

SURFACE WATER ENGINEERING - DAMS

The Bohannon Huston Surface Water team has the expertise to effectively protect, preserve, and manage water as a precious resource. We practice sustainable management and responsible design in all facets of our work. We focus on protecting our natural resources and preserving them in a built environment where resilient solutions are key. We understand the challenges our partners and clients face.

WE SPECIALIZE IN:

- Surveying
- Dam Engineering Analysis and Planning
- Dam Hydrologic and Hydraulic Analysis
- Dam Breach Analysis and Inundation Mapping
- Dam Incremental Damage Assessment
- Preparation of Emergency Action Plans for Dams
- River Restoration
- Geomorphology
- Floodplain Management
- Bank Protection/ Channel Stabilization
- Erosion and Sedimentation
- Scour Analysis and Countermeasure Design
- Levees
- Flood Recovery
- Water Quality
- Master Drainage Plans

Our Approach

RESILIENCY

Our team's experience allows us to provide practical, functional, and resilient engineering solutions to address your needs. Using a comprehensive approach to design we create sustainable solutions that minimize environmental and social impacts in urban and semi-urbanized areas.

FLOOD RECOVERY

The BHI team's experience allows us to provide practical, value-based observations, evaluations, and recommendations to address your needs. Using the planning process as a building block, we have supported local municipalities with flood recovery and infrastructure projects developing solutions to realistically mitigate future flooding damage.

HYDROLOGY AND HYDRAULICS

We are recognized leaders in the field of surface hydrology and hydraulics. We incorporate water quality and stormwater best management practices into our modeling and design.

TECHNOLOGY

We offer the latest and greatest in technology! Our team uses a wide range of tools for analysis and design, including multi-dimensional hydraulic models such as HEC-RAS, FLO-2D, and other tools for analysis and design.

About Us

Craig Hoover, PE

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Craig manages BHI's Water Resources - Surface Water Department. Craig leads BHI's team of stormwater engineers to provide solutions related to watershed management, water quality, storm drains, flood control, dams and levees, river restoration, and other elements of drainage design. He is recognized for providing unique and creative solutions for designs.



Stuart Trabant, PE

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Stu is BHI's Senior Hydraulic Engineer and Geomorphologist. With a strong background in water resources engineering, Stu's primary areas of expertise are in hydraulics, hydrology, fluvial geomorphology, stream rehabilitation design, and erosion and sedimentation. He has led numerous stream and river restoration analysis and design projects focused on flood conveyance, flood damage recovery, water quality, and more.



HOW WE SUPPORT OUR CLIENTS

SURVEY

BHI has the advantage of having both engineering and surveying under one roof. Our in-house survey crews provide:

- Boundary Surveys
- Right-of-Way Surveys
- Construction Layout Surveys
- Topographic and Planimetric Surveys
- Bathymetric Surveys
- Control Surveys



We also provide terrestrial scanning services including mobile, fixed, and aerial LiDAR platforms, all in support of dam projects throughout New Mexico.

DAM ENGINEERING ANALYSIS AND PLANNING

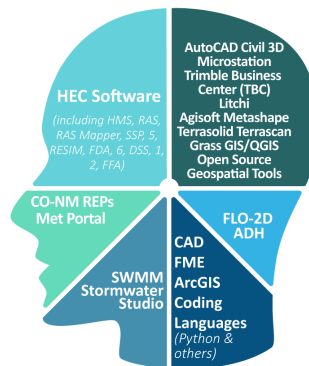
BHI's New Mexico dam analysis and planning experience spans over four decades and includes:

- Hydrologic and Hydraulic Modeling
- Dam Breach Modeling
- Inundation Mapping
- Incremental Damage Assessment (IDA)
- Spillway Assessments
- Inspections
- O&M Manuals

DAM HYDROLOGIC & HYDRAULIC ANALYSIS

BHI was one of the firms who helped the Office of the State Engineer Dam Safety Bureau (OSE DSB) beta test the new Colorado-New Mexico Colorado Regional Extreme Precipitation Study (REPS) tool and has subsequently used the REPS tool on several dam projects including Fenton Lake Dam. We understand the uniqueness of hydrology in the Arid Southwest and the importance of correctly establishing design flow rates.

