



## **New Geophysical Approaches to Providing Hydrogeologists with what they need: Hydraulic Conductivity, Water Content, and the Identification of Fracture Flow and Groundwater Discharge Zones**

*Paul Bauman\*, Franklin Koch\*, Randy Shinduke\*, Landon Woods\*, and Elliot Grunewald\*\**

*\*WorleyParsons-Advisian*

*\*\*Vista Clara Inc.*

### **Summary**

While plume mapping, depth to bedrock profiling, and other geophysical services are certainly of value to water resource and contaminant hydrogeologists, until recently, the ability to provide depth specific properties, with confidence, has been lacking. Recent developments in both surface and downhole techniques now allow geophysicists to provide detailed downhole measurements, with depth, of hydraulic conductivity, total water content, bound water content, free water content, transmissivity, and fracture flow characterization. Specific applicable methods with field examples to be discussed include nuclear magnetic resonance, high resolution temperature logging, acoustic and optical televiwer logging, distributed temperature sensing, and heat pulse flowmeter logging.