

EXECUTIVE SUMMARY

**for Environmental Impact Assessment of
Proposed Kumdanda Open Cast Expansion Project
(Normative Production Capacity 50.00 MTY
Peak Production Capacity 62.50 MTY)**



**South Eastern Coalfields Limited (SECL)
(A Mini Ratna Company)
Seepat Road, Bilaspur (C.G.)**

EXECUTIVE SUMMARY OF KUSMUNDA OPENCAST

50MTPA (Normative) & 62.5 MTPA (peak)

PREFACE:

SECL is the largest coal producing company in India. It is one of the eight subsidiary companies of COAL INDIA LIMITED which became a Maharatna company in the year 2011. South eastern coalfields ltd itself was awarded the Miniratna Company status by Govt. of India in 2007. In the year 2013-14, CIL's production of coal was 462.42 MT out of which SECL produced 124.261 MT (26.9%) which is highest among all 8 subsidiaries of CIL. Kusmunda Opencast Project produced 18.42 MT of coal in FY 2013-14. Thus Kusmunda is one of the major contributors of SECL. Kusmunda as well as SECL has been a major profitable area & subsidiary of CIL since 1980s.

Liberalization of power sector and fast growing requirement of Coal has resulted in a sharp increase in demand of power grade coal. For the purpose of meeting the coal demand the Emergency Coal Production Plan of CIL has been formulated and Kusmunda Open Cast has been identified as one of the project in the emergency Coal Production Plan of CIL. Expansion of Kusmunda Opencast is, therefore, proposed with a view of fulfilling the growing demand of the Coal in the Country in an eco-friendly manner with due regard to safety, conservation & quality.

Kusmunda opencast can meet the requirements of Emergency Coal Production Plan because (i) The basic infrastructure is available at Kusmunda OC mine and the expansion can be planned with short gestation periodic(ii) Sufficient coal reserves at a favorable stripping ratio are available in Kusmunda OC and its surrounding (dip side) Blocks, for planning the expansion. (iii) Kusmunda OC has been identified as suitable block where such large expansion (50 MTY) can be planned.

PROJECT DESCRIPTION:

Name of Project : Kusmunda Opencast Expansion project, 18.75 MTPA to 50.00 MTPA (normative) & 62.50 MTPA (peak)

Name of Area: Kusmunda Area

Name of Company: M/s South Eastern Coalfields Limited

Eastern Part of Jatraj, Risdi & Sonpuri Block, P.O Kusmunda Colliery, Pin Code 495454, district Korba, Chhattisgarh Kusmunda Opencast Project is located in the South Central part of Korba Coalfields in Korba District of Chhattisgarh. It is a part of Eastern Sector of Jatraj, Resdi and Sonpuri Blocks. These blocks cover an area of **37.58** sq. km. Kusmunda is bounded by latitudes 22°15'18" to 22°21'30" North and longitudes 82°38'39" to 82°42' 08" East and included in Survey of India Toposheet No. 64J/11. Nearest Railway Stations are Gevra Road & Korba on Champa – Gevra Road branch line of S.E.C Railway at a distance of 1.5 Km & 5 Km, respectively.

The proposed expansion of Kusmunda opencast project is of 50 MTPA (normative) & 62.5 (peak). Coal winning is being done by surface miner & Payloader-tipper combination & Removal of OB is carried out by shovel-dumper combination. The project currently has production capacity of 18.75 MTPA. Additional land of 1127.588 Ha is required for proposed expansion. Total land – **3510.348 Ha**. The proposed project is planned in 2 stages: in 1st stage, mining without fresh forest land in 1655.825 Ha & in 2nd stage, mining with fresh forest land in 3510.348 Ha, including land of 1st stage.

Village details of existing land of 2382.76 Ha are as follows:

12 villages-Durpa, Dullarpur, Barpali, Khamaria, Barkuta, Barhampur, Jarhajel, Jatraj, Sonpuri, Padania, Pali & Risdi.

Village details of Additional proposed land in 1127.588 Ha:

5 villages- Khodri, Khairbhawna, Amgaon, Churail & Gevra.

