



Wright Water Engineers, Inc.

**SAMUEL PLAZA, P.E., CFM**  
CIVIL ENGINEER

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| <b>CURRENT</b>       | Engineer experienced with hydrology and hydraulics modeling practices and design. Perform engineering related to drainage and flood control, Conditional Letters of Map Revision (CLOMRs), Letters of Map Revision (LOMRs), and design of channel and stormwater improvements. Strong understanding of one-dimensional (1D) and two-dimensional (2D) hydraulic principles and their implementation, including cross section placement, Manning's n-value selection, rain-on-grid hydrology, breakline placement, model calibration, etc. Also responsible for quality control in other model areas. Experience with HEC-RAS, HEC-HMS, PCSWMM, EPA SWMM, FlowMaster, HY-8, HEC-SSP, CUHP, ArcGIS, and AutoCAD. |
| <b>EDUCATION</b>     | B.S., Engineering Science, Civil Engineering Concentration<br>B.A., Liberal Arts, English, and Math Minors<br>Colorado State University, 2015   |
| <b>REGISTRATION</b>  | Registered Professional Engineer—Colorado #58324, South Dakota #16666   |
| <b>CERTIFICATION</b> | Certified Floodplain Manager—#US-18-10808   |

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**REPRESENTATIVE PROJECTS**

**City of Aurora, Colorado, Drainage Criteria Manual.** Updated the City of Aurora's Storm Drainage Design and Technical Criteria Manual. Revised several chapters to be consistent with Mile High Flood District (MHFD) criteria and acted as "editor-in-chief" of final manual, ensuring consistency in content and style between chapters. Required close coordination with City of Aurora staff, detailed knowledge of the City of Aurora's and MHFD's drainage criteria, and firm understanding of stormwater practices.

**Rocky Mountain Ditch.** Provided hydrologic and hydraulic support for expert testimony related to the Rocky Mountain Ditch in Denver, Colorado. Reviewed hydraulic analysis and construction drawings on behalf of the ditch company and provided comments on approach and analysis methods. Involved several site visits and preparation of expert report. Involved strong understanding of hydraulic modeling practices and interpretation.

**Gunnison County, Colorado, Floodplain Support.** Supported Gunnison County in preparing scope of work for updated floodplain mapping for the County. Described the relative benefits and downsides of 1D versus 2D modeling approaches and developed scoping shapefile based on County preferences. Involved close coordination with Gunnison County, City of Gunnison, Colorado Water Conservation Board (CWCB), and their contractors.

**Banning Lewis Ranch Filing 40.** Conducted hydraulic analysis and design calculations for riprap-lined channel associated with the Banning Lewis Ranch development in Colorado Springs, Colorado. Created 1D hydraulic model based on design topography provided by client. Results were used to perform riprap, stilling basin, cutoff wall, and drop structure design calculations per MHFD criteria. Required detailed understanding of 1D hydraulic modeling and MHFD criteria.

**Greenwood Village, Colorado, Drainage Reviews.** Provided quality control support for drainage reviews for Greenwood Village for completeness and consistency. Submittals included construction permits and final drainage reports; each were reviewed for consistency with Greenwood Village drainage and stormwater criteria.

**Wind River Ranch Mudslide Analysis.** Created 2D hydraulic model of Wind River Ranch and surrounding area near Estes Park, Colorado, to assess the impact of a mudslide/debris flow at the property. Hydrographs from hydrologic analysis of area were input into the upper portion of the basin and “bulked” with sediment/debris to determine the magnitude and impact of a potential debris flow. Developed potential mitigation measures to address hazard based on model results. Involved strong understanding of 2D modeling principles and their relationship with non-Newtonian fluid assumptions.

**Blue River – Alta Verde LOMR.** Responded to Additional Data (AD) letter comments for a Letter of Map Revision (LOMR) along the Blue River near Breckenridge, Colorado. LOMR reflected changes to the floodplain due to Alta Verde subdivision. Updated 1D hydraulic analysis and resulting mapping and LOMR package based on comments from the Federal Emergency Management Agency (FEMA). Required strong understanding of FEMA processes and requirements.

**Blue River – Coyne Valley Road to Solar Panels LOMR.** Prepared LOMR application for stream restoration improvements and bridge replacement of Coyne Valley Road along the Blue River near Breckenridge, Colorado. Prepared post-project conditions model, and synthesized modeling from several sources (including effective HEC-2 modeling, a Conditional Letter of Map Revision (CLOMR) application prepared by others, and a newly-effective LOMR downstream). Required detailed understanding of FEMA’s modeling, mapping, and submittal requirements.

