CAPTIVA ISLAND SEPTIC TANK IMPACT STUDY
SUMMARY

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BACKGROUND

The Captiva Community Panel and its Wastewater Committee have been evaluating alternative long-term wastewater strategies for Captiva, an issue of great importance to many Captiva property owners. TKW Consulting Engineers was retained by Lee County at the Panel's request to develop and evaluate Captiva's long- term wastewater alternatives. TKW has presented its findings to Captiva in a written report posted on the Panel website and in a public meeting that was held January, 2019. After reviewing the TKW study and resulting public comment, the Panel determined that it was essential to learn more about potential public health and environmental risks if the island continued to rely upon conventional septic systems as its primary method of wastewater disposal. The Panel also wanted to understand these risks in the context of threats to health and environment from sources other than Captiva septic systems. The Panel retained David Tomasko, PhD of Environmental Science Associates to make an assessment of these risks. Dr. Tomasko has completed his research, issued a final report and will present his findings to Captiva in a public meeting to be scheduled in January. Dr. Tomasko's report is lengthy, detailed and presented using technical language. This document is intended to be a summary of Dr. Tomasko's principal findings written in a manner that will be easily understood by readers who are not technically oriented. Dr. Tomasko has reviewed this summary and believes it accurately describes his principal conclusions.

CAPTIVA SEPTIC SYSTEM FDOH COMPLIANCE

The Florida Department of Health has regulatory guidance that governs proper use and location of conventional septic systems: (1) Conventional septic systems should maintain at least 24" of separation between the septic drain field and the underlying water table. (2) Conventional septic systems should be used only on land parcels one half acre or larger. (3) Conventional septic systems should be set back at least 75 feet from any coastal water bodies. To determine Captiva's current compliance with this guidance, Dr. Tomasko examined permits for 60 septic systems and soil sample data from 30+ properties located throughout Captiva outside the South Seas Resort area (which is served by a central sewer system). Travis Richardson, a soil engineer, conducted the soil sampling program under Dr.Tomasko's direction.

The analyses revealed that nearly half of Captiva's septic systems likely do not maintain the minimum 24 inches of separation between drain field and water table. A large majority of parcels in the village area are less than one quarter acre in size, even less than the one half acre guidance for minimum lot size. There may be some parcels outside the village area that are not at least one half acre but these parcels are likely a small minority. While the majority of Captiva setbacks exceed 75 feet, more than 50 percent of the homes on Roosevelt Channel do not. In sum, there are a great many conventional septic systems now in use on Captiva that do not

meet FDOH guidance for proper septic system use. The lack of compliance is most noteworthy in the Village where density is the greatest and lot sizes the smallest, but lack of compliance exists in other areas of Captiva as well.

COASTAL WATERS NUTRIENT IMPACT

Dr. Tomasko's report contains an estimate of the nutrient impact to coastal waters that can be attributed to Captiva's septic systems. The nutrient impact is not significant, both in absolute terms and in comparison to other sources of nutrients. This conclusion is surprising given Captiva's lack of compliance with FDOH guidelines. To reach this conclusion, ground water sample data collected by SCCF in a 2011 study were evaluated. The nutrient content of the ground water surrounding Captiva's septic systems was far below the nutrient content that is presumed to exist in the septic tanks. Therefore, the vast majority of pollution creating nutrients that are flowing through septic drain fields are not reaching the underlying water table. Dr. Tomasko believes most of the nutrients are converting to an inert form before entering the water table through nitrification and denitrification. An explanation of these technical processes is beyond the scope of this summary. However, it is clear that the nutrients in Captiva's septic tanks are not polluting the ground water significantly and, therefore, cannot be meaningfully reaching and impacting the nutrient content of coastal waters.

While Dr. Tomasko does not find a significant CURRENT nutrient threat to coastal waters, he believes there is a very significant long-term threat due to sea level rise. Using NOAA estimates of local area sea level rise for the year 2050, Dr. Tomasko believes that a majority of Captiva septic systems will have little or no separation between septic drain field and underlying water table 20-30 years out from present day. This creates the potential for septic effluent to flow directly from drain fields into the water table. Moreover, with the water table rising into the drain fields, the likelihood of encountering compromised drainage from sinks, washing machines and toilets will increase. These issues will have to be addressed through significant modification of many septic systems or by employing a central sewer wastewater system. Due to the small size of most lots in the village area and probable widespread lack of existing minimum 24" drain field/water table separation, Dr. Tomasko believes it may be more difficult for the village area to make the necessary adaptations than other areas of Captiva. Dr. Tomasko also cites the possibility that current lack of compliance with minimum FDOH standards for conventional septic system use may become more problematic in the future as concerns over water quality and threats to it gain more public and regulatory attention.

PATHOGEN IMPACT

To evaluate the possibility that Captiva septic systems might be releasing pathogens harmful to human health, Dr. Tomasko collected water samples from Captiva's storm water drainage areas near McCarthy's Marina on two separate occasions. The samples were lab analyzed for the presence of pathogens traceable to human origination. While very large amounts of bacteria existed in the samples, none were human-originated. If Captiva septic systems were spreading harmful pathogens, evidence of these pathogens would likely exist in Captiva's largest storm water collection area. Therefore, the report concludes that Captiva's septic systems are not likely releasing harmful pathogens in significant amounts.

STORMWATER RUNOFF NUTRIENT IMPACT

Dr. Tomasko's research develops estimates of coastal water nutrient pollution from sources other than Captiva's septic systems. These include storm water runoff, the FGUA wastewater processing plant at South Seas and the "package" wastewater treatment facilities at Tween Waters, Captiva Shores and Sunset Captiva. Of these potential sources, the research identifies storm water runoff as a potentially very significant contributor to coastal water nutrient levels. Dr. Tomasko's report states "Currently, it appears that the main source of nitrogen loads to nearshore waters is stormwater runoff." Dr. Tomasko's estimates of coastal water nitrogen loading due to storm water runoff come to nearly identical conclusions as estimates developed by SCCF in a 2011 study. It should be clear that storm water runoff is vastly more important to Captiva's coastal water quality today than is the current impact of Captiva's reliance on septic systems.

CONCLUSION

The preceding summary does not purport to review all the data, analyses and conclusions contained in Dr. Tomasko's research report. However, the following are the principal conclusions the Panel should consider as it develops wastewater strategic guidance for Captiva: (1) Present day, Captiva's reliance on septic systems is not a significant threat to coastal water quality or human health. (2) If Captiva continues to rely upon septic systems long term, major adaptations will be required long-term to ensure that septic systems can cope with the impact of sea level rise, (3) There is significant lack of conformance to FDOH guidelines for proper septic system operation, (4) The biggest current threat to local coastal water quality that can be impacted by public action is stormwater runoff.