APPLICATION
FOR
ENVIRONMENTAL CLEARANCE
(AS PER EIA NOTIFICATION, 2006)
FOR EXPANSION AND AMALGAMATION
YEKONA-I & YEKONA-II OCP
(Opencast Project)
MAJRI AREA
WESTERN COALFIELD LIMITED

(One Time Capacity Expansion for incremental production from 1.00 MTPA to 3.44 MTPA (Peak) by Expansion and Amalgamation of Yekona-I OCP & Yekona-II OCP increasing total leasehold area from 680.06 Ha to 1701.02 Ha)

FORM – 1
&
TERMS OF REFERENCE

FEBRUARY - 2016

Prepared by:-
Central Mine Planning & Design Institute Limited

CMPDI / Form – I / WCL / 2015 – 16 /Feb / 27/ 01

Sub:- Application (Form-I) for Amalgamation of Yekona-I and Yekona-II OC & Expansion in production capacity from 1.00 MTPA (0.40 + 0.60) to 2.75 MTPA (1.25 + 1.50) peak 3.44 MTPA and ML area from 680.06 to 1701.32 ha. – For grant of TOR reg.

A. Background

1. Yekona-I opencast coal mine project (0.40 MTPA) of WCL located near village Yekona, Tehsil Warora, District Chandrapur, Maharashtra was accorded EC for production of coal of 0.40 MTPA rated capacity in a lease area of 265.50 ha under the provision of the EIA Notification 2006 vide letter no. J-11015/175/2006-IA.II(M) dated 17th October, 2006.
2. Yekona-II opencast coal mine project (0.60 MTPA) of WCL located near village Yekona, Tehsil Warora, District Chandrapur, Maharashtra was accorded EC for production of coal of 0.60 MTPA rated capacity in a lease area of 414.56 ha under the provisions of the EIA Notification 2006 vide letter no. J-11015/182/2006-IA.II(M) dated 17th October 2006.
3. The salient features of the two projects located in close vicinity are as follows:

SL. NO.	HEAD	YEKONA-I OC	YEKONA-II OC
1	Latitude and Longitude	20□14'47'' to 21□15'45'' N 78□56'56'' to 78□58'30'' E	20□13'42'' to 21□15'10'' N 78□55'0'' to 78□57'31'' E
2	Tehsil	Warora	Warora
3	District	Chandrapur	Chandrapur
4	State	Maharashtra	Maharashtra
5	Land (ha)	265.50	414.56
6	Agricultural land (ha)	251.81	409.56
7	Government land (ha)	13.69	5.00
8	Forest land (ha)	NIL	NIL
9	Quarry land (ha)	69.80	132.30
10	External OB dump (ha)	48.00	76.00
11	Final depth of quarry/void	90 m	80 m
12	Total OB to be generated (Mm^3)	29.86	53.96
13	Backfilling Percentage	43.23%	43.03%
14	Stripping Ratio	1 : 5.61	1 : 5.02
15	Life (Years)	15	20
16	Reserves (MT)	5.32	10.75
17	Rated Capacity (MTPA)	0.40	0.60
18	PH	27.10.2005	27.10.2005
19	Board approval	28.12.2004	05.09.2003
20	Resettlement	NIL	NIL

B. Present Status

Now the physical possession of land in Yekona - II is being taken as detailed below:-

1. Total land acquired - 421.70 ha
2. Land Compensation Paid - Rs. 40.00 Crores (approx.)
3. Total nos. of land losers - 227 (Prov)
4. Total nos. of Employment Sanctioned - 226

The OB excavation is likely to start in next 3-4 months time in Yekona – II OC.

The present status of Yekona – I is placed below:-

1. Total land acquired - 254.15 ha
2. Total Compensation paid - under Assessment
3. Total nos. of land losers - 141
4. Total nos. of Employment Sanctioned - To be processed

C. Present Proposal

Due to revision of land rate, a new PR has been formulated with amalgamation of common infrastructural facilities with enhanced production capacity by including the dip side reserves and working both the mines independently, so as to bridge the gap between demand and availability to a significant extent (Surface lay out plan attached for kind reference). This amalgamated PR has been prepared upto a maximum depth of 160 m (previously maximum 90 m) with reserves up to 57.85 MT (previously total in two projects was 16.07 MT). Now the solid waste management has been reworked whereby the percentage of backfilling has improved significantly. The amalgamated PR (Yekona-I & Yekona-II) has been duly approved by CIL Board for 2.75 MTPA capacity in its 319th meeting held on 12.08.2015 as communicated by Company Secretary, CIL vide its letter no. CIL:XI(D):04112:2015:10875 dated 26.08.2015.

Salient features of Original PR/EMP vis-à-vis Amalgamated PR

SL. No.	ITEM	YEKONA-I	YEKONA-II	AMALGAMATED PR	
				YEKONA-I	YEKONA-II
1	Mineable Reserves (MT)	5.32	10.75	25.04	32.81
2	Target capacity (MTPA)	0.40	0.60	1.25	1.50
				Total - 2.75 , Peak – 3.44	
3	OB (Mm^3)	29.86	53.96	225.71	226.78
4	Depth (maximum) in m	90	80	160	150
5	Stripping Ratio (m^3/te)	5.61	5.02	9.01	6.91
6	Life (years)	15	20	25	24
7	Backfilling percentage	43.23	43.03	70.73	
8	Land (ha)	265.50	414.56	1701.32 (including the earlier PR land).	
9	Forest land	NIl	NIL	NIL	
10.	Resettlement	Nil	Nil	Marda Village	

D. Submission

Now in view of the PR of Amalgamated Yekona – I & II OC Project (duly approved) the application for grant of TOR is being made for:-

i). Amalgamation of Yekona – I and Yekona – II (Based on approved PR).

ii). Expansion in production capacity of both the mine
Yekona – I from 0.40 to 1.25 MTPA
Yekona – II from 0.60 to 1.50 MTPA

Total 1.0 to 2.75 MTPA *
* with a combined peak production capacity being 3.44 MTPA.

iii). Expansion in land area from 680.06 ha to 1701.32 ha.

AMALGAMATED YEKONA-I & II OCP
(As per EIA Notification, 2006)
APPENDIX I
(See paragraph-6)
FORM - I

- **Basic Information**

<table>
<tr><th>SN.</th><th>Item</th><th>Details</th></tr>
<tr><td>1</td><td>Name of the project/s.</td><td>Amalgamated Yekona-I & II OC Project,
Majri Area, WCL</td></tr>
<tr><td>2</td><td>S.No. in the schedule.</td><td>1(a) (i)Mining of Minerals</td></tr>
<tr><td>3</td><td>Proposed capacity/area/length/ tonnage to be handled/command area/lease area/number of wells to be drilled.</td><td>Capacity:
--2.75 MTPA(Normative)
--3.44 MTPA(Peak)
Total Land Area – 1701.32 ha</td></tr>
<tr><td>4</td><td>New/Expansion/Modernization.</td><td>Expansion</td></tr>
<tr><td>5</td><td>Existing Capacity/Area etc.</td><td>
<table>
<tr><th>S. No.</th><th>Project</th><th>EC Capacity (MTY)</th><th>Leasehold Area (Ha)</th><th>MoEF Letter No</th></tr>
<tr><td>1</td><td>Yekona-I OC</td><td>0.40</td><td>265.50</td><td>J-11015/175/ 2006-IA.II(M) Dated-17 October, 2006</td></tr>
<tr><td>2</td><td>Yekona-II OC</td><td>0.60</td><td>414.56</td><td>J-11015/182/2006-IA.II(M) Dated- 17 October, 2006</td></tr>
<tr><td></td><td>Total</td><td>1.00</td><td>680.06</td><td></td></tr>
</table>
</td></tr>
<tr><td>6</td><td>Category of Project i.e. ‘A’ or ‘B’.</td><td>‘A’</td></tr>
<tr><td>7</td><td>Does it attract the general condition? If yes, please specify.</td><td>No, since it is a Category “A” project</td></tr>
<tr><td>8</td><td>Does it attract the specific condition? If yes, please specify.</td><td>No, since it is a Category “A” project</td></tr>
<tr><td rowspan="6">9</td><td>Location</td><td>Near to Yekona village</td></tr>
<tr><td>Plot/Survey/Khasra No.</td><td>Latitude : N 20^{0}13’42’’ to N 20^{0}16’10’’
Longitude : E 78^{o}55’00’’ to E 78^{o}58’30’’
Topo sheet no :55L /15 & 55L/16</td></tr>
<tr><td>Village</td><td>Near Yekona Village</td></tr>
<tr><td>Tehsil</td><td>Warora</td></tr>
<tr><td>District</td><td>Chandrapur</td></tr>
<tr><td>State</td><td>Maharashtra</td></tr>
<tr><td>10</td><td>Nearest railway station/airport along with distance in kms.</td><td>Nearest Railway station is Warora Railway station at about 7 km and nearest airport is Nagpur airport at about 110 km.</td></tr>
<tr><td>11</td><td>Nearest Town, City, District Headquarters along with distance in kms.</td><td>Town – Warora, Distance 7 km (Approx.) District – Chandrapur, Distance – 52 km (Approx.)</td></tr>
<tr><td>12</td><td>Village Panchayats, Zilla Parishad, Municipal Corporation, Local body (complete postal addresses with telephone nos. to be given).</td><td>Yekona Village Panchayat, Tahsil – Waroara, Dt. Chandrapur, Maharashtra State</td></tr>
</table>

13	Name of the applicant.	General Manager (Environment) Western Coalfields Limited (HQ) Coal Estate, Civil Lines, Nagpur – 440 001.
14	Registered Address	Western Coalfields Limited, Coal Estate, Civil Lines, Nagpur - 440001
15	Address for correspondance:	
	Name	Shri Kaushik chakarvorty
	Designation (Owner/Partner/CEO)	General Manager (Environment)
	Address	Western Coalfields Limited (HQ) Coal Estate, Civil Lines, Nagpur – 440 001.
	Pin Code	440 001
	E-mail	gmenvironment@westerncoal.gov.in
	Telephone No.	0712 – 2510151
	Fax No.	0712 – 2510151
16	Details of Alternative Sites examined, if any. Location of these sites should be shown on a topo sheet.	Coal is site specific, hence only coal bearing areas are proposed to be worked for coal production.
17	Interlinked Projects.	NIL
18	Whether seperate application of interlinked project has been submitted?	No
19	If yes, date of submission.	Not Applicable
20	If no, reason.	Not Applicable
21	Whether the proposal involves approval/clearance under: if yes, details of the same and their status to be given. a) The Forest (Conservation) Act, 1980? b) The Wildlife (Protection) Act, 1972? c) The C.R.Z. Notification, 1991?	a) There is no forest land in the project under consideration as such the Forest (Conservation) Act, 1980 is not applicable. b) There is no National Park, Wild life Sanctuary, Bio – Sphere reserve within 10 km of the project under consideration and as such the Wild Life(Protection) Act, 1972 is not applicable. c) There is no sea coast within 10 km of the project under consideration as such the C.R.Z. Notification 1991 is not applicable.
22	Whether there is any Government Order/Policy relevant/relating to the site?	No
23	Forest land involved (hectares).	Nil
24	Whether there is any litigation pending against the project and/or land in which the project is propose to be set up? a) Name of the Court b) Case No. c) Orders/directions of the Court, if any and its relevance with the proposed project.	No

(I)Activity

1. **Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)**

<table>
<tr><th>S.No.</th><th>Information/Check list confirmation</th><th>Yes/ No</th><th>Details thereof (with approximate quantities /rates, wherever possible) with source of information data</th></tr>
<tr><td>1.1</td><td>Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)</td><td>Yes</td><td>
The total land requirement for this project is 1701.32 ha and out of 1701.32 ha of land 84.14 ha is government land and balance land 1617.18 Ha is tenancy land/Agriculture land.
Land use details
<table>
<tr><td>S. N.</td><td>LAND USE</td><td>Within ML Area (ha)</td><td>Outside ML Area (ha)</td><td>Total</td></tr>
<tr><td>1</td><td>Agricultural land</td><td>1579.18</td><td>38</td><td>1617.18</td></tr>
<tr><td>2</td><td>Forest land</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td>3</td><td>Waste land/Govt. land</td><td>84.14</td><td>-</td><td>84.14</td></tr>
<tr><td>4</td><td>Grazing land</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td>5</td><td>Surface water bodies</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td>6</td><td>Settlements</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td>7</td><td>Others (specify)</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td></td><td>Total</td><td>1663.32</td><td>38</td><td>1701.32</td></tr>
</table>
The entire area of the block is covered by agriculture land with black cotton soil. Forest land is not involved in the project.
Marda village is proposed to be re-located at a new site (under mutual agreement and consent and as per CIL's R & R Policies).
<u>Changes of Land Use during Mining</u>
<table>
<tr><th>Sl. No</th><th>Particulars</th><th>Area (ha)</th></tr>
<tr><td>1.</td><td>Quarry/ excavated Area (including existing quarry)</td><td>689.20</td></tr>
<tr><td>2.</td><td>External OB dump</td><td>320.02</td></tr>
<tr><td>3.</td><td>Nalla Diversion and existing Nalla & Irrigation Canal</td><td>58.35</td></tr>
<tr><td>4.</td><td>Residential Colony (Approximately)</td><td>10.00</td></tr>
<tr><td>5.</td><td>Roads, Road diversion And Barriers due to roads (Approximately)</td><td>30.00</td></tr>
<tr><td>6.</td><td>Infrastructure and service roads (Approx.)</td><td>100.00</td></tr>
<tr><td>7.</td><td>Flood protection embankment</td><td>44.37</td></tr>
<tr><td>8.</td><td>Land for relocation of Marda village</td><td>8.00</td></tr>
<tr><td>9.</td><td>Railway siding and its Approach road</td><td>30.00</td></tr>
<tr><td>10.</td><td>Blasting / Safety zone along quarries and external dump</td><td>270.00</td></tr>
<tr><td>11.</td><td>Rationalisation of boundary</td><td>141.38</td></tr>
<tr><td></td><td>Total</td><td>1701.32</td></tr>
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<tr><th>S.No.</th><th>Information/Check list confirmation</th><th>Yes/ No</th><th>Details thereof (with approximate quantities /rates, wherever possible) with source of information data</th></tr>
<tr><td>1.2</td><td>Clearance of existing land, vegetation and buildings?</td><td>Yes</td><td>Land for the proposed expansion of mine has been acquired/ to be acquired as follows: -
<table>
<tr><th>S. N.</th><th>LAND USE</th><th>Within ML Area (ha)</th><th>Outside ML Area (ha)</th><th>Total</th></tr>
<tr><td>1</td><td>Agricultural land</td><td>1579.18</td><td>38</td><td>1617.18</td></tr>
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<tr><td>7</td><td>Others (specify)</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td></td><td>Total</td><td>1663.32</td><td>38</td><td>1701.32</td></tr>
</table></td></tr>
<tr><td>1.3</td><td>Creation of new land uses?</td><td>Yes</td><td>Land Use during Mining of ML/Project Area
<table>
<tr><th>Sl. No</th><th>Particulars</th><th>Area (ha)</th></tr>
<tr><td>1.</td><td>Quarry/ excavated Area (including existing quarry)</td><td>689.20</td></tr>
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<tr><td></td><td>Total</td><td>1701.32</td></tr>
</table>
Post-mining Land use pattern of ML/Project Area
<table>
<tr><th rowspan="2">S. N.</th><th rowspan="2">Land use during mining</th><th colspan="5">Land use (ha)</th></tr>
<tr><th>Plantation</th><th>Water Body</th><th>Public use</th><th>Undisturbed</th><th>Total</th></tr>
<tr><td>1</td><td>External OB Dump</td><td>320.02</td><td>--</td><td>--</td><td>--</td><td>320.02</td></tr>
<tr><td>2</td><td>Top soil dump</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td>3</td><td>Excavation</td><td>352.00</td><td>337.20</td><td>--</td><td>--</td><td>689.20</td></tr>
<tr><td>4</td><td>Roads</td><td>5.00</td><td>--</td><td>25.00</td><td>--</td><td>30.00</td></tr>
<tr><td>5</td><td>Built up area</td><td>70.00</td><td>58.35</td><td>122.37</td><td>--</td><td>250.72</td></tr>
<tr><td>6</td><td>Green Belt</td><td colspan="4">Included in S. No. 4, 5 & 7</td></tr>
<tr><td>7</td><td>Undisturbed Area</td><td>100.00</td><td>--</td><td>--</td><td>311.38</td><td>411.38</td></tr>
<tr><td></td><td>Total</td><td>847.02</td><td>395.55</td><td>147.37</td><td>311.38</td><td>1701.32</td></tr>
</table></td></tr>
</table>

S.No.	Information/Check list confirmation	Yes/ No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
1.4	Pre-construction investigations e.g. bore holes, soil testing?	Yes	The necessary exploratory boreholes had been drilled to assess the coal reserves in the block. Boreholes were drilled in an area of 7.581 km^2. Borehole density of the mining area works out to 18 nos. / km^2
1.5	Construction Work	Yes	The details of various construction works to be undertaken in the proposed site as per approved PR are given below: • E & M Workshop • Sub-station • Magazine • Other Service buildings • Coal Handling Plant – capacity 400tph • Railway Siding • Residential Colony- 132 Units • A flood protection embankment 6m above HFL around the proposed mine wherever necessary. The top width of embankment is proposed as 30m. • 1000m long colony road with culverts and drains • 2.0 km long Haul road for 35t dumper capacity • 3.00 km Heavy duty road for 35t dumper capacity • For approaching different Service Buildings 2.00 km long Sector Road on Stratum `D' specification with culverts, drain, tree guards etc. • 7.0 Km length of Stratum 'C' has been proposed for Diversion of PWD road and 5.0 Km length of Stratum 'C' has been proposed for Diversion of village road. • Diverted irrigation canal – 6.9 Km length • Diverted Nallah – 2.9 Km length • Diverted of 11 KV HT Line and 33 KV HT Line Electric Lines • Resettlement colony for Marda Village – Approx 200 residential units will be constructed
1.6	Demolition works?	Yes	Demolition works during opening of project envisages shifting of Marda village, diversion of Nallah, irrigation canal, PWD roads, O.H. transmission line.
1.7	Temporary sites used for construction works or housing of construction workers?	Yes	Initially temporary structures will be made essentially to meet the enabling needs of Construction manpower & machinery deployed.
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations	Yes	• The details of various construction works to be undertaken in the proposed site have been given in the sanctioned PR and also at item no 1.5 above. • Excavation – 689.20 Ha • External OB Dump – 320.02 Ha OB will be dumped on surface in the form of well-designed OB dump. Total 3 (three) OB dumps will be formed during the life of mine. From these 3 (three) OB dumps 2 (two) external OB dumps will be merged with the internal dumps. Maximum height of two OB

