PUBLIC HEARING DOCUMENT

on

DRAFT EIA & EMP

prepared for obtaining

Environmental Clearance

for

Cluster No. 12

(Group of 14 Mines in ECL)

Eastern Coalfields Limited

Eastern Coalfields Limited,

PO: Sanctoria, Dist: Paschim Bardhaman (WB)

11.1 Project Description

11.1.1 Background

EC for Cluster No. 12 (Group of 19 Mines of ECL) was granted by MoEF&CC vide letter no. J-11015/76/2011.IA-II(M) dated 09.02.2015 for a peak capacity of 31.83 MTY in a cluster area of 14047.00 Ha. Subsequently, 3 amendments in EC were granted to the cluster, details of which are given below:

Sl. No.	EC Amendments	Approval of Revised Mining Plan / Supplementary Note to Revised Mining Plan	Date of Grant of EC Amendment	Reasons for Amendments	Remarks
1	1st EC Amendment	30.01.2016	03.03.2016	Merger of 4 mine leaseholds in 2 mine leaseholds; 2 mines were dropped from the cluster. No. of mines reduced from 19 to 15. Capacity of few mines were increased with proportionate reduction in capacity of other mines of the cluster. No change in cluster capacity. However, cluster area reduced from 14047.0 Ha to 12736.0 Ha.	EC Amendments were granted after due appraisal at MoEF&CC
2	2nd EC Amendment	22.04.2020	31.07.2020	Merger of 2 more mine leaseholds in 1 mine leasehold. No. of mines reduced from 15 to 14. Capacity of few mines were increased with proportionate reduction in capacity of other mines of the cluster. No change in cluster capacity. However, cluster area reduced from 12736.0 Ha to 12694.47 Ha.	
3	3rd EC Amendment	20.12.2022	31.07.2023	Amendment was sought for increase in production capacity of Sonepur-Bazari OC. No change in no. of mines, capacity and area of the cluster.	Valid for 1 year only

The details of the cluster as per the existing EC (2nd Amendment) are given below:

#	Name of mines/project	Existing Lease Area (Ha)	Existing EC Capacity (MTY)	Life (years)
1	Pandaveswar- Dalurband UG & OC	1385.00	2.25	>25
2	Manderboni – South Samla UG	1025.00	0.28	>25
3	Madhaipur UG & OC	622.00	0.65	>25
4	Nutandanga UG	543.00	Production suspended	-
5	Kendra UG	459.00	Production suspended	-
6	Samla UG & OC	676.00	0.60	3
7	Sonepur Bazari OCP	2405.00	12.00	13
8	Nakrakonda – Kumardihi B UG & OC*	642.00	4.12	>25
9	Kumardihi A UG	457.00	0.20	>25
10	Jhanjra UG	1520.00	5.00	>25
11	Tilaboni UG	827.47	2.14	>25

#	Name of mines/project	Existing Lease Area (Ha)	Existing EC Capacity (MTY)	Life (years)
12	Shyamsundarpur UG	533.00	1.59	>25
13	Bankola UG	830.00	0.30	>25
14	Khottadih UG & OC	770.00	2.70	>25
	Total	**12694.47**	**31.83**	

(Source: EC Letter)

11.1.2 Present Proposal

As per the approved Supplementary Note to Revised Mining Plan of Cluster No. 12 (Minutes of Meeting attached as Annexure-XIV), there is increase in leasehold area of the cluster from 12694.47 Ha to 14791.77 Ha and corresponding increase in the overall cluster capacity from 31.83 MTY to 34.83 MTY, which requires preparation of fresh EIA & EMP report to accommodate the proposed changes. Cluster No. 12 consists of 6 mixed mines and 8 underground mines. The cluster falls administratively under Sonepur-Bazari, Jhanjra, Bankola and Pandaveswar Areas of ECL and there is no joint venture.

The major changes proposed in the cluster vis-à-vis existing EC are given below:

1) Proposal for change in method of mining in Sonepur Bazari from OC to mixed mine (UG & OC) along with expansion of leasehold area from existing 2405.0 Ha to 4681.35 Ha as well as increase in capacity from existing 12.0 MTY to 15.0 MTY. Out of the existing area of 2405.0 Ha, 2294.13 Ha is mine take area while the remaining 110.87 Ha includes township and rehabilitation colony, which is outside the mine take area. The additional 2276.35 Ha area includes 1167.57 Ha (Haripur UG-693.23 Ha, Shankarpur UG-452.0 Ha, Chora 7 & 9 pit-15.0 Ha and Khandra UG-7.34 Ha) and 30.00 Ha from Siduli UG & OC to be carved out from Cluster No. 11, 195.0 Ha area from Bankola UG (which is a part of Cluster No. 12) as well as 413.0 Ha area lying outside the Cluster. An area of 632.78 Ha (470.78 Ha + 162.0 Ha) out of 661.54 Ha required for rehabilitation colony and Project Township has been considered outside the cluster since the exact location of the rehabilitation site will depend on the outcome of discussions with stakeholders. However, for the purpose of calculation of the cluster area, this entire area of 632.78 Ha (470.78 Ha + 162.0 Ha) has been included in the cluster area. In case, part of the proposed area falls within the cluster, the area of the cluster will be reduced accordingly.

On the boundary between Sonepur-Bazari Expansion OC and Siduli UG & OC (Cluster No. 11), 100 m of safety zone considered for Sonepur-Bazari Expansion OC falls in the leasehold of Siduli UG & OC. This area is approximately 30.00 Ha over which Sonepur-Bazari Expansion OC will have operational rights as it falls within its project area. The matter will be informed to DGMS for amending the underground working permission for Siduli UG & OC.

Bord & Pillar method of UG is proposed in R-III & R-II seams with the introduction of Mass Production Technology (Low Height Continuous Miner). Only development of seams will be done.

2) Inclusion of 38.38 Ha of Forest land (excluding 1.60 Ha infrastructure of Forest Department) previously excluded from the Cluster. This patch of forestland falls within the project area of Tilaboni UG. Stage – I Application has been made for 38.38 Ha forestland in Tilaboni UG. The Advisory Committee, MoEF&CC has recommended the proposal for grant of 'in-principle' approval for diversion of 39.98 Ha (including the 1.60 Ha of forest land excluded by the agency (ECL)) under the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 with the condition that no underground mining shall be carried out beneath the Office complex of the Tilaboni Beat and approach road involving forestland of 1.60 Ha. Minutes of Meeting, dated 28.02.2024 is attached.
3) To exclude 22.43 Ha of forestland falling in the leasehold of Pandaveswar-Dalurband UG & OC and thus, reducing the leasehold area, considered for this project, from 1385.00 Ha to 1362.57 Ha. Although, this forestland falls within the leasehold area, the same will not be required for mining or any other allied activities.

Note: It is pertinent to mention here that the TOR was granted for 14810.20 Ha including 22.43 Ha forestland falling in Pandaveswar-Dalurband UG & OC. However, in this report, the same forestland has been left out reducing the overall cluster area from 14810.20 Ha to 14791.77 Ha.

4) Overall, there is a change in the Cluster boundary with increase in area from 12694.47 Ha to 14791.77 Ha and increase in cluster capacity from 31.83 MTY to 34.83 MTY requiring fresh EC to be obtained.

The composition of the cluster after incorporating the changes are as follows:

As per Existing EC					As proposed in Revised Mining Plan					Remarks
#	Name of mines/project	Existing ML Area (Ha)	Existing EC Capacity (MTY)	Life (years)	#	Name of mines/project	Proposed ML Area (Ha)	Proposed EC Capacity (MTY)	Balance Life (years)	
1	Pandaveswar- Dalurband UG & OC	1385.00	2.25	>25	1	Pandaveswar- Dalurband UG & OC	1362.57	2.25	>25	Reduction in ML area considered within the cluster due to removal of 22.43 Ha forestland; No change in capacity.
2	Manderboni-South Samla UG	1025.00	0.28	>25	2	Manderboni-South Samla UG	1025.00	0.28	>25	No change
3	Madhaipur UG & OC	622.00	0.65	>25	3	Madhaipur UG & OC	622.00	0.65	>25	No change
4	Nutandanga UG	543.00	Production suspended	-	4	Nutandanga UG	543.00	Production suspended	-	No change
5	Kendra UG	459.00	Production suspended	-	5	Kendra UG	459.00	Production suspended	-	No change
6	Samla UG & OC	676.00	0.60	3	6	Samla UG & OC	676.00	0.60	3	No change
7	Sonepur Bazari OCP	2405.00	12.00	13	7	Sonepur Bazari Expansion UG & OC	4681.35	15.00	33	Method of mining changed from OC to mixed mine; Area: (+) 2276.35 Ha; Capacity: (+) 3.00 MTY
8	Nakrakonda – Kumardihi B UG & OC*	642.00	4.12	>25	8	Nakrakonda – Kumardihi B UG & OC*	642.00	4.12	>25	No change
9	Kumardihi A UG	457.00	0.20	>25	9	Kumardihi A UG	457.00	0.20	>25	No change
10	Jhanjra UG	1520.00	5.00	>25	10	Jhanjra UG	1520.00	5.00	>25	No change
11	Tilaboni UG	827.47	2.14	>25	11	Tilaboni UG**	865.85	2.14	>25	Area: (+) 38.38 Ha due to inclusion of forest land within project area; No change in capacity
12	Shyamsundarpur UG	533.00	1.59	>25	12	Shyamsundarpur UG	533.00	1.59	>25	No change
13	Bankola UG	830.00	0.30	>25	13	Bankola UG	635.00	0.30	>25	Reduction in ML area consequent to transfer of 195.00 Ha to Sonepur-Bazari Expansion UG & OC; No change in capacity
14	Khottadih UG & OC	770.00	2.70	>25	14	Khottadih UG & OC	770.00	2.70	>25	No change
	Total	**12694.47**	**31.83**				**14791.77**	**34.83**		**Area: (+) 2097.30 Ha Capacity: (+) 3.00 MTY**

