at reasonably comparable costs, with more sensitive customer service and an adequate source of water for their future needs.

Q. IS THAT THE END OF YOUR TESTIMONY?

A. Yes.

EXHIBITS

INDEX OF EXHIBITS

DIRECT TESTIMONY—V. ABRAHAM KURIEN

DOCKET NO. 010503-WU

EXHIBIT NAME	EXH. NO.	
NO OBJECTION STATEMENT FROM ALOHA UTILITIES CITIZENS ADVISORY COMMITTEE, JULY 21, 2003	VAK-1	_____
LETTER TO MARSHALL WILLIS FROM ATTY. STEVE BURGESS, JULY 23, 2003	VAK-2	_____
LETTER FROM V. ABRAHAM KURIEN, M.D. TO ATTY. STEVE BURGESS OF OPC, JUNE 13, 2004, SUBMITTED BY REFERENCE TO PSC ON JUNE 16, 2004	VAK-3	_____
PSC MEMORANDUM, JUNE 17, 2004 - PAGE 19	VAK-4	_____
PHASE II AUDIT REPORT BY DR. AUDREY A. LVINE, PAGE iv	VAK-5	_____
LETTER FROM MR. DAVID PORTER TO MR. DOUGLAS BRAMLETT, SEPTEMBER 11, 1997	VAK-6	_____
''OXIDATION COUPLED WITH FILTRATION FOR REMOVAL OF HYDROGEN SULFIDE FROM GROUNDWATER'' BY DR. AUDREY A. LEVINE, BLAKE J. RAYMER, JOHNA JAHN, ARNOLD BECKEN, AMERICAN WATER WORKS ASSOCIATION, WATER QUALITY TECHNOLOGY CONFERENCE, 2003	VAK-7	_____
MONTHLY OPERATING REPORTS SUBMITTED BY ALOHA TO DEP	VAK-8	_____

''TURBIDITY FORMATION DURING HYDROGEN SULFIDE CHLORINATION'', TROY LYN et al. AMERICAN WATER WORKS ASSOCIATION PROCEEDINGS 1993, WATER QUALITY TECHNOLOGY CONFERENCE, MIAMI 1993, PART II, PAGES 981, 984 and 985	VAK-9	_____
FPSC VOTE SHEET, JUNE 29, 2004	VAK-10	_____
MEMORANDUM FROM MR. DEVLIN TO DR. MARY BANE	VAK-11	_____
E-MAIL CORRESPONDENCE BETWEEN DR. KURIEN AND MR. DEVLIN	VAK-12	_____
LETTER TO PSC CHAIRMAN BAEZ FROM V. ABRAHAM KURIEN, JULY 6, 2004	VAK-13	_____
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LETTER FROM MR. TOM WALDEN TO DR. CHRISTINE OWEN OF TBW FOR CLARIFICATION FOR TBWA STANDARDS, SEPTEMBER 1, 2004	VAK-15	_____
COMMENTS ON FEASIBILITY OF MONITORING FOR HYDROGEN SULFIDE AT CUSTOMER METERS: REPORT FROM MR. DAVID PORTER TO MR. STEPHEN WATFORD, FORWARDED TO PSC, SEPTEMBER 3, 2004	VAK-16	_____
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FILING BEFORE THE PSC, AUGUST 10, 2004: PETITION REQUESTING HEARING AND PROTEST OF PROPOSED AGENCY ACTION	VAK-18	_____

NO OBJECTION STATEMENT
FROM
ALOHA UTILITIES CITIZENS' ADVISORY COMMITTEE

1. Whereas, Aloha Utilities Inc. has presented cogent arguments as to why the Florida Public Service Commission's order for the removal of 98% hydrogen from source water is not technically feasible at all ranges of hydrogen sulfide, on behalf of the customers of Aloha in the Seven Springs Area, **Aloha's Citizens' Advisory Committee** is prepared to state that it has NO OBJECTION to the prescription of a maximum total sulfide level of 0.1mg/L in 'finished' water as an alternate benchmark for Aloha Utilities. This is a performance standard accepted by the West Coast Regional Water Supply Authority for the water it supplies to its member governments.

[However, this will not be the only standard for finished water, because the audit that is being currently undertaken may reveal other deficiencies. The customers suspect that there is elemental sulfur in the delivered water and also ionized sulfide, both of which are corrosive. There may also have to be a standard related to the disinfection of water such that it is effective against sulfur reducing bacteria.]

2. Whereas Aloha Utilities desires to have institution of appropriate methodologies to achieve the above standard in a step by step fashion rather than by simultaneous implementation at its wells, **the Aloha's Citizen Advisory Committee** states that it has NO OBJECTION to the placement of appropriate equipment initially at **Wells 8 and 9** and subsequently at other wells on the basis of experience gathered.

These NO OBJECTION statements should in no way be considered as a permit from the customers of Aloha Utilities in the Seven Springs System to Aloha Utilities to install and maintain new methods for water processing or as a consent order that the customers are accepting financial responsibility through rate increases for the installation and maintenance of any particular method.

In its turn, Aloha Utilities shall facilitate without delay or restrictions an expedited and comprehensive audit of the present processing methods, the facilities that are available and the current finished product. Aloha Utilities shall also supply CAC with a specific cost analysis relating to the installation and maintenance at **Wells 8 and 9** of technology considered appropriate to improve the quality of 'finished' water so that the CAC can determine the cost effectiveness of proposals for the solution of the current problems associated with water quality.

When Aloha Utilities meets these conditions, the CAC will consider its next step.

Wayne Forehand

Chairman, Aloha Utilities Citizens' Advisory Committee

July, 21, 2003

July 23, 2003

Marshall Willis
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Dear Marshall:

It is my understanding that for practical reasons, Aloha Utilities is seeking to have the Commission amend some of the requirements of Order No. PSC-02-0593-FOF-WU. Specifically, Aloha seeks to change: (1) the current deadline for completion of the removal projects for wells 8 and 9; (2) the requirement that the utility begin planning removal projects for wells 1-7; and (3) the requirement that 98% of the hydrogen sulfide be removed from all sources of raw water. I have been in touch with Aloha's Citizens' Advisory Committee and can report their position on these three issues.

As to the deadline for completing all remedial additions to wells 8 and 9, the customers want and expect to have a voice in the determination of which changes should be made. As the Commission is aware, the Advisory Committee is involved in an audit being performed by Dr. Levine of the University of South Florida. Until Dr. Levine's audit findings have been completed, the Advisory Committee cannot reach a conclusion as to the proper remedial actions for wells 8 and 9. As a result, the Advisory Committee strongly advises that Aloha refrain from expending any significant amount of funds to reduce hydrogen sulfide levels at wells 8 and 9, until the Citizens' audit is complete. The Advisory Committee is aware that this position may require that the current deadline be adjusted. The Advisory Committee does not object to an appropriate adjustment of the deadline date.

The Advisory Committee also believes that any remedial actions should first be implemented on wells 8 and 9 only. After an analysis of the results on those two wells, a decision on the remaining seven wells would be in order. This approach means that, for the present, Aloha should not expend any money for changes to wells 1 through 7.

As to the 98% removal requirement, the Advisory Committee agrees that this standard should be removed, and replaced with other standards. Rather than a percentage removal, the standard(s) should focus on the level to be attained. One such standard is a maximum total sulfide level of 0.1 mg/L in the "finished water." This performance standard is applied by the West Coast Regional Water Supply Authority for the water it supplies to its member governments. Additional standards may also be appropriate, depending on the final audit findings. Until the final audit report, however, no other measurable standards can be specified.

One further concern needs to be discussed and clarified. It is Aloha that is seeking to amend these three areas which have withstood an appellate challenge to their legitimacy. The Citizens successfully fought alongside the PSC to assure that Order No. 0593 was upheld. The customers' current willingness to join Aloha in requesting these three amendments, therefore, demonstrates a spirit of extreme cooperation. In return, the customers expect Aloha's full cooperation with Dr. Levine in any sampling or data gathering she may need to undertake. I am sure you agree that with their show of good faith, the customers are entitled to reciprocation.

I hope this letter clarifies our position on the three areas in which Aloha seeks to amend Order No. 0593.

Sincerely,

Stephen C. Burgess
Deputy Public Counsel

SCB/dsb

cc: Marty Deterding, Esquire

V. Abraham Kurien, M.D.
1822 Orchardgrove Avenue,
NEW PORT RICHEY, FL 34655

Atty. Steve Burgess,
Office of Public Counsel,
111 West Madison Street, Room 812
TALLAHASSEE, FL 32399-1400

June 13, 2004

Dear Atty. Burgess,

Thanking you for sending me a copy of the request of Aloha Utilities Inc., to the PSC, "The motion to modify requirements of Order No. PSC02-0593-FOF-WU".

I have reviewed it carefully and discussed its content with other members of the CAC, who had previously sent you a NO OBJECTION STATEMENT concerning this matter.

In view of pertinent findings and discussions arising from the audit reports, we need to add some qualifiers to our previous statement, to ensure that any modification made to the order does not negatively affect the ability of Aloha Utilities to improve water quality as demanded by the Corporations' customers.

1. **The reference to sulfide levels in "finished water" should be stated as a maximum contaminant level for total sulfides of 0.1mg per liter of delivered water at the point of its entry into the domestic system at the domestic meter.** (This change is necessary because of recognition during Phase II of the audit that sulfides may be generated within the transmission and distribution system of the Aloha Utility due to conditions over which the customers have no control. This also reflects the standard of the Tampa Bay Water, which meets this level at the point of connection for "the water it supplies to its member governments". The water Aloha supplies to its customers begins at the domestic side of the meter. The wording as proposed by Aloha states " to meet a goal of 0.1mg/l of sulfides in its finished water as that water leaves the treatment facilities of the Utility", is not satisfactory)

2. **The improvements should be such that sulfide present as S^{2-}, HS^- or H_2S in raw water or generated during treatment and transmission will 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.** (The method Aloha Utilities now proposes to remove hydrogen sulfide from water involves only a reversible oxidation of the hydrogen sulfide in raw underground water into sulfur and sulfate and there is no elimination from raw water of the byproducts that have not been converted fully into sulfate).

3. **Compliance with such requirements shall 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 shall be rotated to provide the greatest likelihood of detecting any departure from the maximum levels permitted. (This addition is necessary because of the enormous variation in hydrogen sulfide levels among the wells).

V. Abraham Kurien

V. Abraham Kurien, M.D
On behalf of the CAC of Aloha

State of Florida

Public Service Commission

CAPITAL CIRCLE OFFICE CENTER • 2540 SHUMARD OAK BOULEVARD
TALLAHASSEE, FLORIDA 32399-0850

-M-E-M-O-R-A-N-D-U-M-

DATE: June 17, 2004

TO: Director, Division of the Commission Clerk & Administrative Services (Bayó)

FROM: Office of the General Counsel (Gervasi, Jaeger)
Division of Economic Regulation (Walden, Daniel, Kummer, Willis)
Office of Standards Control & Reporting (Lowery)

RE: Docket No. 020896-WS – Petition by customers of Aloha Utilities, Inc. for deletion of portion of territory in Seven Springs area in Pasco County.