<table>
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<tr><td></td><td></td><td></td><td>dump will be 90 meter while the 3rd dump will be of 30 meter only.</td></tr>
<tr><td>1.9</td><td>Underground works including mining or tunneling?</td><td>No</td><td>----</td></tr>
<tr><td>1.10</td><td>Reclamation works?</td><td>Yes</td><td>Stage-wise Land use and Reclamation Area (ha)
<table>
<tr><th>S. N.</th><th>Land use category</th><th>1st year</th><th>5th year</th><th>10th year</th><th>15th year</th><th>20th year</th><th>25th year (End of mine life)</th><th>3 years after end of mine life</th></tr>
<tr><td>1</td><td>Backfilled Area (Reclaimed with plantation)</td><td>--</td><td>--</td><td>60.3</td><td>220.92</td><td>290.3</td><td>352.00 (100)</td><td>352.00 (352.00)</td></tr>
<tr><td>2</td><td>Excavated Area (Not reclaimed)/void</td><td>--</td><td>111.8</td><td>225.18</td><td>180</td><td>342.26</td><td>337.2</td><td>337.20</td></tr>
<tr><td>3</td><td>External OB dump (Reclaimed with plantation)</td><td>--</td><td>134.65</td><td>437.44</td><td>388.00</td><td>360.00 (176.4)</td><td>320.02 (190.00)</td><td>320.02 (320.02)</td></tr>
<tr><td>4</td><td>Reclaimed Top soil dump</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td>5</td><td>Green Built Area</td><td colspan="7">Included in S. No. 6, 7 & 8</td></tr>
<tr><td>6</td><td>Undisturbed area (brought under plantation)</td><td>1701.32</td><td>1174.15</td><td>697.68 (25.00)</td><td>631.68 (55.00)</td><td>428.04 (75.00)</td><td>411.38 (100.00)</td><td>411.38 (100.00)</td></tr>
<tr><td>7</td><td>Roads (avenue plantation)</td><td>--</td><td>30.00 (0)</td><td>30.00 (5)</td><td>30.00 (5)</td><td>30.00 (5)</td><td>30.00 (5)</td><td>30.00 (5)</td></tr>
<tr><td>8</td><td>Area around buildings and Infrastructures</td><td>--</td><td>250.72 (20)</td><td>250.72 (50)</td><td>250.72 (50)</td><td>250.72 (70)</td><td>250.72 (70)</td><td>250.72 (70)</td></tr>
<tr><td></td><td>Total</td><td>1701.32</td><td>1701.32</td><td>1701.32</td><td>1701.32</td><td>1701.32</td><td>1701.32</td><td>1701.32</td></tr>
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<tr><td></td><td></td><td></td><td>
Stage-wise cumulative plantation
(Area figures are in ha, Plantation Nos in '000')
<table>
<tr><th rowspan="2">S. N.</th><th rowspan="2">Year</th><th colspan="2">Green Belt</th><th colspan="2">External Dump</th><th colspan="2">Backfilled area</th><th colspan="2">Others (undisturbed area/etc.)</th><th colspan="2">Total</th></tr>
<tr><th>Area (ha)</th><th>No. of trees</th><th>Area (ha)</th><th>No. of trees</th><th>Area (ha)</th><th>No. of trees</th><th>Area (ha)</th><th>No. of trees</th><th>Area (ha)</th><th>No. of trees</th></tr>
<tr><td>1</td><td>1st year</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td>2</td><td>3rd year</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td>3</td><td>5th year</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>20</td><td>50</td><td>20</td><td>50</td></tr>
<tr><td>4</td><td>10th year</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>80</td><td>200</td><td>80</td><td>200</td></tr>
<tr><td>5</td><td>15th year</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>110</td><td>275</td><td>100</td><td>275</td></tr>
<tr><td>6</td><td>20th year</td><td>--</td><td>--</td><td>176.40</td><td>441</td><td>--</td><td>--</td><td>150</td><td>375</td><td>326.4</td><td>816</td></tr>
<tr><td>7</td><td>25th year(end of mine life)</td><td>--</td><td>--</td><td>190</td><td>475</td><td>100</td><td>250</td><td>175</td><td>437.5</td><td>465</td><td>1162.5</td></tr>
<tr><td>8</td><td>3 years after end of mining</td><td>--</td><td>--</td><td>320.02</td><td>800</td><td>352</td><td>880</td><td>175</td><td>437.5</td><td>847</td><td>2117.55</td></tr>
</table>

Post-mining Land use pattern of ML/Project Area (ha)
<table>
<tr><th rowspan="2">S. N.</th><th rowspan="2">Land use during mining</th><th colspan="5">Land use (ha)</th></tr>
<tr><th>Plantation</th><th>Water Body</th><th>Public use</th><th>Undisturbed</th><th>Total</th></tr>
<tr><td>1</td><td>External OB Dump</td><td>320.02</td><td>--</td><td>--</td><td>--</td><td>320.02</td></tr>
<tr><td>2</td><td>Top soil dump</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td>3</td><td>Excavation</td><td>352.00</td><td>337.20</td><td>--</td><td>--</td><td>689.20</td></tr>
<tr><td>4</td><td>Roads</td><td>5.00</td><td>--</td><td>25.00</td><td>--</td><td>30.00</td></tr>
<tr><td>5</td><td>Built up area</td><td>70.00</td><td>58.35</td><td>122.37</td><td>--</td><td>250.72</td></tr>
<tr><td>6</td><td>Green Belt</td><td colspan="4">Included in S. No. 4, 5 & 7</td></tr>
<tr><td>7</td><td>Undisturbed Area</td><td>100.00</td><td>--</td><td>--</td><td>311.38</td><td>411.38</td></tr>
<tr><td></td><td>Total</td><td>847.02</td><td>395.55</td><td>147.37</td><td>311.38</td><td>1701.32</td></tr>
</table>
</td></tr>
<tr><td>1.11</td><td>Dredging?</td><td>No</td><td>---</td></tr>
<tr><td>1.12</td><td>Offshore structures?</td><td>No</td><td>---</td></tr>
<tr><td>1.13</td><td>Production and manufacturing processes?</td><td>Yes</td><td>Open Cast mining with Shovel - Dumper Combination method. Peak production from the mine is envisaged to be 3.44 MTY.</td></tr>
</table>

S.No.	Information/Check list confirmation	Yes/ No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data

Production schedule for Amalgamated Yekona I & II OC:

Year	Coal (Mt)		OB (Mm3)				Rehan-dling of OB
			In Quarry		Trench Cutting	Total	
	Yearly	Cumm.	Yearly	Cumm.			
1	0.30	0.30	2.00	2.00	1.66	3.66	
2	0.60	0.90	3.00	5.00		3.00	
3	1.00	1.90	4.00	9.00		4.00	
4	2.00	3.90	13.00	22.00	1.88	14.88	
5	2.25	6.15	16.00	38.00		16.00	
6	2.50	8.65	23.00	61.00		23.00	
7	2.50	11.15	24.00	85.00		24.00	
8	2.50	13.65	24.00	109.00		24.00	
9	2.50	16.15	24.00	133.00		24.00	
10	2.75	18.90	23.00	156.00		23.00	5.00
11	2.75	21.65	26.00	182.00		26.00	5.00
12	2.75	24.40	25.50	207.50		25.50	5.00
13	2.75	27.15	25.50	233.00		25.50	1.38
14	2.75	29.90	25.50	258.50		25.50	2.63
15	2.75	32.65	19.50	278.00		19.50	4.94
16	2.75	35.40	20.50	298.50		20.50	5.00
17	2.75	38.15	21.50	320.00		21.50	
18	2.75	40.90	21.50	341.50		21.50	
19	2.75	43.65	23.00	364.50		23.00	
20	2.75	46.40	23.00	387.50		23.00	
21	2.75	49.15	17.50	405.00		17.50	
22	2.75	51.90	15.50	420.50		15.50	
23	2.75	54.65	14.00	434.50		14.00	5.00
24	2.16	56.81	11.78	446.28		11.78	5.00
25	1.04	57.85	6.21	452.49		6.21	4.88
	57.85		**452.49**		**3.54**	**456.03**	**43.83**

1.14	Facilities for storage of goods or materials?	Yes	✓ Coal produced from the mine shall be stored on surface at designated coal stock yard duly provided with fire fighting & dust suppression system. ✓ The goods & materials shall be stored in designated store. ✓ Explosives shall be stored in magazine (3te) as approved by Controller of Explosives.
1.15	Facilities for treat-ment or disposal of solid waste or liquid effluents?	Yes	Solid Waste –

Project	Total waste generation (Mm^3)	Top soil (Mm^3)	Total OB generation (Mm^3)	Total OB in Ext. Dump (including top soil) (Mm^3)	Total OB Backfilled (including top soil) (Mm^3)
Original Project (ha)	456.03	16.38	439.65	133.5	322.53
Total (Mm^3)	456.03	16.38	439.65	133.5	322.53

S.No.	Information/Check list confirmation	Yes/ No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
			Liquid Effluent – a) Mine Pumped Out Water – Initial sedimentation in the mine sump provided at the floor of the seam and then treatment in Sedimentation Pond on surface. b) Workshop Effluent – In designated Effluent Treatment Plant with Zero Discharge. c) Domestic Effluent – Treatment in DETP
1.16	Facilities for long term housing of operational workers?	Yes	Total manpower proposed for this project is 257. Considering the necessity of the project, 132 Nos. of Type quarters have been envisaged which satisfies the 51.40% of the required manpower of Amalgamated Yekona-I & II OC. Type quarter consists of 56 MQ's, 32 B-type , 28 C-type, 2 D-type & 14 hostel accommodation.
1.17	New road, rail or sea traffic during construction or operation?	Yes	• For residential quarters, 1000m long colony road with culverts, drains, etc. has been envisaged. • 2.0 km long Haul road for 35t dumper capacity has been provided for transportation of coal / OB inside quarry. • 3.00 km Heavy duty road for 35t dumper capacity has been provided for transportation of coal / overburden on surface. • For approaching different Service Buildings 2.00 km long Sector Road on Stratum `D' specification with culverts, drain, tree guards etc. has been proposed. • 7.0 Km length of Stratum 'C' has been proposed for Diversion of PWD road and 5.0 Km length of Stratum 'C' has been proposed for Diversion of village road.
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	Yes	As given in 1.17 above
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	Yes	Diversion of PWD road- 7.0 km Diversion of village road-5.0 km
1.20	New or diverted transmission lines or pipelines?	Yes	Diversion of 11KV & 33 KV Electric HT line, other rural feeder & telephone lines.
1.21	Impoundment, damming, culverting,	Yes	• A seasonal nallah flowing in the eastern boundary of the mine will be diverted along the mine boundary. • An irrigation canal passing through the project area will

S.No.	Information/Check list confirmation	Yes/ No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
	realignment or other changes to the hydrology of watercourses or aquifers?		also be diverted along the southern boundary of OCP. • It is proposed to make a flood protection embankment 6m above HFL around the proposed mine wherever necessary along the Wardha River flowing in west of project area. The top width of embankment is proposed as 30m.
1.22	Stream crossings?	No	---
1.23	Abstraction or transfers of water form ground or surface waters?	Yes	• Ground Water – Due to excavation strata seepage water gets accumulated at the floor of the coal seam in the sump having capacity to deal with peak rainfall. In order to maintain the working faces dry for coal production this water is pumped out daily. • Surface Water – No abstraction from surface water course, treated mine water and sub-soil water will be used for Industrial and Domestic use.
1.24	Changes in water bodies or the land surface affecting drainage or run-off?	Yes	As given in S No 1.21
1.25	Transport of personnel or materials for construction, operation or de-commissioning?	Yes	A residential colony has been proposed for the personnel working in the mine. Personal as well as official vehicles will be used for transportation of mining personnel. Store and construction material will be transported by trucks.
1.26	Long-term dismantling or decommissioning or restoration works?	No	Not envisaged at present. However, adequate fund for closure activities have been provided in the sanctioned PR.
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	Not envisaged at present.
1.28	Influx of people to an area in either temporarily or permanently?	Yes	Temporary Influx – 600 to 800 (Approximately).
1.29	Introduction of alien species?	No	---
1.30	Loss of native species or genetic diversity?	No	---
1.31	Any other actions?	No	

2. **Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):**

<table>
<tr><td>S.No.</td><td>Information/checklist confirmation</td><td>Yes/No</td><td>Details thereof (with approximate quantities /rates, wherever possible) with source of information data</td></tr>
<tr><td>2.1</td><td>Land especially undeveloped or agricultural land (ha)</td><td>Yes</td><td>Tenancy/Agricultural land – 1617.18 ha.</td></tr>
<tr><td>2.2</td><td>Water (expected source & competing users) unit: KLD</td><td>Yes</td><td>Source – Mine Pumped out Water, & sub-soil water.
i)Consumption at site - 810 KLD.
ii)Consumption in colony - 110 KLD</td></tr>
<tr><td>2.3</td><td>Minerals (MT)</td><td>Coal</td><td>Total mineable reserves considered for extraction are 57.85 Million Tonne.</td></tr>
<tr><td></td><td colspan="3">Details of coal reserves:
<table>
<tr><td></td><td>Geological Reserves</td><td>Geological Losses</td><td>Mining Losses</td><td>Mineable Reserves</td></tr>
<tr><td>Yekona-I OC</td><td>29.28</td><td>2.92</td><td>1.32</td><td>25.04</td></tr>
<tr><td>Yekona-II OC</td><td>38.37</td><td>3.83</td><td>1.73</td><td>32.81</td></tr>
<tr><td>Total</td><td>67.65</td><td>6.75</td><td>3.05</td><td>57.85</td></tr>
</table></td></tr>
<tr><td>2.4</td><td>Construction material – stone, aggregates, sand/ soil (expected source(MT)</td><td>Yes</td><td>Will be required for construction of infrastructures etc as detailed in sanctioned PR.</td></tr>
<tr><td>2.5</td><td>Forests and timber (source – MT)</td><td>Yes</td><td>Will be required for construction of infrastructures etc as detailed in sanctioned Project Report.</td></tr>
<tr><td>2.6</td><td>Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)</td><td>Yes</td><td>• Electricity –
Source – MSEDCL
Maximum Demand- 3303 KVA
• Diesel
Source – Area Store
Consumption – 17440395 liters /annum</td></tr>
<tr><td>2.7</td><td>Any other natural resources (use appropriate standard units)</td><td>No</td><td>----</td></tr>
</table>

3. **Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.**

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)	No	---
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	--
3.3	Affect the welfare of people e.g. by changing living conditions?	No	---
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	No	---
3.5	Any other causes	No	---

4. **Production of solid wastes during construction or operation or decommissioning (MT/month)**

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
4.1	Spoil, overburden or mine wastes	Yes	Overburden consisting of Alluvium, Shale & Sand Stone. Total Quantity- 456.03 Million Cubic Meter Yearly Quantity- 31.00 Million Cubic Meter (Maximum)
4.2	Municipal waste (domestic and or commercial wastes)	Yes	Domestic – Recycling for manures. Approximately 260 kg/ day
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	Yes	• ETP Sludge – Secured Land Fill in CHWTSDF • Used Oil –Through approved Recyclers.
4.4	Other industrial process wastes	No	---
4.5	Surplus product	No	---
4.6	Sewage sludge or other sludge from effluent treatment.	Yes	Sludge from effluent Treatment – Will be disposed as per Consent Conditions.
4.7	Construction or demolition wastes	Yes	• During construction wastes: - Insignificant • Demolition :- Not envisaged at Present
4.8	Redundant machinery or equipment	Yes	• By auction through authorized agencies.
4.9	Contaminated soils or other materials	Yes	• Through biological reclamation by growing trees (Native Species).
4.10	Agricultural wastes	No	---
4.11	Other solid wastes	No	---

5. Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr)

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data.
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	Yes	• Operation of Heavy Earth Moving Machines (HEMMs). • The quantum of gases viz. SO_2 and NO_2 in ambient environment are measured through ambient air quality monitoring in the mine activity area every fortnight as per Environment Protection Amendment Rule, 2000. The same will be continued for Amalgamated Yekona I & II OC.
5.2	Emissions from production processes	Yes	• Dust particles including coal dust. • The quantum of Dust (TSPM & PM_{10}) in the ambient environment is measured through ambient air quality monitoring in the mine activity area every fortnight as per Environment Protection Amendment Rule, 2000. The same will be continued for Amalgamated Yekona I & II OC.
5.3	Emissions from materials handling including storage or transport	Yes	• Dust particles including coal dust. • The quantum of Dust (TSPM & PM_{10}) in the ambient environment is measured through ambient air quality monitoring in the mine activity area every fortnight as per Environment Protection Amendment Rule, 2000. The same will be continued for Amalgamated Yekona I & II OC.
5.4	Emissions from construction activities including plant and equipment	Yes	Insignificant
5.5	Dust or odours from handling of materials including construction materials, sewage and waste	No	---
5.6	Emissions from incineration of waste	No	---
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	No	----
5.8	Emissions from any other sources	No	---

6. Generation of Noise and Vibration, and Emissions of Light and Heat:

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data with source of information data
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	i) Generation of Noise and Vibration will be due to the following operations. i) Operation of HEMMs / Machineries. ii) Blasting Operations The quantum of noise in ambient environment is measured through ambient noise quality monitoring in the mine activity area every fortnight as per Environment Protection Amendment Rule, 2000. The same will be continued for Amalgamated Yekona I & II OC.
6.2	From industrial or similar processes	No	
6.3	From construction or demolition	Yes	Insignificant
6.4	From blasting or piling	Yes	ii) Blasting – Will be carried out as per permission from DGMS and will be maintained within the permissible limits specified by DGMS.
6.5	From construction or operational traffic	Yes	Construction: Insignificant Operational – through movement of coal transportation trucks and dumpers. Noise level is monitored every fortnight as per Environment Protection Amendment Rule, 2000. The same will be continued for Amalgamated Yekona I & II OC.
6.6	From lighting or cooling systems	No	---
6.7	From any other sources	No	---

7. **Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:**

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials	Yes	Used Oil – will be disposed off through approved Recyclers and same will be continued.
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	Yes	Mine Pumped Out Water – Excess Treated mine pumped out water is proposed to be discharged into local nullah. Quality parameters will be monitored and will be continued every fortnight. Domestic sewage Domestic Sewage is treated in existing DETP. Workshop Effluent – Effluent will be treated in Effluent Treatment Plant with Zero Discharge. Quality parameters will be monitored and will be continued every fortnight.
7.3	By deposition of pollutants emitted to air into the land or into water	Yes	Fugitive emission into air from OB dumps, transportation roads. Quantum of fugitive emission in ambient environment will be monitored and will be continued every quarter
7.4	From any other sources	No	---
7.5	Is there a risk of long term build up of pollutants in the environment from these sources?	No	---

8. **Risk of accidents during construction or operation of the Project, which could affect human health or the environment**

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances	No	
8.2	From any other causes	Yes	Due to – 1) Land Sliding in OB Dump and mine Pit 2) Mine Inundation 3) Blasting - All operations will be carried out as per statute.
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc)?	No	----

9. **Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality**

9.1	Lead to development of supporting Facilities, ancillary development or development stimulated by the project which could have impact on the environment e.g.: • Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.) • housing development • extractive industries • supply industries • other	Yes	The project will lead to development of housing, roads, ancillary industries, Improvement in social & living standards by providing opportunities of direct & indirect employment to local community. One time monetary compensation in lieu of employment (@ Rs. 5 lakh/Acre) for 50% of Tenancy land has been considered in Project Report. However, it is envisaged that WCL may offer jobs as per the New R&R policy of CIL to those land losers who are not willing to take monetary compensation in lieu of employment. A Capital provision of Rs. 41.1908 crores has been made in the Project Report for resettlement of Marda Village. This includes 8.00 ha land for resettlement site of village and cost of 8.12 ha Gaothan land of Marda village.
9.2	Lead to after-use of the site, which could have an impact on the environment	Yes	The degraded land is proposed to be biologically reclaimed which will improve the green cover in the area.
9.3	Set a precedent for later developments	Yes	Activities detailed out in previous paragraph above do culminate in conjunction with local setup has set precedence of economic development leading to over all socio-economic growth of the area.
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	Yes	Operating opencast coal mines. Coal occurs in layers and continues for large distance. Associated mining activity with such closely located centers along with other related service sector could have a cumulative impact.

