GEOTHERMAL RESOURCES OF INDIA - SCOPE AND FUTURE UTILISATION

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ABSTRACT

Geothermal resources discovered in India consist of warm/hot water systems. The main geothermal manifestations are distributed in four areas viz: (1) a continental collision zone: Himalayan region, (2) marginal depressions: Himalayan foredeep, (3) coastal areas and (4) Peninsular shield areas.

Geochemical and geophysical surveys are indicative of high temperatures, high heat flows and low resistivity zones in Puga, Manikaran and the West coast geothermal areas. At shallow depths medium temperature waters and reversal of temperature are very common. The mountaineous terrain, negative temperature gradient at the bottom and presence of travertine deposits of borax and sulphur distributed at different sites indicate that the above geothermal areas under exploratory drilling are that of lateral outflows of geothermal fluids away from upflow centres. To the south of Puga valley, very low resistivity zones have been recently located but it is difficult to do exploratory drilling in this area due to unruly topographic conditions.

The thermal manifestations in India are in three different types of meteorological, topographical and geographical conditions. The

temperatures of the geothermal springs in the Himalayan regions are medium (max. temperatures of 127°C) temperatures and are found in steep remote terrains with cold-dry conditions and seasonal temperature variations from -40 to 20°C. In peninsular and coastal regions, the thermal manifestations are generally of low (55°C - 90°C) temperatures with seasonal variations from 15°C to 45°C under hot-dry and hot-humid conditions respectively, with the exception of Cambay, West coast and Tatapani-Salbardi areas which are of medium (108°C - 120°C) temperature. Such thermal manifestations may be utilized only for non-electrical purposes.

Such site specific conditions in all these areas limit the exploitation of these geothermal resources.