

WELL SITING IN THERMAL AREA FOR MINERAL WATER TDEM METHOD

Project: Hydrogeological study for the best location of new water wells for mineral water

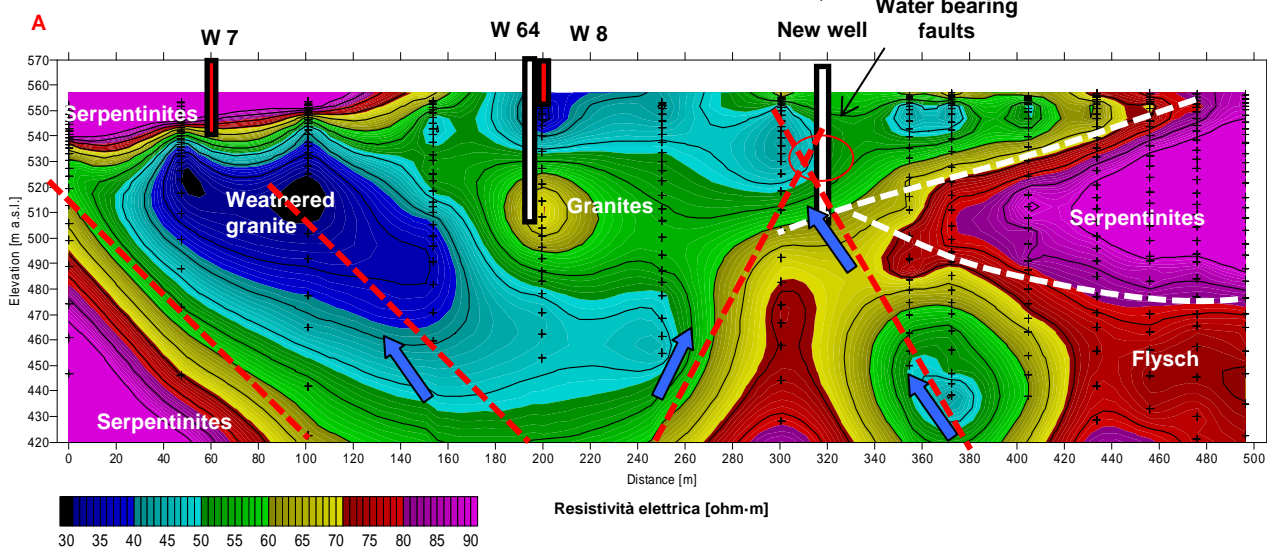
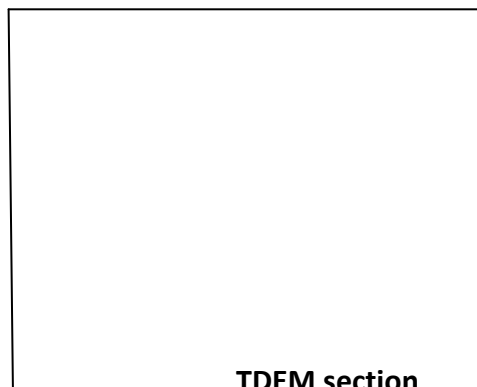
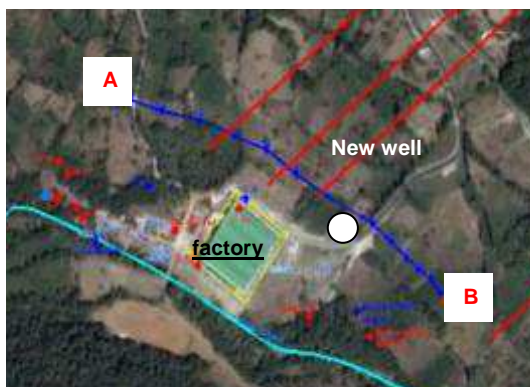
Site: Bursa (Turkey) - 2008

The purpose of the investigation:

- a) Define the hydrogeological model in a complex thermo-mineral area
- b) locate the main water-bearing structures;
- c) Positioning of a new well in the most promising zone far from the existing sources (fault zone with rising of mineral water)

Design Survey:

The survey was made with TDEM method (with soundings placed every 25 or 50 m, with a side loop of 50x50 m) on a section of about 500 m in length (maximum depth of 150 m)



Log stratigraphy	Log description	Main water inflows	Well design (draft)	Drilling operations
0m	Debris	-12.35 m G.W.L. (total inflows)	2E m	FIRST DRILLING METHOD (June 2008) 1. Reverse circulation with mud down to 20 m ($\phi = 17.5''$) 2. Install of mild iron casing ($\phi = 305$ mm) 3. grouting of the space between the hole and the casing
-0 m	Aluvial deposits (sand and gravel) with boulders of granite	-15.0 m G.W.L. of inflow N° 1		
22 m	Metamorphytes (schists/prasinites);		SECOND DRILLING METHOD (2-4 JULY 2008) Rotary percussion with air lift ($\phi = 178$ mm; down to 75 m)	
34 m	Metamorphytes (schists/prasinites)	Water Inflows N° 1 (R. conductivity = 0.5 mS/cm)		
46 m	Gneiss/granites weathered and fractured. Water bearing fractures with reddish water during drilling	Water Inflows N° 2 and N° 3 (R. conductivity = 1.3 mS/cm)	60 m	Sealing of the bottom with bentonitic clay to prevent mixing of water N° 4-5.
50 m				
52 m			67.5	
62 m				
65 m	Gray granite with clay layer at 75 m (hydrothermal weathering zone)	Water Inflows N° 4 and N° 5 (R. conductivity $K_{25} = 2$ mS/cm) At 75 m strong evidence of carbon dioxide	73.7	
75 m			75 m	