III) Environmental Sensitivity

S.No.	Areas	Name/ Identity	Aerial distance (within 10 km.) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	No	---
2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	Yes	Forest (within 10 kms)- • Phiski Reserved forest – at a distance of 6 kms south-west from proposed project • Shegaon Reserved forest- at a distance of 8 kms east of proposed project. Wardha river flows along the south-western boundary of the project. There are no coastal zones biospheres, mountains. Source- Toposheet No 55L/15,55L/16, 55P/3 and 55P/4
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	No	---
4	Inland, coastal, marine or underground waters	No	---
5	State, National boundaries	No	----
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	No	----
7	Defence installations	No	---
8	Densely populated or built-up area	Yes	Project set up and villages. No such densely populated areas. Marda village at a distance of 100 meter from the proposed quarry surface of Yekona-II will be rehabilitated.
9	Areas occupied by sensitive man-made land uses *(hospitals, schools, places of worship, community facilities)*	Yes	Limited to Project township area and nearby villages.
10	Areas containing important, high quality or scarce resources *(ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)*	Yes	Ground water – Yes Surface water- River, Nallah's. Forestry - Yes Agricultural – Yes Fisheries - Yes Minerals – Coal.

11	Areas already subjected to pollution or environmental damage. *(those where existing legal environmental standards are exceeded)*	No	---
12	Areas susceptible to natural hazard which could cause the project to present environmental problems (*earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions*)	No	---

(IV). PROPOSED TERMS OF REFERENCE FOR EIA STUDIES

Based on the information furnished in Form – I, the Terms of Reference (TORs) for undertaking detailed EIA is proposed as under:

i) The proposed project under consideration is Amalgamation of Yekona-I and Yekona-II OC & Expansion in production capacity from 1.00 MTPA (0.40 + 0.60) to 2.75 MTPA (1.25 + 1.50) peak 3.44 MTPA and ML area from 680.06 to 1701.32 ha located in Tahsil - Warora, Dist - Chandrapur, State - Maharashtra as shown in the plan (Pate – I) and fall under the administrative control of Majri Area of Western Coalfields Limited.

ii) The study area will comprise of 10 km (radius) zone around the mine lease as shown in the enclosed plan (Pate – I).

iii) The proposal is for Amalgamation of Yekona-I and Yekona-II OC & Expansion in production capacity from 1.00 MTPA to 3.44 MTPA (Normative Capacity-2.75 MTPA & Peak capacity-3.44 MTPA). The total land involved is 1701.32 ha. Tenancy land is 1617.18 Ha and rest 84.14 ha is government land.

iv) A site plan entitled quarry and surface layout plan which will show the details of mining project, administrative block, colony, workshop, stores, coal stock yard etc and will be enclosed with the EMP. This plan will form the part of detailed EIA study.

v) One season primary environmental data will be generated at base line frequency (covering ambient air quality – PM_{10}, $PM_{2.5}$, SO_2, Nox, Water Quality, Noise level, soil characteristics & flora & fauna) in the study area. This will form the basis of detailed EIA study.

vi) Hydro geological study including water balance study in the study area will be carried out and will be further detailed in the EIA Study. It will also include the impact of pumping of ground water & its discharge into natural water body in the area.

vii) Prediction of impact on different environmental components inter- alia.

a) Ambient air including noise.
b) Water.
c) Soil/Land
d) Socio-economic will be carried out.

viii) Impact due to blasting, noise & vibrations will be carried out.

ix) Details of land use, waste generation, stage-wise land use & reclamation area, stage-wise cumulative plantation and post mining land use pattern will be provided in detailed in EMP report.

x) Details of effluent treatment in colony/township will be provided.

xi) Details of control of pollution level will be provided.

****

I hereby given undertaking that the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance give, if any to the project will be revoked at our risk and cost.

Date: _____ Signature of the applicant

With Name and Full Address

Place: _____ (Project Proponent / Authorized Signatory)

BRIEF SUMMARY OF PROJECT REPORT

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1.0 INTRODUCTION

1.1 BACKGROUND OF PROJECT REPORT

The proposed Yekona-I and II block is located in Warora Tahsil of Chandrapur district of Maharashtra State and is named after nearby Yekona village. The exploration in Yekona block was carried out by MECL during the period from 14.6.1989 to 07.06.1991. A total of 8 boreholes were drilled which proved the existence of shallow coal in this block. The finding of exploration by MECL is documented in "Status Note on Exploration for coal in Manegaon and Yekona Area, Wardha Valley Coalfield, Distt. Chandrapur (M.S.) January'1992. The block was subsequently divided into two blocks as Yekona-I & Yekona-II on structural pattern. CMPDI explored the Yekona-I in JULY 1996 to April'1998 & submitted the report on February'1999. CMPDI further took up detailed drilling of Yekona-II block from January'1999 to June'2000 & submitted the Geological report of Yekona-II block in December'2000.

1.2 BRIEF HISTORY OF EARLIER REPORTS

PR for Yekona-II OCM was prepared in Nov., 2002 and was approved by WCL board in May 2003 for a target production of 0.60 Mty with a capital investment of Rs. 48.0551 Crores. This PR was approved with Partial Hiring option i.e. OB removal by hiring of HEMM & mining of coal by departmental HEMM. The PR was approved as it was yielding more than 12% IRR at 85% production capacity (IRR 13.67%) with notified price of coal (Rs. 725.85/t). Yekona-II opencast coal mine project was accorded EC for production of coal of 0.60 MTPA rated capacity in a lease area of 414.56 ha under the provisions of the EIA Notification 2006 vide letter no. J-11015/182/2006-IA.II(M) dated 17th October 2006.

Later on PR for Yekona-I OCM was prepared in June, 2004 and was approved by WCL board in Nov.,2004 for a target production of 0.40 Mty with a capital investment of Rs. 46.07 Crores. This PR was approved with Partial Hiring option i.e. OB removal by hiring of HEMM & mining of coal by departmental HEMM. The PR was approved as it was yielding more than 12% IRR at 85% production capacity (IRR 13.60%) with notified price of coal (Rs.

896.00/t). Yekona-I opencast coal mine project was accorded EC for production of coal of 0.40 MTPA rated capacity in a lease area of 265.50 ha under the provision of the EIA Notification 2006 vide letter no. J-11015/175/2006-IA.II(M) dated 17th October, 2006.

The Salient Features of the earlier approved PR of Yekona-I OC and Yekona-II OC are tabulated below:

Sl. No.	Particulars	Approved PR of Yekona-I OC (Nov., 2004)	Approved PR of Yekona-II OC (May, 2003)
A	**Mining Parameters**		
01	Mineable Reserves (Mt)	5.32	10.75
02	Grade/GCV of coal (kcal/kg)	G10/4442	G9/4844
		With 5cm dilution	
03	OB Volume (Mm^3)	29.86	53.96
04	Average S/R	5.61	5.02
05	Mine Capacity (Mty)	0.40	0.60
06	Manpower	211	2`29
07	Overall OMS (t)	3.073	9.925
B	**Financial Parameters**		
01	Total Capital incl existing capital (Rs. In Crores)	46.0725	48.0551
02	Additional Capital Required (Rs. In Crores)	46.0725	48.0551
03	Existing Capital (as on 31.3.2014) (Rs. In Crores)	0	0
04	Cost of Production (Rs./t)		
i	@ 100% of target capacity (Rs./t)	742.09	547.16
ii	@ 85% of target capacity (Rs./t)	807.67	593.99
05	Av. Selling Price (Notified) (Rs./t)	896.00	725.85
06	Profit (Rs./t)		
i	@ 100% of target capacity (Rs./t)	153.91	178.69
ii	@ 85% of target capacity (Rs./t)	88.33	131.86
07	Financial IRR @ 85% capacity (%)	13.60	13.67

Presently both Yekona-I & Yekona-II OC are on-going projects of WCL & land acquisition is under process. However, due to increase in land cost by Maharashtra Govt. & new R&R Policy of CIL, it is not possible to acquire the land of the two projects within the sanctioned capital.

1.3 RECENT STUDIES AND DEVELOPMENT

Presently both Yekona-I & Yekona-II OC are on-going projects of WCL & land acquisition is under process. However, due to increase in land cost by Maharashtra Govt. & introduction of new R&R policy of CIL, it is not possible to complete the land acquisition of the two projects within sanctioned capital of PRs. Hence updation of approved PR was done in the month of October, 2012 with revised price of land & other capital items. During the presentation of updated PR for Yekona-I & Yekona-II OCM in TSC meeting of WCL, it was desired that an amalgamated PR with common infrastructure facilities should be planned for better economics of the project. Accordingly a PR namely Yekona Combined OC was prepared in March 2014 for all the three options namely Departmental option, Partial Hiring option and Total Hiring option. The target of this report was 2.75 Mty & maximum possible proved reserves in both the blocks were considered. However, the PR was not economically viable in any option.

During discussion with WCL, it was decided to rename this project as Amalgamated Yekona-I & Yekona-II OC Mine & to plan upto 150m depth in Total Hiring option so that the project becomes economically viable. Accordingly, the Project Report of Amalgamated Yekona-I & II OC mine was prepared for Total Hiring option in April, 2015. The PR was economically viable as it was achieving 13.56% IRR at 85% of target capacity for Power Sector. The total capital of the PR was Rs. 705.6313 crores including WDV of existing assets of Rs. 18.5497 crores. This report was placed in WCL Board and the WCL Board recommended the PR to CIL Board.

The above PR was discussed in the 87th meeting of Empowered Sub-Committee of CIL Board on 30.07.2015. The Empowered Sub Committee advised to take precautionary measures for working below HFL and to ensure that embankment to be provided against river should be of appropriate design, specification and material for safety of the mine and property. The Committee also advised to:-

i) explore the possibility of deploying Ripper Dozer for working the thin partings and also to ensure strict supervision for maintaining quality of coal and

ii) ensure adequate precaution in handling black cotton soil and OB dumps.

During the discussions, it was pointed out that no provision had been made for railway siding in PR. The Committee was apprised that siding would be separately funded under a scheme for infrastructure development. However, the Committee opined that the cost of Railway Siding should be included in Project Economics and viability should be re-worked.

Accordingly the PR of Amalgamated Yekona-I & II OC mine has been modified in July, 2015 after incorporating the recommendations of ESC of CIL Board. The following provisions have been made in the modified PR (July, 2015) :

1. A financial provision of Rs 40.00 crores and Provision for 30ha of land has been made in project report for construction of railway siding for the proposed mine.
2. In the proposed mine, there is a parting of thickness ranging from 0.17m to 4.07m between Top Section and Bottom section of the coal seam. Hence, the out-sourcing agency is required to deploy Dozer with Ripper attachment to mine out the parting separately to avoid dilution of coal.
3. For stability of external OB dump, it is proposed to remove a thickness of 2.5m of black cotton soil from 120m wide trench along the periphery of external dump. Moreover, separate OB dumps for Loose OB and Hard OB have been envisaged in the PR. The height of Loose OB dump has been restricted to maximum 30m from ground level. Provision of re-handling of Top soil dump has also been made in the PR.
4. In this project report it is proposed to make a flood protection embankment 6m above HFL around the proposed mine wherever necessary. The top width of embankment is proposed as 30m. Capital provision has been made for pitching of embankment on river side upto HFL level.

1.4 SALIENT FEATURES OF PROJECT REPORT

The Salient Features of both the PR of Amalgamated Yekona-I & II OC mine prepared in April, 2015 and subsequently in July, 2015 after incorporating the recommendations of ESC of CIL Board are tabulated:

Sl. No.	Particulars	PR of Amalgamated Yekona-I & II OC (April, 2015)			PR of Amalgamated Yekona-I & II OC modified after incorporating the recommendations of ESC of CIL Board (July, 2015)		
		Yekona-I OC	Yekona-II OC	Total	Yekona-I OC	Yekona-II OC	Total
A	**Mining Parameters**						
01	Mineable Reserves (Mt)	25.04	32.81	57.85	25.04	32.81	57.85
02	Grade/GCV of coal (kcal/kg)	(G-9)/ 4714	(G-8)/ 5053	(G-8)/ 4920	(G-9)/ 4714	(G-8)/ 5053	(G-8)/ 4920
		Without any dilution			Without any dilution		
03	OB Volume (Mm^3)	225.71	226.78	452.49	225.71	226.78	452.49
04	Average S/R	9.01	6.91	7.82	9.01	6.91	7.82
05	Mine Capacity (Mty)	1.25	1.50	2.75	1.25	1.50	2.75
06	Manpower	257			257		
07	Overall OMS (t)	40.532			40.532		
B	**Financial Parameters**						
01	Total Capital incl existing capital (Rs. In Crores)	705.6313			745.8313		
02	Additional Capital Required (Rs. In Crores)	687.0816			727.2816		
03	Existing Capital (as on 31.3.2014) (Rs. In Crores)	18.5497			18.5497		
04	Cost of Production (Rs./t)						
i	@ 100% of target capacity (Rs./t)	1136.07			1143.93		
ii	@ 85% of target capacity (Rs./t)	1199.90			1209.13		
		Power	Non power		Power	Non power	
05	Av. Selling Price (Notified) (Rs./t)	1513.50	2007.50		1513.50	2007.50	
06	Profit (Rs./t)						
i	@ 100% of target capacity (Rs./t)	377.43	871.43		369.57	863.57	
ii	@ 85% of target capacity (Rs./t)	313.60	807.60		304.37	798.37	
07	Financial IRR @ 85% capacity (%)	13.56%	28.92%		12.80%	27.77%	

1.5 JUSTIFICATION OF AMALGAMATED PROJECT REPORT

1. Many of the existing opencast mines of Majri Area (Telwasa OCM, Dhorwasa OCM) are reaching near to its approved limits. The exhaustion of these mines

would create additional gap between Demand & supply, & therefore opening of new projects like Amalgamated Yekona-I & Yekons-II OC is very essential to bridge this gap of demand & supply.

2. Presently both Yekona-I & Yekona-II OC are on-going projects of WCL & land acquisition is under process. However, due to increase in land cost by Maharashtra Govt. & introduction of new R&R policy of CIL, it is not possible to complete the land acquisition of the two projects within sanctioned capital of PRs. Hence preparation of Amalgamated PR in Total Hiring option by sharing the common infra-structure is essential to make it economically viable.

3. The various new guidelines as detailed below have made it possible to prepare economically viable PR of Amalgamated Yekona-I & II OC mine:

   a) Administrative cost per tonne considered as 10% of last audited accounts of WCL which is Rs 16.85 /t. This is as per decision of 310th CIL Board meeting on 08/11/2014.

   b) In pursuant to Cenvat Credit rules intimated by WCL, Service tax has been excluded while calculating hiring rates for extraction of coal, parting and overburden.

1.6 CONSTRAINTS / RISK IN MINING

The proposed mine is very close to Warora town and hence nearby area has lot of developmental activity such as water supply lines, irrigation cannels etc. Major constrains / risks associated with the project are as follows:

a) Shifting of Villages

Marda and Yekona Villages are loacted in close proximity of proposed block particularly close to Yekona-II block. In this project report Yekona – II is planned upto 150 m depth. Marda village is about 100m from quarry surface. In project report resettlement of Marda village has been proposed.

b) Diversion of Road

Due to proximity to town, many villages are settled in nearby area. These villages are well connected by road network. Part diversion of P.W.D Road from Wanoja to Marda, Warora to Madhari, Marda to Yekona village is to be done.

c) Diversion of Water Pipe Line

Water pipe line of Maharashtra Government passes through the block and it needs to be diverted.

d) Diversion of Electric and Telephone Lines

11 KV HT Line, 33 KV HT Line, other rural feeders & telephone lines passing over the quarry area are required to be diverted.

e) Diversion of Irrigation Canals

Entire area of block is used for cultivation. There is network of irrigation cannels in entire area. These irrigation canals over the block need to be diverted.

f) Land Acquisition

Land acquisition will be a major challenge as entire area is very close to built-up area of Warora town and is close to highway.

2.0 MARKETABILITY & JUSTIFICATION

The mines of WCL are under constant pressure to meet the increasing demand of non-coking coal for power plants and other bulk consumers from Western as well as Southern part of country. The justification of this mine has been studied in the light of estimated demand for coal from WCL and production forecast from existing, completed, ongoing and future projects of WCL.

Following table shows the deficit in availability of coal, including middlings from the various Existing, Completed, On-going, and Future Projects of WCL:

Sl. No.	Sector	Projections of Surplus / Deficit of Coal (Mt)				
		2015-16	2016-17	2017-18	2018-19	2019-20
	Demand for coal	69.08	69.28	70.08	70.58	70.58
	Availability of coal	45.000	48.00	50.00	55.00	60.00
	Surplus / Deficit (+/-)	**(-) 24.08**	**(-) 21.28**	**(-) 20.08**	**(-) 15.18**	**(-) 10.58**

The availability of coal shown above includes the coal production from Amalgamated Yekona – I & II OC mine. From the above table, it is clear that the deficit in supply of coal from WCL as a whole will be (-) 24.08 Mt in 2015-16 which will be narrowed down to (-) 10.58 Mt in 2019-20 provided WCL achieved the target of 60.00 Mt production in 2019-20. New mines/ projects have to be opened or expansion of existing operating mines has to be done by WCL in order to meet the ever increasing demand of coal. There is a deficit in supply of coal from the mines of WCL and therefore a ready market exists for the coal produced from proposed Amalgamated Yekona – I & II OC mine.

