

PROJECT AT A GLANCE

Name of the Coal Block	GARE PALMA SECTOR II COAL BLOCK MAND RAIGARH COALFIELD RAIGARH DISTRICT, CHHATTISGARH
Name of the Allottee with complete address	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED PRAKASHGAD, 2nd Floor, Prof. Anant Kanekar Marg, Plot No. G-9, Bandra (East) Mumbai-400 051. Maharashtra STD : 022 FAX : 26581466 PBX: 26474211/26472131 E-mail: cecoal@mahagenco.in

EXECUTIVE SUMMARY OF THE GARE PALMA SECTOR-II COAL BLOCK

Particulars	Features
Status	Non Producing
Mining Lease Area	2583.486 ha
Forest Area	99.735 ha
Geological Reserves(MT)	Total 1059.298 MT O/C-736.105 MT U/G-323.193 MT
Extractable Reserves	Total 655.153 MT O/C 553.178 MT U/G 101.975 MT
Mine Type	O/C & UG
Peak Production*	O/C - 22.0 MTPA U/G - 1.6 MTPA
Project Life	Total 77 Years, O/C 29Year, U/G 69 Year
No. of Seams	31 Coal Seams from X LA to IB. O/C - XLA to VIL . U/G - IV to I.
Exploration Status	Explored in detail
Depth of Quarry	Min - 8.69 m. Max - 203.57 m.
Coal Grade	E to F, Avg. GCV 4376.75 Kcal/Kg.
Av. Stripping Ratio	4.99 (m ³ /t)
Manpower (OC+UG)	Total-3400 (OC-2430 &UG-970)
Estimated Project cost	Total 666.97 Crore (433.75 Crore for OC & 233.22 for UG mining)

Source: Mining Plan

Introduction

General:

The Gare Pelma sector -II Coal block has been allotted to Maharashtra State Power Generation Company Limited (MAHAGENCO) vide allotment order No. 103/30/2015/NA dated August 31, 2015.

The Gare Pelma sector -II Coal block is located in the Mand Raigarh coalfield of Raigarh district, Chhattisgarh which is situated between IB coalfield in south-east and Korba Coalfield in north-west. The Mand Raigarh coalfield extends over more than 900 Sq. km. Detailed exploration of Gare Pelma sector -II Coal block has been carried out by Mineral Exploration Corporation Limited. The Coal Block occupying an area of 2583.486 Ha & has Geological reserves of 1059.298 MT.

Boundary demarcation of the Coal Block allocated has been completed by Central Mine Planning & Design Institute Limited (CMPDI). Topographical Survey, land scheduling & demographic profiling has been completed for the Block. Mining Plan has been prepared which will be submitted to the Ministry of Coal for approval. There are 14 Villages Namely: Thilirampur, Dholnara, Muragaon, Libra, Kunjemura, Jhinkabahal, Rodopali, Dolesara, Bhalumura, Sarasmai, Pata, Chitwahi, Gare, Saraitola, Tahsil: Tamnar located in the block area. It is proposed to produce coal from this block at 23.60 MTPA (22 MT from Opencast & 1.60 MT from Underground).

1. Location

The Gare Pelma sector-II coal Block lies in Mand Raigarh Coalfield in Raigarh district of Chhattisgarh State. The area is covered in the Survey Of India Toposheet no. 64 N/8 & 12 (R.F. 1:50,000) and is bounded by

Co-ordinate: Latitude – 22°06'23.55" N & 22°10'37.04" N

Longitude – 83°26'22.18" E & 83°31'16.90"E

Adjacent to the eastern side of the Gare Pelma Sector – II are Gare Pelma Sectors IV/2, IV/3, IV/6 and IV/7.