Docket No. 010503-WU – Application for increase in water rates for Seven Springs System in Pasco County by Aloha Utilities, Inc.
County: Pasco

AGENDA: 06/29/04 - Regular Agenda - Proposed Agency Action on Issue 4 - Oral Argument Requested on Issue 3 - Interested Persons May Participate on Issues 4 – 7

CRITICAL DATES: None

SPECIAL INSTRUCTIONS: None

FILE NAME AND LOCATION: S:\PSC\ECR\WP\020896.RCM.DOC

Case Background

Aloha Utilities, Inc. (Aloha or utility) is a water and wastewater utility providing service to approximately 14,000 customers in Pasco County, including approximately 11,000 customers in the Seven Springs area. The Seven Springs area, which includes Riverside Villas, has a continuing problem with odor and black water caused by the presence of hydrogen sulfide.

This recommendation involves both (a) the implementation of potential solutions to the odor and black water problem in light of an independent audit financed by the Office of Public Counsel, and (b) the handling of two petitions for deletion of territory and other relief (the "deletion petitions") filed by customers in Seven Springs. The parties to the deletion docket,

> Ordered that Aloha Utilities, Inc. shall make improvements to its wells 8 and 9 and then to all of its wells as needed to meet a goal of 0.1 mg/L of sulfides in its finished water as that water leaves the treatment facilities of the utility. Compliance with such requirement shall be determined based upon samples taken at least annually from a point of connection just after all treatment systems and before entry of such water into the transmission and distribution system of the utility. Aloha should implement this standard no later than February 12, 2005.

On June 16, 2004, OPC filed a letter written by Dr. Kurien dated June 13, 2004 on behalf of the CAC, which OPC adopts by reference as its response to Aloha's motion. The letter states that any modification to the rate case order should be qualified to include the following language:

1. The reference to sulfide in "finished water" should 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 meter;

2. The improvements should be such that sulfide present in raw water or generated during treatment and transmission will 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; and

3. Compliance with such requirements shall 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 shall be rotated to provide the greatest likelihood of detecting any departure from the maximum levels permitted.

It appears to staff that the 98% removal standard required by the rate case order is not attainable for all of Aloha's wells, due to low concentration of hydrogen sulfide in some of the wells. For example, concentrations ranged between 0.61 mg/L to 2.43 mg/L in November, 2003. Removing 98% of 0.61 mg/L (.5978 mg/L) is thus not feasible. TBW is a wholesale water supplier in the area and has voluntarily imposed a standard for hydrogen sulfide not to exceed 0.1 mg/L for its finished water. Staff recommends that this standard be applied by Aloha because it appears to be reasonable and attainable, and will diminish the occurrences of black water.

Staff notes that TBW has already begun using this standard, and Aloha will be blending its water with TBW water when water is purchased through Pasco County. Regarding water blending, it is significant to note that beginning in January, 2005, TBW will be using chloramines for disinfection. Pasco County will also convert to the use of chloramines at that same time. In order for Aloha's water to be compatible then with purchased water, Aloha will have to convert from chlorination to the use of chloramines. Staff has been informed by both the utility's engineering consultant and Dr. Levine that treatment for hydrogen sulfide is necessary in conjunction with converting to chloramines so that the black water problem is not exacerbated. This modification will have the added benefit of allowing Aloha to produce water that is

compatible with purchased water, which will further enhance the water quality provided to Aloha's customers.

It appears to staff that qualifiers nos. 1 and 3, as outlined by Dr. Kurien in response to Aloha's motion to modify the rate case order, are reasonable and should be included in the modification. However, qualifier no. 2, the requirement that the improvements must result in removal, as opposed to conversion, of sulfides not to exceed the 0.1 mg/L standard, would have the effect of eliminating any treatment process which oxidizes, rather than removes, hydrogen sulfide. As discussed further below, staff does not recommend that the Commission prescribe the treatment methodology that Aloha should use in order to comply with the requisite treatment standard. This is a business decision that should be made by Aloha's engineering experts. Therefore, staff does not recommend the inclusion of that qualifier in modifying the rate case order.

For the foregoing reasons, staff recommends that Aloha's motion to modify the rate case order be granted in part and denied in part. The fourth ordering paragraph of the rate case order should be modified to read that:

> Aloha shall make improvements to its wells 8 and 9 and then to all of its wells as needed to meet a goal of 0.1 mg/L of sulfides in its finished water at the point of delivery with the customers' piping. Compliance with such requirement shall be determined based upon samples taken monthly at a minimum of two sites at domestic meters most distant from the multiple treatment facilities. Such sites shall be rotated to provide the greatest likelihood of detecting any departure from the maximum levels permitted. Aloha shall implement this standard no later than February 12, 2005.

In so recommending, staff recognizes that the Florida Supreme Court has found that:

> orders of administrative agencies must eventually pass out of the agency's control and become final and no longer subject to modification. This rule assures that there will be a terminal point in every proceeding at which the parties and the public may rely on a decision of such an agency as being final and dispositive of the rights and issues involved therein. This is, of course, the same rule that governs the finality of decisions of courts. It is as essential with respect to orders of administrative bodies as with those of courts.[9]

Nevertheless, the Court continued by stating that:

> We understand well the differences between the functions and orders of courts and those of administrative agencies, particularly those regulatory agencies which exercise a continuing supervisory jurisdiction over the persons and activities regulated. For one thing, although courts seldom, if ever, initiate proceedings on

[9] Peoples Gas System, Inc. v. Mason, 187 So. 2d 335, 339 (Fla. 1966).

Aloha Utilities

Seven Springs Water System

Technical Review of Production and Distribution of Drinking Water in the Seven Springs Water System

Phase II
Analysis of well water, treated water, and distribution system water

Submitted to
Attorney Steven C. Burgess
Office of Public Counsel
111 W. Madison Street # 812
Tallahassee, FL 32399-1400

Submitted by
Dr. Audrey D. Levine, P.E.
Associate Professor
Department of Civil and Environmental Engineering
University of South Florida
4202 East Fowler Ave., ENB 118
Tampa, FL 33620

February 2004

Executive Summary

The Seven Springs Water System, operated by Aloha Utilities, has been plagued by recurring occurrences of "black water" within residential plumbing systems since the mid 1990s. The purpose of this report is to evaluate water quality factors that impact the Seven Springs Water System and identify potential operational and treatment modifications that could be used to reduce the incidence of black water.

The report has been produced in two phases. Phase I includes extensive background information and a compilation of all available water quality and operations data on the Seven Springs system. Phase II of the report includes the results of supplemental testing conducted during October and November 2003.

The water supply for the Seven Springs Water System is derived from 8 wells located in southeast Pasco County. The water quality of the wells is typical for this region of Florida. The treatment system at each well consists of corrosion control using a polyphosphate corrosion inhibitor, followed by chlorination. Residual chlorine levels are monitored at each well and throughout the distribution system. The system has minimal capacity for storage of water.

The primary water quality concern associated with the Seven Springs Water System is control of hydrogen sulfide in the source water. Under the current treatment approach, the hydrogen sulfide is converted to elemental sulfur, iron sulfides, polysulfides, and sulfate by chlorination at each well. The various forms of sulfur can react biologically or chemically within the distribution system or residential plumbing to either reform hydrogen sulfide or to react with dissolved metals to form insoluble particulates. These reactions are exacerbated by warm water temperatures and tend to occur more consistently in water lines that are used infrequently. Point-of-use treatment systems can further complicate the situation by reducing the capacity to control microbial growth by removing disinfectant residuals in conjunction with removal of minerals that can provide a protective barrier within pipelines.

While the current treatment system is in compliance with Federal and State requirements for potable water systems, the water tends to react with metals in pipelines and hot water tanks to form black insoluble particles. The use of alternative treatment approaches to control hydrogen sulfide may help to reduce the incidence of black water formation. In addition, upcoming modifications to convert the disinfection system from free chlorine to chloramines will impact the stability of sulfides within the distribution system.

The major conclusions from this Phase II report are:

1. The levels of hydrogen sulfide associated with each well are somewhat variable. Wells that have higher levels of hydrogen sulfide also tend to have higher levels of iron and ammonia.
2. Levels of hydrogen sulfide detected in the untreated water ranged from 0.6 to 3.95 mg/L. A trace amount of hydrogen sulfide was detected in the influent to the main plant (0.12 mg/L) during the November sampling.

David W. Porter, P.E., C.O.
Water/Wastewater System Consultant

Regulatory Assistance, Troubleshooting, Permitting, Contract Operation, Rehabilitation and System Design

September 11, 1997

Pasco County
Utilities Services Branch
Public Works/Utilities Building, S-205
New Port Richey, FL 34654
Attn: Mr. Douglas S. Bramlett, Assistant County Administrator

Re: Aloha Utilities, Inc./Seven Springs Water System

Dear Mr. Bramlett:

Last Friday I received a copy of a letter that you wrote to Representative Mike Fasano in which you gave your opinion regarding the cause of "black water" problems that are being experienced by a small number of Aloha's customers located in an isolated section of Aloha's south western service area. Because you expressed opinions concerning Aloha's water system and provided a comparison between Aloha's corrosion control program and that of Pasco County, I believe your letter requires a response. There has been considerable debate and on-going litigation concerning this issue to date. To the extent that you have chosen to express your opinion on these volatile issues I must, on behalf of my client Aloha Utilities, Inc. point out that your letter is wrought with inaccuracies. We therefore request that you immediately issue a retraction, or at the very least a statement that your opinions were in error.

I must start out by telling you that when I read your letter I was astounded. Many of your statements contradicted not only my understanding of water process engineering and water chemistry, but also the specific findings of the numerous treatises and articles which I have researched on this subject over the last several years. I have prepared this letter in hopes that you can clarify your comments to show me the basis, if any, for the specific points your raised which I otherwise believe to be without foundation.

First of all, you state that the source of black water is the "high concentration of naturally occurring hydrogen sulfide (H_2S) in the source water." The source water in question does not contain "high" concentrations of hydrogen sulfide. Since we, like all water utilities (including Pasco County) are not required to submit hydrogen sulfide monitoring data for our source water to FDEP, I would like to know how you concluded that Aloha's source water contains "high" levels of hydrogen sulfide. In fact, the information we have concerning sulfate concentrations in Pasco County's finished water, shown later in this letter, leads us to believe that the County's source water may be higher in hydrogen sulfide then that of Aloha.

Aloha provides proper, and generally accepted, treatment for the control of hydrogen sulfide at its well sites. Chlorine oxidation of hydrogen sulfide is provided at each well site. This method is very successful as the water entering the distribution system does not contain any measurable quantity of hydrogen sulfide. All hydrogen sulfide is oxidized to sulfate. The chemical equation related to this reaction is well know and well understood. This process has been utilized at countless numbers of water facilities for controlling hydrogen sulfide for decades. The equation follows:

$$H_2S + 4Cl_2 + 4H_2O \rightarrow H_2SO_4 + 8HCl$$

Please note that no elemental sulfur is produced in this reaction...only the sulfate form of sulfur remains.