Thus, there will be no problem in marketing of 2.75 Mty coal from Amalgamated Yekona-I & II OC mine in view of large deficit in availability of coal from the mines of WCL.

3.0 PROJECT SITE INFORMATION

3.1 LOCATION & COMMUNICATION

Yekona I & II block is the Northern extension of western limit of Wardha Valley Coalfield and located adjacent to Yekona village which falls in Warora Tahsil of Chandrapur District of Maharashtra State.

The area is bounded by latitudes N 20^{o} 13' 42" to 20^{o} 16' 10" N and longitudes E 78^{o} 55' 00" to 78^{o} 58' 30" and is covered by Survey of India Topo Sheet No. 55L/15 & 55L/16.

Yekona block is an interior under developed region of Chandrapur district. The Delhi Madras Grand Trunk railway line passes from the East of the Yekona-I & II block. The nearest railway station is Warora, situated at 7 km distance, S.E of the

block. The Nagpur Chandrapur road is about 7 km to the East of the Yekona-I &

II block. The block can be approached by a fair-weather road from Warora to Nagri via Wanoja. This road passes through the eastern part of the block and joins Nagpur-Chandrapur road at Warora. Nagpur and Chandrapur townships are located at a distance of 110 kms and 52 kms from the block respectively.

3.2 TOPOGRAPHY & DRAINAGE

The entire area of the block is covered by agriculture land with black cotton soil and exhibits a gently undulating topography with general slope towards north. The altitude of the area ranges from 187 m to 203.72 m from Mean Sea Level.

Yekona - I & II block exhibits a gently undulating topography with the general slope towards North. The drainage in the area is controlled by the Wardha River which is flowing southerly and also demarcates the western limit of the block. One seasonal nala flowing towards west passes north of the block and meets Wardha River. H.F.L. of Wardha River in the block area is about 198 m.

4.0 GEOLOGY AND DEPOSIT APPRAISAL

4.1 INTRODUCTION

The shallow occurrence of coal in Yekona block was reported by D.G.M (M.S.) near Yekona Village. MECL explored the block during 1988-91 covering an area of about 20 sq.km. Exploration by MECL revealed that the entire area is structurally distributed and shallow occurrence of coal is confined in the faulted blocks. Yekona-I is one of the sub-blocks identified for detailed exploration by CMPDI. It explored the Yekona-I block in July 1996 to April 1998 & submitted the report in February 1999.

Regional exploration of drilling by MECL during 1989 and 1991 in Yekona Block has revealed the shallow occurrence of coal in Yekona Block. The block was subsequently divided into two blocks as Yekona-I and Yekona-II on structural pattern. CMPDI took up detailed drilling of Yekona-II block from Jan1999 to June 2000 and submitted the Geological report entitled "Geological report on quarriable potentiality of Yekona-II block in December 2000.

4.2 GEOLOGICAL BLOCK BOUNDARY

Yekona – I block

North - Subcrop of Composite Seam.

South - Arbitrary line passing through BH CMWY-77, 76, 57,56 & MWN-9

East - Fault F8-F8

West - Fault F1-F1

Yekona – II block

North - Subcrop of Composite Seam.

South - 200 mtrs. Arbitrary Line from the last borehole drilled (CMWY-42, 44 47 & 117 & 118 & MWM-21)

East - Fault F1-F1.

West - Eastern Bank of Wardha River

4.3 SEQUENCE OF COAL SEAMS AND PARTING WITHIN THE BLOCK AREA

Sequence of coal seam along with minimum and maximum thickness and number of bore holes intersected are summrised below for both Yekona – I & II blocks.

Yekona – I block

Coal Seam/Section	Thickness range (m)		No. of BHs. Intersection
	Min.	Max.	
Upper Coal Band	0.33 (CMWY-52)	0.98 (CMWY-75)	21
Parting	68.74 (CMWY-26)	80.47 (CMWY-56)	
Composite Seam			
Top Section	1.53 (CMWY-81)	8.34 (CMWY-67)	49
Parting	0.17 (MWM-77)	4.07 (CMWY-72)	
Bottom Section	1.60 (CMWY-56)	5.72 (CMWY-12)	50
Parting	11.94 (MWM-10)	14.47 (MWM-12)	
Lower Band-I	0.31 (MWM-7)	0.75 (MWM-12)	4
Parting	13.01 (MWM-12)	14.78 (MWM-7)	
Lower Band-II	1.10 (MWM-12)	1.33 (MWM-7)	2

Yekona – II block

Coal Seam/Section	Thickness range (m)		No. of BHs. Intersection
	Min.	Max.	
Upper Coal Band	0.25 (CMWY-117)	2.29 (MWM-41)	9
Parting	65.98 (MWM-58)	82.30 (CMWY-118)	
Top Section	3.75 (CMWY-100)	8.45 (MWM-58)	31
Parting	1.05 (CMWY-57)	3.76 (CMWY-42)	
Bottom Section	2.12 (MWM-41)	5.38 (CMWY-110)	36
Parting	(27.99) (MWM-27)	30.37 (MWM-28)	
Lower Coal Band	(0.41) MWM-30	1.31 (CMWY-123)	4
Combined Section	8.83 (MWM-21)	12.47 (MWM-33)	7

4.4 GEOLOGICAL STRUCTURE OF THE BLOCK

4.4.1 Strike & Dip

Yekona – I block

Coal Seam dips towards SE in the Western part and towards East in the Eastern part. The gradient of seam is 1 in 8 (6^0) to 1 in 17.5 (3^0) in the Western part and 1 in 6 (9^0) to 1 in 8 (6^0) in general in the eastern part with local flattering.The strike of coal seam in the Western part is NE-SW whereas; in the eastern part it is N-S with minor swing.

Yekona – II Block

The general strike of the coal seam as determined from the floor contour plan of composite seam is WNW-ESE dipping SSW however local swings in strike

also observed in the area. The dip of the formation in the block is in 1 in 4 to 1 in 7.5

a) Middle part dip is 11.3 deg due SSW.

b) Western part dip ranges from 7.6 deg to 11.3 deg due SSW.

c) Eastern part dip is 14 deg due SSW (Gradient 1 in 4)

4.4.2 Faults

Yekona – I Block

A total 10 Nos of fault (F1 to F10) have been interpreted in Yekona-I block based on the evidences such as reduction in seam thickness/parting floor difference in adjacent boreholes.

Details of Faults in Yekona-I Block

Fault No	Extent Of Fault (Km)	Trend	Throw		Evidence
			Direction	Amount	
F1-F1	1.50Km	NW-SE	SW	95m-130m	Difference in floor level of coal seam in boreholes CMWY-84, 11, 73 in upthrown side and CMWY-82, 13 in downthrown side
F2-F2	1.00	NW-SE	SW	0-20m	Difference in floor level of coal seam in boreholes CMWY-67, 27, in upthrown side and CMWY-11, 73 in downthrown side
F3-F3	1.20	NW-SE	SW	0-20m	Difference in floor level of coal seam in boreholes CMWY-28, 39 and MWM-77 in downthrown side CMWY-10 in upthrown side.
F4-F4	1.17	NW-SE	NE	0-15m	Difference in floor level of coal seam in boreholes CMWY-10 in downthrown side.and CMWY-66, 55 on upthrown side.
F5-F5	0.45	NNW-SSE	WSW	10-15m	Difference in floor level of coal seam in boreholes CMWY-79, 5 in upthrown side and CMWY-71 in downthrown side.
F6-F6	1.30	NW-SE	SW	60-140m	i) Absence of Composite Seam in CMWY-24 & 63 .
					ii) Difference in floor level of coal seam in boreholes CMWY-3, 29, 34, MWM-10 in up thrown side and CMWY-33, 32, 52, 26 in downthrown side.
F7-F7	0.350	WNW-ESE	NNW	0-15m	i) Absence of Bottom Section in CMWY-51.
					ii) Difference in floor level of coal seam in boreholes CMWY-74,

Fault No	Extent Of Fault (Km)	Trend	Throw		Evidence
			Direction	Amount	
					61 in up thrown side and CMWY-3, 64 in downthrown side.
F8-F8	2.50	NW-SE	SW	200m	Absence of Composite Seam in its upthrown side.
F9-F9	1.65	NW-SE	SW	10-20m	Difference in floor level of coal seam in boreholes CMWY-38, 56, MWM-12 in down thrown side and CMWY-9 in uphrown side.
F10-F10	1.40	NW-SE	SW	30-40m	i) Absence of Top Section and roof of Bottom Section is faulted in CMWY-58.
					ii) Floor of Bottom Section is faulted in CMWY-54.

Yekona – II block

A total 5 Nos of fault (F1 to F5) have been interpreted in Yekona-II block based on the evidences such as reduction in seam thickness/parting floor difference in adjacent borehole.

Details of Faults in Yekona-II Block

Fault No	Extent Of Fault (Km)	Trend	Throw		Evidence
			Direction	Amount	
F1-F1	1.55	NW-SE	NE	125M	Motur Formation intersected in BH (cmwy-95,107,126,MWM15) on the downthrown side of the fault F!-F1 lies in juxtaposition to middle and upper part of Barakar Formation in Borehole CMWY-91,118&123 MWM-36
F2-F2	0.170	NE-SW	NW	0-4m	Bottom section is faulted in CMWY-55
F3-F3	0.210	NE-SW	NW	0-4m	Bottom Section is MWM-27 is faulted
F4-F4	1.035	WNW-ESE	SW	0-18m	Top section in CMWY-114 and bottom section floor is faulted in MWM-38. Based on FRL differences in boreholes CMWY105&122 in the up throw side and CMWY-113 in the downthrow side.
F5-F5	0.990	NE-SW	NW	20-30m	Based on FRL difference in borehole MWM-29 & 39 in up throw side and CMWY -104 &124 in the downthrown side

4.5 QUARRYWISE QUALITY

Quality computation has been done separately for top section & Bottom section of the seam as well as for combined Top & Bottom Section excluding parting between the two sections. All in-seam bands within Top & bottom section have been included for quality assessment. No dilution at the contact point of seam section & roof & floor has been considered. This assessment is done based on the data available for the boreholes falling with the block area.

Yekona – I Block

The overall quality in Top section, Bottom Section and Bottom Section + Top section are given as below:

Particulars	Top Section		Bottom Section		Top +Bottom Sections	
	Min.	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**
Moisture %	5.9 (CMWY-27)	8.60 (CMWY-28)	6.00 (CMWY-32)	8.60 (CMWY-67,5)	6.40 (CMWY-38)	8.50 (CMWY-28)
Ash %	25.1 (CMWY-3)	45.00 (CMWY-32)	22.80 (CMWY-5)	43.8 (CMWY-32)	28.00 (CMWY-28)	…… (CMWY-32)
V.M %	20.3 (CMWY-32)	27.2 (CMWY-39)	26.00 (CMWY-28)	27.30 (CMWY-39)	26.10 (CMWY-28)	28.00 CMWY-39)
F.C %	28.6 (CMWY-11)	41.70 (CMWY-27)	37.70 (CMWY-28)	37.80 (CMWY-39)	36.40 (CMWY-39)	37.40 CMWY-28)
U.H.V. (K.Cal/kg)	2132 (CMWY-32)	4608 (CMWY-27)	1848 (CMWY-35)	4694 (CMWY-67)	1848 (CMWY-35)	4694 (CMWY-67)
GCV	3636 (CMWY32)	5473 (CMWY-13)	2183 (CMWY35)	5622 (CMWY74)	2183 (CMWY-35)	5622 (CMWY74)
Grade	**G-12**	**G - 7**	**G - 18**	**G - 6**	**G - 18**	**G - 6**

Overall quality for Top + Bottom sections in Yekona-I block has been assessed based on GCV figures of quarriable area which works out to **4714 kCal/kg (G-9)** without dilution at the contact point of roof and Floor of the Seam.

Yekona – II Block

The overall quality (GCV) of Top section, Bottom Section and Bottom Section + Top section in Yekona - II block are given as below:

Particulars	Top section		Bottom section		Top+ Bottom section	
	Min	**Max**	**Min**	**Max**	**Min**	**Max**
Moisture%	6.00 (MWM41)	8.45 (MWM58)	5.70 (CMWY110)	8.60 (MWM30)	5.1 (CMWY-114)	7.6 (MWM-40)
Ash%	20.10 (CMWY117)	35.30 (MWM32)	13.30 (MWM 39)	36.40 (CMWY117)	19.5 (MWM-40)	37.8 (CMWY-114)
V.M%	22.80 (MWM-32)	28.70 (CMWY117)	24.40 (CMWY-116)	30.20 (MWM-28)		
F.C%	34.8 (CMWY-88)	44.40 (CMWY-96)	29.00 (CMWY-112)	45.40 (CMWY97)		
U.H.V	3145.4 (CMWY-88)	5132.6 (CMWY117)	3090.2 (CMWY-117)	5946.8 (MWM-39)	3145.4 (CMWY-88)	5946.8 (MWM-39)
GCV	4210 (CMWY-88)	5374.00 (MWM-40)	4300 (CMWY-117)	6125 (MWM-39)	4210 (CMWY-88)	6125 (MWM-39)
Grade	**G - 11**	**G - 7**	**G - 10**	**G - 5**	**G - 11**	**G - 5**

Overall quality for Top + Bottom sections in Yekona-II block has been assessed based on GCV figures of quarriable area which works out to **5053 kCal/kg (G-8)** without dilution at the contact point of roof and Floor of the Seam.

4.6 GEOLOGICAL RESERVES

Yekona – I block

only one Composite workable seam in two sections designated as as Top and Bottom sections occurs in the area under report. A total of **34.52 Mt** of net proved coal reserves have been reported as per the geological report.

Yekona – II block

No fresh geological reserves has been assessed for this documentation however geological reserves as per the geological report submitted on dec-2002 is furnished and Proved Reserve of 35.822Mt and indicated reserves 45mt have been estimated. However, in the proposed quarriable area net geological reserves are estimated about 44.10 Mt.

5.0 MINE BOUNDARY, MINEABLE RESERVES, TARGET & LIFE

5.1 MINE BOUNDARY DELINEATION

Yekona – I Block

The Block is bounded by Major fault F1-F1 on the Western side and by fault F8-F8 on the Eastern side. The Northern rise side of block is restricted by Sub-crop of composite seam, The Southern Dip side of the block is an arbitrary line passing through BH CMWY-77, 76, 57,56 & MWN-9. The proposed Yekona-I OC mine has been envisaged in Yekona-I block and entire block has been covered for OC mining.

The geological block boundary as well as Mine boundary of Yekona – I OC mine are tabulated below :

Particulars	North	East	South	West
Block Boundary	Subcrop of Composite Seam.	Fault F_8-F_8	Arbitrary line passing through BH CMWY-77, 76, 57,56 & MWN-9	Major Fault F_1 –F_1
Proposed Mine Boundary	Along Major fault F_8 -F_8 / Subcrop of Composite Seam.	Fault F_8-F_8	Block boundary	Major Fault F_1 –F_1

Yekona – II Block

The Block is bounded by Wardha river on Western side and major fault F1-F1 on Eastern side. The Northern rise side of block is restricted by Sub-crop of composite seam. The Southern dip side boundary is and arbitrary line 200 m from the last borehole drilled i.e. CMWY-42, 44 47, 117 & 118 and MWM-21.

The proposed Yekona-II OC has been envisaged in Yekona-II block leaving safe distance from the bank of Wardha river in Western side and upto fault F1-F1 in the Eastern side. The Northern Mine boundary is limited by Sub-crop of Seam and in Southern dip side the boundary is limited at 150m depth on the floor of Bottom section of the Composite Seam.

The geological block boundary as well as Mine boundary of Yekona – II OC mine are tabulated below :

Particulars	North	East	South	West
Block Boundary	Along Sub- crop	Fault F_1-F_1	200m from last row of bore holes	Eastern Bank of Wardha River
Proposed mine Boundary	Half Sub-crop.	Fault F_1-F_1.	upto 150 m depth line.	Safe distance from Eastern Bank of Wardha River / Yekona village

5.2 MINEABLE RESERVES

Total Geological reserves in Yekona-I block are 34.52 Mt and entire sub quarry I (A) has been considered but reserves between 150m depth to block boundary in sub quarry I (B) is left due to higher depth. These reserves can be extracted in later date when it becomes economically viable. However, in Yekona-II geological block, Yekona-II OC mine has been envisaged upto 150m depth on the floor of

bottom section of seam and geological reserves beyond 150m depth has not been considered for opencast mining. Thus, out of total 44.10 Mt geological reserves in Yekona-II Block, 38.37 Mt geological reserves has been considered for proposed Yekona-II OC mine. Thus, out of **total 78.62 Mt geological reserves** in both Yekona-I & Yekona-II geological blocks (34.52 Mt in Yekona-I block and 44.10 Mt in Yekona-II block), **67.65 Mt geological reserves (29.28 Mt in Yekona-I OC and 38.37 Mt in Yekona-II OC)** have been considered for mining.

10% geological loss for geological uncertainties and 5% loss on account of mining losses have been considered to the net geological reserves to workout net mineable reserves. Specific Gravity is considered as 1.60 t/m3. Thus, the net mineable reserves assessed in Amalgamated Yekona-I & II OV mine are **57.85 Mt (25.04 Mt in Yekona-I OC and 32.81 Mt in Yekona-II OC mine).**

SEAMWISE DETAILS OF MINEABLE RESERVES (YEKONA-I OC)

NAME OF SEAM	Floor area (ha)	Average Thickness 'm'	Geological Reserves Mt	Geological Losses Mt	Mining Losses Mt	Coal already extracted in existing mines (Mt)	Mineable Reserves Mt
Top Section	226.14	5.32	16.71	1.67	0.75	-	14.29
Bottom Section	214.70	3.92	12.57	1.25	0.57	-	10.75
TOTAL		**9.24**	**29.28**	**2.92**	**1.32**		**25.04**

SEAMWISE DETAILS OF MINEABLE RESERVES (YEKONA-II OC)

NAME OF SEAM	Floor area (ha)	Average Thickness 'm'	Geological Reserves Mt	Geological Losses Mt	Mining Losses Mt	Coal already extracted in existing mines (Mt)	Mineable Reserves Mt
Top Section	244.12	6.45	23.82	2.38	1.07	-	20.37
Bottom Section	238.64	3.76	14.55	1.45	0.66	-	12.44
TOTAL		**10.21**	**38.37**	**3.83**	**1.73**	**-**	**32.81**

5.3 TARGET PRODUCTION & MINE LIFE

The proposed report has been prepared for a target capacity of 2.75 Mt/annum from Yekona-I OC (1.25 Mty) and Yekona-II OC (1.50 Mty). The parameters of opencast mine field and technical conditions of its development make this target feasible with normal indices namely length, width & depth of the excavated block, thickness of coal seam, seam gradient, method of mining etc.

