

Executive Summary
of
ENVIRONMENTAL IMPACT ASSESSMENT
&
ENVIRONMENTAL MANAGEMENT PLAN
FOR
PUBLIC HEARING AS PER EIA NOTIFICATION, 2006
MUGOLI NIRGUDA EXTN. DEEP OC
(Wani Area, WCL)

for
Increase in Production Capacity from
4.00 MTPA to 4.375 MTPA (Peak)
&
Increase in land area from 818.05 ha to 1317.55 ha
(PREPARED AS PER TOR J-11015/77/2016.IA-II (M) dated 07.03.2017)



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Prepared by

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Executive Summary

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1.0 INTRODUCTION

Mugoli-Nirguda Combined geological block is a part of the south-western part of the western limb of the Wardha Valley Coalfield. Presently an opencast mine named Mugoli OCP Expansion is being operated by WCL in the block. The existing mine is producing about 3.00 to 4.00 Mt per annum.

To continue the production from the mine for gainful utilization of existing men, machinery and infrastructure of Mugoli OCP Expansion, it was decided to make a Project Report of Mugoli - Nirguda Extension (Deep) OC mine to extract the coal reserves of the block coming under proved category beyond the approved PR limit. It was proposed to deploy the Draglines of neighbouring Ghughus OC mine and Umrer OC mine in proposed Mugoli - Nirguda Extension (Deep) OC mine.

Subsequently a Project Report was prepared and approved by WCL board. Based of this approved project report ToR application was made to MoEF&CC. ToR for Mugoli Nirguda Extension Deep OC was granted vide letter no. J-11015/180/2014-IA.II (M) dated 30/09/2014 for Capacity of 3.90 MTPA within Land Area of 1145.16 ha. Baseline data was generated in post monsoon season (Nov 2015- Jan 2016).

Subsequently, Mining Plan / Project Report was revised with change in production capacity from 3.90 MTPA to 4.375 MTPA peak and increase in land area from 1145.16 ha to 1317.55 ha. Based on the revised Project Report an application for Modification in ToR was submitted to MoEF&CC through online portal on 04/02/2016. The project was appraised in 62nd EAC meeting held on 23/08/2016. EAC suggested to re-apply for Fresh ToR.

Based on EAC recommendations, on 29-08-2016 existing ToR & online application for modification of ToR was withdrawn and a fresh application for grant of ToR was filed through MoEF&CC online portal.

The project was appraised in 4th EAC meeting held on 31.01.2017. ToR was issued vide letter no. J-11015177/2016-IA.11 (M) dt. 07/03/2017. Subsequently on the basis of the above said ToR, this executive summary of EIA & EMP is prepared for submission to Maharashtra Pollution Control Board for conducting Public Hearing.

1.1 LOCATION

Project is located in a triangle shaped plain between Wardha and Penganga rivers just opposite to the Cement Factory of ACC near Ghughus. The present area under report falls in Survey of India Topo-sheet No. 56 M/1. The area falls in the Wani tehsil of Yavatmal district of Maharashtra State. The area is bounded by Latitude N19° 50' 54.36" and N19° 54' 57.17" and Longitude E79° 05' 24.04" and E79° 07' 34.02". National grid coordinates of the area lie in zone IIIA from Northing N1065744.4961 & N1073206.1058 and Easting E3009417.9388 & E3013199.9785.

1.2 COMMUNICATION

The project is approachable from Wani Township by all weather metalled road from Wani to Sakhara village. The distance is about 35 kms. The area can also be approached from Tadali by all weather metalled road via Ghughus village. The nearest

railhead is Ghughus located on Ghughus -Tadali branch line of Central railway. The distance between Tadali Junction on Delhi-Chennai (GT) railway line and Ghughus is around 18kms.

1.3 TOPOGRAPHY & DRAINAGE

The area of the block is covered by agriculture land with black cotton soil and exhibits a gently undulating topography. The altitude of the area ranges between 168.3m and 196.1m. Jowar, cotton, paddy, and pulses are grown on this fertile flood plain.

The main drainage channels are Wardha River in the north and Penganga River in the south. General slope of the surface is towards these rivers which submerge the outlying area during high flood. HFL of Wardha River at Ghugus is 185.165m. During unprecedented heavy rain fall in 1994 flood waters of Wardha and Penganga Rivers did not cross this HFL mark in this area. Therefore, 185.165 m has been considered as HFL for this area

1.4 CLIMATE & RAINFALL

The area is characterised by subtropical climate. The highest temperature recorded is 48^o C during summer and during winter season the temperature goes down to 10^oC. Monsoon is normally active during the period from 15th June to 15th September. The annual rainfall data for last five years (2012-2016) indicates minimum of 763.6 mm(year-2014) to maximum of 1317.5 mm(year-2013), which were recorded at district Chandrapur as per IMD records.