PRE MINING LAND USE:

	Without Fresh Forest Land	With Fresh Forest Land
Forest land	205.961 Ha	376.922 Ha
Govt. Land	404.267 Ha	601.061 Ha
Agri./tenancy land	1045.597 Ha	2532.365 Ha
Total	1655.825 Ha	3510.348 Ha

POST MINING LAND USE:

	Without Fresh Forest Land	With Fresh Forest Land
Area to be excavated	788.874	1600
Storage for top soil	3.00	3
External Overburden/ Dump	325	325
Infrastructure (Workshop, Administrative buildings, etc.)	284.634	300
Roads	7.517	10
Green Belt	10.00	10
Effluent treatment plant	1	1
Rehabilitation site (outside of mine)	69	130
Colony (outside of mine)	39	40.25
Safety Zone	82.8	153
Other specified for future mining	45	939.098
Total	1655.825	3510.348

Techno-economical Details of the Proposed Project:

SL.	Items	Unit	Description
1.	Mineable Coal	MT	1005.40
2.	Overburden	Mcum	1342.45
3.	Stripping ratio		1.34
4.	Total No. Of Seams	Nos.	3
5.	Production capacity	MTPA	50 (normative) & 62.5 (peak)
6.	Life of Mine	Years	24
7.	Avg. Seam Gradient	^o (Degrees)	1 in 10
8.	Extent along strike (min. – max.)	Km	4.40-6.50
9.	Extent along dip (min.-max.)	Km	2.60-3.20
10.	Depth of Mine (min.-max.)	Mtrs	150-300 m
11.	Method of Mining		Shovel-Dumper Combination
12.	Total Manpower	Nos	4110
13.	Overall Output per Manshift (OMS)		43.16
14.	Grade of coal	GCV-4100 TO 4300 Kcal/Kg	G-11
15.	Total Capital Investment	Rs Crores	7612.32
16.	Mine Closure Cost (Corpus fund)	Rs/Tonne	3.80

Production for Last Five Years :

SL.	Year	Coal Production (in MT)
1	2009-10	11.2
2	2010-11	14.56
3	2011-12	15.00
4	2012-13	15.00
5	2013-14	18.42

Brief Description of Project:

- General Topography is flat terrain with minor undulations.
- Mean Sea Level ranging from 280 to 300 m

- General Drainage pattern is by southerly flowing Hasdeo River which lies to the east of the block
- Method of Mining: Opencast with Shovel- Dumper Combination
- Climate is generally dry to moist tropical with Temp (6^o C min to 48^oC max)
- Machinery for OB Removal- Combination of 42 & 10 Cum Electrical Rope Shovel & 240 T & 100 T Dumpers
- Machinery for Coal Winning: Surface Miner with combination of 10 Cum of FEL with 60 T truck.
- Coal Handling: It is proposed to transport all coal through in-pit belt conveyor (i.e. In-Pit Central, In-Pit East & in-Pit West). Around 10 MTY coal will be transported to CSPGCL through Belt Conveyor via 20000T Overhead RCC bunker & another 40 MTY will be dispatched to distant consumers by Rail through 4 nos of Silos.

Description of Environment:

CMPDIL, an NABL certified company, carried out Micro-level Environmental Monitoring of Kasmunda Area in the period from 15th Dec 2013 to 15 March 2014 & results are detailed below:

Wind Direction: Predominant winds are between NE / NNE directions.

Wind Velocity: Wind velocity readings are ranging between <1.0 to 5.5 Km/Hr.

Temperature: Temperature values are ranging from 6.0 to 47°C.

Ambient Air Quality:

SL.	Location Name(Code)	Direction (from Site)	Distance (Km)	Reason for Site Selection
1.	Kasmunda OCP, Mine office – (A ₁)	-	In core Zone	To assess pollution levels due to existing mining activities in the industrial area.
2.	Sarbida – (A ₂)	SW	1.0	To assess the effects of pollutants at the populated area in downwind direction
3.	Kapatmura – (A ₃)	NW	3.8	To assess the effects of pollutants at the populated area in upwind direction due to the project activities. Location acts as background location.
4.	Murpara – (A ₄)	NE	4.3	It is at upwind direction and selected to assess the concentration of pollutants upwind.
5.	Jarahapih – (A ₅)	S-SE	3.7	It is selected to assess the effects of pollutants at the populated area due to the project activities
6.	Khairbhawna – (A ₆)	SE	0.9	To assess the effects of pollutants at the nearby populated area due to the project activities

Analysis of Ambient Air quality data obtained for the above monitoring period indicates that the values of all parameters of Ambient Air Quality are well within the prescribed limits of National Ambient Air Quality Standards (NAAQS), 2009.]