(Source: Approved Mining Plan)

*Total project area of Nakrakonda-Kumardihi B UG & OC is 1018.48 Ha which includes the entire lease area of Nakrakonda – Kumardihi B UG & OC (642 Ha) and part areas of Kumardihi-A (192.23 Ha), Bankola UG (51.71 Ha), Shyamsundarpur UG (2.57 Ha), Tilaboni UG (67.34 Ha) & Manderboni-South-samla UG (108.94 Ha).
**Stage – I Application has been made for 38.38 Ha forestland in Tilaboni UG. The Committee recommended the proposal for grant of 'in-principle' approval for diversion of 39.98 Ha (including the 1.60 Ha of forestland excluded by the agency (ECL)) under the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 with the condition that no underground mining shall be carried out beneath the Office complex of the Tilaboni Beat and approach road involving forestland of 1.60 Ha. Minutes of Meeting, dated 28.02.2024 is attached (Annexure-XIII).

11.1.2 Justification for the project

There is a considerable gap between Country's demand of coal and availability of indigenous coal. All out efforts are being made for augmentation in indigenous coal production. Coal India Limited, being the major supplier of coal, has been entrusted with the responsibility of bridging a substantial chunk of the demand-supply gap of the country. In the given scenario, all possible avenues are being assessed by CIL and its subsidiaries to enhance the existing level of coal production.

11.1.3 Size of the project and Magnitude of Operation

As per the present proposal, Cluster No. 12 (Group of 14 Mines) consists of 6 mixed (underground cum opencast) mines and 8 underground mines in a ML area of 14791.77 Ha with mine capacity of 34.83 MTY. Composition of the cluster is shown below:

#	Name of mines/project	Proposed Lease Area (Ha)	Proposed EC Capacity (MTY)	Balance Life (years)
1	Pandaveswar- Dalurband UG & OC	1362.57	2.25	>25
2	Manderboni-South Samla UG	1025.00	0.28	>25
3	Madhaipur UG & OC	622.00	0.65	>25
4	Nutandanga UG	543.00	Production suspended	-
5	Kendra UG	459.00	Production suspended	-
6	Samla UG & OC	676.00	0.60	3
7	Sonepur Bazari Expansion UG & OC	4681.35	15.00	33
8	Nakrakonda – Kumardihi B UG & OC*	642.00	4.12	>25
9	Kumardihi A UG	457.00	0.20	>25
10	Jhanjra UG	1520.00	5.00	>25
11	Tilaboni UG**	865.85	2.14	>25
12	Shyamsundarpur UG	533.00	1.59	>25
13	Bankola UG	635.00	0.30	>25
14	Khottadih UG & OC	770.00	2.70	>25
		14791.77	**34.83**	

*Total project area of Nakrakonda-Kumardihi B UG & OC is 1018.48 Ha which includes the entire lease area of Nakrakonda – Kumardihi B UG & OC (642 Ha) and part areas of Kumardihi-A (192.23 Ha), Bankola UG (51.71 Ha), Shyamsundarpur UG (2.57 Ha), Tilaboni UG (67.34 Ha) & Manderboni-South-samla UG (108.94 Ha).
**38.38 Ha of Forest Land already identified for diversion in Tilaboni UG. Stage – I Application has been made for 38.38 Ha forestland in Tilaboni UG. The Committee recommended the proposal for grant of 'in-principle'

approval for diversion of 39.98 Ha (including the 1.60 Ha of forestland excluded by the agency (ECL)) under the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 with the condition that no underground mining shall be carried out beneath the Office complex of the Tilaboni Beat and approach road involving forestland of 1.60 Ha. Minutes of Meeting, dated 28.02.2024 is attached (Annexure-XIII).

Mine-wise details is provided in Chapter No. 2 of this report.

11.1.4 Project Schedules / Cost Estimates

Total capital cost of all the three mines within cluster is ₹ 729844.00 Lakh. Details of average cost of production, selling price and approx. profit from the cluster are given below:

Name of mines	Cost of production (₹/tonne)	Sale price (₹/tonne)	Avg. Profit (₹/tonne)
Pandaveswar – Dalurband UG	2684.97	2800.23	115.26
Pandaveswar – Dalurband OC			
Manderboni-South Samla UG	27860.00	5459.00	-22401.00
Madhaipur UG	29950.00	5812.00	-24138.00
Madhaipur OC	1506.00	4511.00	3005.00
Samla UG & OC	1431.93	2798.15	1366.22
Sonepur-Bazari Expn. UG & OC	1672.82	2969.15	1296.33
Nakrakonda-Kumardihi B UG	2034.46	2306.72	272.26
Nakrakonda-Kumardihi B OC	1377.21	3044.00	1666.79
Kumardihi A UG	14674.45	4727.71	-9946.74
Jhanjra UG	2049.58	2506.17	456.58
Tilaboni UG	2539.29	2944.04	404.75
Shyamsundarpur UG	2485.68	2744.94	259.26
Bankola UG	14803.23	4753.01	-10050.22
Khottadih UG	7407.00	5440.00	-1967.00
Khottadih OC (Dept.)	4653.00	3927.00	-726.00

(Source: Area Authorities and approved Project Reports)

From the above table, it can be seen that most of the mines within the cluster are profitable. Thus, the cluster is overall economically viable.

11.1.5 Mine Closure Plan

The annual closure cost of the mines within the cluster for the next 10 years as per the revised guidelines issued by MoC vide F. No. 34011/28/2019-CPAM dated 29.05.2020 is given below:

(Fig. in ₹ Lakh)

Sl. No.	Name of the Mine	Mine Closure Cost as per approved MCP	Revised Mine Closure Cost	Annual Mine Closure Cost to be deposited as per revised guidelines for the next 10 years									
				1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
1	Pandaveswar-Dalurband UG	5228.00	2544.54	27.45	28.82	30.26	31.77	33.36	35.03	36.78	38.62	40.55	42.58
	Pandaveswar-Dalurband OC	50.00	5316.81	268.73	282.17	296.28	311.09	326.65	342.98	360.13	378.14	397.04	416.89
2	Manderboni UG	1239.00	1160.97	28.02	29.42	30.89	32.43	34.06	35.76	37.55	39.42	41.39	43.46
3	South Samla UG	1146.00	825.17	7.39	7.76	8.14	8.55	8.98	9.43	9.90	10.39	10.91	11.46
4	Madhaipur UG	2995.00	2629.37	26.50	27.83	29.22	30.68	32.21	33.82	35.51	37.29	39.15	41.11
5	Samla OC	-	652.94	207.12	217.47	228.35	-	-	-	-	-	-	-
6	Sonepur-Bazari Expn. OC	36261.00	110392.62	1286.27	1350.59	1418.12	1489.02	1563.47	1641.65	1723.73	1809.91	1900.41	1995.43
7	Nakrakonda-Kumardihi B OC	426.77	20463.40	341.61	358.69	376.62	395.45	415.23	435.99	457.79	480.68	504.71	529.94
	Kumardihi B UG	1954.00	-	Not required as the same is being deposited by the OC mine.									
8	Kumardihi A UG	1868.00	1314.42	12.04	12.64	13.27	13.93	14.63	15.36	16.13	16.94	17.78	18.67
9	Jhanjra UG	8378.00	8107.23	56.69	59.52	62.50	65.62	68.90	72.35	75.97	79.77	83.75	87.94
10	Tilaboni UG	2403.00	2063.60	13.09	13.75	14.43	15.15	15.91	16.71	17.54	18.42	19.34	20.31
11	Shyamsundarpur UG	1777.00	1636.33	19.84	20.83	21.87	22.97	24.12	25.32	26.59	27.92	29.31	30.78
12	Bankola UG	4575.00	3532.65	20.71	21.75	22.84	23.98	25.18	26.43	27.76	29.14	30.60	32.13
13	Khottadih UG	2303.00	2581.50	30.64	32.17	33.78	35.47	37.24	39.11	41.06	43.11	45.27	47.53
	Khottadih OC	2648.00	-	No payout is further required as complete payment has been made for the OC mine as per mine life.									
Total		**73251.77**	**163221.55**	**2346.10**	**2463.39**	**2586.57**	**2476.13**	**2599.94**	**2729.93**	**2866.43**	**3009.75**	**3160.24**	**3318.24**

(Source: Approved Mining Plan)

11.2 Description of the Environment

11.2.1 Topography & Drainage

Topography

Physiographically, the Raniganj coal belt overlies the granite plateau fringe of Chotanagpur with a general elevation of about 100 meters. Permo carboniferous rock formations of Talcher, Barakar, Barren Measures, Raniganj & Panchet series are exposed in many planes with small isolated occurrences of upper Gondwanas near the southern boundary fault. Among the rock formations, the Raniganj & Barakar series contain some of the thickest & best coals of India (Bose, 1968).