2.0 GEOMINING PARAMETERS

The geo-mining parameters of the Mugoli Nirguda Extn. Deep OC are tabulated below:

Table 1 - Geomining Parameters

Sl. No.	Particulars	Qty.
1.	Area of the Quarry	
a)	On floor (ha) (Including Existing Quarry)	394.22
b)	On surface (ha) (Including Existing Quarry)	513.47
2.	Depth (m)	
a)	Initial	100
b)	Final	150
3.	Gradient of Seams	1 in 10 to 16.5
4.	Average thickness of composite seams (m)	15.20
5.	Average Strike length (m)	4000
6.	Width on surface (m) [dip rise] (Incl Existing Quarry)	1500
7.	Width on floor (m) [dip rise] (Including Existing Quarry)	1000
8.	GCV (kCal/kg) (with 5cm dilution at each contact point)	4674 (G - 9)
9.	Mineable Reserves (Mt)	45.85
10.	Total OB Excluding Re-handling (Mm ³)	269.85
11.	Trench cutting below proposed external dump (Mm ³)	2.78
12.	Total Re-handling (Mm ³)	8.40
13.	Total OB (including Rehandling) (Mm ³)	281.03
14.	Average stripping ratio Excluding Re-handling (m ³ /t)	5.88
15.	Average stripping ratio including Re-handling (m ³ /t)	6.12

Type and Method of Mining Operations: Opencast Mining, Dragline with Shovel - Dumper Combination is proposed. For Coal Surface Miner is proposed. Parting between two seams will be removed by Ripper Attachment.

3.0 DESCRIPTION OF ENVIRONMENT AND ANTICIPATED IMPACT

Baseline data has been generated in Nov 2015 – Jan 2016 (Post Monsoon Season). Same data as been presented to EAC in its 4th Meeting held on 31/01/2017 and utilized to assess environmental scenario as well as Air Quality Impact Prediction.

3.1 MICROMETEOROLOGY

A meteorology station has been set up and micrometeorological parameters like wind velocity, wind direction, temperature, relative humidity, cloud cover etc. are recorded on hourly basis for 92 days during the period from 1st Nov to 31st January 2016 representing post-monsoon season. Daily rainfall also has been recorded and reported.

The wind velocity readings were ranging from <0.5 – 3.9 m/s. Predominant wind was from East direction. The maximum temperature recorded was 38.9°C and the minimum was 8.4 °C. The relative humidity ranges from 40% to 73% and No rainfall was recorded during the study period.

3.2 AIR QUALITY

Baseline ambient air quality monitoring has been carried out at six locations. Summary of reports is given below:

PM₁₀ and PM_{2.5} values are ranging from 33 µg/m³ to 95 µg/m³ and 18 µg/m³ to 52 µg/m³ respectively. SO₂ and NO_x values are varying between 6.3 to 19.8 µg/m³ and 10.2 to 36.2 µg/m³ respectively. The heavy metals values are found to be very low and negligible. Heavy metals like Arsenic (As) and Mercury (Hg) were found to be Below Detectable Limit (BDL) and other metals like Nickel (Ni), Lead (Pb) and Chromium (Cr) values are found to be very low and negligible. All the values are found to be well within the NAAQ Standards prescribed by CPCB.

In general, values are found to be well within the AAQM Standards prescribed by CPCB.

3.3 WATER QUALITY

To assess the water quality, six locations are identified and samples (6 Nos.) were collected and analyzed for physico-chemical and heavy metal parameters. Bacterial examination was also carried out to find out the Coliform contamination (if any) at water sources. The water quality all the parameters are found to be well within the prescribed norms of, IS: 10500 – 1991 (permissible) and IS: 2296 - 1982.

3.4 HYDROGEOLOGICAL QUALITY

The average water levels fluctuations measured from the area in and around are given below.

Pre monsoon period May-June	Core Zone (within 3 km)	8.00 m to 12.55 m
	Buffer zone (within 10 km)	2.05 m to 15.80 m
Post monsoon period Oct-Nov	Core Zone	1.50 m to 11.45 m
	Buffer zone	0.92 to 9.50 m

3.5 NOISE LEVELS

Baseline data of Mean L_{eq} noise levels at day time and night time was generated at six locations.

All noise levels values are found to be within the prescribed limits.

