

1 BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

2 ALOHA UTILITIES, INC.

3 DOCKET NO. 010503-WU

4 TESTIMONY OF DAVID W. PORTER, P.E.

5 Q. Please provide a brief resume of you training and experience as it relates to this
6 proceeding.

7 A. I hold a BSCE degree from the University of Massachusetts where the emphasis of
8 my studies was in water and wastewater system engineering. I have 32 years
9 experience in the operation, management, design, construction and troubleshooting
10 of water and wastewater facilities. During that time I have been employed as a
11 treatment plant operator and administrator, a design engineer, principal design
12 engineer and department head, vice president and general manager of a engineering
13 firm that specialized in the operation and design of water and wastewater facilities,
14 a senior engineer for an international water and wastewater equipment manufacturing
15 firm that supplies equipment for water and wastewater treatment projects worldwide
16 and as a independent water and wastewater utility consulting engineer. For 14 years
17 I taught treatment facility operation, maintenance and management as an adjunct
18 instructor at community colleges. I have also lectured on treatment plant operation
19 and troubleshooting at State sponsored short schools for treatment plant operators
20 and engineers. I have authored and/or co-authored technical papers and trade
21 magazine articles related to water and wastewater treatment facility design,
22 troubleshooting, and operation. I have served as the chairman of the American Water
23 Works Association's Pipeline Rehabilitation Standards Committee and have served
24 on technical advisory committees for the Florida Department of Community Affairs,
25 the American Water Works Association and the Florida Department of

DOCUMENT NUMBER-DATE

00275 JAN-7 13

FPSC-COMMISSION CLERK

1 Environmental Regulation. I am an A class certified plant operator in the State of
2 Florida, a Grade VII certified plant operator in the Commonwealth of Massachusetts,
3 and a licensed professional engineer in the States of Florida and Virginia. I am a
4 member of the American Institute of Chemical Engineers, the American Water
5 Works Association, the Water Environment Federation and the American Society of
6 Civil Engineers.

7 Q. Have you testified as an expert in PSC and/or County Utility Regulatory cases.

8 A. Yes I have testified as an expert in a number of PSC and/or County Utility
9 Regulatory cases over the last 9 years. A listing of those cases are as follows:

10 **DOCKET NO. 950615-SU** – PSC – Aloha Utilities - This case included wastewater
11 treatment and reuse issues as well as water quality and treatment issues.

12 **DOCKET NO. 960545-WS** – PSC - Aloha Utilities - This case included water
13 quality and treatment issues.

14 **DOCKET NO. 991643-SU** – PSC - Aloha Utilities - This case included wastewater
15 treatment and reuse issues.

16 **DOCKET NO. 010503-WU** – PSC - Aloha Utilities - This case included water
17 quality and treatment issues.

18 **DOCKET No. 2001-0007-0023** – Intercoastal Utilities - St. Johns Water and Sever
19 Authority - This case included water and wastewater treatment issues.

20 Q. Have you read the Direct Testimony of Dr. V. Abraham Kurien which he has
21 provided in this case do you have any comments related to your review of that
22 testimony?

23 A. Yes. I have a number of specific comments that follow.

24 Q. Dr. Kurien discusses the Tampa Bay Water hydrogen sulfide (H₂S) Standard in his
25 testimony. Regarding that testimony he states “ Water chemistry experts who know

1 what is achievable and what is not were responsible for that standard”? Do you agree
2 with Dr. Kurien’s statement?

3 A. Yes. However, the “Tampa Bay Water H2S Standard,” as it is provided in Exhibit
4 D of that Tampa Bay Master Water Supply Contract, was developed as a “goal” and
5 not an MCL (Maximum Contaminant Level} because, the water chemistry experts
6 who drafted this standard were keenly aware that it would be impossible to set an
7 MCL that could be met and still be economically feasible to implement. A “Goal” is
8 a target, that is to be strived for to the extent possible both from a technical and
9 economic standpoint. An MCL is an entirely different standard which requires that
10 a maximum concentration of a substance (in this case hydrogen sulfide) never exceed
11 a given level. Tampa Bay water (and all its member governments) and the water
12 experts that developed the Tampa Bay Water H2S standard recognized that to apply
13 an MCL instead of a goal would not be feasible and would be cost prohibitive.

