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AGENDA ITEM MEMO

BOARD MEETING DATE: December 17, 2024

TO: Board Members

THROUGH: Bryan McMath, Executive Administrator
Ashley Harden, General Counsel
Rebecca Trevino, Chief Financial Officer
John T. Dupnik, P.G., Deputy Executive Administrator, Water Science
& Conservation

FROM: Mark W. Wentzel, Ph.D., Hydrologist, River Science & Hydrosurvey
Mindy Conyers, Ph.D., Manager, River Science & Hydrosurvey

SUBJECT: Aerial Electromagnetic Survey of Brazos River Alluvium Aquifer

ACTION REQUESTED

Consider authorizing the Executive Administrator to: (a) execute a contract with the University of Texas Bureau of Economic Geology in an amount not to exceed \$400,000 (including \$200,000 from the Texas Water Development Board) for an aerial electromagnetic survey of the Brazos River Alluvium Aquifer and (b) amend the contract in an amount not to exceed \$100,000 for additional unplanned activities.

BACKGROUND

The Brazos River Alluvium Aquifer is the largest alluvial aquifer in the state, extending along 350 river miles from southern Bosque County to eastern Fort Bend County, with a maximum width of as much as seven miles. Formed within a river floodplain as a layer of loose deposits consisting of fine to coarse sand, gravel, silt, and clay, alluvial aquifers lack a consistent structure, making them difficult to characterize using conventional well and bore hole data that can only sample at point locations. However, when coupled with an aerial electromagnetic survey, which uses low-frequency radio waves to map electrical conductivity as much as 1,000 feet below the surface, a three-dimensional image of an alluvial aquifer can be created.

Difficulty in characterizing aquifers, such as the Brazos River Alluvium Aquifer, impacts the ability to understand recharge properties and interactions with overlying surface water bodies. This study will build on ongoing studies and prior efforts to characterize the aquifer. Given a growing interest in the spatial properties of this aquifer among water resource managers and stakeholders, this study was included in the FY24-25 surface water studies

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Bryan McMath, Executive Administrator

plan. The plan utilizes funds appropriated to TWDB Strategy A.1.2 Water Resources Data for the purposes of collecting and analyzing data to support planning, conservation, and development of surface water and environmental flow needs.

KEY ISSUES

The Executive Administrator proposes to negotiate and execute an interagency contract with the University of Texas Bureau of Economic Geology to survey approximately 150 square miles of the Brazos River Alluvium Aquifer near College Station in Brazos and Burleson counties. The purpose of the project is to demonstrate the use of aerial electromagnetic survey techniques to characterize the alluvium aquifer structure to better understand surface water and groundwater interaction in this region.

The University of Texas Bureau of Economic Geology has demonstrated experience in the use of these survey techniques and will lead this project. Study partners include the Brazos River Authority, contributing \$100,000; the Gulf Coast Water Authority, contributing \$50,000; Harris-Galveston Subsidence District, contributing \$25,000; and Fort Bend Subsidence District, contributing \$25,000. The TWDB will contribute \$200,000 in general revenue. To allow for the possibility of unplanned opportunities to expand the study area, we are requesting the ability to add up to an additional \$100,000 to the contract should the need arise. Contracts have not yet been formalized with funding partners. Upon approval of this item, agreements with funding partners will be negotiated and executed.

RECOMMENDATION

The Executive Administrator recommends approval to authorize executing a contract with the University of Texas Bureau of Economic Geology an aerial electromagnetic survey of the Brazos River Alluvium Aquifer which furthers the agency's objectives to collect basic data and information concerning the water resources of the state