On the basis of landform and topography, the area of West Bengal consisting of Bardhaman, Purulia, Birbhum & Paschim Medinipur is classified as western Plateau and highlands in the state. This part is made up of igneous rocks of the Archaean era as well as coal bearing mudstone and quartzite rocks of Carboniferous period.

Coarse, gritty soil blended with rock fragments has been formed from the weathering of pegmatites, quartz veins and conglomeratic sandstones. This soil is of reddish colour, medium to coarse in texture, acidic in reaction, low in nitrogen, calcium, phosphate and other plant nutrients. Water holding capacity of this soil increases with depth as well as with the increase of clay portions. Although the soil is generally not fit for cultivation, paddy can be grown in the areas, which become waterlogged during the monsoons.

Drainage

Ajoy River with its tributaries controls the main drainage of the cluster. There is a seasonal Tumni nullah, which flows from west to east with its tributaries and controls a significant portion of the drainage of the cluster.

11.2.2 Climate & Meteorology

Rainfall

The area receives rainfall by South-West monsoon. Rainy season sets in the middle of June and lasts till September. The normal average rainfall is 1480 mm.

Climate

The climate is tropical with hot dry summer, a good rainy season and cool winter. Thunderstorms accompanied with severe squalls occur in pre-monsoon months. Dust

storms also occur occasionally in April and May. Morning fog occurs in the winter months.

The area is characterized by humid to sub-humid climate. During summer the hot spell prevails from March to middle of June. Rainy season starts from middle of June to end to September. Winter starts from the middle of November and continues till the end of February. The area experiences great heat from April to June, when the maximum temperature crosses 45 ^{0}C. December is the coldest month when the minimum temperatures fall down to as low as 1 ^{0}C.

Micro – Meteorological Data

Micro – meteorological data was generated by Environment Laboratory, CMPDI, RI-I, Asansol during the post-monsoon season (Oct'21-Dec'21). Month-wise summary of the micro – meteorological data is given below:

Month	Temp. (ºC)		Relative Humidity (%)		Rainfall (mm)	No. of rainy days	Pressure (mbar)		Wind Direction		Avg. Wind Speed (m/sec)
	Max.	Min.	Max.	Min.			Max.	Min.	First	Second	
Oct'21	30.8	13.6	99.8	32.3	438.50	3	1005	999	NW	N	3.09
Nov'21	30.5	16.4	99.6	26.9	189.25	2	1015	1011	NE	NW	0.31
Dec'21	28.2	9.6	98.6	23.0	56.67	3	1018	1013	NE	NNW	0.50
Oct'21-Dec'21	30.8	9.6	99.8	23.0	684.42	8	1018	999	NW	N	1.31

It can be observed that the pre – dominant wind direction during post-monsoon season (Oct'21-Dec'21) is from NW and N, which conforms to the long – term trend on the basis of which baseline air monitoring stations had been fixed. Highest wind velocity was recorded as 21.58 m/sec. Maximum and minimum temperatures recorded were 30.8^{0}C & 9.6^{0}C. Maximum and minimum humidity recorded were 23.0 % & 99.8 % and station pressure was around 999 to 1018 mbar. Total number of rainy days were 8 with a maximum hourly precipitation of 160.25 mm.

11.2.3 Ambient Air Quality

Baseline data at 10 stations for ambient air quality was generated for post-monsoon season (Oct'21 – Dec'21) by Environment Laboratory, CMPDI, RI-I, Asansol.

PM_{10}: The maximum concentration for PM_{10} at industrial and residential stations was recorded as 272.1 µg/m^3 and 97.7 µg/m^3 respectively. The maximum concentration was recorded at the Manager's Office, Moira UG (industrial station) while the maximum concentration was recorded at Tilaboni Filter Plant (residential station). The average

concentration at industrial and residential stations was 161.7 µg/m^3 and 71.7 µg/m^3 respectively during the study period. The observed values are within the standard limit of 300.0 µg/m^3 prescribed in GSR 742 (E) dated 25.09.2000 for industrial stations and 100.0 µg/m^3 prescribed in NAAQS, 2009 for residential stations.

$PM_{2.5}$: The maximum concentration for $PM_{2.5}$ at industrial and residential stations was recorded as 97.7 µg/m^3 and 55.3 µg/m^3 respectively. The maximum concentration was recorded at the Manager's Office, Madhaipur Colliery near Railway Siding (industrial station) and the minimum concentration was recorded at Balijuri Community Hall (residential station). The average concentration at industrial and residential stations was 50.1 µg/m^3 and 34.9 µg/m^3 respectively during the study period. The observed values are within the standard limit of 60.0 µg/m^3 prescribed in NAAQS, 2009 for residential stations. No limit is defined in GSR 742 (E) dated 25.09.2000 for $PM_{2.5}$.

SO_2: The concentration level for SO_2 during the study period was below detection limit (< 10.0 µg/m^3).

NO_X: The maximum concentration for NO_X at industrial and residential stations was recorded as 42.2 µg/m^3 and 32.1 µg/m^3 respectively. The maximum concentration was recorded at the Bankola Workshop near Railway Siding (industrial station) and the minimum concentration was recorded at Danya Village (residential station). The average concentration at industrial and residential stations was 19.1 µg/m^3 and 16.6 µg/m^3 respectively during the study period. The observed values are well within the standard limit of 120.0 µg/m^3 prescribed in GSR 742 (E) dated 25.09.2000 for industrial stations and 80.0 µg/m^3 prescribed in NAAQS, 2009 for residential stations.

Heavy Metals: All the 6 heavy metal parameters were below detection limit (BDL) during the study period.

11.2.4 Ground Water/Surface Water/Effluent Water Quality

Baseline data w.r.t. water quality (ground/surface/mine water) was generated by Environment Laboratory, CMPDI, RI-I, Asansol by collecting and analyzing samples.

Ground Water

Sl. No.	Parameters	Ground Water		Standard as per IS10500:2012	
		Min.	Max.	Acceptable	Permissible
1	Colour (Hazen Unit)	2.0	6.0	5.0	15.0

Sl. No.	Parameters	Ground Water		Standard as per IS10500:2012	
		Min.	Max.	Acceptable	Permissible
2	Odour	Agreeable		Agreeable	
3	Taste	Agreeable		Agreeable	
4	Turbidity, NTU	0.08	1.06	1.0	5.0
5	pH	5.94	7.42	6.5-8.5	No relaxation
6	Total Hardness (mg/l)	38.25	316.51	200.0	600.0
7	Iron (mg/l)	0.05	0.06	0.3	No relaxation
8	Chlorides (mg/l)	6.0	94.0	250.0	1000.0
9	Free Residual Chlorine (mg/l)	BDL		0.2	1.0
10	Total Dissolved Solids (mg/l)	221.0	516.0	500.0	2000.0
11	Calcium (mg/l)	12.1	72.6	75.0	200.0
12	Copper (mg/l)	0.03	0.05	0.05	1.5
13	Manganese (mg/l)	BDL		0.1	0.3
14	Sulphate (mg/l)	3.48	44.28	200.0	400.0
15	Nitrate (mg/l)	4.6	21.32	45.0	No relaxation
16	Fluoride (mg/l)	0.12	0.24	1.0	1.5
17	Selenium (mg/l)	BDL		0.01	No relaxation
18	Total Arsenic (mg/l)	BDL		0.01	0.05
19	Lead (mg/l)	BDL		0.01	No relaxation
20	Zinc (mg/l)	0.02	0.05	5.0	15.0
21	Total Chromium (mg/l)	BDL		0.05	No relaxation
22	Boron (mg/l)	BDL		0.5	1.0
23	Total Coliform (MPN/100 ml)	BDL		Shall not be detectable in 100 ml sample	
24	Phenolics (mg/l)	BDL		0.001	0.002
25	Alkalinity (mg/l)	40.0	318.0	200.0	600.0
26	Cadmium (mg/l)	BDL		0.003	No relaxation