2. Communication

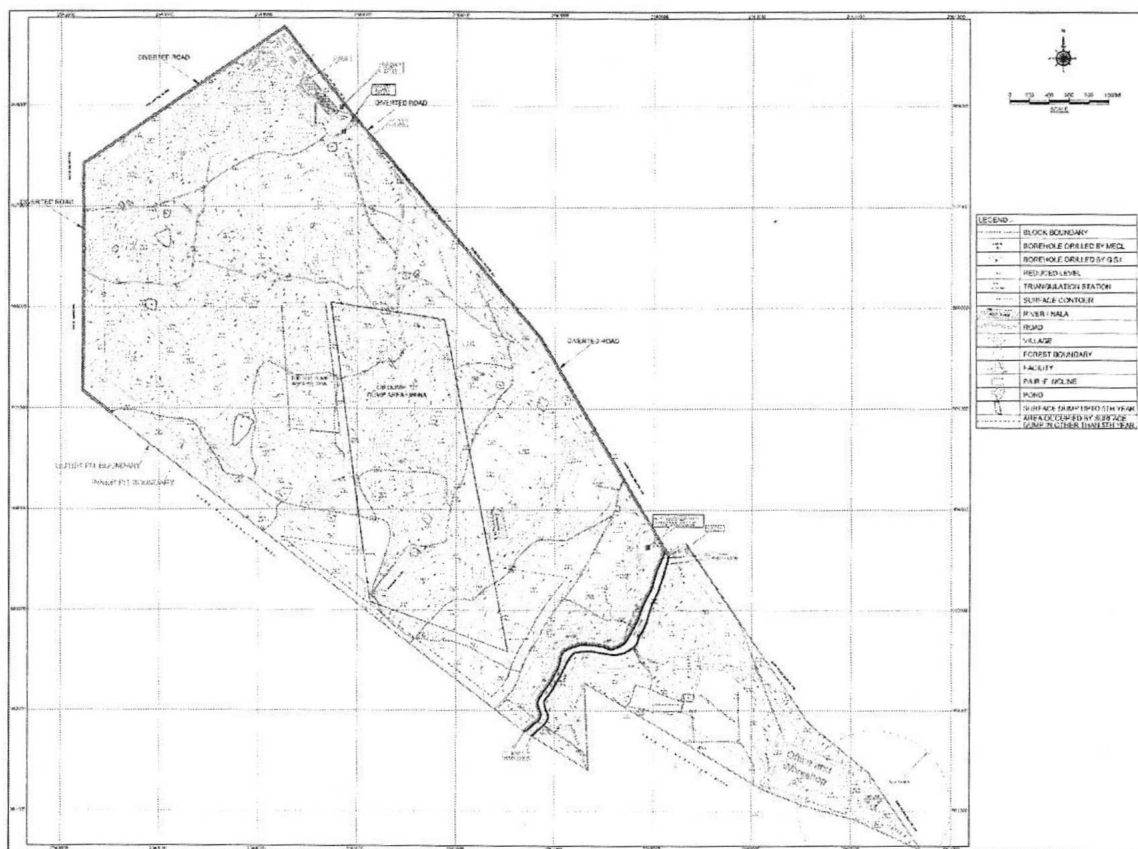
The Gare Pelma area is situated around 35 km away from Raigarh Townships, which is also the nearest railway station on Mumbai-Howrah main line of SE Railway. The block is connected by road from Raigarh via Punjipathara by State highway. Punjipathara village is situated on Raigarh- Ghargoda main Road. The distance from Raigarh to Ghargoda is around 40 km. The road distance between Raigarh to Punjipathara is about 20 km.

3. Area

The area of Gare Sector-II is about 25.83 Sq. km. It is approximately triangular in shape and the maximum length and width of the Sector are 21.75 km. and 3.75 km. respectively Gare Sector – II has a common boundary with Gare Sub-sectors IV/2, IV/3,

IV/6 and IV/7, located in the eastern side, while the western, northern and southern boundaries of the Sector II are marked by faults.

