Identification of Sources of Salinity in the Northern Segment of the Brazos River Alluvium Aquifer

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USGS Project Number: 2018TX517B

PRODUCTS:

1. Noonan, Erin P., 2019, Salinity in the Northern Segment of the Brazos River Alluvium Aquifer: A Hydro-Forensic Approach: Baylor University, unpublished Master thesis, p. 1-232.
2. Noonan, Erin, and Yelderman, Joe C. Jr., 2018, Surface Water/Groundwater Interaction: A Forensic Approach to Salinity in an Alluvial Aquifer, Paper at the 2018 National Groundwater Association Groundwater Summit.
3. Noonan, Erin, and Yelderman, Joe C. Jr., 2018, Sources of Salinity in the Northern Segment of the Brazos River Alluvium Aquifer: A Hydro-Forensic Approach, Paper at the 2018 annual meeting of the Geological Society of America South Central Section.

NOTABLE ACHIEVEMENTS AND AWARDS:

1. Baylor University Elan Allen Field Safety Scholarship, 2018.

RESEARCH:

The Brazos River Alluvium Aquifer is a minor aquifer in central and east Texas under water table conditions. It is an underutilized resource and may be considered a supplemental water source. However, variability in salinity occurs throughout the Brazos River Alluvium Aquifer and the source of this variability is unclear. The objective of this study is to characterize the variability of salinity in the northern segment of the Brazos River Alluvium Aquifer and evaluate potential sources of elevated salinity. Three potential sources of elevated salinity were evaluated: Interactions between the aquifer and the river, concentration from irrigation, and brine contamination from historic oil and gas fields. Based on the ionic and isotopic composition of aquifer and river samples, in- situ water samples, core descriptions, batch leaching of sediment, and hydrographs, the Brazos River and historic oil and gas fields do not appear to be the source of elevated salinity for the aquifer; although, irrigation could impact aquifer salinity.