

# Albuquerque Metropolitan Arroyo Flood Control Authority - 2020-2023

**Client:** Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA)

**Owner:** AMAFCA

**Project Location:** Albuquerque, New Mexico

**Name of Project Manager/Engineer:** Quinn Donnelly, PE

**Brief Description of Project:** RiverRestoration was awarded an IDIQ contract with the Albuquerque Metropolitan Arroyo Flood Control District (AMAFCA) to provide river engineering including hydraulic modeling and flood hazard mapping. To date, three task orders have been awarded for HEC-RAS Two-Dimensional (2D) hydraulic modeling and routing of flood flows through complex sand bed and concrete lined arroyo channels.

**Task Order #1: NAA HYDRAULIC ANALYSIS** was scoped as a flood hazard evaluation of three natural arroyos, totaling 1.1 miles, through a residential development. AMAFCA staff provided topographic information that was used to create the 2D hydraulic models. This included LiDAR data, detailed topographic survey of the arroyo channels, and high resolution aerials of the study area. The aerials were used to place structures and walls when this information was not included in the survey data. An AutoCAD Civil 3D surface was developed and imported in ArcGIS as a raster based digital elevation model (DEM). The 2D HEC-RAS models were developed and run using selected modeling parameters to represent existing conditions. The 2D HEC-RAS results of velocities, shear stresses, and depths for the design flows were imported as raster images into ArcGIS for mapping.

**Task Order #2: NAA HYDRAULIC DESIGN OF CROSSINGS** was scoped as the development and evaluation of conceptual alternatives to improve flood conveyance in 1.1 miles of arroyos through a residential development. Existing conditions models created in TO#1 were used as a starting point. Various channel sizes, shapes, and lining materials considered in the alternatives analysis were designed in AutoCAD Civil 3D and then imported to the 2D HEC-RAS model. The 2D HEC-RAS results of velocities, shear stresses, and water depths for the design flows were mapped in ArcGIS and presented to the AMAFCA board along with a technical report.

**Task Order #3: NORTH PINO ARROYO HYDRAULIC ANALYSIS** was scoped as an evaluation of 1.25 miles of existing grass and concrete lined channel to assess flood capacity and bank stability. Hydraulic analysis of five road and pedestrian bridge crossings was also included in the evaluation. RiverRestoration developed five unique conceptual designs in AutoCAD Civil 3D with and without upgrades to the bridge crossings and analyzed each in 2D HEC-RAS. Through a technical report, the 2D HEC-RAS model results informed AMAFCA on appropriate channel size, bridge improvements, and lining materials.

