INTEGRATED APPROACH OF USING SURFACE GEOCHEMICAL ADSORBED SOIL GAS AND TRACE METAL ANOMALIES WITH 3D SEISMIC DATA FOR EVALUATION OF HYDROCARBON PROSPECTS

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ABSTRACT

The proposed study aims at integrated approach using trace metal, adsorbed soil gas and 3D seismic studies to understand the mechanism of hydrocarbon seepage and to evaluate the hydrocarbon potential in Study Area. Field work was carried out in the Study Area and 101 samples were collected. These samples were analysed for determination of trace element concentration by using Atomic Absorption spectrophotometer (AAS) at GERMI. Geochemical analysis in the surface soil samples revealed high trace element and adsorbed soil gas anomalies in the South Western part of the study area. An attempt has been made to correlate the geochemical anomalies with subsurface structures and amplitude anomalies, using 3D seismic data. The Seismic data interpretation was carried out using OpendTect V.4.6 Software. 7 horizons have been calibrated with help of log data. In all horizons high seismic amplitude anomalies are observed in South Western region of the study area. This may be due to vertical seepage. Major reverse fault oriented NE-SW is observed which may act as conduit for gases seeping on surface. Integration of the trace element and adsorbed soil gas data with 3D seismic data shows that geochemical anomalies were observed in the zone where fault terminates. These geochemical anomalies may be due to the light hydrocarbon gases which have migrated along this fault. High RMS amplitude anomalies in SW region of study area observed in all horizons, it may be indicator of Vertical Seepage of hydrocarbons. This study has brought out meticulous relation between Trace element, soil adsorbed gas and 3D seismic studies. Such techniques are useful in virgin areas to reduce the pre-production investments in petroleum industry.