The life of the project works out to 25 years considering annual target normative production of 2.75 Mty (Peak production – 3.44 MTY) and mineable reserves of 57.85 Mt.

6.0 METHOD OF MINING

6.1 MINE PARAMETERS

The different Mine parameters of proposed Yekona-I OC and Yekona-II OC are as follows:

Sl. No.	PARTICULARS	YEKONA-I OC	YEKONA-II OC	TOTAL
1	Av. Thickness of seam (m)	9.24	9.94	
2	Gradient of seam	1 in 7 to 1 in 14	1 in 4.8 to 1 in 8	
3	Depth (m): Min. Max.	 30 160	 25 150	
4	Av. Strike length (m) At surface At floor	 1700 1400	 3800 3200	
5	Average Dip-Rise width(km) a)On floor b)On Surface	 1.2 to 2.0 1.5 – 2.4	 0.60 0.87	
6	Area of the Quarry (Ha) a)On floor b)On Surface	 214.70 354.50	 238.64 339.74	 453.34 694.24
7	Total mineable reserves (Mt)	25.04	32.81	57.85
8	GCV (kCal/kg) (without dilution at each contact point)	4714 (G-9)	5053 (G-8)	4920 (G-8)
9	Total volume of OB (Mm^3)	225.71	226.78	452.49
10	Average stripping ratio (m^3/t)	9.01	6.91	7.82
11	Annual mine target (Mty)	1.00 to 1.25	1.25 to 1.50	2.75
12	Life of the mine	25	24	25

6.2 SELECTION OF MINING METHOD

The target of proposed quarry has been envisaged as 2.75 Mty. Production is proposed from multi sections (two sections) of composite seam. Property of Yekona-I is highly faulted and the gradient of seam is not favourable for Surface miner in major part of this block, hence, deployment of Surface miner is ruled out in Yekona - I OC mine. Deployment of dragline has not been proposed

considering the geo-mining conditions (especially gradient of the seam). Underground mining has been ruled out considering conservation of coal in

thick seam and better economics in an opencast compared to underground mining.

Presently shovel-Dumper combination is being practiced very successfully in existing mines of WCL. Hence, in proposed Amalgamated Yekona-I & II OC mine also shovel-dumper combination has been proposed. However, the geo-mining condition is favourable for deployment of Surface Miner in Yekona-II OC and deployment of Surface Miner on Hiring basis may be considered in Yekona-II OC subject to economical viability. However, in present PR, shovel dumper mining has been proposed in both Yekona-I & II OC of Amalgamated mine.

In the proposed mine, there is a parting of thickness ranging from 0.17m to 4.07m between Top Section and Bottom section of the coal seam. Separate drilling and blasting for parting is required to avoid dilution of quality of coal but due to lesser thickness of parting it is not possible to drill and blast only parting. Hence, the out-sourcing agency is required to deploy Dozer with Ripper attachment to mine out the parting separately to avoid dilution of coal.

6.2 EQUIPMENT SELECTION

The proposed Amalgamated Yekona-I & II OC mine has been planned for Total Hiring option and the entire coal and OB will be extracted by hiring / out-sourcing agency.

Some Common departmental equipment have been proposed in the mine which are as follows:

Major HEMM Provision (Total Hiring Option)

Sl. No.	HEMM (For Common)	Nos.
1.	Fire Fighting Truck	1
2.	8 t crane	2
3.	2.8 m3 Backhoe	2
4.	6.5 m^3 Front End Loader	1
5.	Diesel bowser	2

7.0 MINING AND DUMPING STRATEGY

7.1 CONSTRAINTS ON MINE DEVELOPMENT

The proposed mine is very close to Warora town and hence nearby area has lot of developmental activity such as water supply lines, irrigation cannels etc. Major constrains / risks associated with the project are as follows:

a) Shifting of Villages

Marda and Yekona Villages are loacted in close proximity of proposed block particularly close to Yekona-II block. In project report Yekona – II is planned upto 150 m depth. Marda village is about 100m from quarry surface. In project report resettlement of Marda village has been proposed.

b) Diversion of Road

Due to proximity to town, many villages are settled in nearby area. These villages are well connected by road network. Part diversion of P.W.D Road from Wanoja to Marda, Warora to Madhari, Marda to Yekona village is to be done.

c) Diversion of Water Pipe Line

Water pipe line of Maharashtra Government passes through the block and it needs to be diverted.

d) Diversion of Electric and Telephone Lines

11 KV HT Line, 33 KV HT Line, other rural feeders & telephone lines passing over the quarry area are required to be diverted.

e) Diversion of Irrigation Canals

Entire area of block is used for cultivation. There is network of irrigation cannels in entire area. These irrigation canals over the block need to be diverted.

f) Land Acquisition

Land acquisition will be a major challenge as entire area is very close to built-up area of Warora town and is close to highway.

7.2 MINING STRATEGY

7.2.1 Quarry and Sub-Quarry

The proposed Amalgamated Yekona I & II OC mine has two quarries namely Yekona-I OC & Yekona-II OC. These quarries would be further sub-divided into two sub-quarries & sequence of mining shall be designed in such a way that backfilling can be maximized. Accordingly the proposed mine would be divided into 4 sub quarries. Summary of these sub-quarries are as tabulated below:-

QUARRY & SUB-QUARRY WISE COAL, OB & STRIPPING RATIO

SL. No.	QUARRY	NAME OF SUB-QUARRY	COAL (Mt)	TOTAL OB (Mm^3)	S.R. (m^3/t)
1.	Yekona – I OC	Sub-Quarry- I A	11.50	131.98	11.48
2.		Sub-Quarry- I B	13.54	93.73	6.92
3.	Yekona – II OC	Sub-Quarry- II A	19.27	132.33	6.87
4.		Sub-Quarry- II B	13.54	94.45	6.98
		TOTAL	**57.85**	**452.49**	**7.82**

7.2.2 Cut-wise Coal, OB & Stripping Ratio

Both the sub-quarries of Yekona-I & II OC have been divided into various Cuts at the interval of 50m depth on the floor of Bottom Section of the seam. There are seven Cuts in Yekona-I quarry and six Cuts in Yekona-II quarry. The different Cuts and their extent along the floor of bottom section are tabulated below :

Quarry	Cut No.	Description	Quarry	Cut No.	Description
Yekona - I OC SUB QUARRY- I (A)	I	Up to 50 m depth	Yekona-II OC SUB QUARRY II (A)	I	Up to 50 m depth
	II	50m to 100m depth		II	50 m to 100 m depth
	III	100m to 150m depth		III	Beyond 100 m depth to quarry limits
	IV	150m depth to quarry limit	Yekona-II OC SUB QUARRY II (B)	IV	Up to 50 m depth
Yekona - I OC SUB QUARRY I (B)	V	Up to 50 m depth		V	50 m to 100 m depth
	VI	50m to 100m depth		VI	100 m to 150 m depth
	VII	100m to 150m depth			

Cut wise quantities for both the quarries are summarized below.

YEKONA - I OC				
SUB-QUARRY WISE AND CUT-WISE COAL, OB & STRIPPING RATIO				
Sub-Quarry	**Cut No.**	**COAL (Mt)**	**OB (Mm3)**	**S/R (m3/t)**
Sub -Quarry-IA	Cut-I	0.75	6.69	8.92
	Cut-II	3.60	41.20	11.44
	Cut-III	3.42	37.90	11.09
	Cut-IV	3.73	46.19	12.38
Sub-Total		**11.50**	**131.98**	**11.48**
Sub -Quarry-IB	Cut-V	3.99	24.56	6.16
	Cut-VI	4.14	34.59	8.36
	Cut-VII	5.41	34.58	6.39

Sub-Total		**13.54**	**93.73**	**6.92**
TOTAL (YEKONA – I OC)		**25.04**	**225.71**	**9.01**
YEKONA – II OC				
SUB-QUARRY WISE AND CUT-WISE COAL, OB & STRIPPING RATIO				
Sub-Quarry	**Cut No.**	**COAL (Mt)**	**OB (Mm3)**	**S/R (m3/t)**
Sub -Quarry-IIA	Cut-I	4.51	20.08	4.46
	Cut-II	7.42	60.30	8.13
	Cut-III	7.35	51.95	7.07
Sub-Total		**19.27**	**132.33**	**6.87**
Sub -Quarry-IIB	Cut-IV	3.22	22.35	6.95
	Cut-V	5.72	49.94	8.75
	Cut-VI	4.60	22.16	4.82
Sub-Total		**13.54**	**94.45**	**6.98**
TOTAL (YEKONA – II OC)		**32.81**	**226.78**	**6.91**
GRAND TOTAL (YEKONA – I OC + YEKONA – II OC)		**57.81**	**452.49**	**7.82**

7.3 DUMPING STRATEGY

As detailed above, entire mining area is divided in 2 quarries namely Yekona-I OC & Yekona-II OC. These two quarries are further divided into 2 sub quarries to maximize internal backfilling. In both the quarries, initial OB is proposed to be dumped externally. As soon as space is available inside the quarry, OB is dumped internally. This strategy helps in reducing the external dumping, thereby reducing land requirement.

In Yekona –II OC, first of all Sub-Quarry – IIA will be worked. After construction of flood protection embankment, OB of Cut-I and Cut-II of Sub-Quarry – IIA would be dumped in the external OB Dump – H2 for hard OB (no coal bearing area) as well as in Temporary OB Dump-L1 for soft OB (in coal bearing area of Sub-Quarry-I B of Yekona - I OC). The Top soil shall also be dumped in Temporary Top Soil Dump-S2 in Sub-quarry-IIB of Yekona-II OC which will be re-handled prior to working Sub-Quarry-IIB. After dumping of OB of first two cuts, the height of Hard OB Dump (H2) would reach 90 m above GL.

At the end of first two cuts of Sub-Quarry-IIA, entire OB excavated in subsequent cuts (Cu-III & IV) of Sub-Quarry-IIA would be dumped in decoaled void of previous cuts (Cut-I & Cut-II). The maximum height of backfilling dump would reach 90m above GL. It is proposed to merge external Dump and

internal dumps to generate additional capacity & save land. The OB of temporary OB dump L1 & temporary top soil Dump-S2 will be re-handled over Internal / External OB Dump.

In Yekona –I OC, construction of flood protection embankment is not required & OB of entire Sub-Quarry-IA (Cut-I, II & III) and part of cut-IV of Sub-Quarry-IB would be dumped in the external OB dump H1 (no coal bearing area) and OB dump H3 (this is on coal bearing area outside the quarry and shall be re-handled at the end of mine working) for hard OB and in OB dump L adjacent to quarry for soft OB. It is also proposed to dump part of loose OB in Dump-L1 on coal bearing area of sub quarry – I B. The Top Soil would be dumped in quarry area in Temp. Soil Dump-S1 and would be re-handled at a later stage on hard OB Dump. After dumping of OB of Sub-Quarry-IA (Cut-I, II & III) and part of Cut-IV of sub-Quarry-IB, the height of Hard OB dump would reach 90 m above GL.

After working Sub-Quarry-IA and Cut-IV of Sub-Quarry-IB, entire OB excavated in subsequent cuts (Cut-V & VI) of Sub-Quarry-IB would be dumped in decoaled void of previous cuts. The maximum height of backfilling dump would reach 90m above GL. It is proposed to merge external Dump and internal dumps to generate additional capacity & save land.

After start of sub quarry – IB in Yekona-I OC and sub-quarry – IIB in Yekona-II OC, all top soil and loose OB from quarry shall be dumped over top of existing Dumps. No separate dump is planned for top soil and loose OB, while working sub-quarry-IB and IIB of both the mines.

The proposed height of overburden dumps has been envisaged as 90m above ground level. Presently nowhere in Majri area, dumping is done above 60m. Hence, it is proposed in the PR to conduct a slope stability study, for which capital provision has been made. Moreover, it is proposed to remove a thickness of 2.5m of black cotton soil from 120m wide trench along the periphery of external dump for better stability of dump.

Out of total 456.03 Mm3 OB (452.49 Mm3 from quarry and 3.54 from Trench cutting), 133.50 Mm3 OB will be accommodated in External OB Dump and balance 322.53 Mm3 will be dumped in decoaled void of the two quarries. Thus, 29.27% of total OB will be dumped externally and **70.73% OB will be**

accommodated in Internal Dumps. The Dump Capacities of different OB Dumps are tabulated below:

Sl. No.	Dump	Name of Dump	Location	Capacity (Mm3)
1.	EXTERNAL DUMP	OB Dump (L)	No Coal Bearing	8.64
2.		OB Dump (H1)	No Coal Bearing	69.46
3.		OB Dump (H2)	No Coal Bearing	52.98
4.		EMBANKMENT		2.42
		SUB-TOTAL (EXTERNAL DUMP)		**133.50**
1	TEMPORARY DUMP (TO BE REHANDLED)	Temporary Top Soil Dump-S1	Over Quarry-IB	8.50
2		Temporary OB Dump –L1	Over Quarry-IB	12.57
3		Temporary Top Soil Dump-S2	Over Quarry-IIB	7.88
4		Temporary OB Dump-H3	Coal Bearing outside quarry area	14.88
		SUB-TOTAL (REHANDLING)		**43.83**
C)	INTERNAL DUMP	INTERNAL OB DUMPS		
1		Internal Dump in Yekona-I OC	Void of Yekona-I OC	145.40
2		Internal Dump in Yekona-II OC	Void of Yekona-II OC	177.13
		Total Internal Dump		**322.53**
TOTAL EXTERNAL + INTERNAL DUMP				**456.03**

8.0 MINING SCHEDULE AND EQUIPMENT PHASING

8.1 DESIGN CRITERIA

Project report for Amalgamated Yekona-I & II OC mine has envisaged 330 days of working in a year based on 7 days schedule of mine working. As per the prevalent practice in WCL, there will be three working shifts in a day each of 8 hours duration. The excavation category of OB material has been assumed as 50% Category III + 50% Category IV, whereas for Coal it is assumed as Category IV. The insitu volume weight of OB material has been considered as 2.2t/m^3 whereas for coal it is 1.60t/m^3.

8.2 ANNUAL PRODUCTIVITY OF HEMM WITH DIFFERENT LEAD

The entire coal and OB will be extracted through outsourcing agency and therefore, the productivity of HEMM will depend on the HEMM to be deployed by outsourcing agency. However, the lead for coal / parting and for OB has been estimated based on quarry and dump profile and distance of dump from quarry.

Based on the quarry profile, dump location & distance between different cuts of quarry & dumps, the following average haul distances have been assessed for OB and coal.

a) For OB - 2.75 to 3.25 km

b) For Coal - upto 4.00 km

c) For Parting - 2.00 to 2.50 km

8.3 CALENDAR PROGRAMME OF EXCAVATION

Yekona-I & Yekona-II are on-going projects of WCL & land acquisition is in progress. It is envisaged in this PR of Amalgamated Yekona-I & Yekona-II OC mine that part land will be acquired in 1st year. It is proposed to start coal production and OB removal from 1st year in Yekona-II OC mine. However, coal extraction and OB removal in Yekona-I OC mine will start from 4th year. Thereafter, both Yekona-I & Yekona-II OC will be operated simultaneously.

The separate calendar programme of both the mines as well as combined calendar programme is tabulated:

CALENDAR PROGRAMMED OF EXCAVATION (FOR YEKONA – I OC)

Year	Coal (Mt)		Natural OB (Mm3)			Programed OB (Mm3)			
			In Quarry		Trench	In Quarry		Trench	Total
	Yearly	Cumm.	Yearly	Cumm.	Cutting	Yearly	Cumm.	Cutting	
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.50	0.50	3.83	3.83	1.88	5.00	5.00	1.88	6.88
5	0.75	1.25	8.58	12.41		8.00	13.00		8.00
6	1.00	2.25	11.44	23.85		11.00	24.00		11.00
7	1.00	3.25	11.44	35.29		12.00	36.00		12.00
8	1.00	4.25	11.44	46.72		12.00	48.00		12.00
9	1.00	5.25	11.12	57.85		12.00	60.00		12.00
10	1.25	6.50	13.86	71.71		12.00	72.00		12.00
11	1.25	7.75	13.86	85.57		15.00	87.00		15.00
12	1.25	9.00	15.45	101.02		15.00	102.00		15.00
13	1.25	10.25	15.48	116.50		15.00	117.00		15.00
14	1.25	11.50	15.48	131.98		15.00	132.00		15.00
15	1.25	12.75	7.69	139.67		9.00	141.00		9.00
16	1.25	14.00	7.69	147.37		8.50	149.50		8.50
17	1.25	15.25	7.69	155.06		8.50	158.00		8.50
18	1.25	16.50	9.92	164.98		8.50	166.50		8.50
19	1.25	17.75	10.44	175.42		10.00	176.50		10.00
20	1.25	19.00	10.44	185.87		10.00	186.50		10.00
21	1.25	20.25	9.23	195.09		10.00	196.50		10.00
22	1.25	21.50	7.99	203.08		8.00	204.50		8.00
23	1.25	22.75	7.99	211.07		7.50	212.00		7.50
24	1.25	24.00	7.99	219.06		7.50	219.50		7.50
25	1.04	25.04	6.65	225.71		6.21	225.71		6.21
TOTAL	**25.04**		**225.71**		**1.88**	**225.71**		**1.88**	**227.59**

CALENDAR PROGRAMMED OF EXCAVATION (FOR YEKONA – II OC)

