

# MEMORANDUM

JRS ENGINEERING **CONSULTANT**, LLC

**TO:** Chuck Reid, Manager - CCBWQA  
**CC:** Rick Goncalves, Chairman, TAC  
**FROM:** James R. "Jim" Swanson, P.E.  
**DATE:** September 14, 2018  
**SUBJECT:** Piney Creek Stream Reclamation - Reach 6, Phase 2

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## BACKGROUND AND PURPOSE:

UDFCD and SEMSWA initially entered into an intergovernmental agreement (IGA), on December 22, 2006, for stream reclamation improvements on Piney Creek at Caley Drive. The Authority entered into this IGA, on September 3, 2014, with UDFCD and SEMSWA. This agreement established funding for needed stream reclamation improvements through Reaches 6 and 7 of Piney Creek; reach locations are shown in Exhibit 1 attached hereto. Since the Authority entered into the initial IGA with UDFCD and SEMSWA, seven amendments have been executed, each increasing project funding. To date the Authority's funding contribution totals \$2,750,000.

## EXISTING CONDITIONS:

Piney Creek, in this project area, has severely eroded and continues to experience erosion during each storm event. This continued erosion threatened water quality within the basin, sensitive riparian areas and wildlife habitat as well as existing trails and utilities. The project includes grade control / drop structures and bank stabilization that will mitigate the existing erosion and minimize future erosion on Piney Creek. Typical pre-project conditions are shown in Photos 1, 2 and 3 documenting Piney Creek's degradation within Reach 6, Phase 2.



**Photo 1 - Existing Condition**



**Photo 2 - Existing Condition**



**Photo 3 - Existing Condition**

**DESIGN APPROACH:**

The design approach to reclamation of this project reach is the combination of a natural bioengineering approach connecting the streambed to the overbanks and a more engineered approach in areas where topography or site conditions constrain the channel geometry.

One constructed Grouted Boulder Drop Structure, two Grouted Boulder Cross Vane Check Structures and a 572-linear foot section of void filled channel bottom rip-rap lining, constructed at a two-tenths percent longitudinal grade, was incorporated into the Project to flatten and control the longitudinal grade. A sheet-pile cut-off wall was installed in conjunction with the Grouted Boulder Drop Structure to protect the drop from damage during a larger flood event and anchor the lower end of the project reach. The sideslopes along the stream channel was graded with flatter slopes to reconnect higher channel flows to the riparian corridor. This channel reconstruction reduces channel velocity, shear forces and stream power allowing for more filtration and infiltration and thus reducing erosion and nutrient transport. One equestrian and two low-water crossings were constructed to provide safe access crossings without disturbing area vegetation.

The Project was designed to raise the streambed and re-establish the water table to prevent further loss of vegetation and down cutting, erosion and sediment transport. The overall project goal was to restore and enhance the aquatic, wetland and riparian functions of Piney Creek. In-progress construction for the Cherry Creek Stream Reclamation Channel Improvements constructed in 2017/2018 is shown in Photos 4, 5 and 6.



**Photo 4 – Channel Grading**



**Photo 5 – Construction Access**



**Photo 6 – Channel Grading**

**CONSTRUCTED PROJECT:**

The 2,580 linear foot Piney Creek Reach 6, Phase 2 Stream Reclamation Channel Improvements Project contract was awarded to Edge Contracting, Inc., in the amount of \$2,013,518.50. The Notice to Proceed was issued on November 6, 2017. The work was substantially complete on June 8, 2018. The final Project cost totaled \$1,927,779.90. The project extended downstream of the previously constructed Piney Creek Reach 6, Phase 1 Project. The constructed improvements are shown in Photos 7, 8, 9 and 10.



**Photo 8 – Constructed Channel**



**Photo 7 – Constructed Channel**



**Photo 10 – Constructed Channel & Equestrian Crossing**



**Photo 9 – Constructed Channel & Grouted Boulder Drop Structure**

**WATER QUALITY BENEFITS:**

An assessment of the stream stabilization and water quality benefits for the entire project was made by the Authority<sup>1</sup> and found to include reductions in sediment and other pollutant loads, including phosphorus and nitrogen. These benefits are supported by Authority data, literature research and quantitative analysis. Based on the outcome of this assessment, it is calculated that 44 lbs of phosphorus per year will be eliminated from being transported downstream from the Piney Creek – Reach 6, Phase 2 stream reclamation improvements. The project was found to lower stream velocities, channel shear and stream power from that found prior to the stream reclamation, all which minimizes the transport of sediment and pollutants.

