

Block –XI

Location and Accessibility

- Serial Number 40 L/5 (Toposheet)
- Name/Block Block-XI, Baprana
- Area 101.46 Sq. Km
- Easting 2365410 and 2380000
- Northern 803900 and 817650

The Thar Desert, of which Block-XI is a part, comprises eastern part of the Sindh province of Pakistan, which is bounded by Indian border to the north and east. Towards west of Thar lies the fertile land of the Indus plain of the Sindh province. Across the border to the south lies the Great Rann (Rann of Kutch). The Thar coalfield is 140 km long (north-south) and 65 km broad (east-west) with an area of 9,100 sq. km.

Relief & Topography

Since Block-XI is a part of Thar Desert, the topography of the terrain covering this Block is generally similar to the topography of the whole Tharparkar district. This is characterized by typical Aeolian deposits. The whole area is covered by numerous longitudinal sand dunes, striking NE-SW, stabilized by growing herbs and shrubs, with intervening narrow and broad valleys trending as the sand dunes. Besides inter-dunal valleys, there are flat tracts of land present in Block-XI, just as at several locations in rest of Thar Desert. Full-grown trees are found scattered over these tracts of flat and slightly undulating surfaces. The dunes are longitudinal, ranging in relief from tens of meters to hundreds of meters.

Water Resources

Surface water

Owing to very little rainfall and dry hot climate coupled with sandy desert land, virtually no traditional resources of surface water, such as rivers, lakes, dams, reservoirs exist in Tharparkar District. People have dug large pits in the impervious clays at certain localities that are filled during the occasional rains, particularly in the monsoon season, which can cater to the needs of the population and livestock for potable water for a few months.

However, according to Records of Geological Survey of Pakistan, vol.115 (2002), the possible sources of surface water for use in the proposed power plants could be: (i) Left-Bank-Out Drain (ii) Jamrao Canal and (iii) the marshy land area in the Rann of Kutch. Left Bank-Out-Drain is a channel which has been constructed to drain about 4000 cusecs of saline water to the sea from the water-logged lands in Sindh. This drain passes by the Thar coalfield at a distance of 120 km. This saline water could be channelized to the proposed power plants where it can be used for various purposes except drinking. Besides, there is another source of water, again about 120 km away, the Jamrao Canal, which is an irrigation canal originating from Sukkur barrage that can supply fresh drinking water to the area. The marshy lands of Rann of Kutch towards the south, only 30 km away, can also become a substantial source of water, though very saline.

Groundwater

According to the hydrogeological investigations carried out by GSP (Records of Geological Survey of Pakistan, 2002, vol.115) a number of water wells that produce brackish water are present in the flat low-lying inter-dune playas. Some tube wells are also present. According to them drilling of boreholes has revealed the presence of three aquifers at variable depths: first above the coal zone, second within the coal zone and third beneath the coal zone.

Aquifers above coal zone

A vertical zone about 80 meters thick above the coal zone contains a number of aquifers; one at the contact of Dune sand and Sub-recent is almost persistent throughout the Thar coalfield at a depth of 50 to 90 meters from the surface. The water bearing horizons are medium to coarse sand ranging in thickness from 3.35 to 41.27 meters. In order to determine the water quality, water table, lithology of aquifer, water column, recharge and discharge of water, samples of water and water bearing horizons from 18 boreholes were collected and pumping test was also carried out in Saleh Jo Tar, Block-III by GSP during their investigations in 2002.

The data showed that water bearing horizon consists mostly of dune sand and Sub-recent deposits. The water quality is mostly brackish but in some wells it is slightly saline. Also, it was sweet in three wells.

The depth to water table varied from 50 to 90 meters from the surface. Water column varies between 0.61 to 7.62 meters. The water samples taken from the dug holes in Block-III gave a value of more than 2000 ppm for TDS. The discharge, gallons per hour output, is 155 to 6000 gallons. The recharge time in wells varies from half an hour to 12 hours. The recharge of the aquifers is through seasonal precipitation in Thar. All the dug wells of the area get their supply of water from this perched aquifer.

Aquifers within coal zone

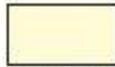
Two to three aquifers composed of sand, varying in thickness from 2.24 to 68.74 meters, occur within the coal zone. The sand is medium to coarse grained and gritty.

