Geochemical Survey of the Sevier River for Assessing the Gold- and Uranium-Bearing Potential of the Mount Belknap Volcanics, South-Central Utah

McKay Nelsen, Brock O. Howell, Norman D. Christiansen, Steven H. Emerman, and Steven A. Fellows
Department of Earth Science, Utah Valley University

Abstract. The Mount Belknap Volcanics in the vicinity of Marysvale, south-central Utah, are riddled with abandoned gold, silver and uranium mines. A reconnaissance survey showed that much of the historic mining was superficial and did not involve either drilling or the application of geological knowledge. For example, numerous outcrops of gossans (associated with base and precious metals) and siliceous caps (associated with precious metals and uranium) appeared to be unexplored. The objective of this study is to carry out a geochemical survey of the Sevier River, which cuts through the Mount Belknap Volcanics, in order to assess the gold- and uranium-bearing potential of the area. The objective is being addressed by collecting water samples from 40 sites along a 30-km stretch of the Sevier River. Water samples are being collected at uniform spacing or 50 m downstream from canyons or significant drainage pathways. Water temperature, pH, electrical conductivity, dissolved oxygen and redox potential are being measured on-site. Samples are being collected from the water surface without filtering so as to retain fine suspended sediment. The PerkinElmer Optima 8000 ICP-OES (Inductively-Coupled Plasma - Optical Emission Spectrometer) is being used to analyze all samples for 17 elements, including Au, U, Th, three Au-indicator elements (As, Bi, Sb), and 11 sulfide-forming elements (Ag, Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb, Ti, Zn). The spatial distribution of analyses will be used to relate pulses of elemental concentrations with drainage pathways and with gossan and siliceous cap outcrops. Results will be reported at the meeting.