

Dr. Chris D. Breeds, PE, PhD, CEng.

Dr. Breeds graduated from University of Nottingham, UK with an honors degree in Mining Engineering and a PhD in Mining Rock Mechanics in 1976. He is a registered Professional Civil Engineer in the US and a Chartered Engineer – Mining in the UK.

His broad experience includes: subsurface rock mechanics and geotechnical engineering; subsidence engineering; underground and surface blasting, shotcrete and concrete technology; feasibility studies and conceptual design for tunnel and mine facilities; mine and tunnel systems analysis; preparation of construction cost estimates, bid documents, and specifications; and project management for both private and government projects. This broad technical expertise is complimented by management experience, which includes incorporating and managing companies in the US, UK and Germany as well as managing large multidisciplinary groups involved in project work.

He started his career as an Assistant Professor at Virginia Tech in 1976 teaching Mining Engineering and receiving awards for teaching excellence in the College of Engineering during each eligible year and a nomination for the University Wide award in 1979. He moved to Denver at the end of 1979 where he worked as a tunnel contractor designing and installing ground support in drill-and-blast and mechanically excavated tunnels. He joined Golder Associates in 1984 as a Geotechnical and Mining Engineer moving to Germany in 1989 to start and manage offices in Celle and Clausthall. He started SubTerra, Inc. in 1991 and SubTerra Engineering LTD (UK) in 1992.

As the President of SubTerra, Inc. Dr. Breeds has worked on numerous projects involving underground and surface construction, subsurface design, instrumentation, and testing. This broad experience provides the ability to develop a project from a concept, through preliminary design, site investigation, final design, bidding, Contractor selection, contract management, to finished product.

He has been the Engineer of Record for tunnels ranging from 2- to 10-meters in width and up to 2 km long and provided claims consultant services for tunnels up to 14.5 km long and 10-meters in diameter. He was the Project Management Oversight Consultant (tunneling) for the USDOT during construction of the \$850 million Metro Goldline West (Los Angeles, CA); provided 30 through 100% Contract Package Review for the \$750 million, 37 km long Brightwater tunnel project; and design review for the 32 km, 2-m diameter Cascade Water pipeline project.

Over the past ten years he has provided Blast Consulting services for large dam construction and hydroelectric projects in Washington, Idaho, and California and is a recognized expert in blast design and evaluating blasting impacts to structures.

Recently Dr. Breeds jointly prepared Chapter 6 – Cost Estimating for the ASCE Recommended Contract Practices for Underground Construction, contributed to the ASCE Guidelines for Geotechnical Baseline Report preparation and authored the recently published ACI 506.5R-09 Guide for Specifying Underground Shotcrete. He has presented refereed technical papers on shaft and tunnel design at the Rapid Excavation Tunneling Conference (RETC), British Tunneling Society (BTS), and NAT symposia and holds a patent on “In Situ Decommissioning of a Nuclear Reactor”.