Aquifer occurring below coal zone

An aquifer ranging in thickness from 5.50 m to 47 meters was found to occur ubiquitously in Block-III at a depth of about 200 meters. It is mainly composed of coarse, gritty, quartzitic sandstone.

A compressor test was also conducted to determine the quality as well as quantity of water. This showed that the water was saline with a production rate of 8,000 to 9,000 gallons per hour. Most of the tube wells installed in this area were fed by this aquifer.

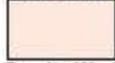
LEGEND



Dune Sand



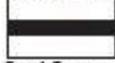
Sub Recent



Granite Wash



Bara Formation



Coal Seam

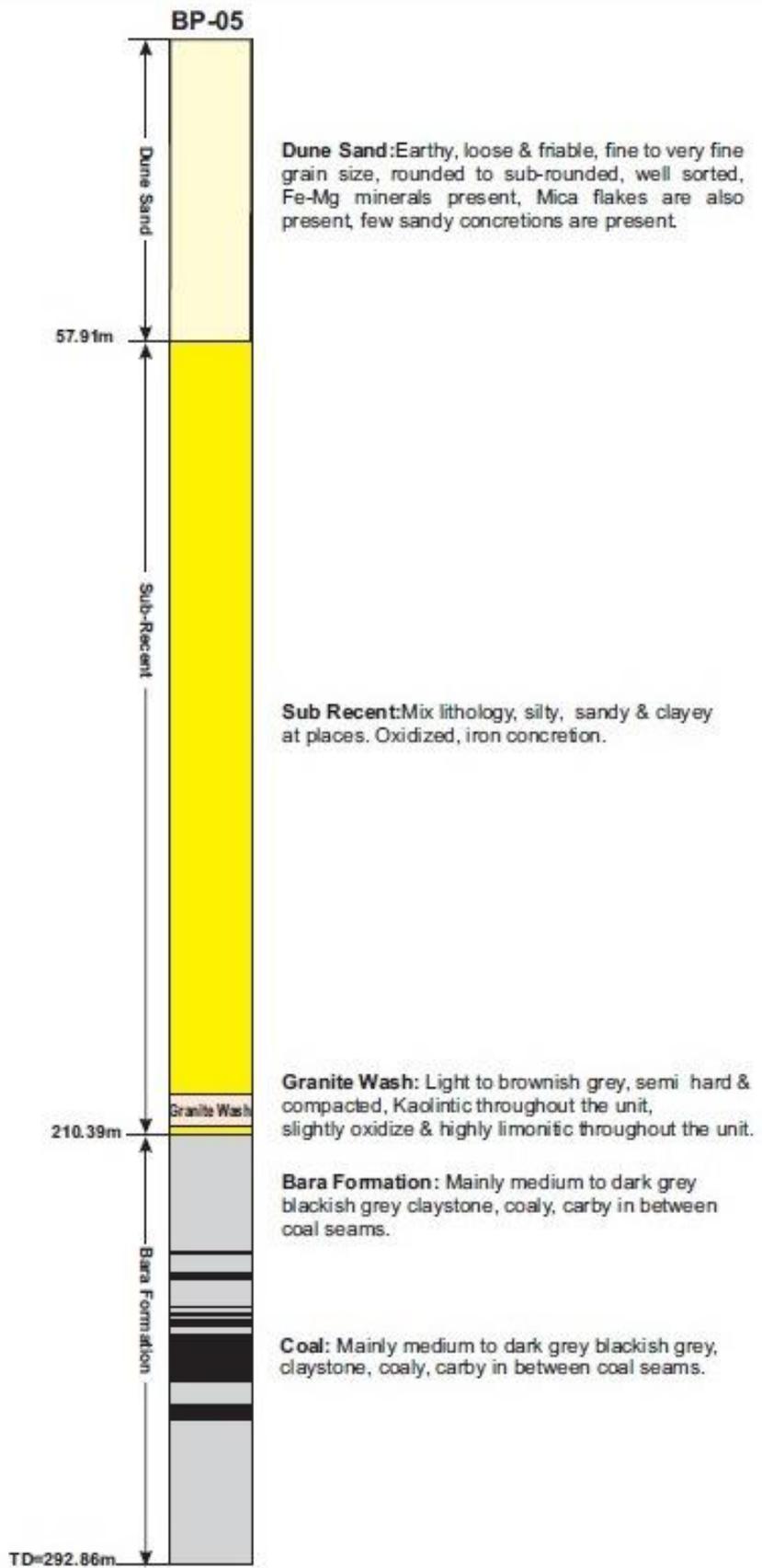


Figure-5.1: Columnar Section of Drilled Borehole BP-05, Block-XI, Baprana (DRD), Thar Coalfield, Sindh, Pakistan