BDL for Free Ammonia: 0.02 mg/l
BDL for Arsenic: 0.02 mg/l
BDL for Iron: 0.01 mg/l
BDL for Copper: 0.03 mg/l
BDL for Cadmium: 0.002 mg/l
BDL for Phenolics Compound: 0.001 mg/l
BDL for Total Coliform: 1.8 MPN/100 ml
BDL for Fluorides: 0.01 mg/l
BDL for Boron: 0.10 mg/l
BDL for Lead: 0.05 mg/l
BDL for Manganese: 0.04 mg/l
BDL for Chromium: 0.01 mg/l
BDL for Free Residual Chlorine: 0.03 mg/l

Surface Water

Sl. No.	Parameters	Surface Water		Standard as per IS 2296:1982 (Class C)
		Min.	Max.	
1	pH	6.90	8.72	8.5
2	Colour (Hazen Unit)	2.0	7.0	300.0
3	Odour	Unobjectionable		--
4	Conductivity (µS/cm)	145.0	636.0	--
5	Dissolved Oxygen (mg/l)	4.22	7.48	4.0
6	Total Hardness (mg/l)	78.34	574.35	--
7	Chlorides (mg/l)	17.0	56.0	600.0
8	Total Dissolved Solids (mg/l)	196.0	775.0	1500.0
9	Free Ammonia (mg/l)	BDL		--
10	Fluoride (mg/l)	0.18	36.00	1.5
11	Sulphate (mg/l)	20.80	63.24	400.0

Sl. No.	Parameters	Surface Water		Standard as per IS 2296:1982 (Class C)
		Min.	Max.	
12	Nitrate (mg/l)	1.34	13.47	50.0
13	BOD (mg/l)	5.16	5.71	3.0
14	Arsenic (mg/l)	BDL		0.2
15	Boron (mg/l)	BDL		--
16	Iron (mg/l)	BDL		50.0
17	Lead (mg/l)	BDL		0.1
18	Copper (mg/l)	0.03	0.06	1.5
19	Manganese (mg/l)	0.03	0.06	--
20	Cadmium (mg/l)	BDL		0.01
21	Chromium (mg/l)	BDL		0.05
22	Total Coliform (MPN/100 ml)	Nil		5000
23	Phenolics (mg/l)	BDL		0.005

BDL for Free Ammonia: 0.02 mg/l
BDL for Fluorides: 0.01 mg/l
BDL for Arsenic: 0.02 mg/l
BDL for Boron: 0.10 mg/l
BDL for Iron: 0.01 mg/l
BDL for Lead: 0.05 mg/l
BDL for Copper: 0.03 mg/l
BDL for Manganese: 0.04 mg/l
BDL for Cadmium: 0.002 mg/l
BDL for Chromium: 0.01 mg/l
BDL for Phenolics Compound: 0.001 mg/l
BDL for Total Coliform: 1.8 MPN/100 ml

Effluent Water

Sl. No.	Parameters	Effluent Water		Standard as per Schedule VI, EPA, 1986 (General Standards for Discharge of Environmental Pollutants Part-A: Effluents) – Inland Surface Water
		Min.	Max.	
1	Colour	1.0	7.0	All efforts shall be made to remove colour and unpleasant odour as far as practicable
2	Odour	unobjectionable		
3	TSS (mg/l)	11.38	18.26	100.0
4	pH	6.84	8.12	5.5-9.0
5	Temperature(^{o}C)	28.3	31.2	Shall not exceed 5^{o}C above the receiving water temperature
6	Oil & Grease (mg/l)	BDL		10.0
7	Total Residual Chlorine (mg/l)	BDL		1.0
8	Ammonical Nitrogen (mg/l)	0.38	0.82	50.0
9	Total Kjeldahi Nitrogen (mg/l)	1.45	1.92	100.0
10	Free Ammonia (mg/l)	BDL		5.0
11	BOD (mg/l)	3.8	6.2	30.0
12	COD (mg/l)	8	28	250.0
13	Arsenic (mg/l)	BDL		0.2
14	Lead (mg/l)	BDL		0.1
15	Hexavalent Chromium (mg/l)	BDL		0.1
16	Total Chromium (mg/l)	BDL		2.0
17	Copper (mg/l)	0.03	0.05	3.0
18	Zinc (mg/l)	0.02	0.06	5.0
19	Selenium (mg/l)	BDL		0.05
20	Nickel (mg/l)	BDL		3.0
21	Fluoride (mg/l)	0.12	0.38	2.0
22	Dissolved Phosphate (mg/l)	1.24	2.46	5.0

Sl. No.	Parameters	Effluent Water		Standard as per Schedule VI, EPA, 1986 (General Standards for Discharge of Environmental Pollutants Part-A: Effluents) – Inland Surface Water
		Min.	Max.	
23	Sulphide (mg/l)	0.008	0.16	2.0
24	Phenolics (mg/l)	BDL		1.0
25	Manganese (mg/l)	BDL		2.0
26	Iron (mg/l)	BDL		3.0
27	Nitrate Nitrogen (mg/l)	3.1	4.9	10.0
28	Cadmium (mg/l)	BDL		2.0
29	Total Dissolved Solids (mg/l)	384	793	--

BDL for Free Ammonia: 0.02 mg/l
BDL for Fluorides: 0.01 mg/l
BDL for Arsenic: 0.02 mg/l
BDL for Boron: 0.10 mg/l
BDL for Iron: 0.01 mg/l
BDL for Lead: 0.05 mg/l
BDL for Copper: 0.03 mg/l
BDL for Manganese: 0.04 mg/l
BDL for Cadmium: 0.002 mg/l
BDL for Chromium: 0.01 mg/l
BDL for Phenolics Compound: 0.001 mg/l
BDL for Free Residual Chlorine: 0.03 mg/l
BDL for Oil & Grease: 2.0 mg/l
BDL for Total Residual Chlorine: 0.03 mg/l
BDL for Nickel: 1.0 mg/l
BDL for Selenium: 0.001 mg/l

11.3 Anticipated Environmental impacts and mitigation measures

11.3.1 Air Quality Impact Prediction and Mitigation Measures

From the above tables, it can be observed that the predicted concentration levels of PM_{10}, $PM_{2.5}$, SO_2 and NO_2 at industrial locations are within the limits as prescribed in GSR 742 (E) dated 25.09.2000 by MoEF&CC. Similarly, the predicted concentration levels of PM_{10}, $PM_{2.5}$, SO_2 and NO_2 at residential locations are within the limits as prescribed in NAAQS, 2009 except at Chinchuria Village (AAQ_7) and Tilaboni Filterplant (AAQ_{10}). The reasons for higher concentration level can be attributed to the fact that the village is located close to pollution sources in Sonepur-Bazari Expn. UG & OC apart from higher baseline concentration levels. Mitigation measures (present and proposed) as suggested in the subsequent sections will be adopted and strictly implemented to keep the concentration levels within the limit.

11.3.2 Impact of Mining on Water Regime and Mitigation Measures

Coal mining is the major industrial activity in the area. Ground water pumping is an integral part of coal mining. Besides this, groundwater utilization is mainly for domestic and irrigation use in the study area.

To minimize the impact of mining on ground water system, the project/mine authority has been adopting all possible measure to increase the ground water recharge potential.

The stage of ground water development in the buffer zone (10 km from the periphery of the core zone) of Cluster No. 12 comes to about 31%. As per the data collected from the Central Ground Water Board, Kolkata, the stage of ground water development in the Andal-Pandaveswar Block is 5.97%, in Faridpur-Durgapur Block is 3.32% and in Jamuria Block is 4.73% in which Cluster No. 12 mines and its buffer zone located and the region falls within the "**Safe**" category. So, artificial recharge is not urgently required in the buffer zone of the Cluster No. 12.

11.3.3 Impact of Mining on Ground & Vibration and Mitigation Measures

A cumulative effect of all mining activities produces enormous noise and vibrations in the mining area, which constitutes a source of disturbance. The availability of large diameter high capacity pneumatic drills, blasting of hundreds of tonnes of explosive, handling of coal at railway siding and CHP to facilitate speedy handling of large quantities, movement of HEMMs as well as Rapid Loading System etc. are identified as major noise creating activities. All these activities are major sources of noise & vibrations in & around the mines in Cluster No. 12 and different railway sidings.