Project : Kasmunda Expn. OCP Season :Winter 2013(Values in µg/m³)

Category	Location Name & Code	Min.	Max.	98 th % Value	AM	GM	SD	MoEF/CPCB Limits
Suspended Particulate Matter (SPM) Concentration								
Industrial	Mine Office – A ₁	536	568	562	552.25	552.20	7.58	600
Residential	Sarbida– A ₂	173	190	189	183.29	183.23	4.82	200
	Kapatmura – A ₃	163	183	180	173.75	173.70	4.44	
	Murapara – A ₄	156	183	182	176.00	175.90	5.90	
	Jarahapih – A ₅	170	188	187	181.33	181.27	4.76	
	Khairbhawana – A ₆	158	190	189	182.08	181.95	6.98	

Air Pollution Control Measures

Appropriate air pollution control measures are being adopted for maintaining the ambient air quality within the stipulated standards as given below:

- i) 3.2 line kms. of fixed water sprinkler commissioned along coal transportation road.
- ii) 14 kms of road has been black topped.
- iii) Belt conveyor has been covered.
- iv) All drills have been equipped with wet drilling arrangements.
- v) Extensive plantation carried out in mine & other areas.
- vi) Atomised dust suppression system proposed in new rapid loading system.
- vii) Coal winning by surface miner (-100 mm size) will result in avoiding drills, blasting & crushing of coal.
- viii) Coal transport in pit conveyors will be provided to reduce pollution due to vehicular movement.
- ix) Further planning and funding has been done for provisioning of dust suppression arrangements in CHP, in pit conveying and haul roads.⁹

Noise Environment:

Category	Sl. No.	Location Name & Code	Average Noise Level		MOEF LIMITS	
			Day Time (06.00 AM to 10.00 PM)	Night Time (10.00 PM to 06.00 AM)	Day Time	Night Time
Industrial	1	Mine Office – N ₁	72.1	67.7	75	70
Residential	2	Kapatmura–N ₂	52.5	42.9	55	45
	3	Korba – N ₃	53.6	42.9		
	4	Jarahapih – N ₄	52.3	43.1		
	5	Khairbhawana– N ₅	52.1	41.4		
	6	Sarbida– N ₆	52.9	42.5		

Thus, Noise levels in all areas are within prescribed limits.

Sources of Noise Pollution:

1. Mining Equipment & Machinery
2. Heavy vehicle Transportation in mines

3. Coal Handling Plant
4. Light Vehicle transportation in area
5. Blasting

Noise abatement measures (Suppressive and preventive)

The following measures are adopted

1. Proper designing of plant and machinery by providing inbuilt mechanisms like silencers, mufflers and enclosures for noise generating parts and shock absorbing pads at the foundation of vibrating equipment.
2. Routine maintenance of equipment
3. Enclosures for crusher house etc.
4. Sound proof cabins for machines in the workshop likely to cause high noise levels.
5. Greenbelts around the quarry, infrastructure sites service building area and township besides avenue plantation on both sides of the roads and railway siding to maintain noise level at night time within the limit for the inhabited localities situated at a very close proximity.
6. Provision of isolator for vibrating equipment (both fixed and mobile) foundation
7. Adoption of personnel protective devices like earplugs, earmuffs, etc.

