

19 March 2020

Texas Commission on Environmental Quality  
PO Box 13087  
Austin, TX 78711-3087  
submitted via on-line comment system

Re: Comments on Honey Creek Ranch WWTP, Permit No. WQ0015835001

Dear TCEQ,

I am Dr. George Veni, Texas Professional Geologist License #682 and Executive Director of the National Cave and Karst Research Institute (NCKRI). NCKRI was created by the US Congress as the national authority on caves and the vulnerable karst terrains and aquifers in which they occur.

As a karst hydrogeologist, I have studied the Glen Rose Aquifer system for over 40 years. The core of my PhD dissertation was focused on the proposed Honey Creek Ranch area. Though I currently live out-of-state, I still maintain the database on caves and karst features in Bexar, Comal, and Kendall counties for the nonprofit Texas Speleological Survey (TSS) and continue to visit and study the area regularly.

After reviewing your undated (presumably late 2019 or early 2020) "Permit to Discharge Wastes" to Silesia Properties, LP, (Permit No. WQ0015835001), I offer the following concerns and comments.

**Hydrogeologically inappropriate location:**

The location and scale of the proposed Subsurface Area Drip Dispersal System (SADDS) is inappropriate for the site's hydrogeological conditions for multiple reasons. Wastewater drip dispersal systems were initially designed in temperate to humid regions with loamy soils tens of feet thick, containing lush vegetation to readily absorb nutrients and breakdown contaminants. In contrast, the Comal County soil survey shows the project area has absent to thin soils, typically about a foot thick. Additionally, they are clay-rich with a greater propensity to shed water than absorb it. Consequently, the ability of the soils to absorb and effectively treat wastewater is quite limited. This limited capacity of the soil will result in relatively rapid saturation of the soil with two major repercussions; untreated water will flow out of the soil either down into Honey Creek and/or down fractures and karst features into the Lower Glen Rose Aquifer.

I have not been able to review a copy of the applicant's proposal to evaluate their site characterization report and specific design criteria to overcome site-specific challenges. However, based on the TCEQ permit I reviewed, I found no mention or consideration of the following factors:

- 1) What is the storage and bioremediation capacity of the soils following rainfall events of different intensities? Such influxes of water will periodically oversaturate the soils, enhancing runoff of untreated effluent down the creek and into the aquifer.
- 2) What is the effect of the watered lawns and gardens, and normal leakage of water and sewer lines, from the proposed homes in the area on the storage and bioremediation capacity of the soils? With the thin soils of the area, there either should be a measurable impact that must be considered in the design of the SADDs, otherwise the lack of impact indicates the water is recharging the aquifer which points to the inappropriate location for the proposed system.
- 3) Much of the proposed disposal areas occur along creeks formed along faults, based on recent detailed mapping by the US Geological Survey. Faults and their many associated unmapped fractures result in higher permeabilities, making those locations more vulnerable to polluting the underlying aquifer.
- 4) There is little consideration or indication that TCEQ or Silesia understands the implications of developing the proposed facility on a karst aquifer. Karst aquifers are the most vulnerable type of aquifer to contamination. Their surfaces are highly permeable and allow contaminants to reach groundwater with little or no filtration. Observable faults and karst features are hypersensitive sites in these already highly sensitive landscapes. Experiments globally have shown how rapidly surface water can move through the soil and into and through karst aquifers. One of the best examples is a study I conducted with the Edwards Aquifer Authority. We selected a random section of flat, soil-covered ground, typical of some of the settings proposed for the SADDs. There was no cave, or observable fault, fracture, or karst feature. We dug a 3-ft square by 4-inch deep pit into the soil, solely for the purpose of holding water that we would flow slowly into that site. Over the course of 30 days, we released almost 29,000 gallons of water into that shallow pit with its 22.4-gallon capacity. The pit never overflowed. We tagged the water with a non-toxic dye and found the dye in an Edwards Aquifer well about 2 miles away (for details on this and other tracer studies, see Edwards Aquifer Authority Report 10-01, *Tracing groundwater flowpaths in the Edwards Aquifer Recharge Zone, Panther Springs Creek Basin, northern Bexar County, Texas*). The same hydrogeologic conditions occur at the proposed Honey Creek Ranch site.

