

Ed Kilduff PG, PGP
Senior Geophysicist
Senior Geologist

Mr. Kilduff is a senior geophysicist and geologist with over 25 years experience. He has worked as an exploration geophysicist in the petroleum industry, specializing in seismic methods augmented by borehole geophysical methods to assess prospects in the Arctic and western North America. For the past 20 years, Mr. Kilduff has focused on hydrogeophysics investigations, especially as they relate to aquifer characterizations pertaining to groundwater quality and quantity. He has applied geophysical methods to characterize and monitor the vadose zone, to map aquifers, to identify prospective water well locations, and to assist with formulation of models related to groundwater flow.

Mr. Kilduff has provided long-term support to the U.S. Department of Energy and the U.S. Navy. He is familiar with numerical modeling methods, GIS and data analysis.

QUALIFICATIONS

Education

- M.S. – Mgmt, MIT Sloan School of Mgmt, 1988
- M.S. – Geophysics, Colorado School of Mines, 1984
- B.S. – Math & Geology, Tufts University, 1982

Registrations / Certifications

- Licensed Geologist, WA (No. 2734)
- Licensed Engineering Geologist, WA (No. 2734)
- Licensed Hydrogeologist, WA (No. 2734)
- Professional Geophysicist, CA (No. 1003)
- Professional Geologist, CA (No. 5752)
- Certified Engineering Geologist, CA (No. 1985)
- Certified Hydrogeologist, CA (No. 578)

Specialized Training

- OSHA 40-Hour Hazardous Waste Operations Safety Training.
- OSHA 8-Hour Hazardous Waste Operations Supervisor Training

SELECTED PROFESSIONAL EXPERIENCE

Geophysical Investigation of Depth to Bedrock, California — Managed the design and performance of a reconnaissance VLF survey and subsequent multi-electrode electrical resistivity investigation of a large tract of land at a confidential location in California. The purpose of the integrated geophysical investigation was to locate productive water-bearing zones for water-well placements. Deliverables included Latitude / Longitude (Lat/Lon) based resistivity models (profiles) that assisted client in identifying optimal locations for additional water-supply wells.

Hydrogeophysical Groundwater Investigation, Southern California — Serving as the lead geophysicist for a project involving the characterization of the hydrostratigraphy in a region with complex structural geology controls. A major target of the geophysical investigation is the identification of fractures zones in bedrock that are believed to be the primary flow pathway for potentially contaminated groundwater. This project is using P- and S-wave seismic, resistivity, and electromagnetic (terrain conductivity) methods to map groundwater and the structural controls that may be controlling groundwater flow.

Geophysical Vadose Zone Monitoring at the Hanford Reservation — Served as the lead geophysicist for a project involving the geophysical characterization and monitoring of the vadose/unsaturated zone beneath radioactive landfills at in the central plateau area of the Hanford Reservation, a former US government nuclear production facility. The goal of the project was to create a geophysics-based early-warning-system capable of detecting unsaturated zone flows emanating from the landfills prior to the uppermost unconfined aquifer becoming

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contaminated. Development of the geophysical vadose zone monitoring system relied on using both surface and borehole geophysical methods configured to record time-series data, thereby allowing for the interpretation of changes to the vadose/unsaturated zone over time. The monitoring methods relied chiefly on electromagnetic methods.

Marine Geophysical Survey, Munitions Response QA, Puget Sound — Providing geophysics quality assurance surveillance to a marine geophysical survey being conducted under contract to the U.S. Navy in Puget Sound. This project involves all QA-related surveillance associated with verifying the quality of an experimental electromagnetic method for geophysically surveying the sea floor. The marine geophysical method is a frequency-domain electromagnetic method normally deployed in airborne geophysical and terrestrial geophysical configurations.

Geophysical Investigation of Geothermal Energy Sources, Nevada — Serving as the lead technical consultant for a geophysical project involving the assessment of potential geothermal energy prospects in Nevada. This project involves investigation of a 75-square mile area using magneto-telluric (MT) and seismic methods. Coordinating geophysical subcontractors, providing oversight to the processing of the geophysical field data, and assisting with the integrated inversion/interpretation of the processed data. The final interpretation also will incorporate legacy airborne gravity and magnetic data obtained during previous geophysical surveys.

Coastal Hydrogeophysics Assessment and Groundwater Monitoring, SF Bay — For five years, managed one of the largest groundwater monitoring programs in the US. In addition to using geophysics to investigate the freshwater/saltwater interface and near-shore dynamics, this program involved tracking the status and condition of over 800 groundwater wells, obtaining quarterly groundwater level measurements in 400 wells, and sampling 200 groundwater wells for water quality. The hydrostratigraphy of the investigation area involved three separate aquifers in a coastal location. The water quality of each of the site's three aquifers was affected differently by groundwater-seawater interactions. The freshwater-seawater interface for the uppermost unconfined aquifer was mapped and monitored.

Depth to Bedrock Geophysical Investigation, Washington State — Managed the design and provided contractor oversight for a seismic (MASW) investigation whose exploration objective was to identify bedrock channels. Paleo-channels from the Missoula Floods were believed to be providing structural control on the hydrostratigraphy and transport dynamics associated with the spread of a plume of chlorinated solvents in groundwater. The MASW survey was followed by a refraction survey to compare data results and better delineate the paleochannels.

Other Related Experience — Over fifteen years of experience supporting environmental, soil and groundwater cleanup, and waste management activities at Lawrence Livermore National Laboratory, Lawrence Berkeley National Laboratory, Stanford National Accelerator Laboratory, Los Alamos National Laboratory, and other DOE laboratories.

Vertical Seismic Profile, Inversion Study (Graduate thesis) — Developed both a forward model and inversion program for evaluating data from vertical seismic profiles (VSPs). This was the first time that inversion had been attempted on VSP data. A forward model was developed that was computationally efficient, and it was paired with an inversion algorithm based on Marquardt's minimization of least squares error. Additional computational techniques for reducing the step-size per iteration were employed to ensure inversion stability.