Topographical Plan of Gare Pelma sector -II Coal block



4. Topography

The topography of Gare Pelma Area is mostly represents an undulating & rolling topography, consisting of hills intersected with broad valleys. The general ground elevation in the block area varies between 240 m & 300 m above MSL & the surrounding area (uto 10 km) varies from 240 m to 640 m above MSL. The slope is towards south. The hills are relict & rise about 450 m above MSL

5. Drainage

The drainage of the Sector is controlled by the perennial Kelo-Nadi flowing NE to SW in the southern part of the sector. Besides this, streams with their branches, mostly seasonal, are present in the sector and discharge in the Kelo-Nadi. The slope of the Sector is from NE to SW.

6. Land Use Pattern

Protected forest is present in a small patch of about 99.735 ha near eastern boundary in northern part. In the Sector -II as many as fourteen villages are present. In the area adjacent to the villages paddy cultivation is done.

7. Climate

The climate of the Block area is subtropical type, and is characterized by an oppressive hot summer, a mild winter and well distributed rainfall during the south western monsoon season. The monthly mean of minimum temperature from 12.04°C in January to 27.57°C in May. The monthly mean of maximum temperature ranges from 27.56°C in January to 42.08°C in May.

8. Exploration

The Detailed exploration in the Gare Pelma Sector II Coal Block has been done by MECL. A total of 73,997.80 meters of drilling was conducted in the block is 188 188 boreholes. The Borehole Density within the Block is 7.3 /sq.km which is adequate.

Geology of Gare Pelma Sector-II Coal Block

The entire Gare Pelma Sector-II Coal Block is occupied by the coal bearing Barakar Formation; Exposures of the formation are present in the stream and river cuttings. Borehole data reveal the presence of Talchir Formation below the coal bearing Barakar Formation. The Barakar Formation is represented by multistoried sandstone, arenaceous shale, gray shale, siltstone, carbonaceous shale, ten correlateable coal seams besides a number of local seams and coal bands.

Structure:

The general strike of the beds is NW-SE with south-westerly dip of 2° to 4° direction. A total 10 no. of Faults are deciphered in the Block. The throw of Faults varies from 0 to 20 m. All the fault dip towards North East except Fault F6, F9 & F10 which dip towards south west.

Coal Seams:

The Detailed Exploration in Gare Pelma Sector-II Coal Block revealed the existence of 31 correlatable Barakar coal Seams. These Seam in descending order are XL-A, X Top, X Bottom, IX-L2, IX-L1, IX, VIII, VIII-L, VII Top, VII Bottom, VII combined, VI, VI L, VA-1, VA-2, VB-1, VB-2, VC-1, VC-2, VD-1, VD-2, IV, III L2, III, III L, I-LI, I-L, I Top, I Bottom & I combined. Out of these 25 seams viz. X Bottom IX, VIII, VIII L, VII Top, VII Bottom, VII combined, VI, VI L, VA-1, VA-2, VB-1, VB-2, VC-1, VC-2, VD-1, VD-2, IV, III L2, III, II, IL-1, I- Top, I Bottom & I Combined are workable.

Coal Quality:

The coal Seams of Gare Pelma Sector-II Coal Block are high moisture; non-coking type with grade in general varying from E to F. Average GCV is 4376.75 Kcal/Kg.

Method of Mining

The main area of mining is located on the west of Kelo River. The length of the property on the west of the Kelo River is about 7 km. The Coal in the block is proposed to be mine by opencast as well as underground method and would be fully mechanized of Coal 23.6 Mt will be produced by OC mining during the initial years as the UG mining operation will start contributing to the Coal production only from 12th year (including) onwards UG mining will produce 1.6 MTPA. The underground mine area is below/beneath the open cast mine area and with mine lease area

Opencast:

Shovel Dumper Combination for OB & partings

1. Coal mining will be done by mechanized opencast mining method.
2. Shovel-Dumper combination has been proposed for overburden.
3. The quality problem can be handled with the help of hydraulic excavators which have three dimensional movement of bucket.
4. Furthermore, to tackle about 130-135 Mcum OB (upto 1st 14 years)& 99 Mcum in later years & 22 MT of Coal at many Locations in the OC mine, comparatively large size

shovels with 10-20 m³ bucket capacity for OB have been envisaged along with 150 Tonne rear dumpers.