Road • Suite 226 • Orange Park, FL 32073 • Phone: 904-269-6773 • Fax: 904-269-3667 • Pager: 904-645-2048 • E-Mail: porterpe@

You state that in your system, you utilize air stripping to remove a portion of the hydrogen sulfide. Air stripping at the pH normally found in raw waters is not very efficient in removing hydrogen sulfide. A large portion of the sulfide is not in the gaseous state at pH 7 or above and can not, therefore, be removed by air stripping. In fact only 64% of the total hydrogen sulfide is in the gaseous state at this pH. Therefore, even if your air stripper was 100% efficient in removing the hydrogen sulfide that is in the gaseous state (which it is not), over 35% of the hydrogen sulfide would not be removed and would pass though the air stripping unit. Your water would still contain a substantial portion of the of hydrogen sulfide originally present. What you may not be aware of is the fact that air stripping adds substantial quantities of oxygen to the water which causes the water to become very corrosive. In addition, the elevated oxygen levels can cause the oxidation of the remaining hydrogen sulfide to elemental sulfur as shown in the following reaction:

$$2\,H_2S + O_2 = 2H_2O + 2S_{(s)}$$

Therefore, it is more likely that facilities utilizing simple air stripping will produce elemental sulfur than will facilities utilizing chemical oxidation. The main problems associated with converting hydrogen sulfide to elemental sulfur are related to finished water turbidity increases and the negative effects that increased water turbidity produce (like lower disinfection efficiency, increased chance for bacterial contamination and growths in the distribution system, etc.).

One of the statements that you made is plainly contrary to all literature on the subject of black water development of which I am aware. Did you really mean to say that "the addition of chlorine disinfection produces elemental sulfur which, combined with the presence of the orthopolyphosphate and the addition of heat in the water heaters causes chemical reduction and results in the development of "black water" (copper sulfate) conditions." There are a number of inaccuracies in this statement. First, chemical oxidation of hydrogen sulfide with chlorine does not produce any appreciable quantities of elemental sulfur as shown in the chemical equation presented on page one of this letter. Next, it is not possible to combine sulfur and orthopolyphospate under any conditions to get copper sulfate...a source of copper is required. Please see the attached letter from the manufacturer of the orthopolyphosphate inhibitor Aloha utilizes confirming this fact.

After Aloha's water is treated at its well sites, there is no appreciable quantity of hydrogen sulfide present in the finished water...it has been converted to sulfate. The level of sulfate in Aloha's water meets all state and federal standards...as you may know the federal standard is presently 250 mg/L for sulfate. Aloha's water typically has a sulfate concentration of about 10 mg/L. Interestingly, Aloha's sulfate concentration is less than half of that produced at the County's treatment system. In fact your 1996 water quality testing data, as submitted to the FDEP and attached here, shows that your West Pasco Water System produces water with sulfates that range from a low of 12.44 mg/L to a high of 47.8 mg/L. Your main facility, the Little Road Water Treatment Plant, which is I believe the facility with the air stripping units, produces water with a sulfate concentration of 24.49 mg/L which is approximately two and one half times greater than that shown for the Aloha system.

Oxidation coupled with Filtration for Removal of Hydrogen Sulfide from Groundwater

Audrey D. Levine[1], Blake J. Raymer[1], Johna Jahn[1], Arnold Becken[2],

[1] University of South Florida, Civil and Environmental Engineering, 4202 East Fowler Ave, ENB 118, Tampa , Florida, 33620-5350
[2]Hillsborough County Water Department; 925 East Twiggs St; Tampa, FL 33602

ABSTRACT

Control of hydrogen sulfide in drinking water is widely practice in groundwater systems to prevent odor complaints and to help control sulfur induced corrosion and associated black-water problems in distribution systems. While chemical oxidation of hydrogen sulfide is well understood, the pH, oxidant chemical, and effective dose influence the reaction products (e.g. sulfate or elemental sulfur) and reaction rates. The purpose of this study was to investigate the feasibility of using hydrogen peroxide oxidation coupled with filtration for removal of hydrogen sulfide. Bench-scale and pilot-scale testing were conducted on groundwater from South/Central Hillsborough County. Chemical addition followed by filtration of oxidized elemental sulfur was tested using a two-stage continuously backwashed upflow filter operated at a hydraulic loading rate of about 5gpm/ft^2. The use of hydrogen peroxide to oxidize hydrogen sulfide at ambient pH (7.2-8.0) required excessive reaction times (>20 minutes). However, when iron coagulants were used in tandem with hydrogen peroxide, dissolved hydrogen sulfide was converted to particulate sulfur (most likely iron sulfide or colloidal sulfur) in less than 3 minutes at molar ratios ranging from 0.5 to 2. The combination of oxidation and two-stage upflow filtration was capable of producing water with turbidities below 0.08 NTU.

INTRODUCTION

Removal of hydrogen sulfide from water can be accomplished using a variety of approaches including removal of gaseous hydrogen sulfide (aeration or degasification), conversion of hydrogen sulfide to elemental sulfur and removal of particulates (biological or chemical oxidation coupled with filtration), oxidation of hydrogen sulfide to sulfate, or removal of negatively charged forms of sulfur (sulfide and sulfate) through ion exchange. Incomplete oxidation of hydrogen sulfide can result in release of turbidity into the distribution system, potentially compromising the effectiveness of disinfection.

Historically, tray aeration has been considered to be the least-cost approach for removal of hydrogen sulfide. However, less than half of the hydrogen sulfide can be volatilized at pH levels typical of groundwater, and the residual sulfide can impose a significant chlorine demand. Over the past decade, in many locations, the encroachment of development on treatment facilities has imposed a need for improved control of odors generated by conventional aeration systems.

In light of increasing attention to groundwater quality and disinfection byproduct formation, it is important to integrate control of hydrogen sulfide with reduction of chlorine demand, turbidity, and odor generation. Because many groundwater treatment systems rely on chlorine disinfection, chemical oxidation of sulfide is widely practiced as a default control technology. However, reaction rates and associated by products are influenced by pH, chemical dose, and oxidant demand.

Monthly Operation Report for Public Water Systems that Use Ground Water and for Consecutive Public Water Systems that Treat Their Water

System PWS Identification Number: 6512214

Treatment Plant Name: Seven Springs Well #6

III. SUMMARY OF DAILY WATER TREATMENT DATA FOR THE MONTH/YEAR OF April 2000

- Type of Residual Disinfectant Maintained in Distribution System Served by Plant: ☐ free chlorine; ☐ combined chlorine (chloramine); ☐ chlorine dioxide
- Summary of Daily Water Treatment Data for Month:

Day of the Month	Hours Plant in Operation	Quantity of Finished Water Produced by Plant (gallons)	Lowest Residual Disinfectant Concentration at Entry to Distribution System (mg/L)	Residual Disinfectant in Distribution System			Reported Emergency or Abnormal Operating Conditions
				Lowest Residual Disinfectant Concentration at Remote Point (mg/L)	Number of Instances Where Residual Disinfectant Measurements Taken at Total Coliform Sampling Points	Lowest Residual Disinfectant Concentration at Total Coliform Sampling Points (mg/L)	
1	24	197000	2.9	0.5			
2		400000	2.8	0.5			
3		365000	2.0	0.7			
4		274000	3.0	0.7			
5		322000	2.0	0.7	20*	0.5	
6		90000	2.0	0.5			
7		139000	2.0	0.5			
8		166000	2.4	0.5			
9		426000	2.5	0.5			
10		511000	3.5	0.5			
11		382000	2.5	0.5			
12		539000	3.0	0.7			
13		297000	2.3	0.5			
14		239000	2.5	0.5			
15		87000	2.6	0.5			
16		552000	2.5	0.5			
17		549000	2.0	0.5			
18		533000	2.0	0.6			
19		416000	1.5	0.6			
20		148000	3.7	0.6			
21		121000	1.8	0.5			
22		89000	3.0	0.5			
23		230000	2.2	0.5			
24		331000	3.0	0.7			
25		351000	3.5	0.6			
26		548000	3.0	0.5			
27		463000	2.8	0.5			
28		316000	1.8	0.5			
29		372000	3.0	0.5			
30		558000	1.8	0.5			
31							
Total		10011000			20*		
Avg.		333700					
Max.		558000					

max ~~produce~~ capability

450 x 1440 = 648,000

...or Public Water Systems that Use Ground Water and for Consecutive Public Water
...r Water
...on Number: 6512214
Seven Springs Well #9

...RY OF DAILY WATER TREATMENT DATA FOR THE MONTH/YEAR SEPTEMBER 2002

ENTERED 10/24/02 nkb

...Residual Disinfectant Maintained in Distribution System Served by Plant: X free chlorine;
...bined chlorine (chloramine); G chlorine dioxide
...nary of Daily Water Treatment Data for Month:

...y of the ...onth	Hours Plant in Operation	Quantity of Finished Water Produced by Plant (gallons)	Lowest Residual Disinfectant Concentration at Entry to Distribution System (mg/L)	Residual Disinfectant in Distribution System			Reported Emergency or Abnormal Operating Conditions
				Lowest Residual Disinfectant Concentration at Remote Point (mg/L)	Number of Instances Where Residual Disinfectant Measurements Taken at Total Coliform Sampling Points	Lowest Residual Disinfectant Concentration at Total Coliform Sampling Points (mg/L)	
1	24	185000	2.3	0.8			
2	24	294000	1.8	0.6			
3	24	342000	2.0	1.7			
4	24	385000	3.5	2.1	25*	0.9	
5	24	314000	2.8	1.7			
6	24	285000	2.5	0.7			
7	24	295000	3.0	1.1			
8	24	191000	2.4	0.4			
9	24	362000	2.4	1.3			
10	24	371000	2.6	1.8			
11	24	341000	2.6	1.1			
12	24	271000	2.6	1.6			
13	24	237000	3.1	1.8			
14	24	215000	2.7	1.6			
15	24	131000	2.6	0.6			
16	24	497000	2.2	2.0			
17	24	420000	3.1	1.3			
18	24	425000	2.9	1.8			
19	24	528000	2.7	1.5			
20	24	351000	2.7	1.8			
21	24	223000	3.0	1.0			
22	24	215000	2.8	0.8			
23	24	403000	3.3	2.0			
24	24	237000	2.5	1.8			
25	24	214000	3.0	1.9			
26	24	241000	3.7	2.5			
27	24	194000	3.6	1.6			
28	24	187000	3.8	1.4			
29	24	211000	3.7	1.5			
30	24	395000	3.3	2.0			
			3.8	1.46	1.38		
Total		8960000			25*		
Avg.		298666					
Max.		528000					

3-8-1-8

[redacted] Operation Report for Public Water Systems that Use Ground Water and for Consecutive Public Water [redacted]tems that Treat Their Water

