BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

KW RESORT UTILITIES CORP.

DOCKET NO. 070293-SU

APPLICATION FOR INCREASE IN WASTEWATER RATES

IN MONROE COUNTY

REBUTTAL TESTIMONY OF ED R. CASTLE

Q. Please state your name and professional address for the record.

A. Edward R. Castle, Weiler Engineering Corporation, 5800 Overseas Highway, Marathon, Florida 33050.

Q. By whom are you employed and what is your position?

A. Employed by the Weiler Engineering Corporation as Vice President and Director of the wastewater division.

Q. Please state your educational background post high school.

A. I was graduated from the University of Kentucky with a Bachelor of Science in Chemical Engineering, emphasis in water pollution control.

Q. Please synopsize your professional experience.

A. I have been employed in wastewater related professions since 1987. I was Laboratory Director for Seminole County Environmental Services for 2 years, followed by 9 years with Operations Management International as a wastewater operations specialist, then 4 years as Director of Operations for Davis Water Analysis/Synagro Technologies. The past 5 years have been as a Professional Engineer for

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the Weiler Engineering Corporation.

Q. Do you have any professional affiliations?

A. I am a licensed Professional Engineer in Florida and hold a Class A wastewater treatment plant operator's license, also in Florida.

Q. What is the purpose of your rebuttal testimony?

A. To provide response or clarification to testimony given by Andrew T. Woodcock and by Kimberly H. Dismukes.

Q. Please describe your familiarity with KW Resort's wastewater system.

A. I first became familiar with KW Resort's wastewater system in 1990, working as an independent Consultant to the company operating the system at that time. In 1998, I was employed full-time by the operating company and continued to assist with KW Resort issues along with their other wastewater systems. Since I began my employment with Weiler Engineering in 2003, I have been assigned as the Consulting Engineer for the KW Resort system.

Q. What have you done in preparation for the rendering of your testimony and opinions?

A. I have reviewed copies of Mr. Woodcock's and Ms. Dismukes' testimony.

Q. Mr. Woodcock commented on the used and useful analysis provided by the utility. What is your opinion with regard to Mr. Woodcock's used and useful analysis?

A. I agree that the permitted capacity is based on annual average daily flow rather than 3-month average daily flow. Mr. Woodcock states in line 22 of page 4 of his testimony that the growth allowance is limited to 5% per year and therefore adjusts growth by 25% for the 5 year period. However, 25-30.432 FAC states that the extent to which the area served is built out should be considered, implying that projected growth based on factors other that a strict percentage should be reasonably allowed. The known developments proposed to connect to the KWRU plant should be considered in future capacity calculations as well as a standard percentage growth rate. Stock Island is experiencing significant redevelopment of properties into higher density uses as indicated by capacity reservation agreements with KWRU. The redevelopment of certain properties is also addressed in the wastewater report generated by URS Engineering for the Monroe County BOCC. I agree with Mr. Woodcock's statement on page 5 of his testimony that the expansion to 0.499 MGD was not required by the agreement with Monroe County. The expansion in 1997 was required by FDEP in order to provide capacity for the Key West Golf Club Development housing. However, the conversion to AWT was required by the agreement with Monroe County.

Q. Have you reviewed Mr. Wookcock's testimony regarding the

original cost study prepared for the utility by your company?

A. Yes.

Q. What is your opinion regarding Mr. Woodcock's analysis and conclusions?

A. Mr. Woodcock deferred providing an analysis until such time as he had reviewed the final version of the cost study. I therefore have no opinion at this time.

Q. Ms. Dismukes commented on the AWT conversion project and on change orders to the US Filter contract as a result of delays with permitting. What is your opinion of Ms. Dismukes' testimony regarding permitting delays?

A. The Capacity Reservation Agreement between Monroe County and KW Resort Utility Corp. specifically stated that the agreement constituted all required permits and that no further permits were required from the County. Based on the agreement, KWRU assumed that no building permit was needed. When the County red-tagged the AWT construction project, work was stopped until a permit could be obtained. The delay was caused by the position taken by the Building Department that the permitting condition in the Agreement was not valid and that a building permit was required. This was beyond the control of KWRU.

Q. What is your opinion of Ms. Dismukes' testimony regarding the resleeving project?

A. Ms. Dismukes contends that the sewer lining project was performed in order to deal with excessive infiltration and inflow. However, there was not excessive infiltration and inflow in the system at the time this project was undertaken, based upon the standard of 500 gallons per day per inch of pipe diameter per mile of pipe. The lining project was necessary to prevent fluctuations in salinity and inflow due to inflow and infiltration that would adversely affect the AWT treatment process. Changes in salinity and in hydraulic retention time can adversely affect the biological nitrogen removal process, causing the AWT process to fail to meet the stringent nitrogen standards. Ms. Dismukes further contends that the lining project will reduce power and chemical costs. The increase in chemical cost for the AWT process is due to the alum feed needed to precipitate phosphorus. Since rainwater and groundwater do not contain significant levels of phosphorus, the impact on chemical cost is negligible. Similarly, the largest cost for power is due to aeration requirements that are directly related to the biochemical oxygen demand created by the pollutant load in the wastewater. Once again, rainwater and groundwater have a very low biochemical oxygen demand, so reduction in rainwater and groundwater flow to the treatment plant would result in a negligible savings in aeration power. There will be a small savings in

the electrical costs at the wastewater pump stations, directly related to the reduction in volume of flow due to reduced inflow and infiltration.