14 Q. Dr. Kurien provides testimony that states that the language proposed by Aloha to the
15 PSC related to the Tampa Bay Water Standard was different than that actually
16 utilized by Tampa Bay Water. Do you agree with this?

17 A. No. The standard that Aloha proposed to the PSC was taken directly from the Tampa
18 Bay Water language. What Dr. Kurien claims is that the Tampa Bay Water standard
19 is applied at the “point of connection” to the member governments water distribution
20 systems and that some how that is different than applying the same standard to
21 Aloha’s point of connection to its water distribution system. In fact, the standard is
22 applied in exactly the same manner in both cases. Tampa Bay Water is made up of
23 a number of member governments who all have water distribution systems. When
24 Tampa Bay Water produces water, in essence, it is the organization (Tampa Bay
25 Water and all its member governments) who control the processing and distribution

1 of the water overall. When the water from Tampa Bay Water is distributed to a
2 member government it flows into the member government's water system and
3 supplements that member governments own water supplies (to the extent that they
4 exist). Therefore, the water supplied to Tampa Bay Water's member governments
5 (who also have control over the operation of Tampa Bay Water) is no different then
6 if the member governments had an additional water supply system of their own from
7 a functional standpoint. In no case does Tampa Bay Water (or any of its member
8 governments) apply the Tampa Bay Water H2S Goal to the water supplied to an
9 individual retail customer of any of the member governments. In fact, Aloha recently
10 completed negotiating a bulk water agreement with Pasco County (a Tampa Bay
11 Water Member Government). During these negotiations Aloha requested that Pasco
12 County extend the Tampa Bay Water H2S Goal on to the Aloha for the water it will
13 supply to the Aloha system and Pasco County refused to do so. Pasco County
14 therefore, refuses to apply this goal to the water it supplies to its bulk water customer
15 Aloha. The Tampa Bay Water H2S goal was meant to be a standard applied at the
16 point of delivery of Tampa Bay Water to the distribution systems of its member
17 governments and not to the point of connection of customer meters of the member
18 governments. This is exactly the same use of the standard that the Aloha proposed
19 to the PSC and the PSC provided in its Order.

20 Q. Do you have any additional comments related to Dr. Kurien's proposal that H2S be
21 monitored at the customer's meters?

22 A. Yes. PSC staff requested that Aloha prepare comments on this issue. On September
23 3, 2004 I provided Aloha with my comments which were subsequently submitted to
24 the PSC. My comments were as follows:

25

1 According to Standard Methods for Examination of Water and Wastewater (20th
2 edition), the analytical method used for monitoring of hydrogen sulfide is considered
3 accurate to 0.1 mg/L. While it is possible to obtain measurements of hydrogen
4 sulfide that are below 0.1 mg/L, these measurements are not considered to be
5 accurate. This is why the Tampa Bay Water “Standard” and, that proposed by Aloha
6 is expressed as a “goal.” To monitor hydrogen sulfide to this “goal” at the treatment
7 plant sites, where sampling and testing procedures can be closely controlled, can be
8 undertaken. To attempt to conduct this testing at a point in the field, where neither
9 sampling nor testing conditions can be controlled would be highly impractical and
10 would lead to unacceptably low accuracy and precision.

11 Aloha will need to utilize the services of a commercial laboratory to conduct the
12 hydrogen sulfide sampling and testing if water anywhere other than at the plants was
13 to be analyzed. Depending on the number of events conducted each year and the
14 number of sites sampled and tested each event, the costs would be quite substantial.
15 In the context of the Aloha system, monitoring of hydrogen sulfide at the treatment
16 facilities can provide direct information on the performance of the process and used
17 to fine-tune the facility operations, if appropriate. The water at any other location in
18 the distribution system can consist of water from multiple wells and/or Pasco County
19 (Tampa Bay Water) bulk finished water supply, depending on the time of day and the
20 net water demand in the system. This mixing of Pasco County (Tampa Bay Water)
21 bulk finished water supply with Aloha water in the distribution system would
22 produce a combined water that would not reflect the quality of water produced by
23 Aloha’s own facilities if taken alone. The water supplied by Pasco County (Tampa
24 Bay Water) would not necessarily contain hydrogen sulfide levels at or below the 0.1
25 mg/L goal. The level of hydrogen sulfide in Pasco County’s (Tampa Bay Water)