Water Quality:

Source of studies of Surface water & Ground Water Quality in Winter 2013:

Location	Direction (w.r.t. centre of core zone)	Distance (Km)	Reasons for selection
Kusmunda OCP, Sump water (MW ₁)	NE	Core Zone	To assess effluent quality (Mine Water)
Kusmunda OCP, Discharge water (MW ₂)	South Central	Core zone	To assess effluent quality (Mine Water)
Up Stream of HasdeoRiver (SW ₁)	NE	1.25	To assess the quality of surface water U/S.
Down Stream of HasdeoRiver (SW ₂)	SE	2.00	To assess quality of surface water D/S.
Chunchuni, Hand Pump (GW1)	NW	0.75	To assess ground water quality
Gevra, Well water (GW2)	W	Core Zone Boundary	To assess ground water quality

Mine Effluent Quality

SL.	Parameters	Concentration Range & Norms	
		Result	F Scheduled - VI
1	pH	7.88 - 7.92	5.5 - 9.0
2	Suspended Solids, mg/l	64 - 68	100

3	Ammonical Nitrogen (as N) ,mg/l	0.56 - 0.58	50
4	Kjeldahl Nitrogen, mg/l	2.58 - 2.60	100
5	BOD - 3 Days @ 27 °C, mg/l	2.0 - 2.1	30
6	COD, mg/l	86 - 88	250
7	Zinc (as Zn) ,mg/l	0.08 - 0.10	5.0
8	Fluorides (as F) ,mg/l	0.58 - 0.60	2.0
9	Iron (as Fe ⁺²) , mg/l	0.40 - 0.46	3.0
10	Nitrate Nitrogen (as N) ,mg/l	3.6 - 3.8	10

Ground Water Quality

SL.	Parameters	Results	IS: 10, 500 - 1991 Norms	
			Desirable	Permissible
1	pH	7.18 - 7.36	6.5 – 8.5	No relaxation
2	Total Dissolved Solids, mg/l	176 - 192	500	2000
3	Chlorides (as Cl), mg/l	36 - 48	250	1000
4	Fluoride (as F), mg/l	0.52 - 0.56	1.0	1.5
5	Sulphate (as SO ₄), mg/l	12 - 26	200	400
6	Total Alkalinity (as CaCO ₃), mg/l	56 - 70	200	600
7	Total Hardness (as CaCO ₃), mg/l	83.2 - 101.6	300	600
8	Zinc (as Zn), mg/l	0.06 - 0.08	5	15
9	Iron (as Fe), mg/l	0.03 - 0.04	0.3	1.0
10	Nitrate (as NO ₃), mg/l	3.28 - 4.36	45	100
11	E. Coli, MPN/100ml	Absent	Absent	Absent

Surface Water Quality(Season: Winter 2013)

SL.	Parameters	Concentration Range & Norms	
		Result	IS: 2296-1982 (Inland Surface Water) Class C
1	pH	7.26 - 7.34	6.5 - 8.5
2	Total Dissolved solids, mg/l	868 - 876	1500

3	Dissolved Oxygen, mg/l	5.3 - 5.4	4 (minimum)
4	BOD, 5 Days @ 20°C, mg/l	2.7 - 2.8	3.0
5	Chloride (as Cl), mg/l	86 - 90	600
6	Fluorides (as F) ,mg/l	0.66 - 0.68	1.5
7	Sulphate (as SO ₄), mg/l	30 - 34	400
8	Nitrate (as NO ₃) ,mg/l	12.6 - 13.2	50
9	Zinc (as Zn) ,mg/l	0.10 - 0.12	15
10	Iron (as Fe) , mg/l	0.38 - 0.40	50

Water Pollution Control Measures

- i) Mine sump of 210 M Gallon capacity in quarry II and 80 M Gallon in quarry III capacity are existing. Mine water is used for industrial water demand and ground water recharge.
- ii) Surface settling tank for mine effluent treatment is in operation. Water is being provided to Jatraj village for irrigation.
- iii) Oil & grease trap of 96 cum. capacity existing and will be strengthened during expansion
- iv) Domestic effluent treatment plant of 2.00 MLD capacity has been commissioned in March, 2001.
- v) DETP caters to the population of 11205 personnel staying quarters in Adarsh Nagar, Vikas Nagar and Jawarhar Nagar. Sludge is in use as fertilizer in afforestation activities.
- vi) Provisioning for Workshop Effluent Treatment Plant has been made in workshop.
- vii) Provisioning of washing platforms for dumpers and dozers has also been made along with the

Groundwater:

Kusmunda Project water demand: Mines require water for both domestic and industrial (*i.e. workshop, dust suppression, CHP, greenbelt development and firefighting*) uses. The industrial water demand for Kusmunda OCP expansion was projected as 13,370 cum/day. The domestic water demand (colony + industrial buildings) was projected as 3,077 m³ / day. Thus, the total water requirement is 16,447 cum/day.