[redacted]em PWS Identification Number: 6512214

[redacted]tment Plant Name: Seven Springs Well #9

[redacted] SUMMARY OF DAILY WATER TREATMENT DATA FOR THE MONTH/YEAR OCTOBER 2002

[redacted]pe of Residual Disinfectant Maintained in Distribution System Served by Plant: X free chlorine; [redacted]combined chlorine (chloramine); G chlorine dioxide

[redacted]mary of Daily Water Treatment Data for Month:

ENTERED 11/21/02 DNB

[redacted]y of the Month	Hours Plant in Operation	Quantity of Finished Water Produced by Plant (gallons)	Lowest Residual Disinfectant Concentration at Entry to Distribution System (mg/L)	Residual Disinfectant in Distribution System			Reported Emergency or Abnormal Operating Conditions
				Lowest Residual Disinfectant Concentration at Remote Point (mg/L)	Number of Instances Where Residual Disinfectant Measurements Taken at Total Coliform Sampling Points	Lowest Residual Disinfectant Concentration at Total Coliform Sampling Points (mg/L)	
1	24	305000	3.9	2.7			
[redacted]	24	340000	4.0	2.4	25*	0.2	
[redacted]	24	392000	3.6	2.2			
4	24	392000	3.9	2.3			
5	24	296000	3.6	1.7			
[redacted]	24	287000	2.5	1.5			
[redacted]	24	474000	3.1	1.9			
8	24	429000	3.2	2.3			
[redacted]	24	448000	4.0	2.8			
[redacted]	24	457000	3.6	1.9			
11	24	373000	3.0	2.2			
12	24	425000	3.8	1.6			
[redacted]	24	319000	3.9	1.4			
14	24	406000	3.8	1.8			
15	24	283000	3.9	1.1			
[redacted]	24	230000	3.8	1.5			
[redacted]	24	344000	3.9	2.2			
18	24	329000	3.9	1.8			
[redacted]	24	271000	3.2	2.0			
[redacted]	24	196000	3.2	2.1			
21	24	423000	3.5	2.0			
22	24	373000	3.7	1.4			
[redacted]	24	374000	3.1	1.9			
[redacted]	24	366000	3.9	2.3			
25	24	400000	3.7	1.7			
[redacted]	24	326000	3.1	2.1			
[redacted]	24	228000	3.2	2.5			
28	24	412000	3.6	2.1			
29	24	413000	3.2	2.1			
[redacted]	24	439000	3.5	1.9			
31	24	370000	3.9	2.3			
[redacted]tal		11120000			25*		
[redacted]		358709					
[redacted]x.		474000					

3.55 1.99 1.55

[redacted]2-555.900(3)
December 10, 1996

4.0 – 2.5

To: JOHN STARLING
PSC
413 6953

From: MIKE LEROY
DEP
921 9447

Turbidity Formation During Hydrogen Sulfide Chlorination

Troy Lyn
Environmental Engineer
CH2M Hill
Deerfield Beach, FL

James Taylor
Professor of Engineering
University of Central Florida
Orlando, FL

Robert Powell
Water Quality Manager
Pinellas County Utilities
Largo, FL

ABSTRACT

This study was conducted to identify the effects of hydrogen sulfide (H_2S) chlorination on sulfur turbidity formation from a groundwater drinking source. The purpose of this research was to determine the conditions under which chlorine would completely oxidize H_2S and limit the production of sulfur turbidity below 1 nephelometric turbidity unit (NTU). These studies showed that H_2S is completely oxidized at a molar ratio (MR) of 2 chlorine to sulfide (Cl_2/S^{-2}) in distilled water. However, sulfur turbidity was produced during complete H_2S chlorination in all reaction conditions common to conventional water treatment. Sulfur turbidity formed in the laboratory by chlorination did not settle and was still observable after 7 days. These studies also showed that chlorine reacted with H_2S before organic precursors to produce trihalomethanes (THMs).

INTRODUCTION

H_2S is commonly removed partially by aeration and then completely by chlorination. Conventional aeration removes approximately one-third of the influent concentration of H_2S. The remaining H_2S is then typically oxidized by chlorine gas. Although this treatment scheme successfully removes H_2S, chlorination produces potentially troublesome by-products. For example, the chlorination of H_2S could produce elemental sulfur (S°), resulting in black water (iron sulfide and/or copper sulfide) or excessive turbidity (greater than 1 NTU) in the finished water. Trihalomethanes resulting from the use of chlorine is another by-product of concern.

DO = Dissolved oxygen content, mg/L O_2
Cl_2 = Chlorine dose, mg/L Cl_2

As shown by the laboratory data and verified by the signs of the exponents of the statistical model, increasing initial H_2S concentration, pH, and time increases turbidity formation while increasing DO and MR of Cl_2/S^{-2} decreases turbidity formation. The coefficients of equation 3 suggest that the factors affecting turbidity in descending order of importance are initial H_2S concentration, chlorine dose, pH, time, and DO. Derivatives of the statistical turbidity model suggest that aeration prior to chlorination is the most effective means of reducing turbidity formation.

Field Results

The field batch and laboratory batch experiments produced similar results. H_2S was completely destroyed at molar ratios slightly greater than 2 Cl_2/S^{-2} as shown in Figure 5. The MR needed to completely destroy H_2S within 1 minute was higher in the field experiments because of other demands in the natural water. The same turbidity trends noted in the laboratory for pH, time, and Cl_2/S^{-2} MR in the field were also observed in the field as shown in Figures 6 and 7. The effect of DO was not observed in the field because all field test were conducted with DO less than 1 mg/L.

The field data sets containing MRs of 4, 8 and 16 Cl_2/S^{-2} were evaluated using the statistical model of equation 3. Since MRs of 1 and 2 Cl_2/S^{-2} did not completely destroy H_2S in the field experiments, these data sets were not used in the testing of the model. Complete destruction of H_2S occurred at a MRs greater than or equal to 4 Cl_2/S-2 or 9.76 mg/L chlorine dose for a 1.1 mg/L initial H_2S concentration. Since large MRs of 8 and 16 Cl_2/S^{-2} overdosed the initial sulfide concentration and the data indicated that no more turbidity removal could be accomplished at MRs higher than 4, their corresponding chlorine doses were not used. Instead a chlorine dose of 9.76 mg/L Cl_2 was used.

Figure 8 shows the predicted verses observed turbidity from equation 3. For MRs of 4 and 8 Cl_2/S^{-2}, the actual versus predicted points seem equally distributed aobut the 45° line. For MRs of 16 Cl_2/S^{-2}, the model over predicts turbidity production. Statistical hypothesis testing of the predicted and actual turbidites indicated that the predicted and actual turbidity formation are statistically equivalent and representative of turbidity formation as observed at the Keller I water treatment plant. The significance of this model from a practical standpoint is that sulfur formation during chlorination cannot be avoided. Consequently, chlorination of sulfide should be avoided if at all possible. Academically, the model can be used to predict sulfur formation in chlorination processes using a natural water source.

Calculated surface loading rates from the laboratory study indicated that settling would not remove sulfur turbidity. Increased exposure to Cl_2 residual would not

oxidize sulfur completely to sulfate. Particle size analysis indicated that the turbidity particle was at maximum 1 micron, the minimum detection limit of the particle size analyzer. If the sulfur particles are colloidal, the particle size could range from 0.01 to 1.0 micron, too small for media filtration.

THM samples collected at varying Cl_2/S^{-2} MRs showed that chlorine reacted more preferentially with H_2S than with THM precursors as shown in Figure 9. THMs were not formed until the hydrogen sulfide was completely destroyed at a MR of 4 Cl_2S/S^{-2}.

CONCLUSIONS

The results of the laboratory and field batch tests support the following conclusions:

- Sulfides were completely destroyed by chlorine at chlorine to sulfide MRs slightly greater than 2 to 1 in distilled water and 4 to 1 in Pinellas groundwater.

- Turbidity is formed when H_2S is completely oxidized by chlorine; the turbidity is attributed to elemental sulfur.

- Turbidity formation during sulfide chlorination increases with increasing pH, H_2S concentration, and reaction time up to 30 minutes; turbidity formation decreases with increasing DO concentrations when H_2S is completely destroyed.

- H_2S oxidation by chlorine cannot be predicted by stoichiometric reactions producing S^o and SO_4^{-2}. However, maximum turbidity was produced during H_2S chlorination at a minimum MR of 2 Cl_2/S^{-2} that destroyed all H_2S. Increasing the chlorine dose or the Cl_2/S^{-2} MR above this point decreased, but did not eliminate, turbidity. Consequently, the referenced stoichiometry is partially representative of the observed trends of turbidity formation. However, more complex reactions involving sulfur oxidation are involved.

- Chlorination should not be used to remove sulfides in potable water treatment unless followed by an effective turbidity removal process.

  Chlorine will react preferentially with sulfides before THM precursors.

- Turbidity production during sulfide chlorination could be generally described by a log variant statistical model.

- According to the statistical model, factors influencing sulfur

VOTE SHEET
JUNE 29, 2004
Docket No. 020896-WS - Petition by customers of Aloha Utilities, Inc. for deletion of portion of territory in Seven Springs area in Pasco County.
Docket No. 010503-WU - Application for increase in water rates for Seven Springs System in Pasco County by Aloha Utilities, Inc.

(Continued from previous page)

Issue 4: Should the Commission grant Aloha's motion to modify the rate case order, to change the 98% standard for removal of hydrogen sulfide contained therein to agree with the Tampa Bay Water Standard of 0.1 mg/L?
Recommendation: Yes, Aloha's motion to modify the rate case order should be granted ~~in part and denied in~~ part. The fourth ordering paragraph of the rate case order should be modified to read that "Aloha shall make improvements to its wells 8 and 9 and then to all of its wells as needed to meet a goal of 0.1 mg/L of sulfides in its finished water ~~at the point of delivery with the customer's piping. Compliance with such requirement shall be determined based upon samples taken monthly at a minimum of two sites at domestic meters most distant from the multiple treatment facilities. Such sites shall be rotated to provide the greatest likelihood of detecting any departure from the maximum levels permitted.~~ as that water leaves the treatment facilities of the utility. Compliance with such requirement shall be determined based upon samples taken at least annually from a point of connection just after all treatment systems and before entry of such water into the transmission and distribution system of the utility. Aloha shall implement this standard no later than February 12, 2005." The Commission should direct Aloha to use the treatment process that Aloha concludes will achieve this level of treatment in the most cost-effective manner. Additionally, Aloha should be required to file comments within 60 days from the date of the Commission's vote on this item regarding the feasibility of collecting and testing monthly samples at domestic meters as proposed by Dr. Kurien. Finally, the Commission should require monthly progress reports, as set forth in the staff analysis.

