

Hydrological Attributes and Treatment Capabilities of “Caliche and Related Soils” Pertinent to On-Site Sewage Facilities

August 2007

Dr. Larry P. Wilding, Ph.D., CPAg, CPSS, PG #42

Grant Contract Number: 582-3-55760

Executive Summary

Approximately 9% of the total land area of Texas is comprised of caliche soils. This research was conducted to determine the water retention capacity of caliche soils, specific pathways of water and solute movement, infiltration rates, alteration of the caliche with long-term treatment of wastewaters, and possible by-pass flow of untreated effluents into subjacent limestones or calcareous deposits. The report focused on the Brackett and Volente series soils located in the Austin area.

Author’s Recommendations

- Guidelines for caliche and non-caliche materials be developed;
- Professional Soil Scientists and licensed Texas Professional Geoscientists be added to the list to perform evaluations of soil conditions;
- Caliche soils be subject to backhoe exposures for soil analysis;
- Soil Class 1a and 1b can be combined when the gravel content is limestone;
- Soil Class II and III should not be restricted when gravel is limestone and is greater than 30%;
- Soil Class IV should be acceptable for standard systems in caliche soils;
- NRCS soil surveys should not be used as data in determining saturated soil zones;
- Site evaluation should determine if landscape is a riser or a tread;
- Degree of caliche cementation should be assessed in site evaluation; and
- Increasing the allowable uniform slope from 30% to 40% for caliche soils.

Were Rule Changes Identified?

No. There were no changes made to TCEQ rules as a result of this research project.

Is Further Research Needed?

Additional research identified by the author:

- Training for OSSF Soil Evaluators on suitability parameters in caliche soil.
- The need to perform tests and analysis on other soil types.

Research identified by TCEQ staff:

- The report was written in 2007, since then the Austin area has experienced record heat, drought, flooding, and fires. With meteorologists predicting continued extreme weather conditions, there is a need to expand the findings to address those types of events.