The obvious implication of noise is, of course, the potential for noise-induced hearing loss. In addition, noise produces other health effects, influences work performance and makes communications more difficult. Besides, the fauna in the nearby areas surrounding the mines/industrial complexes are also affected by noise and it has generally been believed that wildlife is more sensitive to noise and vibrations than the human beings are. Noise can also create a masking effect on wildlife leading to interference with signals important to animals, such as their social communication calls, mother-offspring recognition sounds, echolocation signals, environmental sounds, or sounds by predators and prey. Hearing overexposure can also lead to temporary or permanent hearing loss in wildlife. Vibration due to blasting will damage the surrounding structures / houses.

The sources of noise are:

- ✓ Drilling operation in coal and OB.

- ✓ Blasting for coal & OB removal.
- ✓ Operation of shovels, dumpers, dozers, graders and other HEMMs.
- ✓ Transport of coal and OB to CHP & OB dump respectively.
- ✓ Transport of coal from CHP / coal stockyard to railway sidings.
- ✓ Operation of equipment in CHP, workshop, loading/ unloading of coal and OB.
- ✓ Coal handling activities at mine pit and railway sidings.
- ✓ Ventilation fans in UG mines.

The techniques employed for noise control can be broadly classified as:

- ✓ Control at source
- ✓ Control in the transmission path
- ✓ Using protective equipment.

11.3.4 Impact on Land Management and Management

Mining within the cluster will alter the land use pattern of the project site permanently. About 3199.22 Ha of land will be quarried out and permanently degraded. Apart from this, another 1362.22 Ha land will be brought under external dumping. Additionally, around 828.86 Ha land will be utilized for coal dumps and safety zone and around 2051.65 Ha land will be subject to subsidence. The mines have been planned such that land is utilized judiciously and there is minimum degradation. Sites for infrastructure and other buildings have been planned on non-forest land. At the end of mining, the degraded land will be planted upon to compensate for the loss of land during mining.

Sl. No.	Classes		Core Zone		
			Present Landuse (Ha)	During Mining Landuse (Ha)	Post Mining Landuse (Ha)
	Level-I	Level-II			
1	**Forest Land**	Dense Forest	0.00	**Land diverted for mining purpose**	**Land diverted for mining purpose**
		Open Forest	240.93		
		Total Forest Land	**240.93**		
2	**Scrubs**	**Scrubs**	**1797.00**	**276.00**	**276.00**
3	**Plantation Area**	Social Forestry	477.00	502.80	3465.97
		Plantation on OB	68.00	68.00	1430.22
		Plantation on Backfill	182.00	182.00	3381.22
		Total Plantation Area	**727.00**	**752.80**	**8277.41**
4	**Agriculture Land**	Crop land	2618.62	1519.00	1519.00
		Fallow Land	5296.44	2686.38	2686.38
		Total Agriculture Land	**7915.06**	**4205.38**	**4205.38**
5	**Waste Land**	Waste Land	310.00	0.00	0.00
		Sand Body	5.00	0.00	0.00
		Total Waste Land	**315.00**	**0.00**	**0.00**

Sl. No.	Classes		Core Zone		
			Present Landuse (Ha)	During Mining Landuse (Ha)	Post Mining Landuse (Ha)
	Level-I	Level-II			
6	**Mining Area**	Advance Quarry Area	59.00	3199.22	**Technically and biologically reclaimed**
		Coal Quarry	316.00		
		Water Filled Qry	48.00		
		Back Fill	673.00		
		Coal Dump	10.00	80.00	
		Barren OB Dump	644.00	1362.22	
		Safety Zone	0.00	748.86	
		Total Mining Area	**1750.00**	**5390.30**	**0.00**
7	**Settlements**	Urban Settlements	573.00	473.00	473.00
		Rural Settlements	523.00	297.20	297.20
		Industrial Settlements	68.00	462.66	380.00
		Total Settlement Area	**1164.00**	**1232.86**	**1150.20**
8	**Water Body**	**River / Ponds**	**250.00**	**250.00**	**250.00**
9	**Subsidence**	**Subsided Area**	**0.00**	**2051.65**	**To be brought under plantation**
Total Area (in Ha)			**14159.00***	**14159.00***	**14159.00***

(Source: Land use / veg cover mapping of core zone of Cluster No. 12 based on Satellite Data)

Note:

a) Stage – II Forest Clearance has been obtained for 200.95 Ha forestland (Sonepur-Bazari OCP – 32.65 Ha + Jhanjra UG – 168.30 Ha).

b) Stage – I Application has been made for 38.38 Ha forestland in Tilaboni UG. The Committee recommended the proposal for grant of 'in-principle' approval for diversion of 39.98 Ha (including the 1.60 Ha of forestland excluded by the agency) under the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 with the condition that no underground mining shall be carried out beneath the Office complex of the Tilaboni Beat and approach road involving forestland of 1.60 Ha. Minutes of Meeting, dated 28.02.2024 is attached (Annexure-XIII).

c) *An area of 632.78 Ha (470.78 Ha + 162.0 Ha) out of 661.54 Ha required for rehabilitation colony and Project Township in Sonepur-Bazari UG & OC has been considered outside the cluster since the exact location of the rehabilitation site will depend on the outcome of discussions with stakeholders. However, for the purpose of calculation of the cluster area, this entire area of 632.78 Ha (470.78 Ha + 162.0 Ha) has been included in the cluster area. In case, part of the proposed area falls within the cluster, the area of the cluster will be reduced accordingly. **Thus, the total cluster area is 14159.0 Ha + 632.78 Ha = 14791.77 Ha.**

11.4 Environmental Monitoring Programme

Environmental Management System (EMS) refers to the management of an organization's environmental programmes in a systematic, planned and documented manner. It includes the organizational structure, planning and resources for developing, implementing and maintaining policy for environmental protection. The Environmental Action Plan for mining in this project has been prepared accordingly and the measures suggested will go a long way in improving the overall environmental scenario of the project especially in light of the area coming under the list of critically polluted industrial projects of the country. The scope of environmental management includes plantation,

surface drainage, industrial wastewater treatment plant, subsidence monitoring, air, water and noise pollution check etc.

11.4.1 Environmental Monitoring & Control

For effective implementation and mid-term corrective measures (if required), monitoring and control is essential. Keeping in view this fact and in compliance with the existing Environmental Clearance (EC) of Cluster No. 12, samples of ambient air and water (effluent/ground water) are collected and tested for all four seasons at strategic places/stations representing all the categories of areas as indicated by CPCB at defined interval and in consultation with WBPCB. Noise level measurement is done on quarterly basis. However, from April'24 onwards, the frequency has been changed to monthly basis. Well water level measurement by dugwells & piezometer is done on quarterly basis. The implementation authority is guided and advised as per the feedback data from these tests to take additional steps, if required. CMPDI is also consulted as and when necessary.

11.4.2 Monitoring Schedule

As per the condition of EC, the monitoring schedule for different parameters is shown below:

a) Fortnightly monitoring is being carried out for ambient air quality (5 parameters i.e., SPM, PM_{10}, $PM_{2.5}$, SO_2 and NO_X) and effluent water quality (5 parameters i.e., TSS, pH, COD, TDS and Oil & Grease). SPM is monitored at industrial stations. Sampling stations have been chosen based on meteorological data, topographic features and environmental & ecological sensitive areas in consultation with SPCB. The samples are analysed at NABL Accredited Environmental Laboratory of CMPDI, RI-I, Asansol.

b) Heavy metals (Cr, Cd, Ni, Pb, Hg and As) in ambient air are analysed twice in a year (preferably during the months of March and September).

c) 29 parameters of effluent water are analysed twice in a year as per Schedule – VI of MoEF&CC (preferably during the months of March and September).

d) Well water level measurements are done on quarterly basis.

e) Workplace day-time and night-time noise level measurements are done on monthly basis.

f) Parameters of groundwater samples are analysed once in a year during the month of May as per IS 10500:2012.

g) Filter plant water samples are analysed on quartely basis as per IS 10500:2012.

h) 5 nos. of piezometers are installed within the cluster to monitor groundwater level.

11.4.3 Health Monitoring

A regular schedule is programmed for monitoring health of the workers and staff associated with the mining operations and other connected industrial activities for identifying occupational diseases in time and initiating remedial measures. A personnel working in dusty areas is provided with adequate training and information on safety and health aspects. They are made aware to use protective devices judiciously.

Periodical Medical Examinations (PME) is being done to each worker at an interval of five years under occupational health surveillance programme as per norms at Central Hospital, Kalla, ECL. If any contractions are observed due to exposure to coal dust, appropriate corrective actions are being taken.

PME of workers are being carried out regularly in which audiometric tests are also carried out. If any occupational diseases will be found, they will be sent for health checkup at Regional Hospital in respective areas at Kalla/ referred to specialized agency/institutuion within the District/State.