1 water is not within the control of Aloha. In fact, Aloha has requested that the County
2 provide a clause in its bulk water agreement with Aloha that would limit the
3 hydrogen sulfide concentration to 0.1 mg/L or less and the County has refused to do
4 so. Since Aloha can not control the hydrogen sulfide concentration of the mixture of
5 Aloha produced water and Pasco County (Tampa Bay Water), it can not control the
6 concentration of hydrogen sulfide at any point in the distribution system other than
7 at the point where its treated water enters the distribution system (at the plant
8 locations) prior to it mixing with any other source of water.

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

18 Q. Dr. Kurien stated in his testimony that a Maximum Contaminant Level (MCL)
19 should be ordered for H₂S in stead of the goal as presently ordered. Do you have any
20 comments?

21 A. Yes. Dr. Kurien's proposals would impose upon Aloha a Standard that is not required
22 anywhere in this nation, perhaps in the world. It would be much more stringent than
23 that utilized by Tampa Bay Water and all of its member governments.

24 MCL levels are set by the USEPA and FDEP for substances that pose a health related
25 risk of sufficient magnitude that the costs of compliance are justified. The process

1 that these agencies go through to set and MCL is very complicated and time
2 consuming. Once a potential risk is identified, a number of detailed studies are
3 conducted to determine what the potential health risks are, what the level of risk is,
4 if there are presently treatment technologies available to render the substance less of
5 a concern, if new technologies can be developed to render the substance less of a
6 concern. Cost-Benefit analysis is undertaken as part of the MCL development
7 process. Stakeholders, such as utility representatives, state regulatory agency staff,
8 water users, and many others are then assembled and detailed analysis of the
9 feasibility of setting an MCL for the substance is undertaken. Only after a great
10 amount of study and evaluation have been completed is an MCL for a substance
11 established. This process often takes many years to complete. The PSC should not
12 attempt to set an MCL for any substance without undertaking a study and evaluation
13 process at least as detailed as that used by the USEPA and the FDEP for other water
14 contaminants. The USEPA and FDEP have both considered establishing hydrogen
15 sulfide limits over the years and have always chosen not to do so based on their
16 analysis of the need for such limitations. It is generally understood that hydrogen
17 sulfide is considered by the regulatory agencies to be a substance that affects the
18 aesthetics of the water and does not pose sufficient health risks so as to support the
19 establishment of a MCL.

20 In addition, since Aloha will soon begin taking a substantial quantity of water from
21 Pasco County Water System to supplement its own supply, and since Pasco County
22 has refused to provide Aloha with a guarantee that its water will meet even the
23 present TBW H₂S goal, Aloha would be put in a position that it would have to meet
24 an MCL for the water in its distribution system which would include a substantial
25 portion of water received from Pasco's water system, which Aloha does not control,

1 and which Aloha has no guarantee will meet the Tampa Bay Water Goal, much less
2 the far more stringent MCL standard proposed by Dr. Kurien. If Aloha were ordered
3 to meet a MCL it would have to provide its own treatment for Pasco's already treated
4 water to ensure that the water provided at its customer's meters met the MCL. This
5 would be very expensive to accomplish and would serve no useful purpose.

6 It would not be technically or economically feasible for Aloha (or any other water
7 system) to meet the MCL as proposed by Dr. Kurien.

8 Q. Are there any USEPA or FDEP standards that require water systems to meet a H2S
9 concentration goal or MCL at a customer's meter?

10 A. No there are not. In fact, the language in the present Order setting a goal for H2S
11 concentration at the point of connection of the water plants to the distribution system
12 imposes a standard that is not required by any USEPA or FDEP rule. For the PSC to
13 set an MCL for H2S at the point of connection of the water plants to Aloha's
14 distribution system would be a much higher standard and would be far greater than
15 that which every other water plant in Florida must meet. To impose an MCL for H2S
16 to be measured at the customer's meters would be an unbelievably higher standard
17 that could not be met and has never been required of any water system in the United
18 States to the best of my knowledge.

