

Tool	Property																											
	Lithology Thickness	Thin bed resolution	Depositional Environment	Shale/Clay Content	Lithologic Contacts	Mineral Identification	Potassium, Uranium, Thorium Content	Bulk Density	Formation Resistivity	Strike & Dip of Bedding/Foliation/Fracture	Permeability	Fracture Detection	Fracture Aperture	Fracture Density	Porosity Type(s)/Distribution	Porosity Value	Fluid Flow	Fluid temperature	Borehole Fluid Conductivity	Formation water conductivity	Water Level in Formation/saturation	Casing Integrity	Screen/Intake Location	Borehole diameter	Borehole deviation	Examination Behind Casing	Well completion evaluation (e.g., cement bond, seal/grout location)	Location of debris in well
Nuclear magnetic resonance (NMR)	6	6	6	6	6					6																		
Mechanical caliper	9	9										9	9		9							10	10	10				10
Impeller flow meter																1												
Optical televiewer	4	4	4		4					4		4	4	4	4							5	4, 5		4, 5			4, 5
Acoustic televiewer	1	1	1		1					1		1	1	1	1							3	2, 3	1	1, 2, 3			1, 2, 3
Borehole video	4	4	4		4							4	4	4	4							4	4				4	4
Fluid temperature/differential temperature													1				1	2, 3			2	2, 3	2					
Natural gamma	10	10	10	10	10																					10		
Resistivity	1	1	1	1	1				1			1			1					1	1							
Heat pulse flowmeter																1					1							
Fluid resistivity (or conductivity)																1			1, 2, 3	2	2	2, 3	2					
Other Tools																												
Induction conductivity	6	6	6	6	6				6											6	6					6	6	
Single-point resistance	1	1	1									1									1							
Spontaneous potential	8		8	8	8											8				8	8							
Spectral gamma	10	10	10	10	10	10	10																					
Neutron porosity (neutron-neutron)	7, 10		7, 10	7, 10	7, 10										7, 10											7, 10	7, 10	
Density log (gamma-gamma)	7, 10		7, 10	7, 10	7, 10	7, 10		7, 10													7, 10					7, 10	7, 10	
Acoustic caliper	1	1										1	1		1							1, 3	1, 3	1, 3				1, 3
Radar (borehole GPR)					6							6									6							
Magnetometric resistivity																												
Magnetic susceptibility	6			6	6	6						6												6				
Full wave form seismic				1												1							1					3
Cement bond log																						3				3		3

Legend:  
 Applicable tool to assess property  
 Potentially applicable tool to assess property

- Required hole conditions:**
1. Open fluid filled hole
  2. Screened or open fluid filled hole
  3. Cased fluid filled hole
  4. Clear fluid of dry open hole
  5. Clear fluid or dry cased hole
  6. Open or non-conductive cased hole, dry or fluid filled
  7. Active nuclear log to be run in stable holes only
  8. Conductivity difference between borehole fluid and formation fluid
  9. Open hole
  10. No restrictions

**Sources:**  
 ASTM Standard D5753-05, June 2005, "Standard Guide for Planning and Conducting Borehole Geophysical Logging" ASTM International, West Conshohocken, PA  
  
 Day-Lewis, F.D., Johnson, C.D., Slater, L.D., Robinson, J.L., Williams, J.H., Boyden, C.L., Werkema, D., and Lane, J.W., 2016, A Fractured Rock Geophysical Toolbox Method Selection Tool: Groundwater. doi:10.1111/gwat.12397 (<https://water.usgs.gov/ogw/bgaf/frgt/>).  
  
 Department of the Army, 1995. Engineering and Design: Geophysical Exploration for Engineering and Environmental Applications, Engineer Manual EM 1110-1-1802 (31 August 1995). U.S. Army Corps of Engineers, Washington D.C.  
  
 Keys, W.S., Crowder, R.E., and Henrich, W.J., 1993, Selecting geophysical logs for environmental applications, in Seventh