Mobile ambulance is also being used for such programmes to monitor the health of the population around the area. A well-equipped and manned, round – the – clock Hospital has been proposed to be established for the treatment of the mine personnel as well as catering to the local population at subsidized charges. Proposal for Mobile dispensary, which will also be used to monitor the health of the population around the area, is under consideration. Regular health camps will be held future also.

11.4.5 Conservation Measures for Water

The ground water development factor in the project comes to about 31% which is classified as ‘Safe’ category.

The following conservation measures are being / will be adopted –

- The mine discharge will be effectively utilize to meet the mine’s domestic and industrial needs. Almost, the entire industrial and part of domestic water demand of the Cluster No. 12 project has been met from treated mine water.

- After cessation of mining, with plenty rainfall and abundant ground water recharge, the water levels will recoup and attain normalcy. Thus, the impact of mining on groundwater system may be considered as a temporary phenomenon. The abandoned mine workings (underground and opencast) also behave as water pool and improve the resources availability in the area.
- To increase the source availability, Hand pumps and in some places piped water supply will be provided nearby villages**.**
- The treated mine water from is being supplied to nearby villages for their irrigation and domestic use. From Kendra UG to Angargodia, from Jhanjra UG to Goenka-Ukhra & Laudoha, from Tilaboni UG to Kajora & Guru-Gobindanathpur and from Kumardihi-A UG to Nabagram & Kumardihi village. Thereby the mine water, from the existing mines in the area, is a resource for local villages.
- The excess mine water can be used to recharge groundwater system through connecting pipeline to abandoned dugwells.
- Regular plantation will be taken up during the life of the mine to create green barrier. The plant species will be selected in consultation with State Forest Department.

11.4.6 Conservation Measures for Land

The following conservation / reclamation measures for land will be taken –

Management of OC Voids & Dumps

a. The external dump areas after re-handling will be brought under plantation.
b. Since all the mines where OC mining is going on are mixed mines, OC void of all the mine will be filled-up after exhaustion of reserves to facilitate underground working in the area.

Management of Subsided Land

a. Surface cracks and depressions due to subsidence would be filled up properly by sand, stone chips and clay to achieve original drainage pattern in the area, as far as possible. After laying top soil, wherever required, the entire reclaimed area would be planted with herbaceous plants/shrubs/grass to prevent erosion.
b. Final plantation of trees shall take place after the entire coal reserve is extracted and the underlying strata settles to an acceptable level, which may take 6 to 12 months after the completion of extraction in the underlying seams.

c. Surface drains would be made outside of the subsidence area to prevent the surface water of adjoining area from coming into the active subsidence area.

d. The subsidence areas, which are potentially dangerous, shall be kept fenced till the filling job is over and area does not remain potentially dangerous.

Additional Plantation works proposed

c. By the end of mining, the total planted area within the mine will be 8277.41 Ha (including 727.00 Ha already planted) or 55.96 % of leasehold area. This includes land disturbed by quarrying, OB dumps, subsided land and other free-up space after dismantling of infrastructures.

Present, Progressive and Post Mining Land uses

d. The total area of the cluster is 14791.77 Ha. Present, Progressive and Post Mining (Tentative) Land uses of this area is tabulated below –

Stage-wise Cumulative Plantation

#	YEAR	Green Belt		External Dump (including top soil dump)		Backfilled Area		Others (Undisturbed Area / etc.)		Total	
		Area (Ha)	No. of Trees	Area (Ha)	No. of Trees	Area (Ha)	No. of Trees	Area (Ha)	No. of Trees	Area (Ha)	No. of Trees
1	1st Year (Present Landuse)	0.00	0.00	69.00	1.10	182.00	2.91	0	0.00	251.00	4.02
2	5th year	48.86	0.78	180.22	2.88	830.00	13.28	297.45	4.76	1356.53	21.70
3	10th year	148.86	2.38	386.22	6.18	1062.00	16.99	617.45	9.88	2214.53	35.43
4	20th year	348.86	5.58	588.22	9.41	1499.22	23.99	1141.11	18.26	3577.41	57.24
5	30th year	548.86	8.78	1262.22	20.20	2599.22	41.59	1495.11	23.92	5905.41	94.49
6	Post Mining Landuse	748.86	11.98	1362.22	21.80	3199.22	51.19	2240.11	35.84	7550.41	120.81

Post-Mining Landuse Pattern of ML/Project Area (ha)

S.N.	Land use during Mining	Land Use (Ha)				
		Plantation	Water Body	Public Use	Undisturbed	TOTAL
1	External OB Dump	1342.22	0.00	0.00	0.00	1342.22
2	Top soil Dump	20.00	0.00	0.00	0.00	20.00
3	Excavation (including coal dump)	3279.22	0.00	0.00	0.00	3279.22
4	Roads	20.00	0.00	0.00	67.00	87.00
5	Built up area	62.66	0.00	0.00	400.00	462.66
6	Plantation / Natural Vegetation / Scrubs / Green Belt including safety zone	748.86	0.00	0.00	1003.00	1751.86
7	Undisturbed Area (agricultural land, water bodies, settlements)	25.80	0.00	0.00	5771.36	5797.16
8	Subsided Area	2051.65	0.00	0.00	0.00	2051.65
	TOTAL	**7550.41**	**0.00**	**0.00**	**7241.36**	**14791.77**

11.4.7 Provisions for Environmental Management

Capital Provisions

For Environmental Management in presently operative mines, a total capital investment of ₹ 7732.00 lakh has been envisaged in the approved EIA & EMP of Cluster No. 12 for various Environmental Management activities as shown in the following table:

Capital Investment on Environment Control Measures

Capital for Environmental Protection & Anti – Pollution Measures in Mines, Industrial Area & Townships		**(Amount in ₹ Lakh)**
Sl. No.	**Description**	**Amount**
1	Mobile Water Sprinkler 10KL / 12 KL (25 nos. required)	750.00
2	Dust Suppression in Mines & Railway siding	
I	Fixed type Water Sprinkler at tippler points at mine Pit heads (18 nos.)	36.00
II	Fixed type Water Sprinkler at Railway Siding (08 Railway Sidings)	160.00
III	Fixed type Water Sprinkler at OC Mines & Patches Coal Depot (12 nos.)	60.00
IV	Fixed type Water Sprinkler at all UG Mine Coal Depots (18 nos.)	36.00
3	Sedimentation Tanks (19 nos.)	380.00
4	Pressure Filters (19 nos.)	380.00
5	Solar Lighting at Railway Siding (08 Railway Sidings)	160.00
6	STP (02 nos. – Sonepur Bazari OCP & Jhanjhra UG)	1200.00
7	Sanitation	570.00
8	Roads (in various mines for coal Transportation)	3000.00
9	Miscellaneous (for safety equipment)	100.00
10	Drinking Water Supply	900.0
Total		**7732.00**

(Source: Approved EIA & EMP Report)

Proposed Implementation Schedule for different Environmental Management Activities

(Fig. in ₹ Lakh)

Capital for Environmental Protection & Anti – Pollution Measures in Mines, Industrial Area & Townships				**Future Projection for remaining capacities to be provided**				
#	**Description**	**Amount**	**Investment made till date**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29 onwards**
1	Mobile Water Sprinkler 10 KL / 12 KL (25 nos. required)	750.00	733.20	222.22	62.34	38.06	46.82	
2	Dust Suppression in Mines & Railway siding							
I	Fixed type Water Sprinkler at tippler points at mine Pit heads (18 nos.)	36.00	30.00	24.00	16.00	16.00	24.00	20.00
II	Fixed type Water Sprinkler at Railway Siding (08 nos. Railway Sidings)	160.00	50.00	19.00	49.00	12.00	12.00	18.00
III	Fixed type Water Sprinkler at OC Mines & Patches Coal Depot (12 nos.)	60.00				10.00	20.00	30.00
IV	Fixed type Water Sprinkler at all UG Mine Coal Depots (18 nos.)	36.00		6.00	6.00	6.00	6.00	12.00
3	Sedimentation Tanks (19 nos.)	380.00	45.00	40.00	27.00	12.00	10.00	246.00
4	Pressure Filters (19 nos.)	380.00	40.00	40.00	60.00	40.00	100.00	100.00
5	Solar Lighting at Railway Siding	160.00	1.50		35.50	23.00	50.00	50.00