19 Q. Dr. Kurien states that Dr. Levine's study found that sulfide re-formation occurred
20 with the transmission system of Aloha Utilities? Is this correct?

21 A. No. Dr. Kurien is mistaken. None of the testing completed by Dr. Levine found
22 sulfides in the water transmission system. A slight hydrogen sulfide concentration (of
23 0.12 mg/L) was found in the partially treated water flowing in a pipeline connecting
24 two treatment plants with the main ground storage tank. This water does not flow to
25 the distribution system. It only flows to the inlet of the ground storage tank where it

1 receives final treatment prior to its being pumped to the distribution system. On the
2 same day the water leaving the ground storage tank contained no hydrogen sulfide.
3 Hydrogen sulfide testing was conducted at the meters of 8 customer's homes and no
4 hydrogen sulfide was found at any of these points.

5 Q. Dr. Kurien states that he believes that there is turbidity in Aloha's finished water
6 which causes a reduction in the effectiveness of the chlorine disinfection system
7 resulting in hydrogen sulfide generation taking place in the distribution system?
8 Would you care to comment?

9 A. Yes. Dr. Kurien is mistaken.

10 Dr. Levine conducted suspended solids testing of the water sampled from a number
11 of customer meters during her work. In each case, no measurable quantity of
12 suspended solids were found.

13 More importantly though is the fact that there is no indication that the disinfection
14 process at Aloha's plants is not operating efficiently. In fact, as shown below, just the
15 opposite is true:

16 Aloha tests for coliform bacteria (a measure of the efficiency of the disinfection
17 process) on a regular basis in over 30 locations throughout its distribution system. In
18 the time I have been associated with Aloha (approximately 9 years) Aloha's coliform
19 testing results have been as good if not better than that of the surrounding utilities.
20 This would tend to indicate that the disinfection process is working well and,
21 therefore, turbidity can be assumed not to pose a problem for the disinfection process.
22 Also, Aloha has analyzed its water for Heterotrophic Plate Count (HPC)(which is
23 another measure of the overall biological activity of the finished water and therefore,
24 an indirect measurement of effectiveness of the disinfection process). HPC is also
25 sampled at over 30 locations throughout the water distribution system. The HPC

1 counts have been found to be extremely low overall. This is therefore another
2 measure of how well the disinfection process is working and therefore, also indicates
3 that turbidity is not of sufficient concentration to affect the disinfection process.

4 A large number of samples (many of which were taken by Dr. Kurien himself and/or
5 by FDEP or Dr. Levine) showed that hydrogen sulfide was not present in realistically
6 measurable quantities at the point of delivery to the customers. FDEP has conducted
7 numerous random, unannounced tests of water provided by Aloha at the customer's
8 meters at the request of Dr. Kurien and/or other customers and has found Aloha's
9 water to meet the chlorine residual requirements (a measure of the effectiveness of
10 the disinfection process) and other applicable standards.

11 The presence of free chlorine in the distribution system and at the customer's meters
12 indicates that hydrogen sulfide generation in the distribution system is highly
13 unlikely.

14 Q. Dr. Kurien states in his testimony that the Tampa Bay Water H₂S standard requires
15 their water to be tested at least 4 times annually instead of once per year as requested
16 by Aloha? Would you care to comment?

17 A. Yes. Dr. Kurien is mistaken. The Tampa Bay Water standard requires annual testing
18 as was requested by Aloha.

19 Q. Dr. Kurien states in his testimony that there is "significant consumption of free
20 chlorine residual within the transmission and distribution system" at Aloha? Would
21 you like to comment?