Surface Miners for Coal

1. Surface miners are capable of cutting the Coal precisely & selectively.
2. Mining of thin Coal by Surface miners & ripping has also been now investigated by the RQOP besides the drilling/blasting considered earlier & it has been concluded that the Coal mining will be carried out totally by Surface miners however, 2 nos. ripper will be provided which could be utilized in those corners/ locations as are difficult to approach by CSMs
 - 2 nos CSM 4200 with 10 MTPA capacity
 - 1 nos CSM 3800 with 4 MTPA capacity

Underground:

Bord & Pillar mining with Caving:

1. Mechanized Bord & Pillar mining with low height continuous miner & shuttle cars could be one of the suitable systems for an annual coal production of 1.60 MTPA by underground method in spite of disadvantage of high capital cost.
2. In underground, development & depillaring will be done with the help of Continuous miners only, requiring no blasting.
3. So explosives will be required only for drifting and drivages of access inclines in stones or drivages in seams with less than 1.8 m thickness for heightening.
4. The average daily requirement will be about 0.50 T & that also during the initial years of UG drivages & shaft sinking.
5. It is noted that only permitted explosives will be used in underground coal mines.
6. Four nos. of continuous miner will be deployed each producing 0.4 MTPA.
7. They will be appropriately engaged in development & depillaring depending upon situation.
8. Continuous miners, shuttle car combination along with the LHD & support attachment is proposed.

Equipment For Opencast Mine:

List of main HEMM is given below:

Sr. No.	Equipment	Capacity of machine based on 330 days/year	Population	Total output
A	Overburden			
1	20 cum hydraulic Elec. Shovel with 12 Nos. 150 T dumpers for 4.5 km lead	5.35 Mcum:OB	20 shovels + 240 dumpers	107 Mcum
2	12 cum hydraulic Elec. Shovel with 9 Nos. 150 T dumpers for 4.5 km lead	3.42 Mcum:OB.	7 shovels + 63 dumpers	23.94 Mcum
	5/5.50 cum hydraulic Elec. Shovel with 10 Nos. 50 T dumpers for 4.5 km lead	1.45 Mcum: OB	4 shovels + 40 dumpers	5.8 mcum
B	Coal			
1	Surface miners(3800 SM)	4 MTPA	1 SM + 5 Nos. 100 T dumpers (CB)	4 MTPA
2	Surface miners (4200 SM)	10 MTPA	2 SM + 10 Nos. 100 T dumpers (CB)	20 MTPA

Environmental Management Plan

The environment impact Assessment made in the preceding section has identified the areas where certain control measures are called for to minimize the negative impacts. Subsequent paragraphs deals with effective measures proposed to be taken up with regard to the following aspects so that the proposed mining & allied activities can be continued in an environment-friendly manner.

1. Land use Planning- Afforestation & landscape development.
 - a) Land degradation Control measures
 - b) Top Soil Management
 - c) Post reclamation land use
 - d) Soil conservation measures
 - e) Afforestation
2. Air Pollution Control-
 - a) Controlling fugitive dust
 - b) Preventing Dispersal of air borne dust
 - c) Measures to mitigate CO levels
 - d) Measures to mitigate NO₃ levels
3. Blasting & Noise control
 - a) Measures to control noise pollution
 - b) Measures to reduce ground vibration due to blasting & prevent fly rocks.
4. Water Pollution Control-
 - a) Effluent from mine
 - b) Storm water
 - c) Measures to minimize adverse effects on water regime
5. Socio- economic aspects