3.6 LAND USE

It is proposed to acquire about 529.18 ha of land in addition to existing acquired land (788.37 ha) for Mugoli-Nirguda Extn Deep OC in approved PR. This additional land includes area (12.00 ha) for Mugoli village rehabilitation and about 50.00 ha for setting up Railway siding. The total land for the project works out at 1317.55 ha (788.37+529.18ha). The village-wise break-up of additional 529.18 ha land proposed to be acquired as per PR is tabulated below:

Table 2 - Land Requirement

Sl. No.	Name of Village	Type-wise Area of Land (Ha)		
		Tenancy	Govt	Total
1	Matholi	6.74	0.00	6.74
2	Mugoli	69.62	10.87	80.49
3	Shivani	140.34	2.83	143.17
4	Sakhara	67.72	2.00	69.72
5	Kolgaon	150.88	16.18	167.06
6	Land For Proposed Railway Siding. (Location to be decided by Area. Tentative Location at Borgaon near Access Trench of Penganga OC)	50.00	0.00	50.00
	Sub Total	485.3	31.88	517.18
7	Land For Village Rehabilitation	12.00		12.00
	GRAND TOTAL	497.30	31.88	529.18

3.7 SOCIO ECONOMIC

Mugoli village falling within the core zone are required to be rehabilitated and resettled. Positive impacts on socio-economic environment are expected due to creation of direct and indirect employment opportunities and development of infrastructure such as roads, schools, hospitals etc.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

To have a close watch on the environmental condition and implementation of various measures suggested, a multi- disciplinary approach is essential.

4.1 AIR QUALITY

Prediction of fugitive dust level in the surrounding is carried out (for 24 hours average) with the help of computerized Fugitive Dispersion Model (FDM90121 by USEPA), based on Gaussian Plume formulation. The resultant values are within limits as per CPCB rules.

Air Pollution Control Measures

In order to mitigate the adverse impacts on ambient air, the following main control measures have been proposed and will be implemented during the actual operation of the mine.

- a) Water sprinkling on road, stockpiles by mobile tankers.
- b) Black topping of road.
- c) Covering of trucks carrying coal & avoiding overloading of trucks.
- d) Development of adequate green belt all along the coal transportation road on both sides will be done.
- e) Blasting will be done between shifts or during the rest interval when the minimum number of persons are present around the blast area. In order to quickly disperse the dust generated in blasting operations, blasting will be avoided when there is wind. Blasting will be avoided in the mornings and during cloudy situations.
- f) Wet suppression of unpaved areas can achieve dust emission reductions of about 70 percent or more, and this can sometimes be increased by up to 95% through the use of chemical stabilisation.
- g) Optimize travel distances through appropriate site layout and design.
- h) Vehicular emission of particulates, SO₂, NO_x, hydrocarbons can be minimized by proper training and maintenance of vehicles and other oil - operated equipment.
- i) Regular monitoring of ambient air quality as per CPCB rules for Coal Mines.

Plantation to Check Air Pollution

Plantation will be under taken in the mine area as mitigative measure against air pollution, noise pollution and to increase the aesthetic value. The plantation will be developed at suitable places like overburden dump, along the road sides, unused land etc. to arrest dust generated due to various mining operations viz. quarrying, coal and OB transportation, OB dumping. About 226.48 ha of plantation will be carried out in undisturbed area as green belt. Total 760.30 Ha out of total 1317.55 Ha (57.71%) area will be planted till the end of mine life.

4.2 WATER QUALITY

Anticipated Impact

The major impact of deep and large mines is of natural groundwater table. Lowering of water table may result in reduced groundwater availability. Extraction of different minerals is known to lead to water pollution due to heavy metal, acid discharges and increased suspended solids. However effect of coal mining due to nearby mines of Wani area on water is mainly observed as increase in suspended solids.

Salient controls measures to be taken to reduce water pollution are as follows:

i) Industrial Effluent

The waste-water from workshop, which normally remain laden with oil and grease, suspended and dissolved solids etc. will be treated in the Effluent Treatment Plant (ETP). Clear water coming out from the treatment plant will be taken into the closed water circuit and recycled for its reuse. All parameter of ETP waste discharge will be monitored regularly as per Env. (Protection) Amendment Rule, 2000.

ii) Mine Water

Most of the suspended particles will be settled in the sump located in the quarry and the supernatant water is pumped out to the sedimentation tank present on surface. This water is to be passed through sedimentation pond on surface, before being discharged in to natural drain or agricultural field.

iii) Surface Run-off

Adequate numbers of vegetation will be grown on the top surface and slopes of the dumps in order to arrest the erosion of soil and it will also reduce surface run-off, which helps averting siltation of natural water courses.

