

Comments: 7-10-20 Workshop, Department of Economic Opportunity

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1. My name is Donald Maynard. I am a Florida licensed geologist. I have specialized training in hydrogeology, the movement of fluids in underground environments. I am a resident of the Florida Keys and have spent a great deal of time observing and studying its karst geology. I also have more than 30 years' experience as a licensed geologist and well driller in other states throughout the country.

2. It is my professional opinion that the karst geology of the Florida Keys allows sewage effluent disposed to 100+-foot deep shallow wells to rapidly migrate to surface waters and that this is the functional equivalent of a direct discharge of the effluent to the surface waters.

I. CUDJOE WASTEWATER TREATMENT PLANT DYE TESTS: I have studied test results and photographic evidence of a direct and rapid hydrological connection between the shallow well injection sites at Cudjoe Key and the nearby surface waters. The available data indicates that injected effluent will migrate to surface water within a period of days.

a. I've reviewed and am familiar with the dye tracer tests at the Cudjoe Key Regional Wastewater Treatment Plant conducted by Dr. Henry Briceno and colleagues at the request of the Florida Keys Aqueduct Authority in 2014 and 2015. I agree with Dr.

Briceno's November 14, 2015 e-mail confirming that the results of his dye test and investigation prove a direct connection between the shallow injection wells and the water table aquifer and that rapid transport of the injected effluent to surface water will occur.

b. I've also reviewed the tests conducted by Water Science Associates in 2015 at the Cudjoe facility. The synchronous (at the same time) change in water levels in the shallow (less than 20 feet deep) monitoring wells and the less shallow (80+ feet) injection wells in response to tidal variation indicates a high permeability connection between the less shallow wells and the water table (documented by WSA in their September 2015 report). Therefore, the horizontal layers cited in that report as "potentially" impeding the flow of effluent injected water to the upper aquifer and open water, are not laterally continuous or have significant tunnels and/or holes in them, and do not, in fact, prevent or retard migration of the shallow well injected effluent to surface water (see Figure 4 of the WSA report, noting "DURICRUST Q ZONES - POTENTIAL CONFINEMENT"). I note that Dr. Briceno agrees that the WSA water level data collected during the injection test provides an additional line of evidence that there is a direct hydraulic connection between the shallow injection wells and surface water.

c. As a result of these tests and other information brought forth in citizen litigation involving Cudjoe, the Florida Keys Aqueduct Authority made the scientifically sound decision to drill a deep well and to use its four shallow wells only for back-up.

II. MARATHON SUCRALOSE TESTS: I am familiar with the use of sucralose – a

man-made substance – as an indicator of the presence of human wastewater in the marine environment. I have reviewed the sucralose tests performed at Earl Laboratories from water samples taken from surface water near Marathon’s Wastewater Treatment Plant #4 in 2020. The tests revealed high concentrations of sucralose. The samples were collected from an area with grey smelly water which persisted over several weeks in a defined plume, and contained high concentrations of sucralose, which indicates the presence of a probable hydraulic connection between Marathon’s Wastewater Treatment Plant #4 and the nearby surface waters.

3. These tests demonstrate that in the karst geology of the Florida Keys, shallow sewage well injection is the functional equivalent of a direct discharge to surface waters. There is no significant residence time within the rock structures to “clean” the effluent through any chemical process. The partially treated sewage effluent is basically the same when it reaches the surface water as when it leaves the wastewater treatment plant.

4. I am aware that the Florida Keys use a large number of shallow wells for stormwater disposal without any significant clean up prior to disposal. These shallow stormwater wells, like the shallow sewage wells, are also the functional equivalent of a direct discharge to surface waters.

s/ Donald M. Maynard