APPROVED

DATE: June 29, 2004

TO: **Mary Andrews** Bane, Executive Director

FROM: **Timothy J. Devlin**, Director, Division of Economic Regulation

RE: **Change to Staff** Recommendation (Issue 4) in Docket No. 010503-WU regarding Item No. 5 on the June 29, 2004 Agenda Conference

Staff is requesting approval to make changes to the above mentioned recommendation. These changes are substantial in nature and therefore, a written type and strike modification will be presented. Although these changes are substantial, we do not recommend deferral because timing, resolution of the black water issue, is critical. Aloha plans to purchase water from the Tampa Bay Water Authority (TBW) in January of 2005 and this water will include the use of chloramines. Unless measures are taken, the blending of TBW water will exasperate the black water problem. It is very important that the process to remove hydrogen sulfide be coincident with this change to chloramines.

exacerbate

On June 16, 2004, OPC filed a letter written by Dr. Kurien dated June 13, 2004, outlining three modifications to the rate case order. This was in response to Aloha's June 9, 2004, petition to modify the rate case order. In response to this filing by OPC on the day before the recommendation was due, certain staff revised the draft to recommend, among other things, testing for hydrogen sulfide at point of delivery as opposed to the well site. This change to the draft was not brought to the attention of Division of Economic Regulation management and differed from the agreed upon position that was reflected in the June 14, 2004, draft that was circulated for review. The June 14, 2004, draft recommended that the hydrogen sulfide standard should be consistent with the TBW standard which involves testing at the well site.

While some testing at the point of delivery may have merit, we do not have information at this time on whether testing for hydrogen sulfide at that point is feasible or what associated costs may be incurred. This revision includes a recommendation that Aloha be required to file comments within 60 days from the date of the Commission's vote on this item regarding the feasibility of collecting and testing monthly samples at domestic meters.

C: Charles Hill, Deputy Executive Director
Rick Melson, General Counsel

Approved 6/29/04

Subject: Re: Your memo on Docket 020896
From: "V. Abraham Kurien" <akurien@attglobal.net>
Date: Fri, 02 Jul 2004 16:49:53 -0400
To: Tim Devlin <TDevlin@PSC.STATE.FL.US>

Hi Mr Devlin,

in your reply you are emphasizing the very point I made, that the TBW samples its water at the point of its METERED CONNECTION WITH ITS CUSTOMERS. By correspondence, Aloha should test its water at its point of connection with its customers at THEIR METER- the point of retail distribution.

for example TBW does not expect Pasco to accept water standards as they are found at its processing plant. In fact TBW pays Pasco the cost of processing the water to the declared standards when Pasco receives water that does not meet the standard.

I am not trying to make it difficult for Aloha; I am just indicating that what happens in Aloha's transmission system to the customer's meter cannot be declared to be the customer's bad luck! Aloha must take responsibility for it. I realize it is an awesome and costly responsibility. Some utilities install additional booster chemical pumps when deterioration occurs within the transmission system to correct deficiencies that creep in due to the long distances that water has to travel. Similarly when a reversible oxidation system predisposes to re-generation of hydrogen sulfide in the transmission system, it should be the responsibility of Aloha to deal with it, not that of customers. This becomes criticalwhen hydrogen sulfide is present in raw water and reversible oxidative methods are used for processing, and may not be significant in surface waters which contain higher quantities of oxygen.

My recommendations were my attempt to be helpful!

Abe Kurien

Tim Devlin wrote:
Dr. Kurien

As I understand, TBW does not provide water to retail end use customers. TBW is a wholesale provider. They test water at the point of entry (metered point of connection) with the distribution systems for various public entities. Similarly, we recommended that Aloha test at the treatment facility as its treated water enters its retail distribution system.
That said, I agree that the extent of testing by Aloha needs to be further explored. We will be asking questions of Aloha to help determine the costs and benefits of testing in the distribution system. This is why we recommended that the Commission order Aloha to provide additional information on this matter.

-----Original Message-----
From: V. Abraham Kurien [mailto:akurien@attglobal.net]
Sent: Thursday, July 01, 2004 10:03 AM
To: Tim Devlin; Steve Burgess
Subject: Your memo on Docket 020896

Dear Mr Devlin,

In your memo dated June 29, to Ms Bane the Executive Director which is posted on the PSC website, you say " The June 14, 2004 draft recommended

that the hydrogen sulfide standard should be consistent with the TBW standard which involves testing at the well site".

This is an incorrect conclusion, because TBW water standard is to deliver water at the point of connection to its customers which contains

no more than 0.1 mg of total sulfide per liter of water.

If the TBW standard is accepted, then Aloha must deliver water to its customers with the 0.1 mg total sulfide standard at the utility's connection with the customer's pipes. That by Florida statutes is at the

outlet of the meter onthe domestic side. That was the position I took and included as qualifier 1 in my letter to OPC which was submitted to PSC on June 16.

I think my reading is more correct. I would appreciate hearing from you.

V. Abraham Kurien

V. Abraham Kurien, M.D.
1822 Orchardgrove Ave
NEW PORT RICHEY, FL 34655

Commissioner Braulio Baez
Chairman,
Public Service Commission
2540 Shumard Oak Blvd
TALLAHASSEE, FL 32399-0850

July 6, 2004

Dear Chairman Braulio Baez,

RE: VOTE ON ISSUE 4
PSC STAFF'S REVISED RECOMMENDATIONS
JUNE 29, 2004
DOCKETS 020896-WS
DOCKET No. 010503-WU

As you are aware, on June 29, 2004, the day of the Agenda Conference, the PSC Staff revised its recommendations of June 17 on Issue 4 relating to the site and frequency for sampling of sulfide levels, leaving the customers with very little time to review the reasons for the alterations and their significance. Prior to the Agenda conference, the customers were not provided with the memorandum from Mr. T. Devlin, Director Division of Economic Regulation to Executive Director Dr Mary Bane that attempted to explain *his* reasons for reverting to the draft version of the recommendations approved and distributed among the PSC Staff on June 14.

After a lengthy and somewhat confused discussion of the issues involved, the Commissioners unanimously voted to accept the recommendation of the Staff as revised on June 29th.

From my subsequent correspondence with General Counsel of the PSC, Atty. Richard Melson, I understand that the revisions were made after receiving a letter on June 24 from Atty. Deterding who represents Aloha Utilities. I received a copy of that letter only on June 26 and sent my reply to Atty. Gervasi on June 28.

I am not sure whether before revising the June 17th recommendations Mr. Devlin reviewed my reply to Atty. Deterding's concerns about the appropriateness of two of the qualifiers, which were included in PSC Staff recommendations of June 17. It is also not clear whether the Commissioners had an *adequate* opportunity to review my reply before the Agenda Conference took place.

Such being the case, I feel that the Commissioners should reconsider their vote on Issue 4 for the following reasons.

The memorandum submitted on June 29 by Mr. Devlin, which explains his reasons for revising the Recommendations on Issue 4, says *"The June 14 draft recommended that the hydrogen sulfide standard should be consistent with the TBW standard which involves testing at the well site".*

This statement misrepresents the sampling site for TBW standard. The only reference I could find in Exhibit D of the Supplemental Water Quality Parameters of Tampa Bay Water included as Exhibit B in Aloha Utilities' initial request of June 9, 2004 says, *"Water supplied from the Authority's system shall be sampled annually at a minimum at the Point(s) of Connection"*. There is no mention of *testing at the well site.* This alternate identification of location for sampling as the *well site* is part of Aloha's proposal of June 9, 2004 and is not part of TBW standard as Mr. Devlin implies in his memo of June 29th.

To represent Aloha's proposal as an accurate rendition of TBW standard is not legitimate and will be considered as an attempt to bias the judgement of the Commissioners. I pointed this out to Mr. Devlin in an e-mail dated July 1. He replied me on July 2 by e-mail. *"They [TBW] test water at the point of entry (**metered point of connection**) with the distribution system for various public entities. Similarly we recommend that Aloha test its water at the treatment facility as its treated water enters its retail distribution system".*

There is a failure of logic between the two sentences quoted above. There is *no similarity* between the ideas expressed in these two sentences. Instead there is an inaccurate statement about where Aloha's retail distribution system begins. *The outlet of the domestic meter is the point at which Aloha's water enters the domestic system and that is the retail connection point.* That is the point at which the TBW standard has to be met, if a claim is made that Aloha is accepting the TBW standard for the processed water it *delivers* to its customers. Any earlier point is a part of and legally remains as part of Aloha's transmission system. Like TBW, Aloha must be responsible for delivering water to its customers at *the point of entry (metered point of connection)* where it should meet the 0.1mg of total sulfide per liter of delivered water.

In my response to the PSC via the OPC (June 13-June 16) to Aloha's request of June 9, I had made a very clear statement of this logical foundation for qualifier No 1. The 3 members of the staff who amended the June 14 draft of the PSC Staff recommendation to the June 17 version (Walden, Daniel and Gervasi) found this qualifier to be *reasonable*. The recent correspondence between Mr. Devlin and myself shows that now even Mr. Devlin has come to the conclusion that *TBW tests the water at the metered point of connection to the customer and not at its well site or treatment facility.*

Therefore I would request that the Commissioners reconsider their decision on Issue 4 (revised version of PSC staff Recommendation dated June 29, 2004) and vote for

a site of sampling that is consistent with the TBW procedure instead of accepting Aloha's proposal of June 9, 2004. *For the TBW standard to have any meaning for Aloha customers, it should be shown to be maintained at the metered point of connection with the domestic system, not at the treatment facility.*

The content of this letter and my reply of June 28, 2004 to Atty. Deterding's letter to the PSC of June 24, 2004 will provide persuasive arguments for a reconsideration of your decision when Aloha submits its "comments within 60 days from the date of the commission's vote on this item".

I look forward to your action in this matter.

Yours truly,

V. Abraham Kurien

V. Abraham Kurien, M.D.

Encl. 1. Memo from Mr Devlin to Dr Bane
2. Correspondence between Mr Devlin and Dr Kurien

Electronic copies to:

Commissioner Davidson
Commissioner Jaber
Commissioner Bradley
Commissioner Deason
General Counsel of PSC, Atty Richard Melson
Atty. Gervasi, PSC
Atty. Burgess, OPC
Atty. Marty Deterding, Aloha Utilities
Dr John Gaul
Mr. Harry Hawcroft
Mr. Ed wood
Senator Mike Fasano
Rep. Tom Anderson

V. Abraham Kurien, M.D
1822 Orchardgrove Avenue,
NEW PORT RICHEY, FL 34655

Atty. Charles Beck,
Deputy Counsel, OPC
111 West Madison Street, suite 812
TALLAHASSEE, 32399-1400

August 22, 2004

Dear Atty. Beck,

STANDARD TO REPLACE
98% REMOVAL OF HYDROGEN SULFIDE
FROM SOURCE WATER

Thank you for consulting with the customers in the above matter. As expressed in the initial letter from the customers to the PSC through the OPC when Aloha Utilities raised this matter in July 2003, the customers will accept the regional performance standard that Tampa Bay Water Authority (TBWA) uses as an attainable and practical standard for delivered water. The PSC prescribed standard of "98% removal of hydrogen sulfide from source water" was theoretically unattainable in certain situations and therefore inappropriate. The TBWA standard was recommended, because it is a standard independent of both Aloha's definition and the customers' desires.