**SUMMARY:**

**Project Length = 2,580 linear feet.**

**Water Quality Benefits ≈ 44 # / year Phosphorus removal.**

**Total Construction Cost = \$1,927,779.90.**

**Authority's Share = \$481,945.**

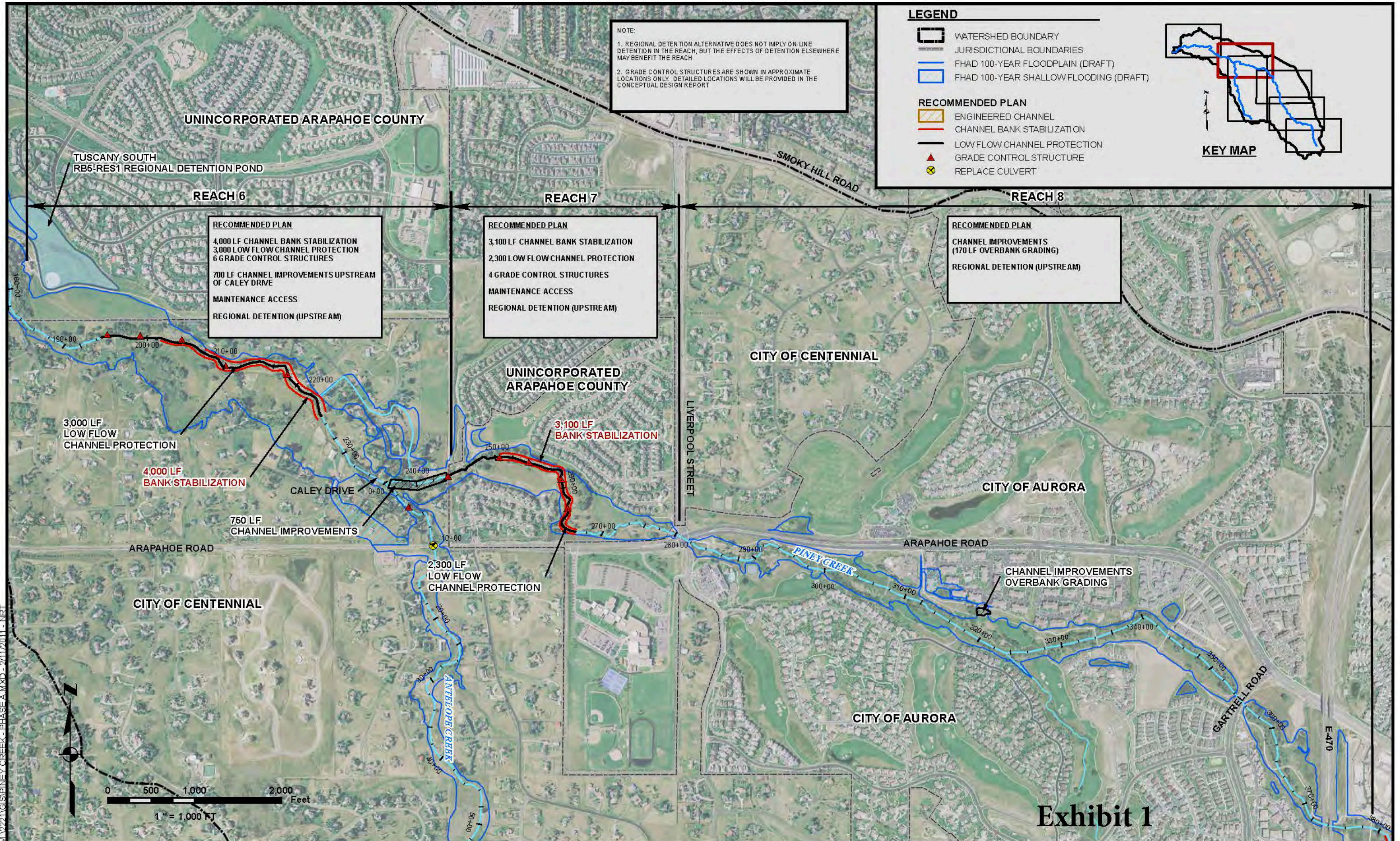
**Project Partners: UDFCD, CCBWQA & SEMSWA.**

**Engineer: CH2M Hill Engineers, Inc.**

**Contractors: Edge Contracting, Inc.**

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<sup>1</sup> CCBWQA Technical Advisory Committee, June 16, 2011. *Stream Reclamation, Water Quality Benefit Evaluation – Interim Report.*



**Exhibit 1**