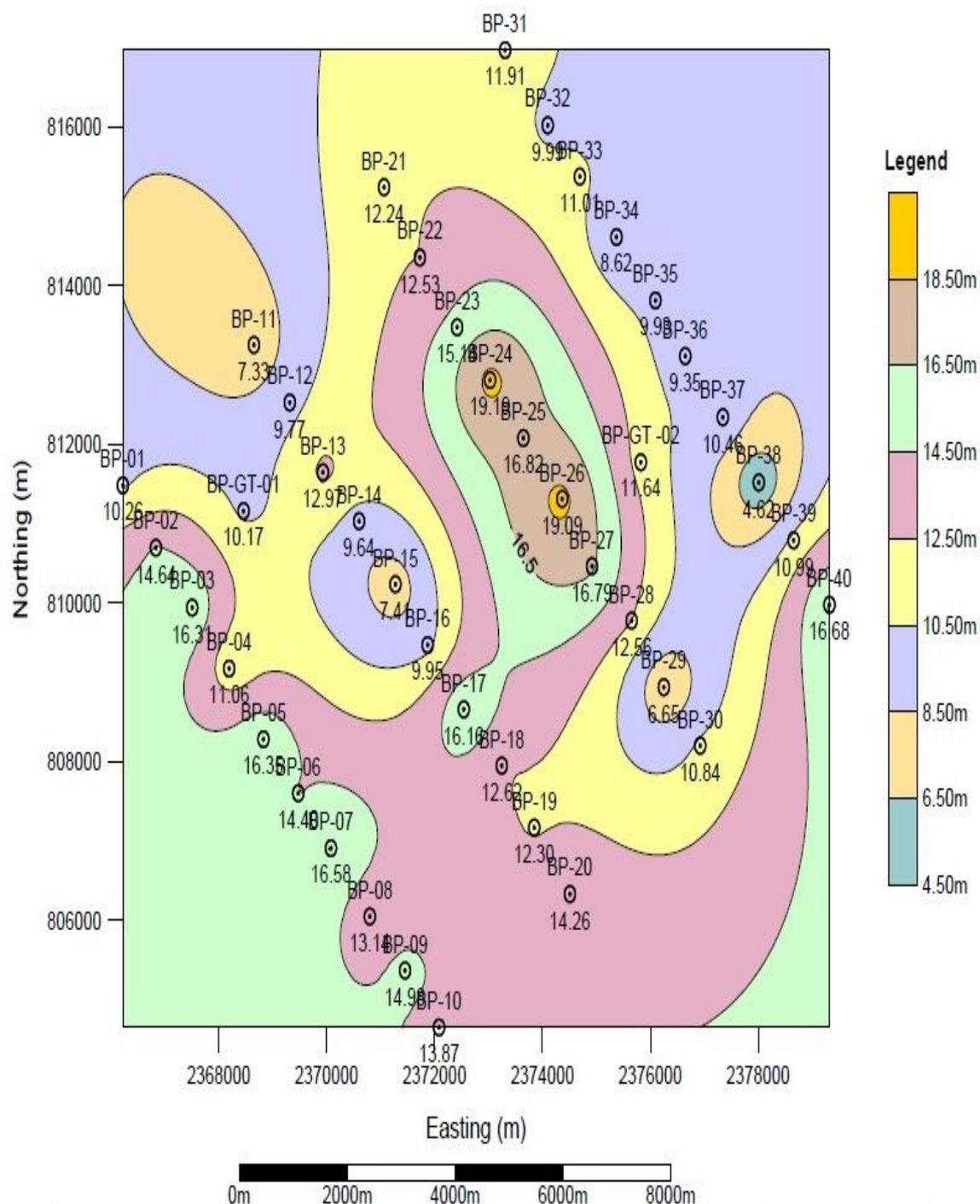


Figure-6.1: Isopach Map Showing Cumulative Coal Thicknesses of Drilled Borehole of Block-XI, Baprana (DRD), Thar Coalfield, Sindh, Pakistan

