

Background

HB 1824 was passed in the 2019 Texas Legislative Session allowing the San Jacinto River Authority (SJRA) and the Harris County Flood Control District (HCFCD) to take material from the San Jacinto River and its tributaries to restore, maintain, or expand the capacity of those bodies to convey storm flows. Additionally, the bill exempted SJRA and HCFCD from any requirement to obtain a permit, pay a fee, or purchase the material taken, and it allowed the deposit of material on private land. As a result of this legislation, the SJRA conducted a conceptual design study, in partnership with HCFCD, to explore the feasibility of implementing sediment trapping facilities, preferably through a public-private partnership, to remove sediments from the West Fork or East Fork of the San Jacinto River. This study was completed in August 2021 and updated in January 2022, and the results and findings have been documented in an engineering report entitled "San Jacinto River and Tributaries Sediment Removal and Sand Trap Development" (the Report).

Purpose

The overall purpose of the study was to assess the feasibility of implementing a pilot project to trap sediment, preferably in coordination with one or more Aggregate Production Operations (APOs), to remove sediment from the West Fork or East Fork of the San Jacinto River. The following steps were taken in completion of the study:

- 1) identify and prioritize regions prone to sediment deposition in the West Fork and East Fork of the San Jacinto River,
- 2) measure the efficacy of the highest priority sites, and
- 3) develop conceptual design criteria and approaches for potential sand-trapping facilities and recommend future activities for implementation.

Findings

A desktop analysis was completed to identify ten regions along the West Fork and East Fork of the San Jacinto River where sediment appeared to deposit naturally. These regions were considered as potential sites for sediment-trapping facilities. Four of these ten facilities were then selected based on the volume of sediment deposited in the area and their proximity to an active Aggregate Production Operation (APO). Additional analysis and field visits were then completed for each facility to determine which three of the four sites should be further studied to determine the efficacy of trapping sediment. Three of the four sites offered multiple opportunities to trap sediment with a varying degree of site conditions that influence sediment trap design and location, and these were recommended for further study. All three sites were located on the West Fork San Jacinto River.

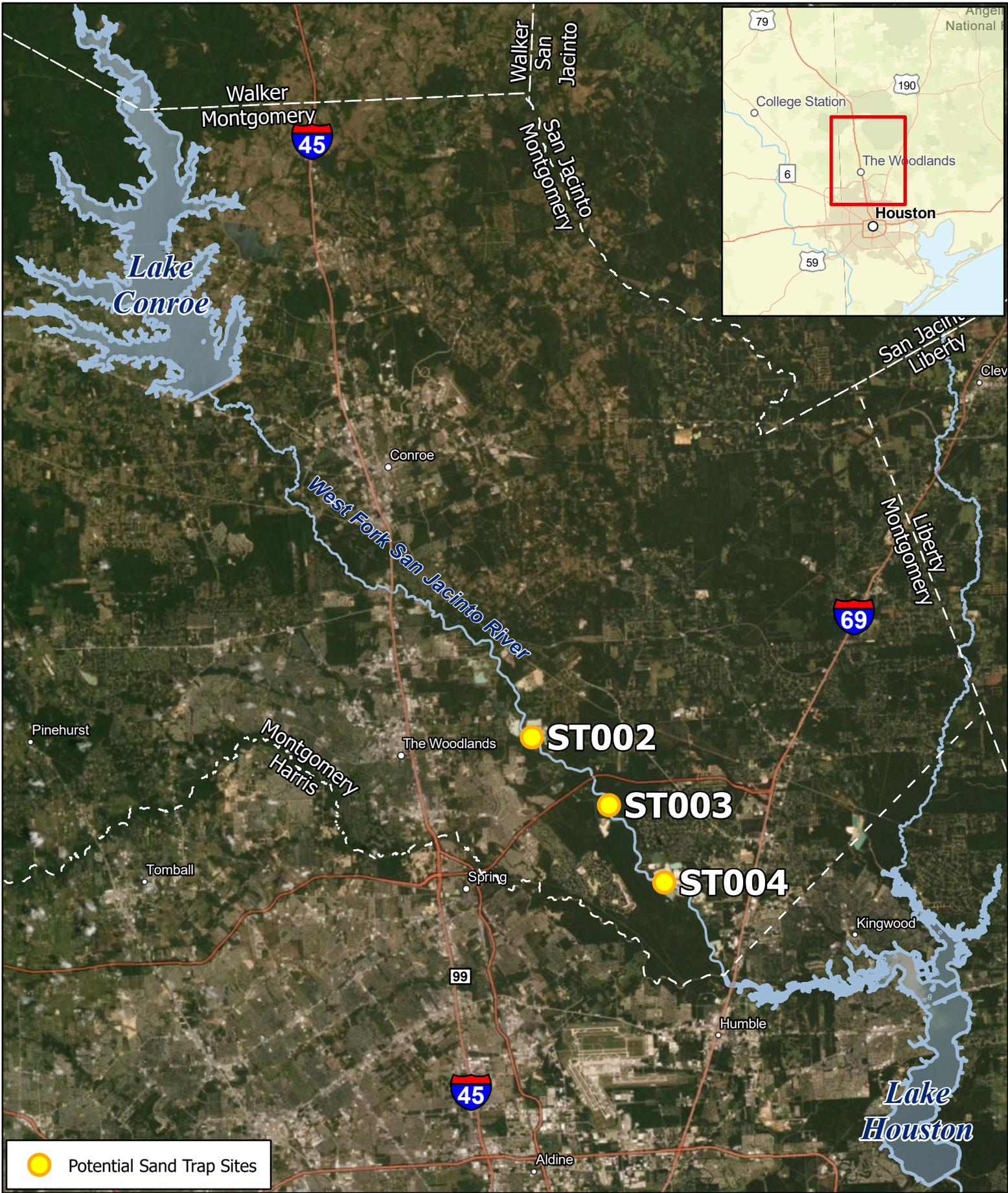
Conceptual alternatives were developed for in-channel and out-of-channel trapping at these sites. An in-channel trap is anticipated to consist of a trapezoidal channel with strengthened perimeter cut through an area of sediment deposition within the river's stream banks. An out-of-channel trap would consist of excavation of a new, or repurposing of an existing, pit adjacent to the river, which would be connected to the river via a conveyance channel. One site, designated as ST004 in the Report and on the attached exhibit, was determined to provide the most promising opportunities for in-channel sand trap(s), with relatively high efficacy and low implementation costs. If the landowner and/or APO at facility ST004 are unwilling to proceed with the project, then the next recommended in-channel trap location is at facility ST002. If in-channel traps are infeasible or if additional storage is desired then it is recommended that out-of-channel trapping be furthered into design, though out-of-channel traps have unique design considerations that need to be further explored. Out-of-channel trapping at facility ST002 was found to be the most promising. Ultimately, in-channel traps are recommended to be explored first due to design complexity challenges, infrequency of inundation, and permitting considerations related to out-of-channel traps. The Report also includes as a potential sediment trapping alternative the use of bedload collectors.