Kusmunda Water Supply: Mine water would be the major source of supply and about 13,370 m³ / day mine water will be utilized towards industrial water demand. Whereas, the domestic water requirement (3077 m³ / day) is met from both Hasdeo right bank canal and Ahiran River (2800 m³ / day) and tube well water (277 m³ / day). An IWSS with a treatment capacity of 2.0 MGD is operating and supply water to Kusmunda, Gevra and Dipka projects.

Solid Waste Disposal And Its Management

Out of 1342.50M.cum. of the overburden only 20.80Mcumplanned to be accommodated in the external dump and the balance 1321.70Mcum. will be accommodated in the internal dump. In expansion of 50 MTPA no overburden material will be dumped as external dump and the total quantity will be backfilled.

Land Reclamation

Systematic handling of top soil with storage- The top soil removed before any drilling, blasting, mining, or other surface disturbances is stored and maintained for the plant growth materials and save it for a later use.

*Systematic redistribution of topsoil-*After the final grading the topsoil would be redistributed in a manner consistent with the post mining land uses, contours, and surface water drainage system.

Technical Reclamation

The technical reclamation would involve breaking and levelling the top of OB dumps, filling of gulleys and terracing etc.

Biological Reclamation

The technical reclamation will be strengthened by biological reclamation for conserving the environment. Details of reclamation plan with plantation has been provided below-

Year	OB removal	Dump plan (M cum)		Dump area (ha.)		Dump area available for reclamation (Ha.)		No of plantation
	(M cum)	External	Internal	External	Internal	External	Internal	
1	20.73	10.4	10.33	162.5	10.1	130	8.08	120282
2	20.73	10.4	10.33	162.5	10.1	130	8.08	137529
3	20.73	0	20.73	0	19.52	32.5	15.61	345203
4	29.89	0	29.89	0	28.14	32.5	22.51	345203
5	40.56	0	40.56	0	38.18	0	30.55	76369
6	40.46	0	40.46	0	38.09	0	30.47	76181
7	50.24	0	50.24	0	47.3	0	37.84	94595
8	66.71	0	66.71	0	62.8	0	50.24	125606
9	66.88	0	66.88	0	62.96	0	50.37	125926
10	66.97	0	66.97	0	63.05	0	50.44	126096
11	67.03	0	67.03	0	63.1	0	50.48	126209
12	67.23	0	67.23	0	63.29	0	50.63	126585
13	67.23	0	67.23	0	63.29	0	50.63	126585
14	67.27	0	67.27	0	63.33	0	50.66	126661
15	67.3	0	67.3	0	63.36	0	50.69	126717
16	67.3	0	67.3	0	63.36	0	50.69	126717
17	67.64	0	67.64	0	63.68	0	50.94	127357
18	68.27	0	68.27	0	64.27	0	51.42	128543
19	68.27	0	68.27	0	64.27	0	51.42	128543
20	68.32	0	68.32	0	64.32	0	51.46	128638
21	68.33	0	68.33	0	64.33	0	51.46	128656
22	68.15	0	68.15	0	64.16	0	51.33	128318
23	67.95	0	67.95	0	63.92	0	51.14	127847
24	38.31	0	38.31	0	36.07	0	28.85	72133
MC1	0	0	0	0	0	0	83	207500
MC2	0	0	0	0	0	0	83	207500
MC3	0	0	0	0	0	0	83	207500
Total	1342.50	20.8	1321.70	325	1245	325	1245	3925000

Impact on Flora & Fauna

Vegetation cover- will not be of stark appreciable level except the area where infrastructures do come in.

Forest degradation-

In case of project area of 1655.825 Ha, the area of forest land involved is 205.961 Ha, which 12.44% of total land. In case of inclusion of fresh forest land, the measure of forests land to be involved in the project is 376.922Ha having 10.74 %, i.e., land of the project (3510.348 Ha) in the core zone areawherein air pollution may stop photosynthesis and transpiration in plants by plugging their leaves pores. SO₂ causes Necrosis disease in plants. Hence, forest degradation is appreciable but on reclamation after the project 1570Haforest will be available.

