Log Selection Chart for Geological Applications Using Common Geophysical Logs

Required Hole Conditions

- ■ Cased fluid-filled hole
- □ Screened or open fluid-filled hole
- ▮ Steel casing only
- ★ Open or non-conductive cased holes, dry or fluid-filled
- ✓ No restrictions
- ? Possible applications
- ◆ Clear fluid or dry cased hole
- ◇ Clear fluid or dry open hole
- △ Active nuclear log to be run in stable holes
- ● Open fluid-filled holes only

Information Desired	Measurement	ACOUSTIC			ELECTRIC & INDUCTION						FLUID LOGS						RADIOACTIVE or NUCLEAR				OTHER METHODS				
		Acoustic Televiewer	Borehole Radar/Tomography	Acoustic Velocity Δt, CBL, VDL, FWS	Induced Polarization	Multi-electrode Resistivity Normal, Lateral, Micro Guard Resistivity	Formation Microresistivity	Single Point Resistance	Spontaneous Potential	Induction (Conductivity)	Hydrophysical Logging	Flow Meter - EM, Impeller, Heat Pulse	Fluid Resistivity	Temperature, Differential Temperature	Fluid Sampler	Colloidal Borescope Fixed, Scanning	Gamma-Gamma density	Gamma	Neutron	Spectral Gamma	Optical Televiewer	Magnetic Resonance	Caliper	Casing Collar Locator	Deviation
Lithology & Correlation	Bed/Aquifer thickness; correlation, structure	●		●		●	●	●	●	★							△	✓	△	✓			✓		
	Lithology - Depositional environment	?		●		●	●	●	●	★							△	✓	△	✓			✓		
	Shale or Clay Content				●	●			●	★							△	✓	△	✓					
	Bulk Density																△								
	Formation Resistivity		?			●	●			★															
	Injection/Production Profiles					?				?	□	□	□	□			△		△						
	Permeability estimates			●							□	□	□	□				✓				✓			
	Porosity (amount & type)	●		●		●				★							△		△			✓			
	Mineral identification				●												△			✓					
	Potassium-Uranium-Thorium content (KUT)																			✓					
Rock Structure	Strike & Dip of bedding	●	★				●														◇				✓
	Fracture detection (number of fractures) ROD	●	★	●		●	●	●													◇		✓		
	Fracture Orientation & character	●					●														◇				✓
	Thin bed resolution	●	?			?	●	●													◇		✓		
Fluid Parameters	Borehole Fluid characteristics										□		□	□	□							✓			
	Vertical Fluid Flow										□	□													
	Horizontal Fluid Flow								●		□					□					◇				
	Formation Water Quality					●			●	★	□				□										
	Moisture Content - Water Saturation					?				?							△		△						
	Temperature										□			□											
	Water level & water table	●		●		●		●	●	?	□		□	□			△		△		◇				
Borehole Parameters	Casing evaluation Integrity, leaks, damage, Screen location	■		■						?	■	■		■							◆		✓	▮	
	Deviation of borehole																								✓
	Diameter of borehole	●																					✓		
	Examination behind casing			●						★							△		△						
	Location of debris in wells	●																			◆		✓	✓	
	Well completion evaluation e.g. cement bond, Seal location, Grout location	?		■						★							△	✓	△						
Contaminate Detection	**Organics**																								
	Hydrocarbons -LNAPL/DNAPL				●	●				?	□				□		△		△		?	✓			
	NAPL Solvents/Chlorinated Solvents				●	●				?	□				□		△		△		?	✓			
	High Volume Organic Wastes /Animal Wastes					●			?	?			□		□										
	Inorganics																								
	Electrically Conductive Wastes/Salts					●				?	□		□		□										
	Metals/Metal Processing Wastes				?	●				?	□		□		□										
	Nutrients								?		□				□										
	Mixed Wastes																								
	Nuclear wastes/NORM					?				?					□		?	✓	?	✓					
	Landfills					●			●	★			□		□		?	?	?	?	?	?			

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