Impact on Hydro-Geological Regime

In the opencast mines, the different aquifers overlying the working coal seam would be contributing groundwater to the mine by gravity drainage since they are exposed/removed at the mine. The anticipated groundwater inflow to the mine is to the tune of 9120 m³/day (approx.). As such due to this pumping/gravity drainage, cone of depression would be formed. The shape and extent of the cone would depend on mainly hydraulic conductivity and specific yield of aquifers, mine depth & area etc.

Generally steep drawdown cone would be formed in poor potential aquifers, thereby the influence area will be limited to small distance and reverse is established in respect of aquifers with high hydraulic conductivity

The radius of mine influence area estimated for the Mugoli Nirguda Extn Deep OC is 504 m based on the above mentioned aquifer. The stage of ground water development in the buffer zone (10 km from the periphery of the core zone) of Mugoli Nirguda Extn Deep OC comes to about 30.91%.

Conservation Measures:

1. The mine discharge will be utilized to meet the mine's domestic, dust suppression, firefighting and other industrial water needs.
2. The artificial recharge by water conservation structures in the outside mine influence areas will check water level lowering. The impact on ground water level is being minimized by artificial recharge by spreading of pumped out water, creation and filling of ponds with mine water and construction of rainwater harvesting structure.
3. After the cessation of mining, with copious rainfall and abundant groundwater recharge, the water levels will recoup and attain normalcy. Thus, the impact of mining on groundwater system may be considered as a temporary phenomenon. The old mine workings also behave as water pools and improves the resource availability in the area.
4. The discharged mine water would be available for the local people to utilize in irrigation and domestic use. Thereby the mine water will be a resource for many of the local villagers.
5. Monitoring of water quality of mine water discharge, local river/nala and domestic water (dug well/hand pumps) will be done under routine monitoring. On analyzing the field data if any area receiving the maximum impact, suitable controls measures will be adopted by the project authorities.

4.3 NOISE QUALITY

In order to assess the existing ambient noise level in the surrounding of proposed project site, the baseline data generated for Mugoli Nirguda Extn Deep OC in post monsoon season 2015 is documented in chapter III of the EIA report and noise level values have been found to be within permissible limits.

Noise Pollution Control Measures

Monitoring of the noise control will be carried out on regular basis as per the Environment (Protection) Amendment Rule 2000. While planning for an effective noise attenuation measures, the concept of source, path and receiver has been considered.

4.4 IMPACT ON LAND AND LAND RECLAMATION

Total area required for the project is 1317.55 Ha. Additional land requirement for Mugoli Nirguda Extn. Deep OC is 529.18 ha. WCL has acquired 328.72 ha under CBA Act 1957. For the balance land of 126.88 ha notification under sec 7(i) was published on 10.02.2017 in gazette of India. The proposal for Section 9(i) has been under process.

The land use in core zone is mainly agricultural land. So the major impact on land will degradation of agriculture land in the mining area. No forest land is involved.

The following activities have been proposed for reclamation of land.

1. Backfilling of the excavated area at the time of mine closure.
2. Levelling of the backfilled area and carpeting with the topsoil.
3. Creation of garland drains in order to arrest the silt load, due to erosion, to enter into natural watercourses during surface run-off.
4. Grass, legumes and different types of plants etc. will be planted on such reclaimed land in order to make it, as far as possible, conducive to agricultural growth.
5. Technical and biological reclamation of external OB dump and rehandling at the end of mine life. The density of trees will be around 2500 plants/Ha.

The land use during the mining would be as follows: -

Table 3 - The Land Use during the Mining

Sl. No	Particulars	Area (ha)
1.	Quarry/ exposed Area (including existing quarry)	513.47
2.	External OB dump (including existing dumps)	295.00
3.	Embankment around quarry (including existing Embankment)	70.00
4.	Proposed Top Soil dump (to be rehandled)	80.00
5.	Land for proposed relocated Magazine *	08.00
6.	Land for proposed relocated Mugoli Village *	12.00
7.	Infrastructure including colony (Approx.)	25.00
8.	Residential Colony	7.60
9.	Roads (Existing and Proposed including Diversions)	30.00
10.	Railway siding*	50.00
11.	Blasting / Safety zone	123.79

Sl. No	Particulars	Area (ha)
12.	Rationalisation of boundary	102.69
	Total Land	1317.55

*Note: - Site will be decided by area authority

The land use at the end of the mine would be as follows:-

Table 4 - Land use at the end of the mine

S.N.	Land use post mining	Land use (ha)				
		Plantation	Water Body	Public use	Undisturbed	Total
1	External OB Dump	295.00				295.00
2	Top soil dump	0.00				0.00
3	Excavation	217.82	295.65			513.47
4	Roads	6.00		24.00		30.00
5	Built up area	8.00		44.60		52.60
6	Green Belt					0.00
7	Land for railway siding	5.00		45.00		50.00
8	Undisturbed Area	226.48			80.00	306.48
9	Embankment around quarry	2.00		68.00		70.00
	Total	760.30	295.65	181.60	80.00	1317.55