There has been no endangered, threatened and endemic category flora & fauna as per the IUCN-Red Data Book (RDB), Botanical Survey of India (BSI) and Indian wildlife (protection) Act, 1972. Even the project area of core and buffer zone does not represent any breeding habitats,

spawning grounds, migratory corridors for important wildlife fauna. During survey period no endangered and threatened aquatic fauna have been noticed by the investigation team.

Ecological change-The project being an opencast, there is no major impact on flora and fauna.

Hydrogeological aspects- Water level and draw down are likely to be affected to a nominal value; however, ground water and surface water are not going to be affected to an appreciable and discernible level.

Plantation, forest & wild conservation- The aestheticity of mine area will increase.

R&R

The mine is under operation as per Project Report of 15 Mty. and the number of villages involved in 15 Mty Project Report are 12 while that in case of project area without forest land (1655.825 Ha) are eight in number.

Five more villages namely Amgaon, Churail, Khodri, Khairbhawna and Gevra are in the mine take area of 50 Mty for project area with forest land (3510.348 Ha).

The approximate number of families to be displaced from these 17 villages are 9250 while that of affected land oustees are 5475.

Whereas, in case of project area without forest land (1655.825 Ha), which includes eight villages, approximate number of families to be displaced are 1344 and 1142 families have already been rehabilitated/compensated. The number of affected land oustees are 2166 and in lieu of which 1543 employments have been given and 04 persons have been given cash compensation.

Community Development Works

The fund for CSR is allocated to minimum of Rs. 5/- per tonne of pervious year production, out of which Rs. 4/- is allocated to CSR activity to be carried out within the radius of 15 KM of the project site, balance Rs. 1/- would be allocated for carrying out CSR activities by subsidiary company in the state in which the subsidiary company belongs. Expenditure done on CSR/CD work in last ten years are as follows-

Year	Expenditure (in Lakhs)	Remark
2013-14	212.84	CSR WORK
2012-13	322.76	CSR WORK
2011-12	124.10	CSR WORK
2010-11	71.98	CSR WORK
2009-10	20.37	CD WORK
2008-09	65.95	CD WORK
2007-08	52.58	CD WORK
2006-07	32.09	CD WORK
2005-06	39.16	CD WORK
2004-05	70.64	CD WORK
2003-04	133.43	CD WORK
2002-03	22.36	CD WORK
2001-02	24.85	CD WORK

In addition to above financial assistance has also been given for various projects of state Govt. in around the project area some of them are as follows-

- (i) Construction of double lane bridge at RD 7940 M of left bank canal of Hasdeo Project against CSR activities of Kusmunda Area, S.E.C.L. **-Rs. 138.00 Lakhs**
- (ii) Construction of Cement Concrete Road in Km 50/6 to 55/4 = 5 Km of Seepat- Baloda-Urga Road including re-construction of damaged hume pipe culverts in Korba Distt. Under the CSR head of Kusmunda Area for 2012-13 **-Rs. 1003.00 Lakhs**
- (iii) Construction of Road from Imliduggu Chowk to Manikpur Railway Crossing within Korba Municipal Corporation. Under the CSR head of Kusmunda Area for 2012-13. **-Rs. 249.00 Lakhs**
- (iv) Contribution for I.T. (Engineering Collage) in Korba town- **-Rs. 800.00 Lakhs**
- (v) Water supply to the villages (Sonpuri, Padaniya, Barkutta&Khodari) **- Rs. 13.75 Lakhs.**
- (vi) Contribution for Trauma Center (Hospital) at Korba town **-Rs. 80.00 Lakhs.**
- (vii) Contribution for bridge at Raitakhar (over Canal) **-Rs.55.00 Lakhs.**
- (viii) Barbaspur-Gorhi Road near Korba town **- Rs. 540.00Lakhs.**

For various skill development and alternate livelihood programmes and scheme for project affected persons, recently MoU has been signed between SECL and Chhattisgarh Centre for Entrepreneurship Development (CGCED) for under taking the project Yuva Swavalamban –a Self-employment and Entrepreneurship Development Project for the youth of project affected areas of SECL under the CSR policy of SECL.