22 A. Yes. The data that Dr. Kurien provides in his exhibit and references in his testimony
23 are monthly reports that Aloha submits to FDEP. These reports show the free
24 chlorine residual of the water as it left the water plants and the lowest free chlorine
25 residual found each day at a remote location. The remote locations are points where

1 the water may sit for a substantial amount of time (as required by FDEP rule). This
2 is where one would expect the free chlorine residual to be at its lowest level. FDEP
3 rules require that the free chlorine residual at this point be at least 0.2 mg/L. The
4 reports referenced by Dr. Kurien show that Aloha's water easily met the FDEP
5 standard each time it was tested, and in most cases, exhibited free chlorine residual
6 greatly in excess of the minimum free chlorine residual required. His own referenced
7 data shows that Dr. Kurien's statement is not correct.

8 Q. On pages 12 through 14 of his testimony, Dr. Kurien provides testimony related to
9 his evaluation of the potential merits of two hydrogen sulfide treatment technologies
10 – conversion utilizing oxidation (with hydrogen peroxide) and removal utilizing
11 aeration or the MLEX process. Do you have any comments about this testimony?

12 A. Yes. First, I believe that Dr. Kurien's testimony here is not appropriate since this
13 topic (choice of treatment technology to meet the specified goal) is not one of the
14 matters at issue according to the Commission's consummating order. However, since
15 Dr. Kurien chose to provide testimony on this issue anyway, I feel compelled to
16 respond to it.

17 Dr. Audrey Levine, a well-respected expert in water treatment, conducted a two-part
18 study of Aloha's existing water system for the Office of Public Council at the request
19 of the customers as part of this Docket. In her reports she provided a series of
20 recommendations which she believed could reduce the frequency of the odor and
21 discolored water problems reported by some of Aloha's customers. One of her
22 recommendations was to consider replacing the existing chlorine oxidation process
23 with the hydrogen peroxide oxidation process. Her reasoning for proposing this
24 process was that it would not produce appreciable quantities of the elemental sulfur
25 or other constituents that Dr. Kurien discusses in this testimony and that this would

1 enhance the overall quality of Aloha's water.

2 Dr. Kurien also proposes that elemental sulfur limitations should be imposed in
3 addition to the 0.1 mg/L sulfide limits already approved by the Commission. The
4 measurement of elemental sulfur as proposed by Dr. Kurien is not technically
5 possible. Standard Methods for Examination of Water and Wastewater (20th edition),
6 the laboratory standards manual used in the industry, does not even include a testing
7 method for elemental sulfur. If the commission was to impose such a requirement,
8 there would be no recognized method for complying with the order.

9 Q. Would you care to offer any additional comments regarding your position on Dr.
10 Kurien's testimony in this matter?

11 A. Yes.

12 Dr. Kurien is not an expert in water treatment, FDEP rule compliance, or any other
13 factor upon which he as testified. He is a layman attempting to provide technical
14 testimony about a subject which even the true experts do not fully understand. He
15 attempts to rationalize his proposed new standards to regulate a water constituent that
16 the experts in the industry have not been able to develop due to the complexity of the
17 issues. What might appear to be "common sense" to Dr. Kurien regarding how to
18 address these issues is far from being so. The USEPA and the FDEP have not seen
19 fit to attempt to establish the standards Dr. Kurien is requesting the PSC impose on
20 Aloha. This is because they are true experts in the water treatment and regulatory
21 field and understand that there are far-reaching ramifications and costly nature of
22 attempting to do so. They also recognize that a great deal of study, investigation and
23 evaluation must be undertaken before any new standard is put into place.

24 The Tampa Bay Water standard, as outlined in the current PSC Order, is already very
25 difficult for water utilities to meet, even the large Tampa Bay Water member

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

government facilities. A recent report prepared for Tampa Bay Water illustrated that some of the member governments were still working on achieving this standard and may not be doing so. Pasco County to this day, will not provide assurances that the water it supplies to Aloha will consistently meet the 0.1 mg/L hydrogen sulfide goal. To expect any utility to meet the much more stringent standards proposed by Dr. Kurien would not be technically and cost-effectively feasible for the large neighboring utilities, much less for Aloha.

Dr. Kurien has not provided any proof in his testimony which shows that implementing his recommendations regarding modifying the existing PSC Order would result any benefit to anyone including the customers. His protest should be dismissed and the present Order as it related to setting an H2S concentration goal and testing requirements should stand as is.

Q. Do you have anything further to offer?

A. No.