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

A Research Project Under

GERMI Summer Internship Programme (2014)

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ACKNOWLEDGEMENT

I wish to express my sincere thanks to **Dr. T. Harinarayana**, **Director**, **Gujarat Energy Research and Management Institute,** for his guidance, motivation, financial support and permission to undertake the project work using the facilities at GERMI.

I am deeply indebted to Mr. **P. H. Rao, Consultant**, **Petroleum Wing, GERMI** for extending his knowledge and support during the course of my project work. It was a great experience to have worked under a highly professional person.

My sincere thanks to **Dr. Syed Zaheer Hasan, Principal Research Scientist, Petroleum Wing, GERMI** for his support and guidance during the course of my project work.

I sincerely thank **Dr**. **Abdul Rasheed, Scientist C, Petroleum Wing, GERMI** for his valuable support and guidance in the entire project period. Your encouragement proved to be instrumental in successful completion of my summer internship.

I thank from bottom of my heart **Dr. P.L.S. Rao, Mr. K. Ramachandran and Ms. Annapurna Borauh, Petroleum Wing, GERMI** for their extreme care and valuable teaching in the entire work period.

I am extremely grateful to **Mr. Santosh Dhubia, Scientist E1, Petroleum Wing, GERMI** without whose support and help this project would not take shape.

I am extremely grateful to **Prof. L.S. Chamyal**, Head of Department**,** General Geology,M. S. University of Baroda for granting me the permission to undertake the project at **GERMI**.

I am grateful to M/S. **DGB Earth Sciences** for providing OPENDTECT to GERMI for our project work.

I truly express my gratitude towards **Mr. Ankur Bhatnagar**, Internship coordinator, for his full support in making our stay comfortable in Gujarat.

Last but not the least, I wish to thank the entire staff of GERMI and my fellow interns for their support, time and moments which we cherished during the stay at GERMI.

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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.