GRADY M. O'BRIEN, M.E., P.G.
Principal Hydrogeologist

CURRICULUM VITAE (CV)

NATURAL-RESOURCES

NEIRBO is a hydrogeology consulting practice led by Grady O'Brien that interfaces with the hydrosphere, biosphere, and engineered environment. Hydrogeology is the study of the distribution and movement of water in the soil and rocks of the Earth's crust. NEIRBO strives to clarify and quantify the interactions of natural processes and engineered systems. By applying this understanding NEIRBO helps its clientele understand the potential impacts to the biosphere and water resources. Of utmost importance are engineering designs, mitigation measures, and water management strategies that improve environmental conditions and advance projects.

EDUCATION

Colorado School of Mines
- Master of Engineering
- Geological Engineering

University of Wyoming
- Bachelor of Science
- Geology

REGISTRATIONS

Professional Geologist
- Arizona
- Washington
- Wyoming

PRACTICE AREAS

- Mine hydrogeology and dewatering
- Engineering & Construction dewatering
- Environmental impacts and permitting
- Water supply and management
- Hydrologic mitigation & engineering controls
- Groundwater and surface-water interactions

Grady has over 25 years of hydrogeology experience with natural and engineered systems in the mining, environmental, water supply, construction, and waste-containment fields. The ability to diagnosis cause-and-effect relationships and conditions that result in favorable or detrimental conditions guides pragmatic engineering and management decisions. Grady provides support and guidance for studies and programs aimed at the protection and beneficial use of water resources, including quantification of hydrologic conditions for engineering design, impact analysis, and water management.

NEIRBO focuses on understanding the dynamics and interactions between groundwater, surface water, geology, soils, vegetation, aquatic species, climate, geomorphology, water quality, and engineering. We work with project teams and engage our network of subject-matter experts to address project-specific challenges. Grady provides value in his ability to interpret, translate, apply, and integrate scientific, engineering, and management principles. Pragmatic solutions are achieved by balancing the sometimes conflicting scientific, engineering, and management needs.

SELECTED PROJECTS

Groundwater and Surface-water Interactions, Rosemont Project, Augusta Resources, Arizona. This project investigated potential impacts to perennial stream reaches, riparian vegetation, and endangered aquatic species. Streamflows are supported by infrequent stormwater runoff/infiltration, the localized, shallow alluvial aquifer, and the regional, deeper bedrock aquifer. Understanding the interactions between these components was critical to predicting the potential impacts from dewatering the bedrock aquifer.

The investigation included monitoring, analyses, and modeling that considered streamflow, precipitation, stream-channel soil moisture profiles, riparian vegetation, isotope ratios, water quality, depth to bedrock, hydraulic characteristics, and groundwater levels of fractured bedrock and stream channel alluvium. Analyses and modeling supported the Environmental Impact Statement and Biological Opinion. This project involved collaboration with aquatic biologists, botanists, ecologists, surface-water engineers, NEPA specialists, environmental managers, and environmental attorneys.

Open-pit Dewatering Analysis and Planning, Rosemont Project, Hudbay Minerals, Arizona. Open-pit engineering design that maximizes recoverable ore reserves depends, in part, on pit-wall rock stability that are dependent on pore pressures. A dewatering plan that illustrated the effectiveness of dewatering/depressurization and provided optimized dewatering well locations, groundwater inflows, and pumping rates was based on a detailed Mine Plan of Operations. The design was based on geologic characterization, rock property analyses, and modeling of groundwater flow and pore pressures. Geologic faults, fractures, structural history, dikes, degree of metamorphism, hydrothermal alterations, rock quality, and lithologic variations were characterized to understand their significance for rock mechanics design and depressurization design. This project involved collaboration with geotechnical engineers, mine design engineers, structural field geologists, hydraulic-testing engineers, drilling engineers, mine operations managers, and mine construction managers.

Engineering Design and Mitigation Performance Evaluation, Dawn Mill Site, Newmont / Dawn Mining Company, Washington. To support design and implementation of corrective action alternatives at this legacy uranium mill site hydrogeologic characterization, testing, and modeling were completed. Critical hydrogeologic and geochemical conditions that control migration of contaminants in the unsaturated and saturated zones were identified. A groundwater flow and contaminant transport model was developed to evaluate the effectiveness and feasibility of groundwater remediation measures that included an engineered soil cover, source removal, pump and treat system, permeable reactive barrier, groundwater collection trenches, and slurry-wall technologies. The most effective remediation components were combined to create a composite design that maximized performance while minimizing capital and operational expenses. This project involved collaboration with geochemists, geologists, civil engineers, environmental managers, and site operations managers.