



GREAT STEP '17

MINEO CASE STUDY

PROBLEM STATEMENT



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A coal deposit comprises two seams of thickness 10m and 17m which are at depths of 20m and 60m respectively at the North side of the lease hold area. The seams are dipping 1 in 50 towards the south. The rectangular lease hold area is 2.5km along the strike length and 5km towards south. The two lithologies available for the deposits are shown in Figure 1 and Figure 2.

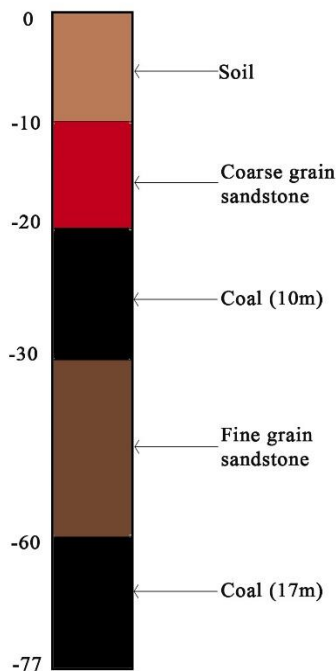


Fig. 1
North Side (Upmost point)

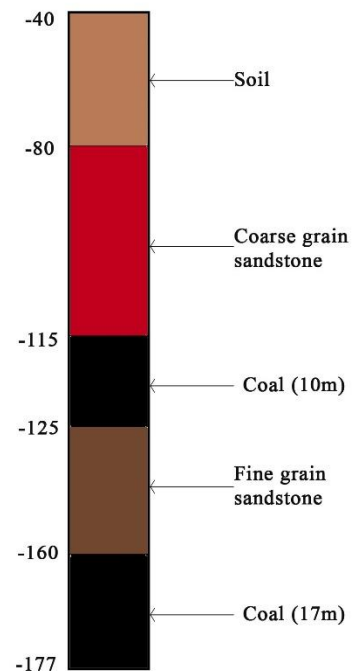


Fig. 2
South Side

Figure 1:- Litholog of hole-1 situated at the farthest North point of the deposit.

Figure 2:- Litholog of hole-2 situated at the farthest South point of the deposit.

The Company has the technical competency of using the following surface mining systems.

- a) Drilling -Blasting – Shovel – Dumper
- b) Drilling – Blasting – Dragline
- c) Surface miner loader – Dumper
- d) Surface miner – Movable Conveyor – High angle Conveyor

The models of different machines available and their prices and specifications are given in the Table below-

Drill (All variable diameter)	Price (In INR)	Penetration Rate	Power
D_X	8 million	4min/m	400 kW
D_Z	12 million	2.5min/m	550 kW
D_Y	15 million	1min/m	750 kW

Shovel	Bucket Capacity	Price (In INR)	Power
S_X	3m ³	10 million	600 kW
S_Y	7m ³	15 million	750 kW
S_Z	10m ³	25 million	900 kW

Dragline	Bucket Capacity 20m ³	Boom Range 90m	Price ₹ 200 million	Power 1600 kW
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Surface Miner	Drum Size	Depth	Speed	Power	Price (In INR)
Sm _x	3.8m	25cm	25m/min	70 kW	60 million
Sm _y	4.5m	50cm	40m/min	1200 kW	300 million
Sm _z	3.5m	40cm	25m/min	1000 kW	100 million

Movable Conveyor	₹ 30 million	250 kW
High Angle Conveyor	₹ 250 million	800 kW

Dumper	Capacity (in tonne)	Power	Price (In INR)
D ₁₀₀	100	350 kW	50 million
D ₁₂₀	120	450 kW	60 million
D ₁₇₀	170	550 kW	80 million

Chose a suitable mining method for the mine including overburden removal considering the life of the mine to be 22 years amongst out of which the first year is for mobilization and the last year is for withdrawal.

Also show calendar wise production target.

{Assume other relevant and realistic data to arrive at your decision}