- 5) The TCEQ permit does not adequately consider karst hydrogeology in its recommended setbacks.
- Special Provision 36 on page 40 calls for evaluations of newly discovered karst features to determine if they are sensitive, when the international scientific karst literature makes it abundantly clear that they are highly sensitive. The permit should require fully characterizing karst features to determine what protective measures are possible, if any.
  - On that same page, Special Provision 43 notes that three karst features are known on the site and recommends 50-ft setbacks with no supporting justification. One-size-fits-all solutions often do not work in karst where conditions and management needs may vary significantly between karst features.
  - Special Provision 9, on page 34, prohibits a SADDs within 150-500 ft of wells according to TAC standards. Such requirements make it clear that the standards were not developed for karst aquifers and this recommendation did not consider that many of Texas' longest caves are formed in the Lower Glen Rose Aquifer. Caves are the natural pipelines for karst aquifers. The above-mentioned Edwards Aquifer report demonstrates flowrates reaching more 16,000 feet/day. Such flow rates can be observed by the general public in Cave Without A Name, a Lower Glen Rose Aquifer cave that is not fully explored and currently has a surveyed length of over 3.5 miles. More significantly, Honey Creek Cave is Texas' longest cave with about 21 miles of aquifer steamways known so far. It is adjacent to the proposed SADDs site and clearly demonstrates rapid, unfiltered flow for miles through the aquifer in that area.

**Monitoring and long-term management problems:**

Monitoring is proposed for the effluent, soil, and seeps. However, no monitoring is mentioned for the riparian area or the aquifer. Those resources are the most critical to protect and they are most effectively monitored directly. Unmonitored seepage and overland flow could have acute and cumulative negative impacts on the riparian area. Aquifer recharge from insufficiently treated effluent may be missed by monitoring the soils and seeps. The most effective aquifer monitoring would be by the discovery of a cave on site that extends to the aquifer. Otherwise, the water quality of wells on site should be monitored with a stage-based sampling plan appropriate to karst aquifers.

The soil is the designated treatment filter for the wastewater. All filters need eventual replacement, especially soil filters as thin as those proposed for this site. There is no mention of standards or requirements for replacing these soils.

Operational Requirement 8a, on page 13, says that if sewage exceeds 75% of permitted flow for three consecutive months, the treatment facility must be expanded or upgraded. If expansion is needed and the housing development is built, then where can expansion occur? This requirement is meaningless unless there is a provision to set aside enough land for expansion of the SADDs. A more effective measure would be to define, as part of the permit, required initiatives that will result in the reduction in effluent volume to bring the facility into compliance.

The Edwards Aquifer Authority report I mention above demonstrates groundwater flow from the Upper Member of the Glen Rose Limestone into the Edwards Aquifer. Increasing research is showing that the Edwards Aquifer is not limited to the Edwards Limestone as simplistically described many decades ago. The water doesn't care what the surrounding rock is called as it flows from one geologic unit into another. A 2000 Texas Water Development Board Report described the Lower Glen Rose Aquifer in the Comal County area as contributing into the Edwards Aquifer. My PhD dissertation in 1994 identified a significant flow path that branches from Honey Creek Cave, flows under the proposed Honey Creek Ranch site, and southeast into the Edwards Aquifer. While hydrogeologists who study the aquifers in the area now readily recognize that these aquifers are interconnected, the legislation that defines the aquifers is far behind in such matters. Nonetheless, TCEQ should remain ahead of the curve in managing the state's aquifers for safe public use by considering these factors in near-term and long-range planning.

### **Conclusions and recommendations:**

Urban and other development of karst is not an impossible task. It is highly challenging and requires the highest level of study, mitigation measures, and monitoring, to assure public welfare is protected. The "no development" option should always be a viable consideration.

The proposed SADDs is an improvement over the initial wastewater disposal plan proposed and withdrawn by Silesia. In my view, based on my four decades of research in this area and the information available for me to review, the SADDs should not be approved for the reasons described above. Lower housing densities would be an improvement on this plan, as well as standards for study, mitigation, and monitoring that truly recognize the exceptional complexity and vulnerability of karst aquifers to contamination.

Development is occurring rapidly along the Texas Highway 46 corridor. Current piecemeal approval of water treatment facilities through this area is not an effective low-risk solution to sewage production. TCEQ's permit mentions twice

the importance of developing regional water treatment facilities. I encourage TCEQ to put aside this Honey Creek Ranch and other sewage disposal requests and work with community officials to develop a regional water treatment facility off the karst, in a far less sensitive location downgradient to the east. I recognize the initial high cost in establishing such a facility, but that cost will be recovered as more developments connect and use it over time. In the long run, this is the safest and possibly lowest cost option by sharing the expense with many users over decades, and minimizing the probability of needing to clean-up the area's aquifers, riparian areas, and ecosystems.

Respectfully,

A handwritten signature in black ink that reads "G. Veni". The signature is written in a cursive, slightly stylized font.

George Veni, PhD  
Executive Director