Q. Have you reviewed Ms. Dismukes' testimony questioning the need for the utility's recent resleeving and ongoing I&I work?

A. Yes.

Q. What is your reaction to her allegation that either of these undertakings were not "required"?

A. I believe my remarks above cover my reaction. Both are definitely required. As I stated previously, the salinity and fluctuations of flow are very detrimental to the biological nutrient removal process necessary to meet the stringent nitrogen limits required by the AWT standards. The resleeving program was necessary to reduce those fluctuations and salinity, and ongoing I&I programs to maintain very low levels of I&I are absolutely necessary for AWT because it doesn't take much to upset the biological process. There is always going to need to be continuous ongoing I&I correction because of the high salinity of groundwater here. That's what causes the impact on the biological nutrient process as opposed to some place with fresh water groundwater where you are only dealing with hydraulic loading rather than both hydraulic loading and salinity changes.

Q. In your experience, what level of I&I is considered acceptable?

A. That varies, based upon the characteristics of the I&I and the treatment requirements of the facility. It is my understanding that the PSC uses the WPCF standard of 500 gallons per day per inch of pipe diameter per mile of pipe. This would equate to an allowable I&I flow of about 80,000 gallons per day for the KW Resort collection system. In my opinion, that standard is insufficiently stringent due to the characteristics of I&I in the Florida Keys combined with the low nitrogen limits for AWT treatment. The porous coral rock and the low surface elevation of the islands means that the groundwater is typically sea water with a salinity of 35 parts per thousand. And the groundwater table elevation rises and falls with the tides. The rising and falling of the saline groundwater elevation means that the I&I can increase and decrease with the tides. The salinity of the wastewater must be kept consistent in order to allow for adequate biological nutrient removal. In the case of KW Resort, the average daily flow is approximately 320,000 gallons per day with a salinity of about 1 part per thousand. To avoid detrimental impacts to the biological process, the salinity should not be allowed to rise above 3 parts per thousand. This means that we can't allow more than about 45,000 gallons per day of saline groundwater to

enter the system.

Q. Are there unique challenges to a system in Key West?

A. I would say that there are two things that make it challenging and different than the average mainland system. One is the salinity again; you need to keep the I&I down because of the impact of the salinity fluctuations on the biological process. Also with the vacuum collection system water-logging the system can be a major problem and a vacuum system is the most cost-effective type of system currently available down here because the groundwater table is so high. The vacuum system must be kept water-tight to reduce the potential for water-logging. The dual challenge down here is to prevent the vacuum system from water-logging and to keep the salinity of the wastewater from fluctuating with the tidal elevation of the groundwater.

Q. Do you have any understanding whether the PSC has a general policy regarding an acceptable level of I&I?

A. I have learned from discussion with the utility's attorneys that the Public Service Commission generally utilizes the policy drawn from the published "Manual of Practice No. 9 of the Water and Pollution Control Federal (WPCP)" that states that infiltration of 500 gpd per inch of pipe diameter per mile is an acceptable level.

Q. Do you believe the ongoing I&I work at KW is both necessary and reasonable?

A. Yes, I do.

Q. Do you believe there are any unnecessary or excessive costs associated with the resleeving of lines or other I&I at KW, both as to your experience in the past and on a going forward basis?

A. Based upon my experience, the resleeving was the most economical approach that the utility could have taken on the gravity system to control the I&I. I have seen other projects down here in the Keys, and in the City of Key West in particular, where I&I was addressed by a total pipe replacement project and, in my opinion, this resleeving with follow up point repairs as needed is a much more economical approach. Trenchless technology such as pipe lining and grouting is typically a fraction of the cost of pipe repair, particularly in areas such as the Keys where the high groundwater table combined porosity of the coral rock makes dewatering of trenches very difficult, increasing the cost of open trench construction dramatically. In my opinion, a program of on-going sleeving and grouting as needed is the most economical means of reducing I&I in existing sewer collection systems.

Q. Did you assist in the preparation of exhibits that are sponsored by Mr. DeChario concerning engineering related services provided by your firm in this rate proceeding?

A. Yes, I did. I prepared both a schedule of actual engineering services provided by my firm and billed to the utility which are directly related to this rate proceeding up through the end of July and an estimate to complete this rate case based upon information of future events of which I was aware through discussions with the utility's counsel about what would be required of me. I believe these accurately represent the actual and estimated cost for engineering services to complete work related to this rate case.

Q. Does this conclude your Rebuttal Testimony?

A. Yes, at this time.