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Magnetotelluric Exploration of the Munir Block, Iran

Edison International, with its partners Lunedin Oil and the National Iranian Oil Company, is carrying out exploration on the Munir Block in SW Iran. This is on the western edge of the Zagros Mountains, in the Dezful Embayment. Major oil fields in the immediate vicinity include the 15 BB Gachsaran Field and 4.5 BB Bibi Hakimeh field. Reservoir and source rocks lie in the Oligocene to Jurassic carbonate sequence; the anhydritic Gachsaran Formation is the usual seal. Seismic data has been of poor quality in this area, due to the outcropping Gachsaran, which is characterized by steeply-dipping recumbent gravity slide folds. These result in a heterogeneous velocity distribution which dissipates rather than transmits seismic energy. However, this unit and the underlying target sequence are characterized by a large electrical resistivity contrast. This suggested the use of magnetotellurics as a tool to map pre-Gachsaran structure. The results of a large scale (500-station) survey, interpreted by 3D inversion techniques, clearly map a series of NW-trending en-echelon anticlinal structures. In that similar geological (and non-seismic) conditions are present along much of the Zagros front, magnetotellurics is suggested as a cost-effective exploration technique.