Capital for Environmental Protection & Anti – Pollution Measures in Mines, Industrial Area & Townships				Future Projection for remaining capacities to be provided				
#	Description	Amount	Investment made till date	2024-25	2025-26	2026-27	2027-28	2028-29 onwards
	(08 nos. Railway Sidings)							
6	STP (02 nos. – Sonepur Bazari & Jhanjhra)	1200.00	435.58	50.00	104.00	110.42	100.00	400.00
7	Sanitation	570.00	110.00	60.00	60.00	60.00	60.00	220.00
8	Roads (in various mines for coal Transportation)	3000.00	842.00	410.00	720.00	278.00	250.00	500.00
9	Miscellaneous (for safety equipment)	100.00	10.90	5.10	14.00	14.00	14.00	42.00
10	Drinking Water Supply	900.00	1390.90					
	Total	**7732.00**	**3689.08**	**876.32**	**1153.84**	**619.48**	**692.82**	**1638.00**

(Source: Area Authorities)

Further to the new proposals, the following additional capital expenditure is proposed:

a) Capital provision as per draft PR of Pandaveswar-Dalurband UG & OC is shown below:

(Amount in ₹ Lakh)

Sl. No.	Particulars	Amount	Year-wise Phasing of Capital					
			1st	2nd	3rd	4th	5th	6th year onwards
I	**Capital for anti-pollution measures in industrial area & mine**							
A	**Underground**							
a	ETP & STP	250.00	150.00	100.00				
b	Settling Tank with connecting drains	40.00			20.00	20.00		
c	Dust suppression through water spraying by 2 nos. of 9 kl tanker-trailers (mobile sprinklers)	37.54			18.77	18.77		
d	Dust suppression by provision of high-pressure water fog system/fixed water sprinklers at the coal loading points, discharging points and dust extraction in CHP.	10.00			5.00	5.00		
e	Dust suppression at Railway Siding by provision of high pressure water fog system / fixed water sprinklers	10.00				5.00	5.00	
f	Miscellaneous (for safety equipment)	10.00				5.00	5.00	
g	Arrangement for rain water harvesting	10.00				10.00		
B	**Opencast**							
a	Settling Pond	30.00		15.00	15.00			
b	Oil Catcher	20.00		20.00				
c	Fencing	10.00		10.00				
d	Garland	14.00		4.00	10.00			
e	Plantation	75.00		12.50	12.50	12.50	12.50	25.00
	Sub-total (I)	**516.54**	**150.00**	**161.50**	**81.27**	**76.27**	**22.50**	**25.00**
II	**EMP**							
a	EMP data generation & Preparation	50.00	50.00					
b	Consent to establish	55.00	55.00					
	Sub-total (II)	**105.00**	**105.00**					
Grand Total (I to II)		**621.54**	**255.00**	**161.50**	**81.27**	**76.27**	**22.50**	**25.00**

b) Capital provision as per approved PR of Sonepur Bazari Expansion OC is shown below:

(Amount in ₹ Lakh)

Sl. No.	Particulars	Amount	Year-wise Phasing of Capital					
			1st	2nd	3rd	4th	5th	6th year onwards
I	**Capital for Restoration**							
a.	HEMM for reclamation	2623.15		2623.15				
b.	Equipment for Environmental work	27.70	9.23	9.23	9.24			
	Sub-total (II)	**2650.85**	**9.23**	**2632.38**	**9.24**			
II	**Capital for anti-pollution measures in mine & industrial area**							
a.	ETP & Sewage Disposal System	610.50		610.50				
b.	Garland Drains	30.00	3.00	3.00	3.00	3.00	3.00	15.00
c.	Toe-wall & drain around OB Dump	685.70	68.57	68.57	68.57	68.57	68.57	342.85
d.	Plantation in and around project area	800.00			160.00	160.00	160.00	320.00
e.	Dust Suppression System at CHP	31.09			31.09			
	Sub-total (III)	**2157.29**	**71.57**	**682.07**	**262.66**	**231.57**	**231.57**	**677.85**
III	**Environmental control measures in township**							
a.	STP & Sewerage disposal	6.14	2.14	2.00	2.00			
b.	Tree guards in colony	2.28	2.28					
	Sub-total (IV)	**8.42**	**4.42**	**2.00**	**2.00**			
IV	**Environmental data generation**	**150.00**	**150.00**					
Grand Total (I to IV)		**4966.56**	**235.22**	**3316.45**	**273.90**	**231.57**	**231.57**	**677.85**

Recurring Expenditure on Environment, Closure Cost & CSR

1. In addition, a cost of ₹ 6.00/tonne has been kept in this report for revenue expenditure on environmental management, which will be ₹ 2089.80 Lakh per annum at peak capacity (34.83 MTY).
2. As per the guideline of MOC, MCP for the mines within the cluster was prepared and got approved on 24.09.2013. Mine Closure Plans have been revised as per F. No. 34011/28/2019-CPAM dated 29.05.2020. Total mine closure cost will come to ₹ 163221.55 Lakh for all the mines within cluster. Details about the mine closure plan is given in Chapter No. 2.

   Funds @ 2% of average PBT of last three years has been earmarked for CSR.

11.5 Additional Studies

11.5.1 R&R Action Plans

Rehabilitation and Resettlement is proposed in the mines of Cluster No. 12. Details of the existing R&R vis-à-vis proposed R&R are given below:

#	Name of Mine	Existing R&R provisions			Proposed R&R provisions		
		No. and Name of villages to be rehabilitated	**Total No. of PAFs**	**Capital Provisions (in ₹ Crore)**	**No. and Name of villages to be rehabilitated**	**Total No. of PAFs**	**Capital Provisions (in ₹ Crore)**
1	Pandaveswar–Dalurband UG & OC	-	-	-	01; Bengali Basti	79 and 660 non-legal title holders	197.88
2	Manderboni – South Samla UG	-	-	-	-	-	-
3	Madhaipur UG & OC	-	-	-	-	-	-
4	Nutandanga UG	-	-	-	-	-	-
5	Kendra UG	-	-	-	-	-	-
6	Samla UG & OC	-	-	-	-	-	-
7	Sonepur – Bazari Expansion UG & OC	12; Arsula, Bhaluka, Bhatmura, Bheladanga, Kuchberia, Madhudanga, Sankarpur, Sonepur, Bazari, Nabagram, Bandhghat and Basabdanga	2284	37.36	14; Bazari, Sonepur, Bhatmura, Madhudanga, Nabagram, Sankarpur, Banbahal, Sitalpur, Haripur, Chora (extn), Basti near Seetalpur Siding, Rehab Site (Bheladanga), Basti near Ukhra RS and Basti near Shankarpur	9313	1589.37
8	Nakrakonda – Kumardihi B UG & OC	03; Nakrakonda, Majhi Basti (Nakrakonda) and Majhi Basti (Joelbhanga)	164	30.50	03; Nakrakonda, Majhi Basti (Nakrakonda) and Majhi Basti (Joelbhanga)	272	48.95
9	Kumardihi A UG	-	-	-	-	-	-
10	Jhanjra UG	-	-	-	-	-	-
11	Tilaboni UG	01; Majhi Basti	58	8.98	01; Majhi Basti	58	8.98
12	Shyamsundarpur UG						
13	Bankola UG	-	-	-	-	-	-
14	Khottadih UG & OC	-	-	-	-	-	-
Total			**2506**	**76.84**		**9722 and 660 non-legal title holders**	**1845.18**

(Source: Approved Mining Plan)

11.6 Project Benefits

11.6.1 Improvements in Physical and Social Infrastructure

Sl. No.	CSR Activity (for improving physical infrastructure)	Financial Year	Status
1	Permanent water supply pipeline at Kumardihi and Shyamsundarpur Villages from Kumardihi A Colliery	2014 – 15	Completed
2	RCC roof over the stage including green room at Ukhra school football ground in Ukhra Village, Bankola Area	2014 – 15	Completed
3	Construction of boundary wall in front of Dihi Park and PCC road including drain inside Dihi Park at Kumardihi Village under Kumardihi A Colliery	2014 – 15	Completed
4	Construction of boundary wall at Shyamsundarpur Village football ground under Tilaboni Colliery	2014 – 15	Completed
5	Construction of toilets in 8 nos. ECL aided Privately managed schools	2015 – 16	Completed
6	Construction of well in Kumardihi Village	2016 – 17	Completed
7	Construction of platform and Boundary wall in Ukhra Kabarsthan	2016 – 17	Completed
8	Construction of Training Centre and Connecting Road in Kumardihi Village	2017 – 18	Completed
9	Construction of PCC Road at Rangamati Village, Jhanjra Area	2018 – 19	Completed
10	Construction of Bathing Ghat with a boundary wall along the side of a pond at Shetalpur Colliery, Supol Dhawrah under ward no. 105 by Barjora Samaj Kalyan Kendra	2018 – 19	Completed
11	Installation of Solar Street Light Projects at different villages in and around command areas of ECL, Raniganj Coalfields for Bankola Area, Pandaveswar Area, Jhanjra Area and Sonepur-Bazari Area	2019 – 20	Completed
	Facilitating 02 Nos. of Trekker or similar type of vehicle for transportation to villagers & school going children for Sonepur Bazari, Madhudanga Village & Bhatmura Village.	2019 – 20	Completed
12	Installation of water cooler & overhead water tank along with pipeline and other associated works at KTBI Higher Secondary School Laudoha	2023 – 24 & 2024 – 25	Under consideration
13	Installation of water purifier cum cooler at HOPE Special School Laudoha	2023 – 24 & 2024 – 25	Under consideration
14	Construction of hall at HOPE Special School Laudoha	2023 – 24 & 2024 – 25	Under consideration