It was our impression at that time that Aloha Utilities agreed in principle that this is a more appropriate standard because it is a regional standard and takes into account local variations in water chemistry. Water chemistry experts who know what is achievable and what is not were responsible for setting that standard.

The disagreement at this moment between Aloha and the customers seems to be centered on the correct interpretation of the Tampa Bay Water Authority performance standard. Aloha seems to have a particular interpretation, which it has proposed as an appropriate replacement for the "98% removal standard". The customers find that particular interpretation to be incorrect.

To abandon all standards at this point, as Atty. Rosanne Gervasi of the PSC proposes would be to revert to the situation before the PSC Order No 02-0593-FOF-WU, with no locally relevant standard. That will be a negation of the judgement of the DCA that PSC can set standards for water quality as opposed to the argument of Aloha Utilities that PSC does not have authority and

jurisdiction in that matter. Such a solution to the present disagreement is highly undesirable.

The PSC would be more consistent with its efforts during the last two years to provide better quality water for the customers of Aloha, if it replaces the "98% removal standard" with the regional performance standard of Tampa Bay Water Authority, **as defined by that authority** rather than by abandoning all standards.

If there seems to be some confusion as to the specifics of that standard and at what point they should be applied, it would be more appropriate for the PSC to consult Tampa Bay Water Authority rather than Aloha Utilities which is a party to this disagreement. A clarification from TBWA must be sought urgently. The customers will abide by the definition of the performance standard that TBWA provides to the PSC and its clarification about the points at which that standard is applicable. As the customers understand the TBWA standard, it has to be met at the **point of connection into the customers' pipes.** The TBWA standard for processed water at the treatment facility is also the same, indicating that TBWA takes responsibility for maintaining that standard throughout its distribution system to the point of connection to the customers.

The concerns of the customers in relation to the frequency of testing are specifically related to the fact that Aloha is considering implementation of a new processing method that must meet this new standard. Proper scientific management during installation of a new method requires more frequent testing in the initial stages and less frequent testing once stabilization of process control is achieved. These are normal expectations during implementation and we do not see any grounds for Aloha to object to this. Sound engineering principles demand such a meticulous approach. There are also principles that determine the appropriate number of locations and their distribution within the service area from which samples must be obtained. They also indicate the number of samples that must be tested from each location for the results to have statistical validity. Increased frequency of monitoring also provide for better process control that was woefully lacking in the past as documented by Phase I report of the audit.

Please transmit this message to Atty. Rosanne Gervasi of the PSC. The customers look forward to an expeditious clearance of this hurdle in a positive manner.

Yours sincerely,

V. abraham Kurien

V. Abraham Kurien, M.D.

STATE OF FLORIDA

TIMOTHY DEVLIN, DIRECTOR
DIVISION OF ECONOMIC REGULATION
(850) 413-6900

Public Service Commission

September 1, 2004

Dr. Christine Owen
Tampa Bay Water Authority
2535 Landmark Drive, Suite 211
Clearwater, FL 33761

Re: Docket No. 020896-WS; Petition by customers of Aloha Utilities, Inc. for deletion of territory in the Seven Springs area in Pasco County

Docket No. 010503-WU; Application for increase in water rates for Seven Springs system in Pasco County by Aloha Utilities

Dear Dr. Owen:

Thank you for speaking with me last month about Tampa Bay Water's source water, specifically the source water that might be provided to Pasco County, and ultimately to the private utility Aloha Utilities, Inc. (Aloha) through a bulk sale agreement in that County. My understanding is that treated water, rather than raw water, will be provided to Aloha by Pasco County to help meet the demands of Aloha's customers. As we had discussed, Aloha has experienced elevations in hydrogen sulfide concentrations in its wells which have contributed to incidences of black water in customers' homes.

We are interested in knowing the level of hydrogen sulfide that might be contained in the bulk water sales to Aloha Utilities. It is our understanding that it is Tampa Bay Water's goal that treated water provided by Tampa Bay Water meet a goal (not a standard) of not more than 0.1 mg/L of hydrogen sulfide. We have several questions related to that goal.

1. What treatment technology does Tampa Bay Water use, and does it prevent the occurrence of black water?

2. Why did Tampa Bay Water choose the methodology now being used?

3. What other treatment methodologies were considered?

4. What caused Tampa Bay Water to set this 0.1 mg/L of hydrogen sulfide as a goal?

5. How long has this goal been in effect?

6. Has Tampa Bay Water been successful in achieving this goal on a consistent basis? If not, at what locations has this goal not been met? Approximately how many times has the goal not been met?

7. What events have, or might cause this goal not to be met?

8. What steps would Tampa Bay take to achieve the goal should the water provided fail to meet 0.1 mg/L hydrogen sulfide goal?

9. At what point(s) in the transmission system does Tampa Bay gather samples to measure conformance with this goal?

10. Does Tampa Bay Water serve any non-governmental customers? For Tampa Bay Water's end-use customers, at what point is the 0.1 mg/L goal measured?

11. Is the goal of 0.1 mg/L stated in wholesale contracts?

12. If the goal is not met, are there penalties associated with failure to meet the goal such as rebates to customers?

13. Would Tampa Bay Water's obligation be different for a private utility like Aloha, as opposed to another governmental entity?

14. Does Tampa Bay Water notify the DEP if it fails to meet the 0.1 mg/L goal? If so, what has been the DEP's response to those notifications?

15. Did Tampa Bay Water consider treating its source water with hydrogen peroxide for hydrogen sulfide reduction? If so, please explain why this methodology was chosen or rejected.

A response to these questions will assist the Public Service Commission staff in our evaluation of customer concerns about the quality of water service in the Aloha service area. Again, thank you for taking the time to speaking with me, and for your response to this letter.

Sincerely,

Thomas Walden
Engineer

TW
cc: Commission Clerk and Administrative Services
Aloha Utilities, Inc.
Mr. Harry Hawcroft
John H. Gaul, Ph.D.
V. Abraham Kurien, M.D. ✓
Mr. Edward O. Wood
Representative Mike Fasano
F. Marshall Deterding, Esquire
Charles Beck, Esquire
Office of the Attorney General
Southwest Florida Water Management District

Comments on Feasibility of Monitoring for Hydrogen Sulfide at Customer Meters

To: Stephen Watford
From: David W. Porter, P.E.
Subject: Seven Springs Water System
Date: September 3, 2004

I have prepared the following initial comments related to the feasibility of monitoring for hydrogen sulfide at the customer meters. As time goes on, and as the project progresses, I may have additional comments.

- According to Standard Methods for Examination of Water and Wastewater (20th edition), the analytical method used for monitoring of hydrogen sulfide (methylene blue method) is considered accurate to 0.2 mg/L (±20%). While it is possible to obtain measurements of hydrogen sulfide that are below 0.2 mg/L, these measurements are not considered to be accurate. This is why the Tampa Bay Water "Standard" and, that proposed by Aloha is expressed as a "goal." To monitor hydrogen sulfide to this "goal" at the treatment plant sites, where sampling and testing procedures can be closely controlled, can be undertaken. To attempt to conduct this testing at a point in the field, where neither sampling nor testing conditions can be controlled would be highly impractical and would lead to unacceptably low accuracy and precision.

- Aloha will need to utilize the services of a commercial laboratory to conduct the hydrogen sulfide sampling and testing if water anywhere other than at the plants was to be analyzed. Depending on the number of events conducted each year and the number of sites sampled and tested each event, the costs would be quite substantial.

- In the context of the Aloha system, monitoring of hydrogen sulfide at the treatment facilities can provide direct information on the performance of the process and used to fine-tune the facility operations, if appropriate. The water at any other location in the distribution system can consist of water from multiple wells and/or Pasco County (Tampa Bay Water) bulk finished water supply, depending on the time of day and the net water demand in the system. This mixing of Pasco County (Tampa Bay Water) bulk finished water supply with Aloha water in the distribution system would produce a combined water that would not reflect the quality of water produced by Aloha's own facilities if taken alone. The water supplied by Pasco County (Tampa Bay Water) would not necessarily contain hydrogen sulfide levels at or below the 0.1 mg/L goal. The level of hydrogen sulfide in Pasco County's (Tampa Bay Water) water is not within the control of Aloha. In fact, Aloha has requested that the County provide a clause in its bulk water agreement with Aloha that would limit the hydrogen sulfide concentration to 0.1 mg/L or less and the County has refused to do so. Since Aloha can not control the hydrogen

sulfide concentration of the mixture of Aloha produced water and Pasco County (Tampa Bay Water), it can not control the concentration of hydrogen sulfide at any point in the distribution system other than at the point where its treated water enters the distribution system (at the plant locations) prior to it mixing with any other source of water.

- The detection of hydrogen sulfide in the distribution system cannot be linked to the effectiveness of the treatment system for the reasons stated above. Monitoring at the point of entry to the distribution system can provide direct information on the process performance and allow for optimization of the treatment processes. Sampling and testing for hydrogen sulfide at the point where Aloha's treatment plants connect to the distribution system is equivalent to that practiced by Tampa Bay Water. Conducting hydrogen sulfide sampling and testing for the purpose of optimizing the treatment process would result in the greatest benefit to the customers.

THE ONLY LOGICAL OPTION THE CUSTOMERS HAVE

Honorable Commissioners,

Now that you have heard from Dr Gaul and myself about our reactions to Dr Levine's Technical Review of Aloha's water processing methods and facilities and the hydrogen peroxide option that Aloha is considering at the present time as the most appropriate one for improvement of water quality, I would request you to consider the context in which the customers see this offer from Aloha. **The petitioners after submitting their petition in July 2002 had hopes that Aloha would consider the need for water quality improvement as urgent.**[1] The customers, in spite of suffering the consequences of black water and foul smell in their homes gave Aloha and the regulatory agencies another 12 months in which to come up with some effective solutions to the customers' problems. Having been met with a lackadaisical approach to the issue by everyone concerned and by yet another legalistic claim that no further moves towards resolution of the problem could be attempted while the matter was in the District Court of Appeals, the customers felt that it was their burden to consider alternate options that are available for them. Aloha squandered its opportunity to meet with its customers and the regulatory agencies did not seem to consider it urgent to find out the scientific causes for the problems so that the issue can be addressed effectively once an appellate decision would be made. Thereby another 9 months have been spent in procrastination of action. Now at the last moment, there is an attempt to precipitate a sense of urgency that seemed to play no role at all in Aloha's deliberations before! **It is now almost 21 months since the customers submitted their petition and there has been no improvement of any sort in water quality. Even the very easily instituted methods suggested by Dr Levine in her Phase I report have not been put into effect.**

Therefore the petitioners are coming to this hearing with serious reservations about the good faith of the utility as well as the determination of the regulatory agencies whose responsibility it was to ensure that a competitive product was made available to

the captive customers of this monopoly utility long before 2004, ten years after the initial approach to the PSC for resolution, as Commissioner Deason will perhaps recall.[2] However, that has not prevented the customers from objectively considering all the options that may be theoretically available to them at this time. In their deliberations the customers have used four basic principles in the evaluation of their options.