Team's Software Competencies



Our team includes numerous members with advanced degrees in hydrology and hydraulics and certified floodplain managers. We are continually refining our H&H modeling abilities through technical training seminars to ensure that we maintain current knowledge and expertise.

DAM STRUCTURAL ENGINEERING

BHI's structural engineering group is experienced in designing dam outlet works and spillways. Working closely with the OSE DSB on projects such as the rehabilitation of the Bonito Lake Dam, which serves as a critical storage reservoir for the City of Alamogordo. This work included design of temporary sheet pile wall associated with a coffer dam to support the control and diversion of water during construction and mitigation of the lake's sediment issues.

In addition, our Structural Engineering group has performed and assisted on numerous dam inspections and emergency rehabilitation projects in New Mexico and Colorado.

DAM BREACH ANALYSIS AND INUNDATION MAPPING

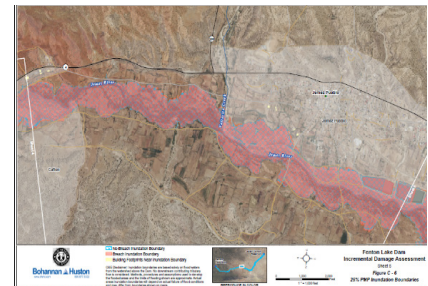
BHI uses the one and two-dimensional capabilities of HEC-RAS 5.0 and RAS Mapper to model flow conditions downstream of a dam breach and efficiently creates inundation maps using ArcGIS.

As part of our recent Fenton Lake Dam project, we breached the dam for six different storm frequencies, ranging from 25% of the PMP to the full PMP storm event, and created inundation map books for each storm event for approximately 43 stream miles from Fenton Lake Dam downstream to the Jemez Canyon Dam. Using ArcGIS, we were able to combine aerial imagery, property records, and any other available GIS data to readily identify roadways and infrastructure at risk from a potential dam breach.

We have used this process on inundation mapping and emergency planning for many other dams, including the Eagle Nest, Plant Lake, Las Cruces, Boca Negra, Mariposa, and Pino dams, using GIS-based tools and the inundation area, flow depth, and velocities to determine at risk areas. Members of our staff have received training from the American Society of Civil Engineers (ASCE) in dam safety and the Association of State Dam Safety Officials (ASDSO) in dam analysis.

DAM INCREMENTAL ASSESSMENT

Incremental Damage Assessment (IDA) is a complex hydrologic and hydraulic modeling approach that can prove highly beneficial to our clients as a means of justifying a lower spillway design flood (SDF) for high hazard dams than the standard full PMP storm event. As part of the Fenton Lake Dam project, we were able to successfully complete this analysis and justify the 50% PMP as the SDF, potentially saving our client, New Mexico Department of Game and Fish, millions once they are ready to increase the capacity of the dam's spillway to meet OSE DSB criteria.



PREPARATION OF EMERGENCY ACTION PLANS FOR DAMS

The BHI team has extensive experience preparing Emergency Action Plans (EAPs) for both public and private dam owners. We have aided cities and flood control authorities, the OSE DSB, and other dam owners prepare EAPs, such as:

- City of Las Cruces
- Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA)
- Southern Sandoval County Arroyo Flood Control Authority (SSCAFCA)

Notable dam EAPs completed by our team include:

- PNM's Plant Lake Dam
- City of Albuquerque Mariposa Dam
- SSCAFCA Montoyas Sportsplex Dam
- Upper Hondo Soil and Water Conservation District Salado Dam
- Las Cruces Dam