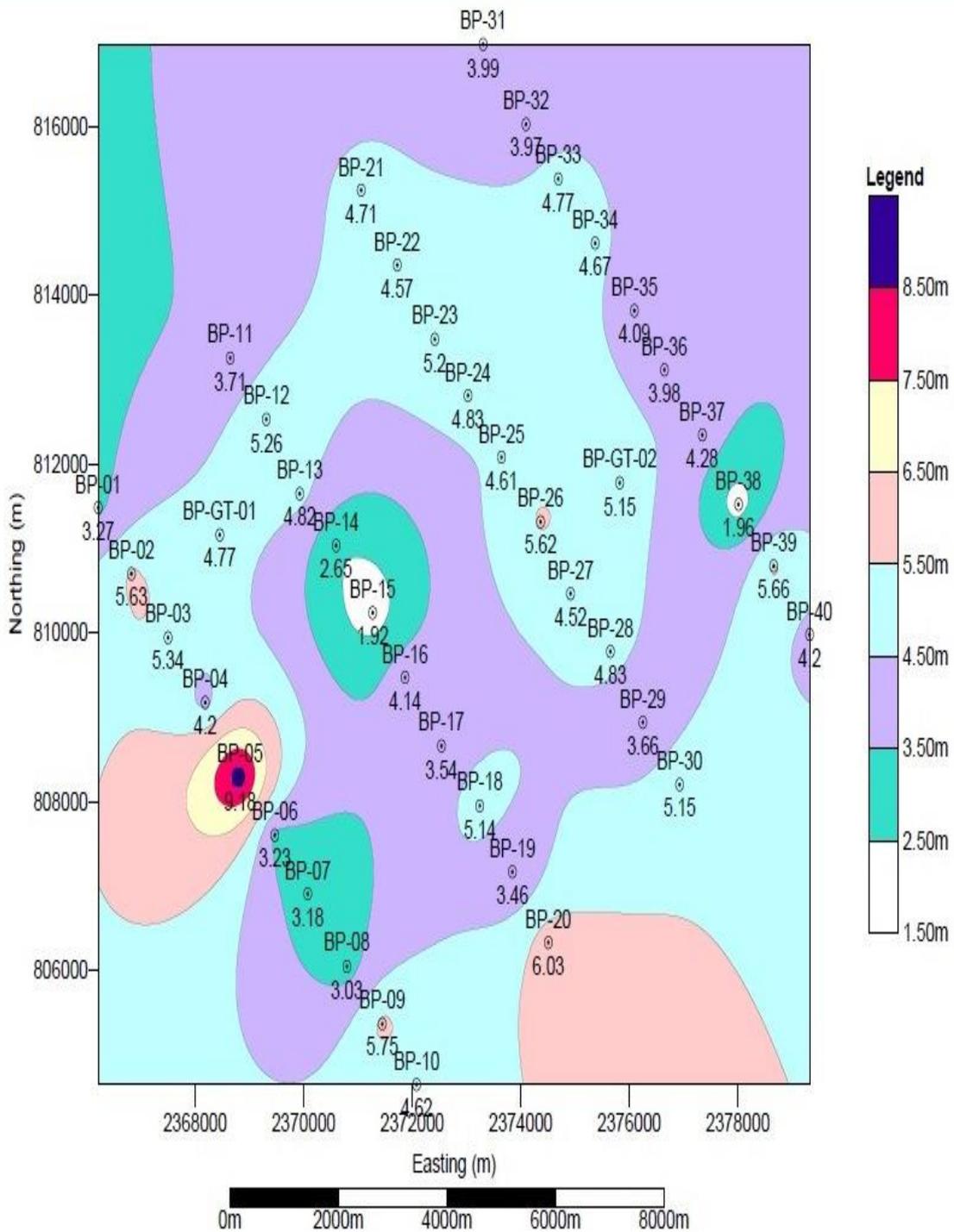


Figure-6.2: Isopach Map showing Main Coal Seam Thicknesses of Drilled Boreholes of Block-XI, Baprana (DRD), Thar Coalfield, Sindh, Pakistan