COMMITMENT ON ENVIRONMENT IN KUSMUNDA OC EXPANSION PROJECT (50 MTPA)

SL.	PARTICULARS	Amount in Rs Lakh
1	CAPITAL FOR RESTORATION	
a)	Housing for Reclamation personnel (Appendix-A.2.2)	80.85
b)	Compensatory afforestation & strengthening of forest for the land involved in the quarry (App-A.8.1)	203.6852
c)	Compensation for existing assets to 8200 families (Appendix-A.8.1)	28905
d)	Compensation in lieu of job to 3390 land oustees (Appendix-A.8.1)	1973.92581
e)	Development in rehabilitation colony @2 lakhs/ PAF	16400
	Sub-Total (1)	47563.46
2	CAPITAL FOR ANTI-POLLUTION MEASURE	
	IN MINE & INDUSTRIAL AREA	
a)	HEMM for Reclamation (Appendix-A.3.1)	7448.134
b)	Sewage disposal arrangement in workshop effluent etc. (Appendix-A.8.3.(A)	400
c)	Other development measures in industrial site viz. drains, tree guards etc. (Appendix-A.8.2.Contd.)	663.83
d)	Garland drains (Appendix-A.8.1)	70
e)	Arboriculture/plantation in industrial area (Appendix-A.8.1)	30
f)	Barbed fencing/boundary walls for the project (Appendix-A.8.1)	30
g)	Reclamation of dumps (Appendix-A.8.1)	20
h)	Dust suppression arrangements (App.- A3.5)	515
l)	Sedimentation tank for treatment of rain water (Appendix-A.8.1)	30
j)	Water drains	29.58
k)	Settling tank for mine water disposal (Appendix-A.8.3.(A)	150
l)	Water treatment plant for drinking purpose etc.	180
	Sub-Total(2)	9566.55

SL.	PARTICULARS	Amount Rs. Lakh
3.	ENVIRONMENTAL CONTROL MEASURES IN TOWNSHIP	
a)	Sewerage disposal in colony (Appendix-A.8.3.(A))	153.31
b)	scientific study for slope stability (Appendix-A.8.1)	20
c)	Development of land around residential & service buildings(Appendix-A.8.1)	20
d)	Other development measures intowmship viz. tree, playground, park etc	60
	Sub Total (3)	253.31
4.	Cost of EMP preparation(Appendix-A)	20
5.	Community development in surrounding villages (Appendix-A.8.1)	130
	Total capital from 4 to 5	150
	GRAND TOTAL	57533.32

SL.	Different type of Revenue nature cost to be considered	Amount Rs. Lakh
1	Land reclamation/restoration@1.25 lakhs/Ha for technical and biological reclamation(20Ha/annum)	83.33
2	Mine Closure Cost(@850.655 Lakh/Year with increament of 5% per annum	850.655
3	Environment Audit @ 0.60 lakhs/annum	0.60
4	Environment monitoring@10 lakhs/annum	10.00
5	CSR Cost @ Rs. 5 per Tonne Coal Prod.	2500.00
	Total Revenue nature cost per annum	3444.585

Conclusion

The demand of Coal is increasing day by day and to meet this demand, expansion of existing project is very much needed. Kasmunda Open Cast Expansion Project is one of them. In the light of above facts it is clear that due to this Expansion Project, Environmental pollution will be well within the permissible limits. Such as dust emission will be reduced due to complete mechanization of Coal transportation through covered in pit belt, silo loading and rail. To control Air & Water pollution steps will be taken at every stage of the Project. Also only 377 ha. forest land is used for mining purpose whereas 1570 ha. land will be developed as new forest. Thus it is a progressive developmental Project as well as eco-friendly also.

With this Project we will move towards independence not only in the field of energy but we will create directly or indirectly thousands of employment also.

Kasmunda Open Cast expansion Project of South Eastern Coalfields Limited shall have a positive impact on the socio – economic state of the area and there will be all round development. Thus it is justified to provide Environmental Clearance to this Project.