**Sioux Falls Low-Head Dam Replacement and Greenway.** Prepared 1D and 2D HEC-RAS hydraulic models of low-head dam along the Big Sioux River in Sioux Falls, South Dakota. Project involved replacing existing low-head dam and implementing greenway improvements along riverbank. The 2D existing conditions model results were analyzed to determine existing flow paths over dam from low-flow to flood flow conditions, and the proposed conditions model results were reviewed to ensure water surface elevation and flow path design objectives were met. The 2D model results were used to perform preliminary design calculations for dam spillway, to size soil riprap along the greenway, and assess the impact of the proposed project on a Burlington Northern Santa Fe bridge that intersects the low-head dam alignment. The 1D existing and proposed conditions hydraulic models were used to perform a no-rise analysis of the greenway improvements in isolation and compliance with an existing CLOMR for both the greenway and low-head dam improvements. 1D hydraulic models were also developed for various cofferdam configurations during construction, and comparisons of risk under various scenarios were performed. Conducted research, analysis, and preliminary design calculations on several related topics, including design velocity and depth at low-head dam; potential for reverse-roller to develop at dam under various flow conditions; sizing of partially grouted boulders downstream of dam to prevent development of reverse rollers and to protect railroad bridge pier; cavitation risk; gate options for low-head dam; and effect of proposed dam on upstream sewer crossing.

**Sioux Falls – 6<sup>th</sup> Street Bridge No-Rise Analysis and Construction Support.** Performed no-rise analysis for bridge rehabilitation along the Big Sioux River in Sioux Falls, South Dakota. Updated 1D modeling from previous CLOMR to match proposed project and achieve no-rise within existing floodway. Prepared hydraulic models for various cofferdam configurations during construction, and provided comparison of risks for each configuration with respect to existing conditions. Contractor and client ultimately used these analyses to determine construction approach for bridge rehabilitation.

**Confidential Flooding Assessments for United States Department of Justice (USDOJ).** Performed analysis and modeling related to historical potential for flooding on behalf of USDOJ. Reviewed hydraulic analyses of major river systems to understand how changes to the system affect potential for flooding at various locations along the system. Required detailed knowledge of hydraulic modeling practices, in-depth review of historical documentation, and understanding of the relationship between observed data and modeling results.

**1% Plus Flood Discharge Analysis for MHFD.** Developed a methodology to determine the upper 84% confidence limit for the 1% annual chance flood, or one standard deviation above the 1% annual chance flood. Reviewed procedures from FEMA, United States Geological Survey (USGS), and the Army Corps of Engineers (USACE) to determine the appropriate equations and methodology to use when calculating the 1% Plus event based on the results of a rainfall-runoff model. Developed a spreadsheet and information for public use.

**City of Aurora, Colorado, Drainage Reviews.** Reviewed preliminary drainage reports as a part of the City of Aurora's development review process. Reviews ranged from single lot developments to multi-lot subdivisions and required detailed knowledge of the City of Aurora's and MHFD's drainage criteria and understanding of stormwater practices.

**Niver Creek Floodplain Analysis.** Prepared 1D and 2D hydraulic analyses to update a Flood Hazard Area Delineation (FHAD) model of Niver Creek in Adams County, Colorado, with improved methods and more recent topography. Analyses incorporated into a CLOMR application. The project involved detailed understanding of various hydraulic modeling procedures and close coordination with MHFD.

**Columbine Glen Stormwater Improvements.** Designed stormwater improvements for residential development near Genesee, Colorado. Analyzed existing and proposed conditions using the rational method consistent with MHFD and Jefferson County criteria in preparation for a Phase III drainage report.

**Meadowbrook Heights LOMR.** Prepared a LOMR application for the Meadowbrook Heights development in Jefferson County, Colorado. Application included 1D/2D hydraulic modeling, coordination with Jefferson County/MHFD on floodplain mapping, property owner notifications, etc. Involved extensive understanding of LOMR submittal requirements and FEMA guidance.

**River Run Ranch LOMR.** Prepared a LOMR application for the River Run Ranch development near Granby, Colorado. Application included hydraulic modeling, mapping, survey data, property owner notifications, application forms, etc. Involved extensive understanding of LOMR submittal requirements and FEMA guidance.

**OTHER EXPERIENCE**

**Water Resources Engineer, CDM Smith, Denver, Colorado, 2015–2021.** Served as an MT-2 Analyst reviewing CLOMR and LOMR applications for FEMA's MT-2 program. Also performed numerous Base Level Engineering (BLE) floodplain studies for watersheds in Colorado, North and South Dakota, Oklahoma, Louisiana, and Pennsylvania. BLE studies utilized either 1D or 2D methods in HEC-RAS to model approximate (i.e., FEMA Zone A) floodplains across large watersheds. Conducted hydraulic and design analyses for projects in Colorado, New Mexico, and Puerto Rico.

**PROFESSIONAL & HONORARY SOCIETIES**

Member of the Colorado Association of Stormwater and Floodplain Managers (CASFM)

Member of the Association of State Floodplain Managers (ASFPM)

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