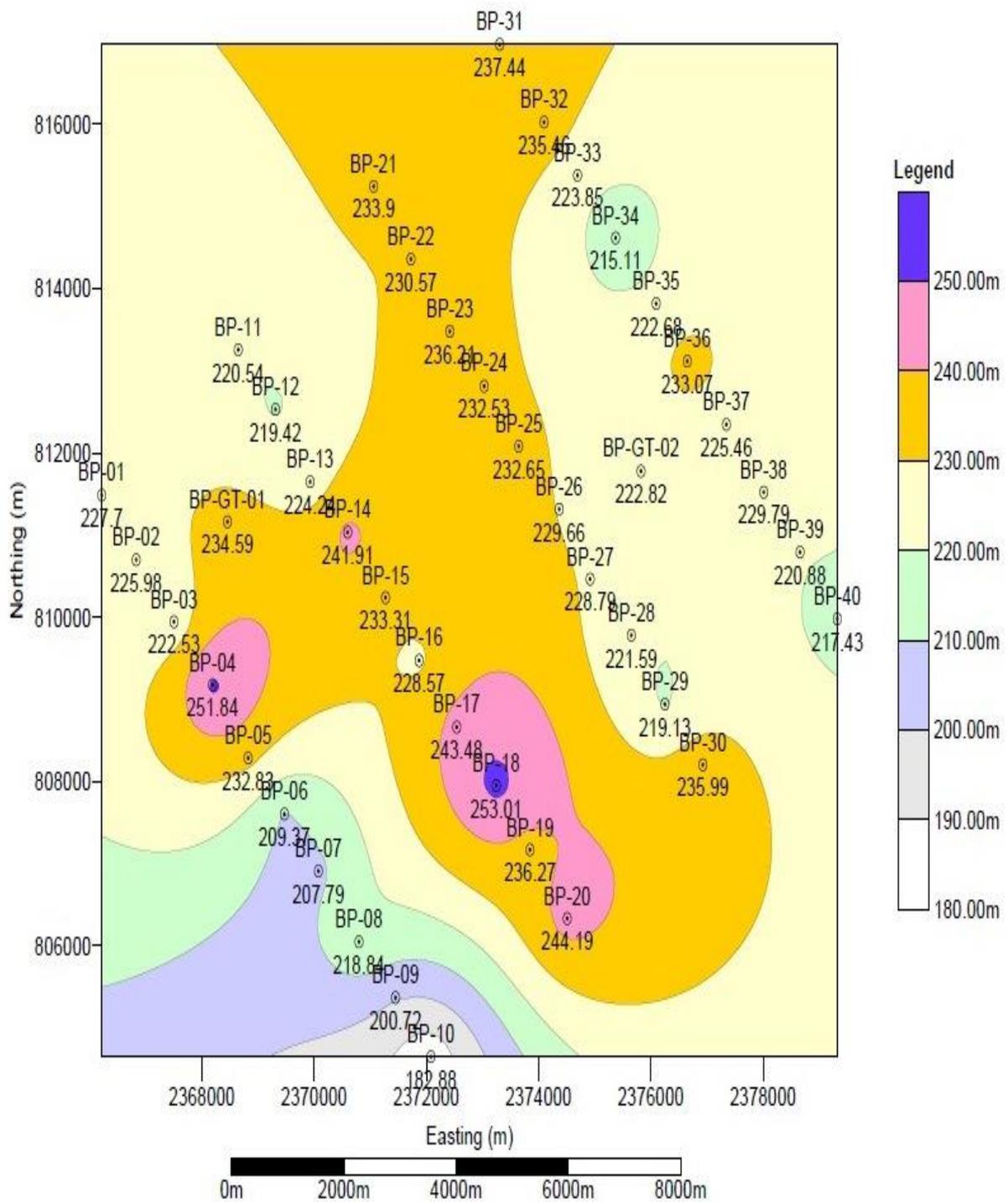


Figure-6.5: Isopach Map showing Overburden Thicknesses of Drilled Boreholes of Block-XI, Baprana (DRD), Thar Coalfield, Sindh, Pakistan