Conclusion

- 1) Project affected families will be 1679 in fourteen villages.
- 2) No washery is envisaged as the Coal can be directly used in Power Plant
- 3) Compensatory plantation is to be planned in line with forest department rules.
- 4) Agricultural land shall be converted to industrial or mining site during mining tenure.
- 5) The easterly flowing river constitutes the main drainage system of the block. Kelo River is flowing across the Coal block towards east & its diversion is not proposed. It will be protected by leaving statutory barriers
- 6) After the change in land use, the mining will provide the opportunity to create a water storage reservoir & comparatively higher tree plantation and greenery will improve the general quality of the environment.
- 7) Dust suppression system (like water spraying) would be adopted at roads, which are used for transportation. Fixed sprinklers (whirling) have been proposed with timers

- to be installed along the haul roads and coal transportation roads to suppress the dust.
- 8) Meteorology & general air quality of the area will not suffer & the planned operation will not have any significant adverse impact on the hydrograph & water quality in the area.
 - 9) Only minor nature of air pollution is visualized for which more than adequate preventive measures have been contemplated.

Mine Closure Plan

The post mine Closure Plan stage use is given in table as applicable at the overall post mine closure (OC+UG) stage 78th to 80th Year)

Total (OC+UG) Mine Closure Land Use (HA) (End of 80th year)

Sr No.	Description Of M.L. Area	Land Use (Ha)						Total
		Bund	Void	Public Use	Company Use	Undisturbed	Plantation/ agricultural including GB	
1	Backfill	0	0	0	0	0	2440.55	2440.55
2	Void/water body	0	0	0	0	0	0	0
3	Surface dump	0	0	0	0	0	0	0
4	Bund	5.20	0	0	0	0	0	5.20
5	Green Belt	0	0	0	0	0	36.07	36.07
6	Top soil dump	0	0	0	0	0	0	0
7	Settling pond	0	0	0	0	0	5.00	5.00
8	Road diversion	0	0	30.30	0	0	0	30.30
9	Facilities retained part	0	0	5.00	0	0	0	5.00
10	Dismantled Part	0	0	0	0	0	45.94	45.94
11	Under Kelo River	0	0	0	0	15.42	0	15.42
12	Undisturbed	0	0	0	0	0	0	0
Total		5.20	0	35.30	0	15.42	2527.56	2583.48

1. The surface dump will be planted with short life cash crops as it is to be rehandled 7 backfilled between 7th & 20th year.
2. The Infrastructure area of 55.94 ha includes 5 ha settling tank, 5 ha left for public use & the remaining 45.94 ha dismantled facilities & reclaimed.
3. During the period of OC post mine closure (30th to 32th year), the east Pit void will be reduced from 191.78 ha to zero ha by rehandling part of the west Pit Crown dump of 100m height will be reduced to 0 m (general ground level) from over the backfilled area to backfill the remaining void except over 138 ha area where the crown height will reduce to 80 m to contain a residual OB volume of 72.37 Mcum(B). Similarly remaining 135.91 ha (60 m depth) void in west Pit area will be completely backfilled.
4. Top soil Dump of 60 ha was over the coal bearing area before 10th year after which it reduced to zero by 15th year as area under it was excavated, the topsoil in subsequent years was stacked over the backfilled area.
5. Surface water reservoir in facilities area measuring 5.0 ha will be backfilled in the post mine closure stage (OC+UG Combined)
6. Surface dump will be rehandled from 7th year to 20th year and area below it excavated
7. Green Belt of 36.17 ha = 23.63 ha along Kelo River 45 m west side & 15 m east side +12.44 ha over 7.5 m along ML Boundary.
8. During post mine closure plan period, agriculture is proposed instead of plantation over the rehandled crown dump area as well as over the backfilled area obtained as a result of reducing the void except over 211.319 ha including the crown dump of 138 ha which will be left for forest use as in pre-mining scenario.