Year	Coal (Mt)		Natural OB (Mm3)			Programed OB (Mm3)			
			In Quarry		Trench	In Quarry		Trench	Total
	Yearly	Cumm.	Yearly	Cumm.	Cutting	Yearly	Cumm.	Cutting	
1	0.30	0.30	1.34	1.34	1.66	2.00	2.00	1.66	3.66
2	0.60	0.90	2.67	4.01		3.00	5.00		3.00
3	1.00	1.90	4.46	8.46		4.00	9.00		4.00
4	1.50	3.40	6.68	15.15		8.00	17.00		8.00
5	1.50	4.90	8.12	23.27		8.00	25.00		8.00
6	1.50	6.40	12.19	35.46		12.00	37.00		12.00
7	1.50	7.90	12.19	47.65		12.00	49.00		12.00
8	1.50	9.40	12.19	59.84		12.00	61.00		12.00
9	1.50	10.90	12.19	72.03		12.00	73.00		12.00
10	1.50	12.40	11.69	83.72		11.00	84.00		11.00
11	1.50	13.90	10.61	94.33		11.00	95.00		11.00
12	1.50	15.40	10.61	104.93		10.50	105.50		10.50
13	1.50	16.90	10.61	115.54		10.50	116.00		10.50
14	1.50	18.40	10.71	126.25		10.50	126.50		10.50
15	1.50	19.90	10.43	136.68		10.50	137.00		10.50
16	1.50	21.40	10.43	147.10		12.00	149.00		12.00
17	1.50	22.90	11.16	158.26		13.00	162.00		13.00
18	1.50	24.40	13.10	171.36		13.00	175.00		13.00
19	1.50	25.90	13.10	184.45		13.00	188.00		13.00
20	1.50	27.40	16.27	200.72		13.00	201.00		13.00
21	1.50	28.90	7.23	207.94		7.50	208.50		7.50
22	1.50	30.40	7.23	215.17		7.50	216.00		7.50
23	1.50	31.90	7.23	222.40		6.50	222.50		6.50
24	0.91	32.81	4.38	226.78		4.28	226.78		4.28
TOTAL	**32.81**		**226.82**		**1.66**	**226.78**		**1.66**	**228.44**

CALENDAR PROGRAMMED OF EXCAVATION (FOR AMALGAMATED YEKONA-I & YEKONA – II OC)

Year	Coal (Mt)		Natural OB(Mm3)			Programed OB (Mm3)				Rehan-dling of OB
			In Quarry		Trench	In Quarry		Trench	Total	
	Yearly	Cumm.	Yearly	Cumm.	Cutting	Yearly	Cumm.	Cutting		
1	0.30	0.30	1.34	1.34	1.66	2.00	2.00	1.66	3.66	
2	0.60	0.90	2.67	4.01		3.00	5.00		3.00	
3	1.00	1.90	4.46	8.46		4.00	9.00		4.00	
4	2.00	3.90	10.51	18.98	1.88	13.00	22.00	1.88	14.88	
5	2.25	6.15	16.70	35.68		16.00	38.00		16.00	
6	2.50	8.65	23.63	59.31		23.00	61.00		23.00	
7	2.50	11.15	23.63	82.94		24.00	85.00		24.00	
8	2.50	13.65	23.63	106.56		24.00	109.00		24.00	
9	2.50	16.15	23.31	129.88		24.00	133.00		24.00	
10	2.75	18.90	25.55	155.43		23.00	156.00		23.00	5.00
11	2.75	21.65	24.47	179.89		26.00	182.00		26.00	5.00
12	2.75	24.40	26.06	205.95		25.50	207.50		25.50	5.00
13	2.75	27.15	26.09	232.04		25.50	233.00		25.50	1.38
14	2.75	29.90	26.19	258.23		25.50	258.50		25.50	2.63
15	2.75	32.65	18.12	276.35		19.50	278.00		19.50	4.94
16	2.75	35.40	18.12	294.47		20.50	298.50		20.50	5.00
17	2.75	38.15	18.85	313.32		21.50	320.00		21.50	
18	2.75	40.90	23.01	336.33		21.50	341.50		21.50	
19	2.75	43.65	23.54	359.87		23.00	364.50		23.00	
20	2.75	46.40	26.71	386.58		23.00	387.50		23.00	
21	2.75	49.15	16.45	403.04		17.50	405.00		17.50	
22	2.75	51.90	15.22	418.25		15.50	420.50		15.50	
23	2.75	54.65	15.22	433.47		14.00	434.50		14.00	5.00
24	2.16	56.81	12.37	445.84		11.78	446.28		11.78	5.00
25	1.04	57.85	6.64	452.49		6.21	452.49		6.21	4.88
	57.85		**452.49**		**3.54**	**452.49**		**3.54**	**456.03**	**43.83**

8.4 DUMPING SCHEDULE

The year-wise Dumping Schedule in the proposed Amalgamated Yekona-I & II OC mine is tabulated below:

YR.	QUARRY / TRENCH CUTTING	PROG OB (MM3)	DUMPING (MM3)									
					EXTERNAL DUMP						INTERNAL DUMPING	
			TEMP. TOP SOIL DUMPS (S1)	TEMP. TOP SOIL DUMPS (S2)	OB DUMP (L)	TEMP. OB DUMP (L1)	EMBANK-MENT	OB DUMP (H1)	OB DUMP (H2)	TEMP. OB DUMP (H3)	IN VOID OF YEKONA -I OC	IN VOID OF YEKONA -II OC
1	Yekona-I											
	Trench Yekona-II	1.66		1.66								
	Yekona-II	2.00		0.08			0.17		1.75			
2	Yekona-I											
	Yekona-II	3.00		0.13			0.25		2.62			
3	Yekona-I											
	Yekona-II	4.00		0.17			0.33		3.50			
4	Trench Yekona-I	1.88	1.88									
	Yekona-I	5.00	0.60				0.56	3.84				
	Yekona-II	8.00		0.68			0.66		6.66			
5	Yekona-I	8.00	1.06		0.44		0.45	6.05				
	Yekona-II	8.00		1.06		0.66			6.28			
6	Yekona-I	11.00	1.10		1.24			8.66				
	Yekona-II	12.00		1.02		1.00			9.98			
7	Yekona-I	12.00	1.10		1.36			9.54				
	Yekona-II	12.00		0.94		0.99			10.07			
8	Yekona-I	12.00	1.00		1.36			9.64				
	Yekona-II	12.00		0.90		1.00			4.61			5.49
9	Yekona-I	12.00	1.00		1.36			9.64				
	Yekona-II	12.00		0.90		0.99			2.90	5.00		2.21
10	Yekona-I	12.00	0.76		1.36			9.88				
	Yekona-II	11.00		0.34		0.91				4.61		5.14
	Rehandling		-4.61	-0.39				0.39	4.61			
11	Yekona-I	15.00			1.52	0.17		7.78			5.53	
	Yekona-II	11.00				0.91				5.27		4.82
	Rehandling		-0.56	-4.44				4.04			0.56	0.40
12	Yekona-I	15.00				1.69					13.31	
	Yekona-II	10.50				0.87						9.63
	Rehandling		-3.33	-1.67							3.33	1.67
13	Yekona-I	15.00				0.77					14.23	
	Yekona-II	10.50				0.87						9.63
	Rehandling			-1.38								1.38
14	Yekona-I	15.00									15.00	

YR.	QUARRY / TRENCH CUTTING	PROG OB (MM3)	DUMPING (MM3)									
			TEMP. TOP SOIL DUMPS (S1)	TEMP. TOP SOIL DUMPS (S2)	EXTERNAL DUMP						INTERNAL DUMPING	
					OB DUMP (L)	TEMP. OB DUMP (L1)	EMBANK-MENT	OB DUMP (H1)	OB DUMP (H2)	TEMP. OB DUMP (H3)	IN VOID OF YEKONA -I OC	IN VOID OF YEKONA -II OC
	Yekona-II	10.50				0.87						9.63
	Rehandling					-2.63						2.63
15	Yekona-I	9.00									9.00	
	Yekona-II	10.50				0.87						9.63
	Rehandling					-4.94						4.94
16	Yekona-I	8.50									8.50	
	Yekona-II	12.00										12.00
	Rehandling					-5.00						5.00
17	Yekona-I	8.50									8.50	
	Yekona-II	13.00										13.00
18	Yekona-I	8.50									8.50	
	Yekona-II	13.00										13.00
19	Yekona-I	10.00									10.00	
	Yekona-II	13.00										13.00
20	Yekona-I	10.00									10.00	
	Yekona-II	13.00										13.00
21	Yekona-I	10.00									10.00	
	Yekona-II	7.50										7.50
22	Yekona-I	8.00									8.00	
	Yekona-II	7.50										7.50
23	Yekona-I	7.50									7.50	
	Yekona-II	6.50										6.50
	Rehandling									-5.00	5.00	
24	Yekona-I	7.50									5.21	2.29
	Yekona-II	4.28										4.28
	Rehandling									-5.00	3.23	1.77
25	Yekona-I	6.21										6.21
	Yekona-II	0.00										
	Rehandling									-4.88		4.88
TOTAL			**0.00**	**0.00**	**8.64**	**0.00**	**2.42**	**69.46**	**52.98**	**0.00**	**145.40**	**177.13**

8.5 EQUIPMENT SCHEDULE ~ SCHEDULE OF EXPENDITURE ON HIRING/ OUTSOURCING OF EQUIPMENT

As described earlier, the entire coal and OB will be excavated by hiring/outsourcing of equipment. The cost of OB and parting removal and coal extraction by hiring/outsourcing of equipment depends on type of strata and lead/lift. In the proposed Amalgamated Yekona-I & II OC mine, the strata under consideration is medium hard strata.

The rates for OB by hiring of equipment for the proposed mine have been estimated on the basis of Approved FD approved rates circulated by WCL, updated with change in price of diesel for April'2015.

Rates for excavation for hiring/ outsourcing of HEMM are being adopted in project report for planning purpose and economic evaluation of the project. These rates may vary at the time of actual implementation. The rates include excavation, transport, drilling, dozing at face & dumps, water spraying and Land Reclamation. It is also suggested here that before awarding the work to hiring agency, geological structure should be further confirmed by drilling additional boreholes.

Lead for OB, bench-wise, horizon-wise has been calculated for each cut on weighted average basis keeping into account the OB dumping programme. The lead for coal is calculated based on floor RL of each cut to coal stock yard. On actual implementation of report these rates and lead may vary based on site conditions. It is suggested to re-assess hiring rates again based on site conditions while awarding tender.

The average rate (Rs./m^3) for excavation / rehandling of OB and extraction of coal (Rs/t) are tabulated below :

Year wise Outsourcing rates

Yr	Coal (Mt)	Hiring Rate (Rs./t)	Top OB (Mm3)	Hiring Rate (Rs./m3)	Parting OB (Mm3)	Hiring Rate (Rs./m3)	Trench Cutting (Mm3)	Hiring Rate (Rs./m3)	Rehan-dled OB (Mm3)	Hiring Rate (Rs./m3)
1	0.30	32.69	1.93	56.79	0.07	56.79	1.66	52.81		
2	0.60	32.69	2.86	56.79	0.14	56.79				
3	1.00	32.69	3.76	56.79	0.24	56.79				
4	2.00	32.69	12.52	56.79	0.48	56.79	1.88	52.81		
5	2.25	37.31	15.46	61.92	0.54	56.79				
6	2.50	37.31	22.39	61.92	0.61	56.79				
7	2.50	37.31	23.39	61.92	0.61	56.79				
8	2.50	37.31	23.39	61.92	0.61	56.79				
9	2.50	37.78	23.39	64.51	0.61	56.79				
10	2.75	39.13	22.33	64.62	0.67	56.79			5.00	52.81
11	2.75	39.13	25.33	65.63	0.67	56.79			5.00	56.23
12	2.75	39.66	24.83	62.62	0.67	56.79			5.00	56.23
13	2.75	39.66	24.83	62.62	0.67	56.79			1.38	56.23

Yr	Coal (Mt)	Hiring Rate (Rs./t)	Top OB (Mm3)	Hiring Rate (Rs./m3)	Parting OB (Mm3)	Hiring Rate (Rs./m3)	Trench Cutting (Mm3)	Hiring Rate (Rs./m3)	Rehan-dled OB (Mm3)	Hiring Rate (Rs./m3)
14	2.75	39.66	24.83	62.62	0.67	56.79			2.63	56.23
15	2.75	32.69	18.83	62.71	0.67	56.79			4.94	56.23
16	2.75	32.69	19.83	62.63	0.67	56.79			5.00	56.23
17	2.75	32.69	20.83	62.60	0.67	56.79				
18	2.75	37.31	20.83	64.31	0.67	56.79				
19	2.75	37.31	22.33	64.38	0.67	56.79				
20	2.75	37.31	22.33	64.38	0.67	56.79				
21	2.75	38.38	16.82	65.61	0.67	56.79				
22	2.75	39.66	14.83	66.24	0.67	56.79				
23	2.75	39.66	13.33	66.28	0.68	56.79			5.00	52.81
24	2.16	39.66	11.25	66.45	0.53	56.79			5.00	52.81
25	1.04	39.66	5.95	67.07	0.26	56.79			4.88	52.81
TOTAL	**57.85**		**438.40**		**14.09**		**3.54**		**43.83**	

Weighted Average Rate for hiring of HEMM arrived at as explained above are being adopted for purpose of economic evaluation of the project during planning stage. These rates are based on FD approved rates.

8.6 DRILLING & BLASTING

Drilling pattern in overburden, with a bench height of 10 m has been envisaged with the burden as 5.0-6.0 m and spacing as 6.5-7.0 m. The powder factor of 2.25m^3/kg has been considered for overburden for overburden planning purpose.

For coal, depending upon the thickness available in the horizons, bench height of max. 8 m is being proposed. For coal bench, drilling pattern with burden and spacing of 3.0 m & 4.0 m respectively has been proposed. A powder factor of 6.0t/kg has been considered for blasting in coal for planning purpose. However at the time of operation of mine, drilling parameters have to be optimized on the

basis of actual field trial depending upon joint pattern, bedding plane and local geology of the blast site and accordingly powder factor for OB & coal may be vary after final trial of blasting.

It is proposed that bulk loading explosive may be used. For storage of L.D. explosive and accessories one magazines having 20 t capacity has been proposed in the proposed PR.

9.0 QUALITY

Quality of coal has been assessed for both the quarries separately as well as for Amalgamated OC based on the borehole data available within the quarry area.

Yekona – I OC

Overall quality has been assessed based on borehole wise GCV in quarriable area which works out to **4714 kCal/kg (G-9)** without dilution at contact point of roof and floor of the Seam.

Yekona – II OC

Overall quality has been assessed based on borehole wise GCV in the quarriable area which works out to **5053 kCal/kg (G-8)** without dilution at contact point of roof and Floor of the Seam.

OVERALL QUALITY

The overall quality of composite seam (top & bottom section combined) for amalgamated project as a whole, on average basis, without dilution works out to **4920 kCal/kg (Grade G-8).**

10.0 PUMPING & DRAINAGE

The Pumping capacity required at the time of five years after reaching the target has been calculated as under:-

Sl. No.	DEISCRIPTIONS	CALCULATED DATA		
		Yekona-I OC	Yekona-II OC	TOTAL
1	Maximum exposed area (ha)	159.10	94.14	253.24
2	Area beyond excavation (ha), 5% of item no.-1	7.955	4.707	12.662
3	Backfilling Area		48.55	48.55

Sl. No.	DEISCRIPTIONS	CALCULATED DATA		
		Yekona-I OC	Yekona-II OC	TOTAL
4	Run-off co-efficient for			
	i) Open excavation	0.70	0.70	
	ii) Area beyond excavation	0.10	0.10	
5	Rainfall infiltration co-efficient for backfilled area	0.20	0.20	
6	Probable max. rainfall in a day (mm)	210	210	
7	Water collected in the quarry due to exposed area and area beyond excavation (cum/day)	255939	139374	395313
8	Required pumping capacity to handle the whole water of the rain water in 100 hrs (lps)	711	387	1098
9	Seepage due to strata (15% of Item no.-7)	107	58	165
10	Total pumping capacity (lps)	818	445	1263
11	Depth in target plus five years (m)	200	150	

Pumping system has been designed for the volume of water accumulated in the mine at the target plus five year production considering maximum rainfall in a day as **210**mm

10.1 SELECTION OF PUMPS DELIVERY RANGES

1) Ten pumps of 160 lps x 200m head have been proposed. Out of ten pumps, two pump are standby.

2) Four pumps of 80 lps x 150m head have been proposed for initial and auxiliary pumping.

3) One diesel pumps of 80 lps x 60m head have been proposed.

4) Six face pumps of 11 lps x 30 m head have been envisaged in project report and out of six pumps, one is standby.

5) Three delivery ranges of 406.4 mm dia. have been proposed for main pumps of 160lps x 250m head and maximum two pumps will be connected in each delivery.

6) Two delivery range of 312mm dia. has been proposed for main pumps of 160lps x 250m head and maximum one pump will be connected in each delivery.

7) 80 mm dia. G.I. pipe will be used for face pumps.

8) No piping provision has been made for standby pumps.

11.0 COAL HANDLING ARRANGEMENT

Combined CHP is proposed for both quarries. This CHP shall be erected at place near to railway siding. Salient Features of CHP are summarized below.

a) Three nos. 2 - stage crushing double roll secondary sizer, ROM coal to (-) 100 mm, 400tph.

b) Conveying of coal by three nos. of 1200 mm wide belt conveyors

c) Storage of coal in three nos. of overhead twin hoppers, each of 2 x 100 t capacity

d) Despatch of coal on road by trucks to washery / railway siding

e) Dust suppression and fire extinguisher system

f) Power supply, illumination and control systems

g) Civil and structural cost

h) Weighment of coal with the help of road weighbridge

11.1 RAILWAY SIDING

The nearest Railway Siding from the proposed Amalgamated Yekona-I & II OC mine is GMR Railway siding which is about 7 km from the project. A financial provision of Rs 40.00 crores and Provision for 30ha of land has been made in project report for construction of railway siding for the proposed mine. Location of siding may be decided by area at any suitable place on non-coal bearing area.

12.0 WORKSHOP

The proposed Amalgamated Yekona-I & II OC mine has been planned for Total hiring option. The entire coal extraction and OB removal will be done by hiring agency. The HEMM deployed in the mine will be operated and

maintained by hiring / out-sourcing agency. Hence, No provision for excavation workshop has been made in project report.

E & M workshop

E & M Workshop facilities have been proposed in this PR to carry out maintenance & repair of the CHP, equipment, pumps, LMVs, electrical etc. The E&M workshop is essentially a unit workshop and will depend on central/regional workshop for major repair and part manufacture.

13.0 POWER SUPPLY

The projected maximum demand for the proposed Amalgamated Yekona-I & II OC (including residential) for Total hiring option is 3303 kVA. Incoming power supply for the project is envisaged at 33 kV. There is no 33 kV source presently available nearby. Power supply at 33 kV shall be available from Warora substation of MSEDCL. Accordingly capital provision has been made for 15 km of 33 kV overhead line. Capital provision has been made for diversion of 11 kV & 33 kV overhead line falling under the project area.