They are:

1. That any new method adopted shall have the ability to significantly reduce the incidence of black water and rotten-egg odor in the water that comes out of domestic faucets:

2. That any new method adopted and the financial expenditures necessary to have it installed and maintained shall not result in an unreasonable increase in water costs above what is charged by neighboring utilities:

3. That the Utility that takes responsibility for providing improved quality of water at reasonably comparable costs shall also publicly undertake to be transparent about its processing methodology and shall resolve any and all technical problems that arise in a scientific manner rather than by appeal to legal standards:

4. That the Utility shall document that it has contracted sources of water to maintain an adequate supply of drinking water for the Seven Springs Area for at least ten years into the future.

After careful evaluation, the customers have chosen **one** as the alternative they want to be granted as the most suitable for them taking into consideration the events of the past and the possibilities for the foreseeable future.

The options the customers have considered can be divided into two different groups depending on where the distributed water will be obtained:

1. From **Raw water processed by Aloha Utilities, or**
2. From **Processed water obtained from Pasco County Water Utility and its suppliers.**

We have presented the details of these options and their implications, as we understand them to the PSC,[3] recognizing that we do not have all the information necessary for being totally specific about the relative costs because the capital expenditures involved are unknown to us.

The customers want to make special emphasis on the cost of these two categories of options. If the Seven Springs Area customers must stay with Aloha Utility, it appears to us that it would result in their paying much greater costs per 1000 gallons of water because the two methods for producing a 'competitive product' for which complete cost estimates are available from Aloha are prohibitive. It was estimated in 1997 that packed tower aeration would involve a capital cost of 10 million dollars. Inflation has increased that cost from 10 to 17 million dollars. Over 20-30 million dollars would be necessary if reverse osmosis is used, resulting in an even greater increase in water bills. Both of these methods will require a minimum of 3 years for installation. Such large financial investments as Aloha has indicated to process the relatively small amount of water for which Aloha has a Water Utilization Permit (WUP) will result in an enormous increase in unit cost of water for Aloha customers. **Aloha had calculated in 1997 that this would result in a 398% increase in water bills.[4] The customer base of Aloha is too** small for such a large financial burden to be placed on this community. Further, Aloha's water source is extremely limited and its WUP is only for 2.04 million gallons a day (MGD) and it is already pumping over 3.00MGD resulting in violation of SWFWMD permits by 50%.[5] Considering that Aloha's own estimate shows that it would require close to 6.0MGD per day by 2013[6] and it has no other foreseeable new water source, it seems very likely that the only way Aloha can obtain enough water to service the area is to **buy water in bulk from Pasco County at a rate much higher than its retail rate.** One would expect Aloha to charge approximately another 25%[7] for the costs of reprocessing and blending that water with the supply from its own wells, for the profit

margin it seeks and for business costs associated with this transaction. Essentially that means Aloha would become a pass through utility with Pasco County supplying two-thirds of its water demands and that the cost of such an arrangement, while it is of benefit to the Corporation would result in significant additional costs to the consumer. **The customers cannot and do not find any justification for such a middleman monopoly utility.** Additional infrastructure costs will become necessary to provide large enough connection to Aloha's network from Pasco County water mains and this also will have to be met by customers through rate increases. Even the most recent 'Conceptual Capital Costs and Incremental Annual O&M Costs" for Hydrogen Peroxide oxidation included in Schedule 2 and 3 in Aloha's recent submission to the PSC,[8] when combined with the unreported but additional costs of buying water at bulk rates from Pasco and the yet undetermined costs of pilot project, and other inevitable costs of instituting a new method gives little hope to the customers that water costs will be competitive.

On the other hand, it seems to us that the cost per 1000 gallons of water will be less expensive to the customers if Pasco County Utility is the **direct provider** for our drinking water. While we recognize capital costs are involved in a direct connection to Pasco, given the proximity of Pasco County Water Utilities supply lines to the Seven Springs area distribution network, it should not involve exorbitant costs to connect the petitioners to that water supply. These infrastructure costs are the same that Aloha would need to meet if Pasco County Utility becomes its major supplier. If such costs are amortized over a 20-year period as has been done on occasions where the county has taken over service areas from other private utilities, these additional costs can be very reasonable when applied as a surcharge over a period of 20 years rather than as a lump sum upfront cost, since the County Utility does not need a 10-12% profit margin that Aloha has been granted.

There are other obvious advantages also. Pasco County through its supplier, the Tampa Bay Water can provide us with water that meets a performance standard[9] that is much higher than the legal standard that Aloha has accepted as its norm and which does not take into consideration the variations in local water chemistry. Tampa Bay Water

provides aerated water and therefore meets one of the recommendations Dr Levine had indicated as a possible solution for black water in her Reports.[10] Pasco County Utility, in as much as it is a governmental utility, provides opportunity for customers to have direct input into its management especially through representative commissioners, who are more sensitive to citizen needs than Aloha as a private utility can be. Lastly, Pasco County through Tampa Bay Water has access to larger sources of water supply that will be guaranteed into the foreseeable future. It also appears that the infrastructure necessary for adequate connections between Pasco County Water lines and Seven Springs Area network can be provided much sooner, within a 12-month period.

Of even greater concern to the customers is the unpleasantness of the experience that they will have in the future based on Aloha's attitude to customer service and the treatment it has meted out to its customer base in the past. The customers have no desire to repeat into the future the experiences of the last 10 years. A significant number of customers would have abandoned Aloha for another provider as shown by the petitions submitted to the PSC except for the fact that the citizens have not had such an option because Aloha is a **monopoly utility**. We are providing the PSC with a list for the reasons of our unease in this regard.[11] We like to emphasize **four** areas of our concern.

First, the petitioners are extremely concerned about the way Aloha has informed the public and regulatory agencies about water chemistry and has inappropriately claimed adequacy for its current methodology and facilities in spite of evidence to the contrary, as has been explained in great detail by Dr John Gaul, and myself. Dr Levine's audit has also indicated that the present method and the facilities that Aloha currently has in place, did not possess the ability to provide processed water that has the stability not to undergo deterioration within the domestic plumbing within a short period after delivery. Hence her recommendation for upgrades to water processing methods. The technical staff of Aloha did not recognize this situation and take corrective steps earlier, but studiously avoided drawing attention to the limitations of the method and its facilities that are obvious from Dr Levine's Phase II report.[12] Since Aloha was allowed to "**self-regulate**" by the FDEP,[13] it has become the burden of customers to point out this matter to the PSC

and indicate how this scientific oversight or incompetence might be the real reason for the intensity and high frequency of black water and rotten-egg smell phenomena within certain areas of Seven Springs. **The unwillingness of Aloha to face the reality of scientific facts is of grave concern to the customers**. As Dr Gaul pointed out this does not forebode well for the future especially with a much more complicated and untried system of water processing that Aloha is now considering.

Secondly, the customers want the PSC to note that Aloha has downplayed the incidence of water quality issues by basing its statistics on the number of persons who have made individual presentations at PSC hearings rather than use the data obtained from the survey done in 1998.[14] Even accepting Aloha's own interpretation of the data (which may not be the usual way of evaluating data from surveys of this type), the incidence of consumer reports of unsatisfactory secondary water characteristics was close to 30% and not the less than 1/10 of one percent as reported by Aloha attorneys.[15] **This tendency to avoid the truth to protect its own interest at the risk of the customers' suffering does not serve as a good recommendation for Aloha to continue as our water provider.** We also have grave concerns about Aloha's record keeping and reporting activities.

Thirdly, the extremely legalistic attitude of Aloha in its dealing with its customers, especially since they have to bear the burden of legal costs through rate increases, indicates to the customers that a great deal of the financial resources of the customers is being wasted in unproductive litigation instead of improving the infrastructure of the processing plants. The primitive manual methods used by Aloha to monitor water parameters instead of providing updated automatic methods that could have provided better process control [16]towards optimum stability of water is difficult to excuse, especially after its service connections increased enormously since 1993. Its public expression of the desire[17] in January 2002 to create a Citizens' Advisory Committee to facilitate 'more expedient and compatible solutions' and the subsequent legal attempts to prevent the formation of such an entity to find scientific solutions to the problems faced by customers displays a cynicism that is also not acceptable. Aloha's

unwillingness to submit to regulatory supervision is exhibited by its appeal of the April 2002 Orders of the Public Service Commission to the District Court of Appeals.[18] Aloha's accusation that the PSC was trying to "punish" the Corporation when it tried to help the customers get better quality water is appalling. The customers consider Aloha's oft-repeated accusation and propaganda that the citizens' have "politicized" the issue of water quality for some other latent agenda,[19] a hostile and insulting attitude towards its customers. Aloha's attempt to prevent customers from getting a PSC hearing, while appealing in courts every decision of the PSC to help customers, is unforgivable. **These examples of extreme legal maneuvering do not appear to the customers to be a good recommendation for Aloha to continue as a water utility.**

Lastly, Aloha's attempt to view the customers as a cash cow is extremely distressing to the customers. As the PSC knows only too well, Aloha made an effort to collect **$659,000** from its present customers in 2002,[20] which it had absolutely no right even to consider as a legitimate approach, to offset its financial losses created by financial management inefficiency. This Corporate ethical lapse is extremely galling to the customers. Except for customer intervention, we might have been burdened with at least a significant portion of it! At this very moment, Aloha is trying extremely inappropriate legal maneuvers not to return to its customers escrowed funds of over **$275,000** authorized as interim rate increases but subsequently denied.[21] Not only the petitioners, but also all customers of Aloha must find this verges on corporate greed, especially in view of the prolonged litigation involved.

