

Hydrogeological Survey in Faryab - Afghanistan

TRAINING COURSE SUMMARY SHEET	NORPLAN 
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1.2 Geophysics DB proposal.doc

Course title:		Course no	
Hydrogeology I Geophysical Survey (Surface geophysical survey (VES, IP, total station) data collection and interpretation)		1.2	
		Date prepared: 18/6/12	
Training purpose	To enable geophysicists and groundwater engineers to use surface resistivity equipment for identifying potable groundwater resources, and to familiarize them with the manual and software-assisted interpretation of data. Emphasis will be placed on quantifying uncertainty and on the non-uniqueness of interpretations. The course will focus on the use of the IRIS Syscal Pro instrument used by several NGO and government agencies in Afghanistan.		
Target group	Education level (degree/ technicians etc): Must have a degree in physical natural sciences, geology, engineering or mathematics	Experts/national planners/provincial/ district: Experts	
Course details:	Course language(s):	English (possibly Dari)	
	Duration(days): 5	No. participants per course: 4 to 8	Theoretical /practical/training? Combination
	Planned course location(s) Kabul University	Responsible presenter	Handouts to be prepared by: Presenter
Summary syllabus	<p>Day 1: Electrical Resistivity Theory: The theory of electrical current in the ground. The electrical properties of different sediment/rock types. Calculating apparent resistivity. Different electrode configurations. Vertical electric sounding and electrical resistivity profiling. An introduction to total station / multi-channel resistivity data acquisition.</p> <p>Day 2: Electrical Resistivity Practical: Introduction to the IRIS Syscal Pro instrument. Data collection using different electrode configurations at a test site within Kabul. VES soundings and profiles.</p> <p>Day 3: Interpretation of Electrical Resistivity Data: Manual interpretation, curve fitting, conceptual models. Non-uniqueness of solutions. Evaluating and communicating uncertainty. Software-based interpretation using Winsev software.</p> <p>Day 4: Induced polarization theory: Time domain and frequency domain IP. Uses of IP in groundwater studies – saline water, detection of pipes. <i>Practical:</i> Data collection for IP interpretation.</p> <p>Day 5: Interpretation of IP data: Manual interpretation, conceptual models. Non-uniqueness of solutions. Evaluating and communicating uncertainty. Software-based interpretation, using data acquired during practical and/or supplied data sets.</p> <p>Note that this syllabus needs to be confirmed and improved by a <u>real</u> geophysicist!</p> <p>If we decide to purchase geophysical well logging equipment, a further two days are suggested:</p> <p>Geophysical borehole logging</p> <p>Day 1: Theory: Natural gamma and mineral sources of radioactivity. 16 and 64” electrical resistivity, temperature, fluid conductivity, caliper. Order and direction of logging.</p> <p>Day 2. Practical demonstration of fluid temperature and conductivity, natural gamma and caliper in a designated test well. Interpretation and discussion of data.</p>		

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Training- equipment required	<p>Equipment to be made available for course:</p> <p>Test site with interesting geology and absence of buried services.</p> <p>IRIS Syscal Pro electrical resistivity and IP kit, batteries, electrode stakes, hammers, water, cables</p> <p>Notebooks</p> <p>Graph paper</p> <p>Calculators</p> <p>At least 3 PCs with Winsev software installed</p> <p>For downhole logging:</p> <p>Test well, free of downhole equipment, pumps and cables</p> <p>Geophysical logging equipment</p> <p>Pulley</p> <p>Cables/cable drum</p> <p>Natural gamma, fluid conductivity / temperature, resistivity and caliper sondes</p> <p>Hi-Lux or similar</p>
Training material	<p>Can existing material be used? If so what/ from where?</p> <p>Not known</p> <p>If no: what material needs to be developed? And By who?</p> <p>All syllabus material, by experienced geophysicist</p>
Field/practical training.	<p>Preparations needed, responsible officer(s)</p> <p>Health/ safety. Test site needs to be identified and trialled.</p> <p>Test borehole needs to be located / drilled and trialled</p> <p>Completeness of surface geophysical equipment needs to be verified</p> <p>Downhole geophysical equipment needs to be purchased</p> <p>Equipment manuals need to be translated to Dari.</p>
Prepared by	<p>Prepared by: D. Banks</p>