Salient features of the electrical parameters are given in table below:-

Sl.	ITEM HEAD	**TOTAL HIRING**
1	PROJECTED MAXIMUM DEMAND	
	A) ONLY MINE	**2981 kva**
	B) ONLY TOWNSHIP	**323 kva**
	C) TOTAL	**3303 kva**
2	SPECIFIC ENERGY CONSUMPTION	
	A) WITH RESPECT TO OB PRODUCTION	**NIL**
	B) WITH RESPECT TO COAL PRODUCTION	**0.89 kwh/t**
	C) WITH RESPECT TO COMMON LOAD	**2.41 kwh/t**
	D) WITH RESPECT TO TOTAL LOAD	**3.30 kwh/t**
3	SPECIFIC POWER COST	**30.83 Rs. /t**
4	FIXED PERCENTAGE OF POWER COST	**69.56 %**
5	VARIABLE PERCENTAGE OF POWER COST	**30.44 %**
6	AVERAGE COST OF PURCHASED POWER	**9.35 Rs./kwh**

14.0 CIVIL CONSTRUCTION WORKS

The Building Cost Index for the Maharastra has been worked out to 560 in 2015 (1st half) taking the prevalent rates of materials and labours in Maharastra. This Building Cost Index is with reference to base 100 in Nagpur as on 1.1.1992.

14.1 SERVICE BUILDINGS

Keeping in view the needs and requirements of this mine, provision for all necessary service buildings such E & M workshop, Sub–station, Magazine and other service buildings have been provided.

14.2 RESIDENTIAL BUILDING

Total manpower proposed for this project is 257. Considering the necessity of the project, 132 Nos. of Type quarters have been envisaged which satisfies the 51.40% of the required manpower of Amalgamated Yekona-I & II OC. Type quarter consists of 56 MQ's, 32 B-type , 28 C-type, 2 D-type & 14 hostel accommodation**.**

14.3 ROADS & CULVERTS

For above number of quarters, 1000m long colony road with culverts, drains, etc. has been envisaged. 2.0 km long Haul road for 35t dumper capacity has been provided for transportation of coal / OB inside quarry. 3.00 km Heavy duty road for 35t dumper capacity has been provided for transportation of coal / overburden on surface. For approaching different Service Buildings 2.00 km long Sector Road on Stratum `D' specification with culverts, drain, tree guards etc. has been proposed. Accordingly, provision for service road and culverts have been made.

7.0 Km length of Stratum 'C' has been proposed for Diversion of PWD road and 5.0 Km length of Stratum 'C' has been proposed for Diversion of village road. Accordingly, provision for road diversion have been made.

14.4 WATER SUPPLY & SEWERAGE

Water supply arrangements have been envisaged for colony and project both. The water demand for **132 quarters is 110 KL**. The total water requirement for project site has been worked out to **810 Kl**. Water demand for project site includes water to be supplied for dust suppression, fire fighting, water sprinkling on roads, etc.

Water demand for project site includes water to be supplied for dust suppression, fire fighting, water sprinkling on roads, etc.

Sub-soil water has been envisaged as the source. Accordingly, bore-well provisions have been made. However, it is suggested that the source of water may be ascertained after carrying out hydro-geological investigations as regards the quality and quantity of water.

Sub-soil water through bore well has been proposed to be conveyed to O.H. reservoirs via ground sumps. Further, water from O.H. reservoir shall be supplied under gravity to different buildings after chlorination.

It is, however, suggested that permanent water supply arrangement should be formulated after carrying out detailed survey, investigations for the adequate source of water and detailed engineering.

15.0 SAFETY & CONSERVATION

15.1 Safety from Inundation

The part of proposed mine area is under the HFL of Wardha river (recorded HFL is 198 m). In project report it is proposed to make a flood protection embankment 6m above HFL around the proposed mine wherever necessary. The top width of embankment is proposed as 30m. Capital provision has been made for pitching of embankment on river side upto HFL level. During rainy season regular inspection of embankment shall be done. All precautions as per CMR 126 shall be taken. Capital provision for scientific study to assess the effect of construction of embankment on HFL has been made in this PR.

15.2 Dust Suppression

For suppression of dust, fixed type water sprinklers have been provided. Suppression of mine dust may be done by using package bond & dust bond, for methodology of application DGMS Circular No.8 of 1997 may be referred.

15.3 Slope Stability

Stability of dump slope may pose problems as proposed dumps are 90m above ground level. Slope stability studies should be done beforehand & its recommendation should be implemented. Also on dip side of quarry where depth is about 150m, it is proposed to conduct studies for stability of quarry slope. Again side batter runs along a major fault. This fault shall be knocked out at the floor of the coal seam to avoid any bench slope failure due to fault.

It is suggested that following action may be taken to deal with slope stability problem :

i) Vulnerable area may be identified and marked on quarry plan.

ii) Observation of actual alignment of fault planes, its throw, joints, etc. may be recorded during the process of excavation.

iii) Water drainage system may be properly implemented. Regular monitoring of tension cracks, horizontal and vertical movement of strata in critical area may be done.

iv) Mine encounters lot of faults, whenever mine workings approaches to fault plane proper monitoring may be done. Efforts may be made to reduce load on fault plan

v) Water accumulation at dump top and toe is major cause of dump failure. Adequate drainage shall be maintained at top and toe of dump.

15.4 Precautions from Blasting

Special precautions will be taken while performing blasting operations to avoid danger from fly rock. Controlled blasting shall be practiced near built up area and near embankment to avoid any damage to them.

15.5 Safety aspects for Outsourcing / Hiring of HEMM

Special precaution should be taken while employing contractual machine & labours in the mine. Before employing contractual workers to the mine proper vocational training should be imparted based on recommendations of various Safety Conference. Terms and conditions for deployment of contractual labours as well as machineries shall be fixed by management. Some of the major aspects are as follows:

A) For persons :

i) Records in Form-B & Form-E shall be maintained.

ii) Records of VTC driving license of operators shall be kept by Operators and readily available for inspection by management

iii) Salaries shall be distributed in front of management representative

iv) No person shall be employed unless person holds VTC certificate and Management is informed.

v) Adequate supervision shall be maintained by competent person.

vi) All persons employed in mine shall obey lawful instructions of mine supervisors and officials.

B) For Machineries :

i) All the machineries to be deployed in mines should be passed by the management.
ii) RTO certificate photo copies of all vehicles shall be submitted to management.
iii) Daily welding, monitoring, inspection shall be done by contractor's mechanic as directed by management.
iv) Machine manufacturers should be asked to give risk analysis.
v) Records of daily maintenance breakdown repairs etc shall be maintained by contractor and shall be available for inspection by mine officials.

C) General :

i) No person/vehicle shall be deployed at any place other than authorized place.
ii) All employees of contractors should obey lawful instruction of mine management.
iii) Risk Management Plan by contractor of tipper and excavators may be made and implemented.
iv) VTC trained Manpower shall only be deployed in the mine.
v) Restricted traffic & traffic control planning shall be done and implemented.

16.0 ENVIRONMENTAL MANAGEMENT

Proposed PR for Amalgamated Yekona-I & II OC is located in Warora Tahsil of Chandrapur district of Maharashtra State and is named after Yekona village. Yekona-I OC and Yekona-II OC are on-going projects of WCL and Environment Clearances for separate Yekona I OC (Capacity 0.40 MTPA) and Yekona II OC (Capacity 0.60 MTPA) vide letter no J-11015/175/2005-IA.II (M) dated 17/10/2006 and J-11015/182/2005-IA.II (M) dated 17/10/2006 are available. However for enhanced capacity of Amalgamated Yekona-I & Yekona-II OC mine (Peak capacity of 3.44 Mty), environment clearance will be required.

17.0 LAND REQUIREMENT

The total land requirement for Amalgamated Yekona-I& II OC mine is 1685.20 ha (1609.18 ha tenancy land & 76.02 ha Govt. land which includes 712.56 ha land proposed in on-going Yekona-I OC & Yekona-II OC PR (693.87 ha tenancy land & 18.69 ha Govt. land). The above 1685.20 ha land includes 30 ha land required for proposed railway siding on non coal bearing area & for road / conveyor to transport coal to siding. In addition to this, acquisition of 8 ha tenancy land has been proposed for re-settlement of Marda village outside the mine area at some suitable location. Provision for 8.12 ha gaothan land has also been proposed in this PR. Thus, total land involved including the land for resettlement and gaothan land is 1701.32 ha (1617.18 ha tenancy land & 84.14 ha govt land).

About 245.15 Ha and 421.70 Ha land (total- 666.85) has been already acquired for Yekona-I OC & Yekona-II OC respectively.

For economic evaluation, one time monetary compensation in lieu of employment (@ Rs. 5 lakh/Acre) for 50% of Tenancy land has been considered in this PR. However, it is envisaged that WCL may offer jobs as per the New R&R policy of CIL to those land losers who are not willing to take monetary compensation in lieu of employment.

In project report rehabilitation of Marda village is proposed as it is located on coal bearing area. The census data of year 2011 is available for Marda village. The data for Marda Village is as tabulated below:-

Population of Marda Village As Per 2011 Census Data

Sl. No	Village Name	Households	Population	Males	Females
1	Marda	208	864	450	414

A Capital provision of Rs. 41.1908 crores has been made in this PR for resettlement of Marda Village. This includes 8.00 ha land for resettlement site of village and cost of 8.12 ha Gaothan land of Marda village.

As no details of land holding, details of Marda village population and actual no of persons opting for job for present acquisition was provided by area, notional data is considered. Actual value of this head may change while execution of project.

The total capital provided in this PR for land acquisition is 513.1195 crores in addition to Rs. 41.1908 crores for village rehabilitation. Thus total capital including village rehabilitation works out to Rs. 555.1103 crores.

17.1 LAND USE PATERN

The land use pattern for the proposed project is as tabulated below :

Sl. No	Particulars	Area (ha)
1.	Quarry/ exposed Area (including existing quarry)	689.20
2.	External OB dump (including Embankment)	320.02
3.	Nalla Diversion and existing Nalla & Irrigation Canal*	58.35
4.	Residential Colony (Approximately)*	10.00
5.	Roads, Road diversion And Barriers due to roads (Approximately)*	30.00
6.	Infrastructure and service roads (Approx.)*	100.00
7.	Flood protection embankment	44.37
8.	Land for relocation of Marda village*	8.00
9.	Railway siding and its Approach road*	30.00
10.	Blasting / Safety zone along quarries and external dump	270.00
11.	Rationalisation of boundary	141.38
	Total	**1701.32**

*Location of these shall be decided by implementing authority.

18.0 MINE CLOSURE PLANNING

Mine closure planning has to be carried out at the starting of the mine and needs periodic reviewing and revision during its life cycle to cope with the geo-technical constraints, safety and economic risks, social & environmental challenges. In the proposed Amalgamated Yekona – I & II OC mine, necessary provision has been kept towards mine closure based on latest guidelines of MOEF. The closure cost works out to Rs. **48.66/t.**

The mine closure cost will cover the closure activities for which a corpus fund will be created by opening an escrow account with the coal controller organization in nationalised bank. In case of occurrence of acid mine drainage, post closure acid mine drainage management cost shall also be included in the total closure cost. 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 above rate has been taken from Circular No. 55011-01-2009-CPAM, Government of India, Ministry of Coal, Dated 27 August, 2009 duly updated on 7th January, 2013.

Type of Mine : Open Cast.

Project Life: 25 years

Total project area of the mine: 1701.32 ha

The financial provision for closure of Project Report for Amalgamated Yekona-I & II OC mine for the entire mine life comes to around Rs. 281.5160 Crores (based on January, 2015 WPI @ Rs 6 lakh/ Ha and 5% escalation each year. The break-up of closure cost for Amalgamated Yekona-I & II OC mine is hereunder :-

Activity wise Break-up of Closure Cost

Sl. No.	Activity	% of Total Mine closure Cost	Amount (Rs.in Crores)	Remarks
A	**Dismantling of structures**			To be included in final mine closure plan.
	Service Building	0.2	0.56	
	Residential Building	2.67	7.52	
	Industrial Structures like, Workshop, Field substation, etc.	0.3	0.84	
B	**Permanent Fencing of mine void and other dangerous area**		0.00	To be included in final mine closure plan.
	Random rubble masonry of height 1.2 meter including leveling up in cement concrete 1:6:12 in mud mortar	1.5	4.22	
C	**Grading of highwall slopes**		0.00	To be included in final mine closure plan.
	Levelling and grading of highwall slopes	1.77	4.98	
D	**OB Dump Reclamation**		0.00	
	Handling/Dozing of OB Dump into mine void and preparation of Internal dump for reclamation.	88.66	249.59	71% for progressive and 17.66% for final mine closure.
	Technical and Bio-reclamation including plantation and post care.	0.4	1.13	Equal Weightage throughout the life of the mine.
E	**Landscaping**		0.00	
	Landscaping of the open space in leasehold area for improving its aesthetic and eco value.	0.3	0.84	Equal Weightage throughout the life of the mine.
F	**Plantation**		0.00	
	Plantation over cleared area obtained after dismantling.	0.5	1.41	To be included in final mine closure plan.
	Plantation around the quarry area and in safety zone.	0.2	0.56	Equal Weightage throughout the life of the mine.
	Plantation over the external OB Dump	0.02	0.06	Equal Weightage throughout the life of the mine.
G	**Post Closure Env Monitoring/Testing of Parameters for three years.**		0.00	For three years after mine closure
	Air Quality	0.22	0.62	
	Water Quality	0.2	0.56	
H	**Entrepreneurship development (vocational/ skill development) Training for sustainable income of affected people**.	0.26	0.73	Equal Weightage throughout the life of the mine.
I	**Miscellaneous and other mitigative measures.**	2	5.63	Equal Weightage throughout the life of the mine.
J	**Post Closure Man power cost for supervision**	0.8	2.25	To be included in final mine closure plan.
TOTAL		**100%**	**281.52**	

1. Mining should be carried out in a phased manner initiating afforestation/ reclamation work in the mined out area of quarry and dumps done during previous years.

2. Upto 80% of the total deposited amount including interest accrued in the ECSROW account may be released after every 5 years. The amount released should be equal to expenditure incurred on Progressive Mine closure in past 5 years or 80% whichever is less.

3. The above cost/expenditure will be met from the corpus fund deposited in the escrow account by the mine operator. However, the additional amount beyond the escrow account will be provided by the mine operator after estimating the final mine closure cost (as per the mine closure guideline).

4. The amount indicated separately under each head is indicative only and based on actual expenditure the amount may change.

ESTIMATE OF PROPOSED ESCROW FUND

The total area involved in proposed Yekona-I & II OC mine is 1701.32 Ha. So the corpus based on August, 2009 rate is 102.0792 crores @ Rs 6.0 Lakh /ha of project Area. The wholesale price Index in August, 2009 is 129.6 and the WPI for the month of January, 2015 available in the website of Office of Economic Adviser, Ministry of Commerce, Government of India is 178.3. So the current value of corpus for 2014-15 is Rs.102.0792*178.3/129.6 crores which comes to Rs.140.4377 crores. This corpus is to be divided by the life of mine (starting from the year when mining activity is started till the end of the mine) which is 25 years in case of Amalgamated Yekona-I & II OC. So dividing by 25 years, the annual corpus comes to Rs 5.6175 crores. The 1st year of proposed Amalgamated Yekona-I & II OC mine is 2015-16. So the above annual corpus amount calculated for 2014-15 is escalated for 1 year@ 5% per annum to get the annual corpus fund of Rs 5.8984 crores to be deposited in escrow a/c in 1st year of mine i.e. 2105-16. Thereafter in each subsequent year, the annual corpus amount will be deposited by escalation @ 5% per annum. Escrow account has been opened for the Amalgamated Yekona-I & II OCM.

Annual Corpus Fund to be Deposited in Escrow Account

Project Year	Financial Year	Amounts (Rs. '000)
1	2015-16	58984
2	2016-17	61933
3	2017-18	65030
4	2018-19	68282
5	2019-20	71696
6	2020-21	75281
7	2021-22	79045
8	2022-23	82997
9	2023-24	87147
10	2024-25	91504
11	2025-26	96080
12	2026-27	100884
13	2027-28	105928
14	2028-29	111224
15	2029-30	116785
16	2030-31	122625
17	2031-32	128756
18	2032-33	135194
19	2033-34	141953
20	2034-35	149051
21	2035-36	156504
22	2036-37	164329
23	2037-38	172545
24	2038-39	181172
25	2039-40	190231
		2815160

19.0 MANPOWER & PRODUCTIVITY

The manpower requirement for proposed amalgamated Yekona-I & II OC is 257 in total hiring option. The manpower requirement for proposed project has been calculated on the basis of 3 shift operation for 330 days in a year. The OMS including Welfare manpower works out to 40.532 t.

Manpower Requirement

Sl. No.	Particulars	Total Hiring Option
1.	Executives	36
2.	Non-executives:	
i)	Monthly rated staff	85
ii)	Daily rated staff	136
3.	**Total**	**257**

20.0 PROJECT IMPLEMENTATION SCHEDULE

The proposed OC mine is amalgamation of already approved PR of Yekona- I & Yekona-II OCM. As this is a Greenfield project all the infrastructural facilities have been provided independently in order to ensure its proper development. The two main phases in project construction would be Pre - Sanction and Post - Sanction phases. Some major activities under both heads are detailed in following table.

PRE AND POST SANCTION ACTIVITIES BEFORE STARTING EXCAVATION

Pre Sanction Activities	Post Sanction activities before starting excavation
Detailed surveying of the area	Preparation of budgetary estimates for construction of various infrastructural facilities like , Workshop, VTC Building, Magazine, Approach Road, etc.
Dialogue with State Government and other appropriate authorities to expedite various statutory clearances.	Posting of core management group.
Dialogue with MAHAGENCO to finalise sources of power supply and diversion of power line passing over the Property.	Getting various statutory clearances.
Soil investigation for construction work.	Procurement of HEMM and OPM equipment. Creating facilities for erection and commissioning of equipment.
Preparation and submission of EMP	Starting construction of permanent approach road.
Dialogue with Railway authorities to expedite railway siding.	Starting construction of workshop, pit office, Magazine, etc.
Dialogue with State Government and other appropriate authorities for diversion of Nalas	Selection and training of manpower for the project as per manpower budget.
	Proposal for various scientific studies.
	Construction of Railway siding

21.0 PROJECT ECONOMICS

21.1 OUTSOURCING OPTION (TOTAL HIRING OPTION)

Proposed PR for Amalgamated Yekona-I & II OC has been prepared considering leasing/out sourcing of HEMM for excavation, transport, drilling, dozing, Dumping etc. for Top OB, Coal and Parting. Blasting, surface illumination, pumping, CHP, supervision etc. would be done departmentally.

Mine target is 2.75 Mty and the weighted average GCV of coal without considering contamination works out to 4920 kCal/kg (calculated).