Recommendations and Path Forward

The Report provides a recommendation to further the design of two in-channel sediment traps at facility ST004. These in-channel sediment traps have a combined storage volume of over 25,000 cubic yards, are estimated to cost approximately \$2.75 million to implement in 2020 costs, and are believed to be capable of harvesting most of the West Fork's annual sediment load if frequently maintained. The Report does not recommend that all of the West Fork's sediment load be harvested because this could cause unwanted instabilities downstream. The following activities are recommended to further develop and implement a pilot project, though they are not comprehensive of all activities that should be performed:

- Communicate and coordinate with Aggregate Production Operators (APOs) to gauge interest in participating in this pilot project,
- Evaluate total annual sediment load transported to Lake Houston, including the area downstream of proposed sediment traps, and compare to anticipated trapped sediment loads,
- Perform further geomorphic assessment to address potential downstream instabilities due to removing sediment and to determine appropriate sediment removal volumes, and
- Perform preliminary engineering design of sediment trap(s) for implementation of the pilot project.

SJRA has included in its 10-Year Project Plan for Fiscal Years 2023-2032 a project to design and construct one of the two recommended in-channel traps at facility ST004 (costs are based on the larger of the two, providing a conservative, flexible estimate). The decision to only include one in-channel trap in the plan is due to the high cost of implementing two traps, as well as the fact that although one trap would result in the need for more frequent maintenance/cleaning activities, SJRA believes the anticipated public-private partnership with an APO would be able to accommodate maintenance and cleaning needs. SJRA estimates preliminary design efforts beginning in its Fiscal Year 2023 (9/1/22 – 8/31/23), final design and permitting efforts beginning in Fiscal Year 2024 (9/1/23 – 8/31/24), and construction occurring in Fiscal Year 2026 (9/1/25-8/31/26). This approximate schedule includes substantial permitting activities. If less complicated permitting efforts are required, the schedule for construction could be accelerated. Preliminary design, permitting, and final design are anticipated to cost between \$400,000 and \$500,000, with SJRA funding 50% of the costs and the other 50% to be funded via partners or other funding sources. Construction, including construction phase engineering services, is anticipated to cost approximately \$1.6 million. Due to a lack of dedicated funding for flood management activities, SJRA has estimated only being able to provide a contribution of \$100,000, plus inflation, toward construction costs, leaving nearly \$1.5 million to be funded via partners or other funding sources. SJRA previously submitted an application for Texas Water Development Board Flood Infrastructure Fund grant funding for the next phase of the project (preliminary design) but did not receive any grant funds. SJRA has previously received interest from an APO currently operating in the vicinity of one of the evaluated sand trapping facilities (ST003) to perform construction of a trap with input, guidance, design/permitting assistance, etc. from SJRA. ST003 is not one of the facilities recommended for further design in the Report, however, if the APO is willing to perform all construction efforts, then the potentially vastly-reduced cost to SJRA, HCFCD, and any other partners/funding sources could make this a viable option for a pilot project. SJRA will coordinate with HCFCD, along with any additional project partners identified, to determine the desired path forward for preliminary design of a pilot sand trap or traps.



San Jacinto River and Tributaries Sediment Removal and Sand Trap Development