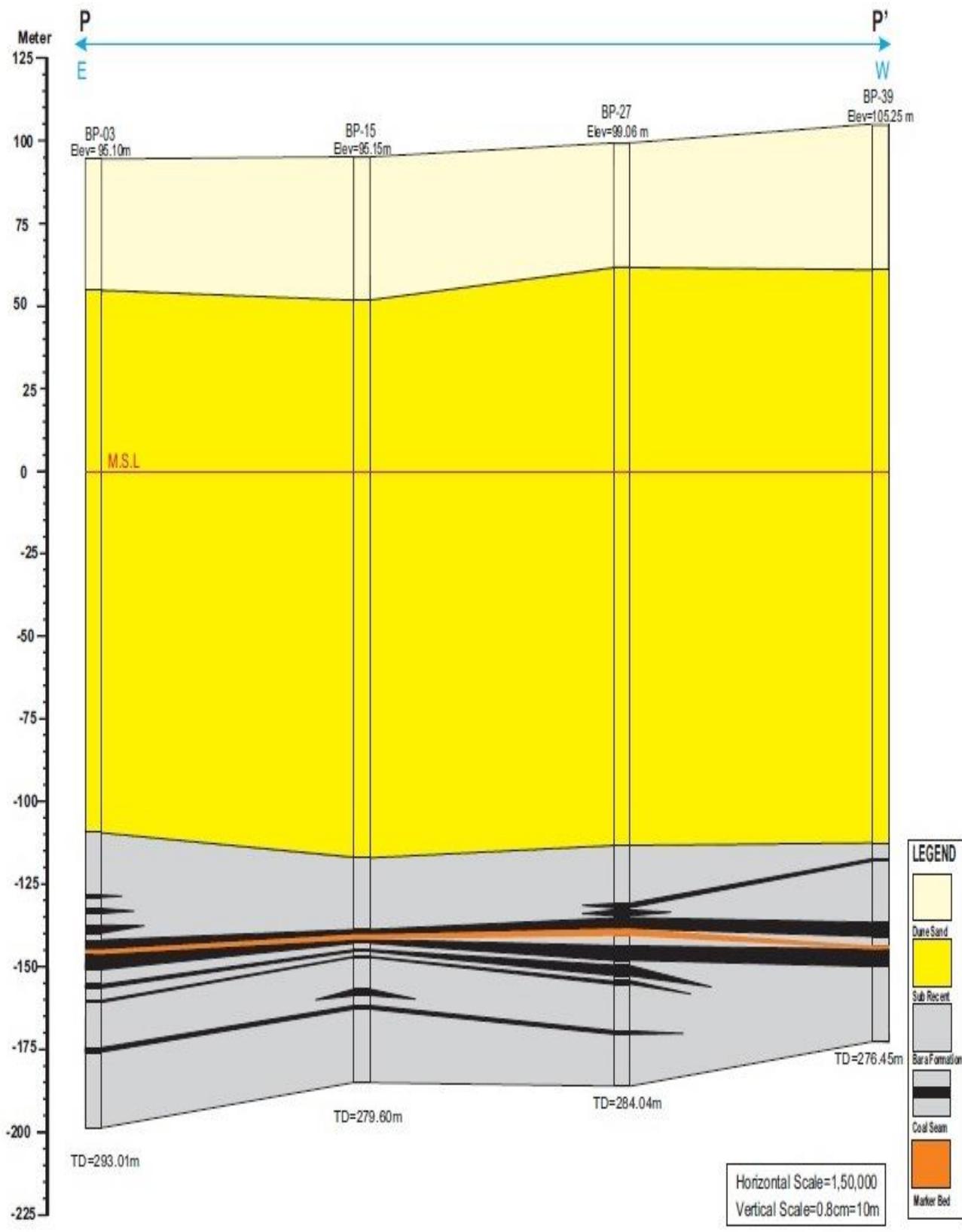


Figure-6.20: Cross Section Along Line P-P', Block-XI, Baprana (DRD), Thar Coal Field, Sindh, Pakistan

Chemical composition (as received)

- Moisture: 49.97%
- Ash: 8.07%
- Sulphur 1.61%
- Fixed Carbon 17.26%
- Volatile Matter 24.16%
- Heating Value 5228.86 Btu/lb

Cumulative Reserves

- The total coal resources of Block-XI (101.46 sq.km area) according to USGS are as follows:

➤ Measured Resources	315.60	million tons
➤ Indicated Resources	1014.28	million tons
➤ Inferred Resources	282.17	million tons
➤ Total Resources all categories	1612.05	million tons

- The total coal resources of Block-XI (101.46 sq.km area) according to JORC are as follows:

➤ Measured Resources	449.38	million tons
➤ Indicated Resources	669.04	million tons
➤ Inferred Resources	467.37	million tons
➤ Total Resources all categories	1585.79	million tons