21.2 SCOPE OF WORK PROPOSED TO BE OUTSOURCED

The scope of work by hiring/outsourcing of HEMM shall include blast hole drilling, earth work excavation, loading, transportation, dumping, dozing, leveling at dumping sites, haul road maintenance, water spraying and land reclamation etc. as per guidelines of the project authorities highlighted in this project report or otherwise to suit the local conditions. In the proposed mine, there is a parting of thickness ranging from 0.17m to 4.07m between Top Section and Bottom section of the coal seam. Separate drilling and blasting for parting is required to avoid dilution of quality of coal but due to lesser thickness of parting it is not possible to drill and blast the parting separately. Hence, the out-sourcing agency is required to deploy Dozer with Ripper attachment to mine out the parting separately to avoid dilution of coal. All statutory rules, regulations and applicable laws are to be followed including those related to Mines act, government licenses, workmen compensation, insurances etc.

Excavated materials shall have to be dumped at sites, which will be shown by project authorities from time to time in accordance with dump plan of project report. Haul road has to be maintained with the requisite gradient as per regulation and in accordance with the conditions imposed by DGMS in its permission under regulation 98(1) and (3) and other relevant provisions of Coal Mines Regulations, 1957.

21.3 SCOPE OF WORK PROPOSED TO BE DONE DEPARTMENTALLY

Blasting operation, surface illumination, pumping and CHP facilities and E & M workshop would be provided departmentally.

21.4 OUTSOURCING RATES

The rates for OB by hiring of equipment for the proposed mine have been estimated on the basis of Approved FD approved rates circulated by WCL, updated with change in price of diesel for April'2015. Rates for excavation for hiring/ outsourcing of HEMM are being adopted in project report for planning purpose and economic evaluation of the project. These rates may vary at the

time of actual implementation. The rates include excavation, transport, drilling, dozing at face & dumps, water spraying and Land Reclamation. It is also suggested here that before awarding the work to hiring agency, geological structure should be further confirmed by drilling additional boreholes.

Lead for OB, bench-wise, horizon-wise has been calculated for each cut on weighted average basis keeping into account the OB dumping programme. The lead for coal is calculated based on floor RL of each cut to coal stock yard. On actual implementation of report these rates and lead may vary based on site conditions. It is suggested to re-assess hiring rates again based on site conditions while awarding tender.

21.5 PROJECT ECONOMICS

21.5.1 EXISTING CAPITAL AND ADDITIONAL CAPITAL WITH PHASING

The total estimated capital investment for the proposed amalgamated Yekona-I & Yekona-II OCM, having an annual capacity of 2.75 Mt of coal and 26.00 Mm^3y of Peak OB, works out Rs. 745.8313 crores (including existing assets as on 1/4/2014 worth Rs. 18.5497 crores). Additional capital requirement for proposed amalgamated Yekona-I & Yekona-II OCM works out to Rs. 727.2816 crores. The summarized form of Initial Capital Investment is given in Table below.

Initial Capital Investment (Total Hiring Option)

/c Head	Particulars	Capital Provisions (in Rs. Crores)		
		Total Capital (Existing +Additional)	Existing as on 1.04.2014	Additional Capital
01	Land	555.1103	0.0000	555.1103
02	Service & Residential Buildings	19.7135	0.0000	19.7135
03	Plant & Machinery	58.1868	0.0000	58.1868
04	Furniture & Fittings	0.5000	0.0000	0.5000
05	Railway Siding	40.000	0.0000	40.000
06	Vehicles	0.4943	0.0000	0.4943
07	Prospecting & Boring	2.1640	2.0040	0.1600
08	Mine Development	68.6403	15.5236	53.1167
09	Revenue Expn. Capital.	1.0221	1.0221	0.0000
	Total	745.8313	18.5497	727.2816

21.5.2 BASIS OF PRICE OF P&M & CIVIL WORKS

The pricing of P&M is based on the standard price list of August, 2014 (Updated upto March'2015) circulated by the specialist cell of CMPDI, Ranchi. The cost of civil works has been estimated on the basis of Cost Index of 560 at Maharashtra as on 1st half of the year 2015 with a base of 100 in Delhi as on 1.1.1992. The other cost indices taken in costing are as under:-

Indices	AICPI	WPI	Diesel Cost	Electricity Cost
Value	5767.34 for the period 1.12.14 to 28.2.15 for non Executives	178.3 (prov. Jan'2015)	Rs. 54.86 /lit. (April,2015)	Rs. 9.35/kWh

21.5.3 OPENING OF REVENUE ACCOUNT

The mine is considered to be in revenue from 1st year. The mine would be commercially ready in 1st year.

21.5.4 REPLACEMENT CAPITAL

Yearwise replacement capital is indicated in cash flow statement.

21.5.5 SOURCES OF FINANCE: INTERNAL RESOURCES OR LOAN

The source of finance will be through internal resources.

21.5.6 COMPLETION COST

The completion cost for the project works out to Rs. 881.1847 crores. (including WDV of existing assets of Rs. 18.5497 crores.)

21.5.7 COST OF PRODUCTION AT DIFFERENT LEVEL OF PRODUCTION:

A) SALARIES & WAGES COST

The detail of category-wise /scale-wise manpower requirement and year-wise estimated wages cost is given in detailed project report. The estimated salaries & wages cost works out to Rs. 83.15/t at 100% target capacity.

B) STORES COST

Stores cost has been estimated taking into account provision for repair & maintenance, POL, explosive, and miscellaneous stores cost. The estimated stores cost has been worked out to Rs. 140.73/t at 100% target capacity.

C) POWER COST

The average power cost per tonne of coal production works out to Rs. 34.46/t at 100% capacity.

D) MISC. EXPENDITURE

This cost has been estimated to cover expenditure on printing & stationary, postage, telephone, repair & maintenance of assets other than P&M, workshop debit, ins. & taxes for vehicles and other repairs and a further provision has been made for deterioration of coal stock. The miscellaneous cost per tonne of coal production works out to Rs. 82.23 at 100% level of operation.

E) ADMINISTRATIVE CHARGES

As per decision taken in 310th meeting of CIL Board, administrative charges shall be taken as 10% of Administrative overhead as communicated by WCL for financial year 2014-15. Accordingly the administrative cost works out to Rs. 16.85/t at 100% capacity. However, the above decision of CIL Board is subject to vetting by Institute of Cost Accountants of India.

F) OUTSOURCING COST - YEAR WISE WITH LEAD DISTANCE.

The average outsourcing cost per tonne of coal production works out to Rs. 531.20 at 100% level of operation.

G) INTEREST ON WORKING CAPITAL

Interest on working capital (@ 14.50%) works out to Rs. 45.59/t at 100% capacity.

H) DEPRECIATION

Straight line method of depreciation has been considered to arrive at depreciation cost per tonne of coal production. The depreciation cost works out to Rs. 120.06 per tonne at 100 % capacity.

I) INTEREST ON LOAN CAPITAL

Interest @ 11.50% on loan capital has been computed based on given debt equity mix. Interest on loan capital works out to Rs. 35.00 /t.

J) ENVIRONMENT RELATED COST

Rs. 6.00/t of coal has been provided for environmental related cost in the project at 100% capacity utilization.

K) MINE CLOSURE COST

Rs. 48.66 /t have been provided in the project against mine closure cost at 100% target production.

L) COST OF PRODUCTION

Total cost of production works out to be Rs. 1143.93/t and Rs. 1209.13/t at 100% and at 85% of target capacity respectively.

21.5.8 GRADE OF COAL & WEIGHTED AVERAGE SELLING PRICE

The weighted average GCV of coal without considering contamination of coal at the contact points works out to 4920 kCal/kg (Grade G-8) (calculated). The selling price of coal of G-8 Grade is Rs.1513.50/t. for Power Fertilizer and Defense sector, whereas for Other than Power, Fertilizer and Defence Sector the selling price is Rs. 2007.50/t

- **TRANSPORTATION / LOADING / SIZING CHARGES**

Rs. 79.00/t. has been considered for sizing charges for coal upto (-) 100 mm size.

- **DESPATCH OF COAL & POINT OF SALE.**

Coal from the face would be dispatched to coal stock yard. From stock to CHP it will be transported by tippers. Provision of a railway siding has been done in this PR for onwards transport of coal to customer.

21.5.9 PROFITABILITY (PROFIT/LOSS)

The profit with average sale value of coal as Rs. 1513.50/t for power fertilizer and defense sector works out to be **Rs. 369.57/t and Rs. 304.37/t at 100% and 85% target capacity** respectively.

The Profit with average sale value of coal as Rs. 2007.50/t for other than power, fertilizer and defence sector works out to **Rs. 863.57/t and Rs. 798.37/t at 100% and 85% capacity** respectively.

21.5.10 MANPOWER & OMS

The total requirement of manpower works out to 257 giving **OMS of 40.53 t**. This includes provision for leave/ sickness.

21.5.11 EMS

The overall EMS works out to Rs. 3369.09 based on CMPDI norms. The salary & wages works out to Rs. 83.15/t.

21.5.12 FINANCIAL IRR

The IRR of the project at 100% and 85% capacity works out to **16.97% & 12.80% for power sector.**

The IRR of the project at 100% and 85% capacity works out to **33.97% & 27.77% for Non-Power sector.**

21.5.13 SENSITIVITY ANALYSIS

Risk analysis and its impact on IRR, NPV (@ 12%) and Desired selling price at discounting rate of 12% have been studied due to change in different parameters such as Land and R&R capital cost, Mine development capital cost, Salary and wages cost, Store cost, Power cost, Operating cost, sales realization and capacity utilization etc.

21.6 CONCLUSION

The Project report of Amalgamated Yekona I & II OC mine has been prepared for a target capacity of 2.75 Mt for Total Hiring option. The entire workload of OB and parting removal and coal extraction would be catered by hiring of HEMM. Total Cost of Production is Rs. 1209.13/t at 85% of target capacity, Average Sale Price of coal (Grade G-8) is Rs.1513.50/t for Power Sector and Rs. 2007.50/t for Non Power Sector. IRR works out to 12.80% for power sector at 85% of target capacity and 27.77% for non power sector at 85% of target capacity in Total hiring option.

The Project Report in Total Hiring option is yielding more than 12.00% IRR at 85% of target capacity for power sector, hence this option with additional capital of Rs 727.2816 crores may be considered for approval by competent authority as this mine is economically viable for approval on notified price.

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RISK ASSESSMENT
AND
DISASTER MANAGMENT

Risk Assessment and Disaster Management

1. Safety from Inundation

The part of proposed mine area is under the HFL of Wardha river (recorded HFL is 198 m). In this report it is proposed to make a flood protection embankment 6m above HFL around the proposed mine wherever necessary. The top width of embankment is proposed as 30m. Capital provision has been made for pitching of embankment on river side upto HFL level. During rainy season regular inspection of embankment shall be done. All precautions as per CMR 126 shall be taken. Capital provision for scientific study to assess the effect of construction of embankment on HFL has been made in this PR.

2. Dust Suppression

For suppression of dust, fixed type water sprinklers have been provided. Suppression of mine dust may be done by using package bond & dust bond, for methodology of application DGMS Circular No.8 of 1997 may be referred.

3. Slope Stability

Stability of dump slope may pose problems as proposed dumps are 90m above ground level. Slope stability studies should be done beforehand & its recommendation should be implemented. Also on dip side of quarry where depth is about 150m, it is proposed to conduct studies for stability of quarry slope. Again side batter runs along a major fault. This fault shall be knocked out at the floor of the coal seam to avoid any bench slope failure due to fault. It is suggested that following action may be taken to deal with slope stability problem :

i) Vulnerable area may be identified and marked on quarry plan.

ii) Observation of actual alignment of fault planes, its throw, joints, etc. may be recorded during the process of excavation.

iii) Water drainage system may be properly implemented. Regular monitoring of tension cracks, horizontal and vertical movement of strata in critical area may be done.

iv) Mine encounters lot of faults, whenever mine workings approaches to fault plane proper monitoring may be done. Efforts may be made to reduce load on fault plan

v) Water accumulation at dump top and toe is major cause of dump failure. Adequate drainage shall be maintained at top and toe of dump.

4. Precautions from Blasting

Special precautions will be taken while performing blasting operations to avoid danger from fly rock. Controlled blasting shall be practiced near built up area and near embankment to avoid any damage to them.

5. Safety aspects for Outsourcing / Hiring of HEMM

Special precaution should be taken while employing contractual machine & labours in the mine. Before employing contractual workers to the mine proper vocational training should be imparted based on recommendations of various Safety Conference. Terms and conditions for deployment of contractual labours as well as machineries shall be fixed by management. Some of the major aspects are as follows:

D) For persons :

i) Records in Form-B & Form-E shall be maintained.
ii) Records of VTC driving license of operators shall be kept by Operators and readily available for inspection by management
iii) Salaries shall be distributed in front of management representative
iv) No person shall be employed unless person holds VTC certificate and Management is informed.
v) Adequate supervision shall be maintained by competent person.
vi) All persons employed in mine shall obey lawful instructions of mine supervisors and officials.

E) For Machineries :

i) All the machineries to be deployed in mines should be passed by

the management.

ii) RTO certificate photo copies of all vehicles shall be submitted to management.

iii) Daily welding, monitoring, inspection shall be done by contractor's mechanic as directed by management.

iv) Machine manufacturers should be asked to give risk analysis.

v) Records of daily maintenance breakdown repairs etc shall be maintained by contractor and shall be available for inspection by mine officials.

F) General :

i) No person/vehicle shall be deployed at any place other than authorized place.

ii) All employees of contractors should obey lawful instruction of mine management.

iii) Risk Management Plan by contractor of tipper and excavators may be made and implemented.

iv) VTC trained Manpower shall only be deployed in the mine.

v) Restricted traffic & traffic control planning shall be done and implemented.

MINE CLOSURE PLAN

MINE CLOSURE PLANNING

Mine closure planning has to be carried out at the starting of the mine and needs periodic reviewing and revision during its life cycle to cope with the geo-technical constraints, safety and economic risks, social & environmental challenges. In the proposed Amalgamated Yekona – I & II OC mine, necessary provision has been kept towards mine closure based on latest guidelines of MOEF. The closure cost works out to Rs. **48.66/t.**

The mine closure cost will cover the closure activities for which a corpus fund will be created by opening an escrow account with the coal controller organization in nationalised bank. In case of occurrence of acid mine drainage, post closure acid mine drainage management cost shall also be included in the total closure cost. 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.

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Type of Mine : Open Cast.

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Total project area of the mine: 1701.32 ha

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up of closure cost for Amalgamated Yekona-I & II OC mine is hereunder :-

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Sl. No.	Activity	% of Total Mine closure Cost	Amount (Rs.in Crores)	Remarks
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	Residential Building	2.67	7.52	
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B	**Permanent Fencing of mine void and other dangerous area**		0.00	To be included in final mine closure plan.
	Random rubble masonry of height 1.2 meter including leveling up in cement concrete 1:6:12 in mud mortar	1.5	4.22	
C	**Grading of highwall slopes**		0.00	To be included in final mine closure plan.
	Levelling and grading of highwall slopes	1.77	4.98	
D	**OB Dump Reclamation**		0.00	
	Handling/Dozing of OB Dump into mine void and preparation of Internal dump for reclamation.	88.66	249.59	71% for progressive and 17.66% for final mine closure.
	Technical and Bio-reclamation including plantation and post care.	0.4	1.13	Equal Weightage throughout the life of the mine.
E	**Landscaping**		0.00	
	Landscaping of the open space in leasehold area for improving its aesthetic and eco value.	0.3	0.84	Equal Weightage throughout the life of the mine.
F	**Plantation**		0.00	
	Plantation over cleared area obtained after dismantling.	0.5	1.41	To be included in final mine closure plan.
	Plantation around the quarry area and in safety zone.	0.2	0.56	Equal Weightage throughout the life of the mine.
	Plantation over the external OB Dump	0.02	0.06	Equal Weightage throughout the life of the mine.
G	**Post Closure Env Monitoring/Testing of Parameters for three years.**		0.00	For three years after mine closure
	Air Quality	0.22	0.62	
	Water Quality	0.2	0.56	
H	**Entrepreneurship development (vocational/ skill development) Training for sustainable income of affected people**.	0.26	0.73	Equal Weightage throughout the life of the mine.
I	**Miscellaneous and other mitigative measures.**	2	5.63	Equal Weightage throughout the life of the mine.
J	**Post Closure Man power cost for supervision**	0.8	2.25	To be included in final mine closure plan.
TOTAL		**100%**	**281.52**	

1. Mining should be carried out in a phased manner initiating afforestation/ reclamation work in the mined out area of quarry and dumps done during previous years.

2. Upto 80% of the total deposited amount including interest accrued in the ECSROW account may be released after every 5 years. The amount released should be equal to expenditure incurred on Progressive Mine closure in past 5 years or 80% whichever is less.

3. The above cost/expenditure will be met from the corpus fund deposited in the escrow account by the mine operator. However, the additional amount beyond the escrow account will be provided by the mine operator after estimating the final mine closure cost (as per the mine closure guideline).

4. The amount indicated separately under each head is indicative only and based on actual expenditure the amount may change.

ESTIMATE OF PROPOSED ESCROW FUND

The total area involved in proposed Yekona-I & II OC mine is 1701.32 Ha. So the corpus based on August, 2009 rate is 102.0792 crores @ Rs 6.0 Lakh /ha of project Area. The wholesale price Index in August, 2009 is 129.6 and the WPI for the month of January, 2015 available in the website of Office of Economic Adviser, Ministry of Commerce, Government of India is 178.3. So the current value of corpus for 2014-15 is Rs.102.0792*178.3/129.6 crores which comes to Rs.140.4377 crores. This corpus is to be divided by the life of mine (starting from the year when mining activity is started till the end of the mine) which is 25 years in case of Amalgamated Yekona-I & II OC. So dividing by 25 years, the annual corpus comes to Rs 5.6175 crores. The 1st year of proposed Amalgamated Yekona-I & II OC mine is 2015-16. So the above annual corpus amount calculated for 2014-15 is escalated for 1 year@ 5% per annum to get the annual corpus fund of Rs 5.8984 crores to be deposited in escrow a/c in 1st year of mine i.e. 2105-16. Thereafter in each subsequent year, the annual corpus amount will be deposited by escalation @ 5% per annum.

Annual Corpus Fund to be Deposited in Escrow Account

Project Year	Financial Year	Amounts (Rs. '000)
1	2015-16	58984
2	2016-17	61933
3	2017-18	65030
4	2018-19	68282
5	2019-20	71696
6	2020-21	75281
7	2021-22	79045
8	2022-23	82997
9	2023-24	87147
10	2024-25	91504
11	2025-26	96080
12	2026-27	100884
13	2027-28	105928
14	2028-29	111224
15	2029-30	116785
16	2030-31	122625
17	2031-32	128756
18	2032-33	135194
19	2033-34	141953
20	2034-35	149051
21	2035-36	156504
22	2036-37	164329
23	2037-38	172545
24	2038-39	181172
25	2039-40	190231
		2815160