Such being the anxiety that we have about the financial costs to the customers if they are forced to remain with Aloha Utility and the even more serious concerns about Aloha's attitude towards its customers, it must come as no surprise to the PSC and even to Aloha itself that the petitioners after close to a decade of unpleasant experiences now seek **deletion of territory as the only recourse** that they have to improve their customer status and release themselves from captivity. **This preferred option of the petitioners to be connected as retail customers of Pasco County Water Utility will also provide them with water at a lower cost than Aloha can offer, assurance of continued water**

supply, a more friendly and proactive customer service and improved water quality within a much shorter interval of time from now. When Aloha had the chance to create a win-win situation for itself and the customers soon after the PSC hearing in January 2002, it deliberately rejected that opportunity, because it wanted to protect its interests at great risk to the customers. That is an indication to the petitioners that the corporate culture of Aloha is dominated by legalism and total disregard for its customers. **The customers are not masochistic enough to want to continue this relationship into the future. That the customers want their water provider to have a more customer oriented corporate culture is an extremely important point that we want the PSC to appreciate.**

Now that I have presented these well documented reasons for our freedom from the statutory imprisonment that we have been under for many years, we want the Commissioners, who have been given the police powers of the State of Florida to "***protect public health, safety and welfare***", to consider very carefully whether Aloha Utilities now has the credentials to be a drinking water provider for the citizens of Seven Springs or whether the PSC should grant the citizens the remedy that they are seeking of deletion of territory. **In the past the laws of this State have been used to protect the interests of a private corporation and to retain its monopoly status in spite of it not delivering to the customers a 'competitive product'. To continue to allow Aloha to be in the business of being a water utility in the context of what we have said here and documented extensively would be criminal injustice to the petitioners.**

The Public Service Commission in the year 2000 exercised its authority and jurisdiction by Order No PSC 00-0581-FOF-WS to extend the territory of Aloha under an administrative finding that it was in the 'public interest' to do so. In that particular instance Aloha had already violated Florida Statutes 367.045 (2) by extending its service outside the area described in its original certificate of authorization for a period of nine years without notifying the PSC. That PSC Order is a precedent setting event in which the PSC considered it appropriate to use its authority and jurisdiction for the furtherance of 'public welfare'. I would like to

suggest to the Commission that the case that the petitioners are making today for deletion is also very much in the 'public interest' and for the welfare of those who have suffered emotionally, physically and financially because of Aloha's unwillingness to attend to its customers' needs with the same vigor that it has approached its interest as a private enterprise.

Therefore, we request your deliberate and careful consideration of the choice that WE, the people have presented to you. We know that it is within your authority to grant our request. Whether you will do so as an urgent matter of fairness and justice to whom such has been denied during the last decade remains a task that you must undertake as you listen to the customers and petitioners who will make their presentations to you today.

Thank you.

V. Abraham Kurien, M.D.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Customers of Aloha Utilities, inc., for Deletion of Portion of Territory in Seven Springs Area in Pasco County, Florida	)	Docket 020896-WS
In re: Application for Increase in Water Rates for Seven Springs System in Pasco County by Aloha Utilities, Inc.	)	Docket 010503-WU
	)	Filed August 10, 2004

PETITION REQUESTING HEARING PURSUANT TO ∋120.57(1), FLORIDA STATUTES, AND PROTEST OF PROPOSED AGENCY ACTION

Pursuant to Rules 25-22.029 and 28-106.201, F. A. C., and ∋350.0611, Fla. Stat. (2003), V. Abraham Kurien, MD, Harry Hawcroft, and Ed Wood, individually and collectively, file this petition to protest proposed agency action order no. PSC-04-0712-PAA-TP issued July 20, 2004, and request an evidentiary hearing under ∋120.57(1), Fla. Stat. (2003).

1. The names and addresses of petitioners are as follows: V. Abraham Kurien, MD, 1822 Orchardgrove Avenue, New Port Richey, FL 34655; Harry Hawcroft, 1612 Boswell Avenue, New Port Richey, FL 34655; and Ed Wood, 1043 Daleside Lane, New Port Richey, FL 34655. Each of the petitioners is a customer of Aloha Utilities, Inc.

2. The action taken by the Florida Public Service Commission in its proposed agency action order no. PSC-04-0712-PAA-TP issued July 20, 2004 affects the substantial interests of Petitioners because the order would adversely affect the quality of water provided to petitioners by Aloha Utility, Inc.

3. Petitioner received notice of the Commission's decision electronically on or about July 21, 2004.

4. Order No. PSC-02-0593-FOF-WU was issued in April 2002 for the specific purpose of significantly reducing the incidence of "black water" and related complaints. That Order required removal of 98% of hydrogen sulfide from raw water in Aloha's wells from which underground water is pumped and processed using chlorination as the sole method.

5. On October 18, 2002 Aloha requested modification of the Order, because it was felt "that achieving the 98% removal standard was at best very expensive and at worst impossible". On July 23, 2003 OPC submitted a letter stating that the "Citizens agree that the 98% removal standard should be replaced with other standards". The letter suggested the use of the regional standard that the Tampa Bay Water Authority (TBW) uses of a total sulfide level of 0.1mg/L . The same letter noted, "Additional standards may also be appropriate depending on the final audit report findings".

6. On June 9, 2004 Aloha requested that the "fourth ordering paragraph of Order No PSC-02-0593-FOF-WU should be revised to read as follows:

> "Ordered that Aloha Utilities, Inc. shall make improvements to its wells 8 and 9 and then to all of its wells as needed to meet a goal of 0.1mg/l of sulfides in its finished water as that water leaves the treatment facilities of the utility. Compliance with such requirement shall be determined based upon samples taken at least annually from a point of connection just after all treatment systems and before entry of such water into the transmission and distribution system of the Utility. Aloha should implement this standard no later than February 12, 2005". (underlining added).

7. Dr. Kurien in a letter submitted through the OPC requested three amendments to this modification, two of which were initially included in the PSC Staff recommendations submitted on June 17, 2004.

8. On June 24, Attorney for Aloha submitted a letter to Atty. Rosanne Gervasi of the PSC objecting to these amendments, which were considered reasonable by the PSC staff. Dr. Kurien replied on June 27 and explained in great detail why these changes were appropriate in view of the Tampa Bay Water Authority's definition of its own standard and were scientifically necessary in view of audit findings as well as the fact that Aloha will soon start receiving water from a source other than its own wells.

9. On June 29, the PSC Staff withdrew its recommendations of June 17 and presented a new version, which accepted Aloha's modification, but with the proviso that

"Aloha shall be required to submit within 60 days from the date of the Commission's vote on this item regarding the feasibility of collecting and testing monthly samples at the domestic meters as proposed by Dr Kurien".

10. Since it seems likely that the Commissioners may have had very little time, just like the customers, to understand the implications of the PSC staff revision of its own recommendations at the last minute before the Agenda conference, petitioners wish to present in a §120.57(1) hearing the reasons why the Commissioners should change their decision on issue 4 of the Agenda Conference on June 29, 2004 issued as a PAA order.

11. The language of the Aloha modification of the PSC Order 02-0593-FOF-WU is a distortion of the Tampa Bay Water Standard as presented by TBW in its EXHIBIT D (submitted as Exhibit B with Aloha's request dated June 9, 2004). TBW standard states "Water supplied from the Authority's System shall be sampled annually at a minimum at the Point(s) of Connection for the following parameters". TBW supplies water to its member customers and the water is sampled at the point of connection into the customer's pipes. Instead, Aloha wants the sampling to be done "after all treatment systems and before entry of such water into the transmission and distribution system of the Utility", which is well before it reaches (in some cases miles away from) the point of connection with its customer's pipes.

12. This is a major departure from the TBW standard that the citizens agreed to on July 23, 2003. Dr. Kurien's correspondence with Mr. Devlin of the PSC shows that Mr. Devlin concedes that TBW maintains its standard to the point of connection with its customer's pipes and not at its treatment facility. If the intent of the Commission is to ensure that Aloha adopts the same standard as the TBWA, which the Citizens agreed to on July 23, 2003, then the language of the modification must be different from that suggested by Aloha and adopted by the Commission in its vote on June 29, 2004.

13. Major conclusion (2) in Phase II Report of Audit (page iv) submitted in February 2004 was: "A trace amount of hydrogen sulfide was detected in the influent to the main plant (0.12mg/L) during the November sampling".

14. The main plant receives its influent from treated water from wells 1,2, 3 and 4 . On November 12, 2003 the samples that were taken after the treatment facilities from these wells showed the levels of hydrogen sulfide to be less than 0.01 mg/L at all wells. Yet the hydrogen sulfide level in the influent into the main plant had risen to 0.12 mg/L during the transmission from the wells into the main plant reservoir. This strongly indicates re-formation of hydrogen sulfide is occurring within Aloha's distribution system, before the water reaches the customer's pipes. This will cause black water. Therefore, a standard of 0.1mg/L maintained at "treatment systems and before entry of

such water into the transmission and distribution system of the Utility", the modification of TBW standard recommended by Aloha and voted upon by the Commission is no guarantee to the customers that such low levels will be maintained to the point of connection with the customer's pipes. Aloha Utility must be held responsible for the quality of its water throughout its transmission and distribution system to the point of connection with its customer's pipes, the domestic side of the meter, as TBW holds itself responsible. Since re-formation of hydrogen sulfide is considered to be the major reason for corrosion of pipes and formation of black water, the standard should be maintained to the point of connection with the customer's pipes – the domestic meter.

15. Since Aloha does not have a central treatment plant and water from different wells are pumped into the distribution manifold there is a possibility that hydrogen sulfide levels are variable in different parts of Aloha's transmission and distribution system. Therefore it is important to check hydrogen sulfide levels at different sites, at the domestic meter on a rotational basis. Since hydrogen sulfide levels fluctuate seasonally, monthly tests are also necessary for ensuring compliance to the standard. Once a year sampling is not adequate for process control.

16. Aloha will soon receive water from Pasco County Water utility. Since Pasco County has not agreed to ensure that the water delivered to Aloha will meet the TBW standard, there is a possibility that such water may contain higher concentrations of hydrogen sulfide than the TBW standard. Mixing of water from Pasco County Utility

and water from the Aloha wells will take place; without careful blending and further treatment, the mixed water may contain more hydrogen sulfide levels than the TBW water standard. This lack of uniformity of hydrogen sulfide levels in Aloha's distribution system may result in persistence of the pattern of black water distribution now seen in the Seven Springs area.

17. Since Aloha does not undertake monitoring of hydrogen sulfide levels as part of process control and oxidant levels are manually adjusted, there is always the possibility of a mismatch between the two. An adequate chlorine residual is no guarantee of conversion of all hydrogen sulfide to sulfate. Elemental sulfur is almost always a likely intermediate product. In view of the association between elemental sulfur and black water, recently emphasized by the latest FDEP guidelines, it seems unwise not to include elemental sulfur within the standard in any attempt to reduce the incidence of black water.

18. As these reasons are based on a more accurate interpretation of the TBW standard and on data obtained from the audit, we respectfully request that the suggestions made previously by Dr Kurien in his letter of June 13 and submitted by the OPC to the PSC on June 16 be adopted by the Commission.

19. Accordingly, petitioners submit the following disputed issues of material fact, policy, and law for resolution in a hearing conducted under ∋120.57, Florida

Statutes (2003):

a. What would be the effect of the actions proposed by order no. PSC-04-0712-PAA-TP issued July 20, 2004, on the quality of water delivered to the customers of Aloha Utilities, Inc.?

b. Should the reference to sulfide in "finished water" in the proposed agency action order 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?

c. 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 0.1 mg/L, in finished water delivered at the point of entry into the domestic system?

d. 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

such sites be rotated to provide the greatest likelihood of detecting any departure from the maximum levels permitted?

WHEREFORE, Petitioners protest the Commission's proposed agency action order no. PSC-04-0712-PAA-TP issued July 20, 2004, and request an evidentiary hearing to be held pursuant to ∋120.57, Fla. Stat. (2003).

Respectfully submitted,

V. Abraham Kurien

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DOCKET NOS. 001503-TP and 020896-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 18th day of November, 2004.

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