Table 5 - Stage-wise Land use and Reclamation Area (ha)

S.N.	Land use category	Present 1st Year	5 th year	10 th year	End of Mine Life	Post Mining (3 year after)
1	Backfilled Area (Reclaimed with plantation)	20.67	77.74	145.25	217.82	217.82
		0	0	0	0	217.82
2	Excavated Area (Not reclaimed) /void(partially backfilled)	197.51	370.7	349.28	295.65	295.65
3	External OB dump (Reclaimed with plantation)	46.51	295	295	295	295
		38.39	45	80	250	295
4	Reclaimed Top soil dump	0	80	80	0	0
		0	0	0	0	0

5	Green Built Area	0	0	0	0	0
6	Undisturbed area (brought under plantation)	884.7	291.51	245.42	306.48	306.48
		49.78	50	80	100	226.48
7	Roads (avenue plantation)	18	30	30	30	30
		2.315	4	6	6	6
8	Area around buildings and Infrastructures	40.6	40.6	40.6	40.6	40.6
		0	6	6	6	6
9	Embankment	47.56	70	70	70	70
		2.315	2.5	2.5	2.5	2.5
10	Land for proposed relocated Mugoli Village	12	12	12	12	12
		0	2	2	2	2
11	Railway siding*	50	50	50	50	50
		0	5	5	5	5
Total		1317.6	1317.6	1317.6	1317.6	1317.55
Total Plantation		92.80	114.5	181.5	371.5	760.80

*Note: - Site for railways siding will be decided by area authority.

- Present year plantation figures are as on 01/07/2017 (as received from mine management)

4.5 REHABILITATION & RESETTLEMENT

Resettlement / rehabilitation of Mugoli village is proposed as it is located very close to the existing mine. As per the data communicated by mine / Area, the population and no. of family in the Mugoli village are as follows:

Sl. No.	Particulars	Data as communicated by Mine/ Area
1.	Population	1100
2.	Residential structure	600

A Capital provision of ₹ 59.7557 crores have been made in this PR for resettlement of Mugoli Vilage. This includes 12.00 ha land for resettlement site of village. The resettlement work of 'Beghar Basti' located over coal bearing area is already in process.

4.6 PROGRESSIVE MINE CLOSURE PLAN

The mine closure cost will cover the different mine closure activities for which a corpus fund will be created by opening an escrow account with the coal controller organization in nationalised bank. An amount @ Rs 6.00 lakhs per Ha of the project area will be deposited in this account for final mine closure. Progressive mine closure will be done with the fund provided in approved report. The financial provision for closure of Project Report for Mugoli Nirguda Extn Deep OC for the entire mine life comes to around Rs. 60.0288 Crores

5.0 ENVIRONMENTAL MONITORING PROGRAMME

The Environmental Monitoring Programme will be carried out as per statutory requirements.

Environment Management Cell

WCL, has an Environment Deptt. headed by General Manager (Env.) at its HQ. The department provides necessary support that are required for environmental management of various mining projects under the jurisdiction of the company. At area level, Area General Manager co-ordinates the activities of various disciplines in the area to render all necessary assistance at the implementing level i.e. the Project level. Nodal Officer (Environment) of the area monitors all aspects of environment on behalf of the Area General Manager. He will also take suitable steps for generation of environmental data along with CMPDI team for its analysis and interpretations.

6.0 ENVIRONMENTAL COST PROJECTION

A capital provision of Rs **97.95** lakhs has been made against environment protection. Rs. 6.00/t of coal has been provided to absorb environmental related cost in the project.

7.0 PROVISION FOR CSR WORK

The fund for the CSR will be allocated based on 2% of the average net profit of the Company for the three immediate preceding financial years or Rs 2.00 per Tonne of Coal Production of the previous year whichever is higher.

8.0 CONCLUSION

The project envisaged R & R of Mugoli village. The compensation is to be paid as per R & R policy of Coal India Limited in timebound manner. The mining sequence has been planned in a way to maximise internal dumping so that least area is required for external OB dumping.

The project authorities need to follow the mitigation measures strictly as given in the report. This will minimise the impact on environment.

The Mugoli Nirguda Extn Deep OC may be granted environmental clearance so that the project can bridge the gap between demand and supply of coal in the country and help in achieving the target of 1 BT of domestic coal production by 2019-20.