Geochemical Analyses of Karst Springs within the Lampasas Cut Plain, Fort Hood Military Installation, Texas

Kaleb J. Henry and Melinda Faulkner

Department of Geology, Stephen F. Austin State University, P.O. Box 13011, SFA Station, Nacogdoches, Texas 75962

GCAGS Explore & Discover Article #00341*
http://www.gcags.org/exploreanddiscover/2018/00341_henry_and_faulkner.pdf
Posted September 29, 2018.

*Article based on an abstract published in the *GCAGS Transactions* (see footnote reference below) and delivered as an oral presentation at the 68th Annual GCAGS Convention and 65th Annual GCSSEPM Meeting in Shreveport, Louisiana, September 30–October 2, 2018.

ABSTRACT

The Fort Hood Military Installation is a karst landscape characterized by plateaued outcrops of Cretaceous-age Trinity and Fredericksburg Groups including the Glen Rose, Walnut Clay, Comanche Peak, and Edwards limestones and marls. Many springs and seeps exist across the training areas, potentially providing valuable information about flow paths, residence times and basic geochemistry of the fluids within the system. The installation is underlain by the Trinity and Edwards aquifers, and geochemical variances exhibit a mixed-flow regime of varying lithologies and residence times. A collection of three springs from the eastern and western training areas were selected for monitoring over a six to eight month period in order to understand spatial and temporal physiochemical variations and gain an understanding of the hydrogeologic controls and potential coupling to other parts of the military installation. Permeability varies greatly across the installation; regions where Edwards and Comanche Peak formations interfinger typically have lower permeabilities than regions dominated by only Edwards deposition. Results from this study suggest that the interfingered nature of Edwards and Comanche Peak sediments has created a partitioned groundwater system where vadose and phreatic components mix in the subsurface. The Edwards and Comanche Peak formations have likely created a semi-confined aquifer system where deeper phreatic fluids migrate upwards through low permeability strata along preferential flow paths and communicate with meteoric waters near the ground surface in response to surface denudation and climate change, attesting to a complex groundwater system that is continuing to evolve.

Originally published as: Henry, K. J., and M. Faulkner, 2018, Geochemical analyses of Karst Springs within the Lampasas Cut Plain, Fort Hood Military Installation, Texas: Gulf Coast Association of Geological Societies Transactions, v. 68, p. 707.