Sl. No.	CSR Activity (for improving social infrastructure)	Financial Year	Status
1	Health Check Up camps in nearby villages, Bankola Area & Jhanjra Area	2014 – 15 to 2019 – 20	Completed
2	Distribution of aids appliances to physically challenged persons	2014 – 15	Completed
3	School Health Check Up under CSR	2014 – 15	Completed
4	Eye Camp under CSR	2014 – 15	Completed
5	Swabhiman (Women Empowerment)	2015 – 16 to 2019 – 20	Completed
6	Essay Competition under Swach Bharat Abhiyan	2016 – 17	Completed
7	Procurement of Offset Printing Machine under CSR	2016 – 17	Completed
8	Unnati – A Microenterprise of Handicrafts run by women	2017 – 18 to 2019 – 20	Completed
9	Diet for Football Academy Students	2018 – 19	Completed
10	Training of 50 nos. of Mining Sardar (SC/ST candidates)	2019 – 20 to 2020 – 21	Completed
11	Training of Kantha Stitch work to rural BPL women in nearby villages	2019 – 20	Completed
12	Cardiac Check-up camp at Jhanjra Area Hospital by doctors from DESUN Hospital, Kolkata	2019 – 20	Completed
13	Distribution of Ration to needy people during COVID-19	2020 – 21	Completed

Sl. No.	CSR Activity (for improving social infrastructure)	Financial Year	Status
14	Training of 100 nos. of women in Tailoring and Jewelry Making in Ichapur Panchayat	2022 – 23	Completed
15	SWABHIMAAN – Installation of sanitary napkin vending machine & sanitary napkin incinerator along with napkin supply	2023 – 24 & 2024 – 25	Under consideration

Many eco-parks have also been constructed within the cluster, which improve the aesthetic beauty of the area as well as help the local people by providing sites for social events, recreational activities, morning walks, Yoga, meditation etc. List of eco-parks within the cluster are:

1. Jhanjra eco-park: 4.20 Ha
2. Jhanjra tourism eco-park: 13.02 Ha (under development)
3. Sonepur-Bazari eco-park: 8.0 Ha (under development)
4. Dihi Park: 5.0 Ha

The existing manpower of the mines in the cluster as on 31.03.2023 is 11675. As per the approved Mining Plan, a total of 4394 additional employment (including 474 nos. of pending employment) will be provided to the land losers @ 1 employment/2 acres of land as per R&R policy of CIL. Direct employment will help the individual and his / her family in a big way as it will secure the economic requirements of the family. Other than direct employment, indirect employment has also been provided to local residents by means of opening of small businesses like sale of consumables (batteries, tyre and tubes), vehicle repairing shops, local eatery shops etc. in the vicinity of the mine engaging various categories of workers viz. skilled, semi-skilled and unskilled.

Resourceful and good markets / shopping centres are being established for feeding the incoming population, workers and villagers in the area.

Apart from above direct employment, indirect employment of skilled, semi-skilled and unskilled workers deployed through contract is huge. Traders, dealers, retailers, vendors, etc. are also being indirectly employed with the commencement of the project.

There is spontaneous economic stimulus in the area due to running mines within the cluster. Some traders and private enterprises have grown in the area with this economic growth. Economic status of the people of the area has also increased, and a good market involving lots of economic transaction are taking place and will take place in future too. With opening of shopping centers all the commodities, essential as well as

luxury have been made available in the area. Communication are improving and will have better shape in future. The area will be a good economic zone thereafter.

Besides, the State exchequer is deriving financial revenues through levy of royalty; sales tax etc. and Central Government is also being benefited by way of Taxes, Cesses etc. These benefits as mentioned above will be further boosted by the expansion of the cluster.

11.7 Public Consultation

A. Status Report of previous Public Hearing for Cluster No. 12 held on 07.03.2014

Sl. No.	Key Issues / demands	PP's Remarks	Provisions made in the EIA & EMP		Present Status
			Capital Provisions (₹ Lakh)	Annual Provisions (₹ Lakh / year)	
1	Provision of Water Supply to Villages	Mine water after filtration through pressure filter will be supplied to the local villages	₹ 380.00 Lakh for installation of 19 nos. of pressure filters	Will be spent from CSR fund	Water is being supplied to 5 villages of Haripur Gram Panchayat through CSR involving cost of around ₹ 13.50 lakhs annually.
2	Dust suppression	Proper water sprinkling will be done and measures taken as suggested in the EIA & EMP	₹ 750.00 Lakh for purchase of 25 nos. of mobile water sprinklers & ₹ 292.00 Lakh for 56 nos. of fixed type sprinklers at mines and railway sidings	₹ 1000.00 Lakh / annum for pollution control	Mobile sprinklers along with mist formation are running at haul road to control fugitive dust suppression. Further, Rapid Loading Silo System along with water spraying arrangement is running at new railway siding and CHP.
3	Spillage of coal during transit – obnoxious emissions from dumpers	Transportation by tarpaulin-covered trucks will be strictly enforced. ECL has taken up a R&D project in collaboration with C.M.E.R.I., Durgapur to minimize the obnoxious gas emission from the dumpers			➢ Transportation of coal is being carried out by tarpaulin-covered trucks only. ➢ Further, new railway siding with silo loading facility has been established which has reduced the need for road transportation.
4	Improvement of road condition	Road conditions will be improved	₹ 3000.00 Lakh	Covered under pollution control fund and CSR fund	All coal transportation roads are black topped and maintained regularly. Road is constructed or repaired where necessary.
5	Damage to houses due to ground vibration generated from mine blasting in OC mines	Presently control blasting technique has been adopted and drill hole patterns are scientifically designed as per vibration studies being carried out from time to time			Blasting is controlled by muffling. Detail study is this regard is also done by CMPDIL. Expenditure around ₹ 4.00 Lakh per annum. Scientific study for conducting deep hole blasting is being carried out by CSIR-Central Institute of Mining and fuel research. Control Blasting technique is being used presently.
6	Backfilling of OC voids after exhaustion and reclamation – fencing of quarries to	Is mandatorily done in all OC mines		Covered under mine closure fund of ₹ 2706.84 Lakh per annum	Progressive. Backfilling of mines is being done concurrently once coal is excavated completely. Till date backfilling of 509.42 Ha has been done.

Sl. No.	Key Issues / demands	PP's Remarks	Provisions made in the EIA & EMP		Present Status
			Capital Provisions (₹ Lakh)	Annual Provisions (₹ Lakh / year)	
	prevent accidents				
7	Intensive Plantation programme – plantation of fruit bearing trees	Plantation programme will be continued until all the open lands are made green. Stress will be given on fruit bearing trees. He informed that ECL has already planted 177840 plants during the last year on 185.25 ha and has extensive plantation programme in near future		Covered under mine closure fund of ₹ 2706.84 Lakh per annum	Progressive. Plantation is being done in consultation with West Bengal Forest Department. Till date plantation of 328.20 Ha has been done I and around mine lease area. Orchard plantation of 3.00 Ha was done in the FY 2021-22. 3000 fruit bearing plant species were distributed to local gram panchayats in the FY 2022-23.
8	Arrangement of street lighting	Management has taken initiative for street lighting		Will be spent from CSR fund	Progressive.
9	Arrangement of solar lighting	Management has taken initiative for solar street lighting	₹ 160.00 Lakh for 8 railway sidings	-do-	Completed. 181 Street Solar Lights is installed at Jamuria Block involving CSR expenditure, of around ₹ 22.70 lakhs.
10	Repairing of local village roads, schools and hospitals	Road repairing / widening will be started shortly	₹ 570.00 Lakh has been kept exclusively for improving sanitation	-do-	Progressive. Repairing and widenining of roads is being done at regular interval. Roads are being constructed at rehabilitation site and local villages for transportation.
11	Proper utilization of CSR fund for development	Invited proposal from the villagers for development of villages under CSR. He further informed that solar street lighting, medical camps, free medical checkup for BPL card holder will also be covered under CSR		Breakup of yearly allocations of CSR fund	Progressive. Mobile Medical Van was running at Sonepur Bazari Area for health checkup of local villagers involving cost of around ₹ 31.00 lakhs annually. 181 Street Solar Lights is installed at Jamuria Block involving CSR expenditure, of around ₹ 22.70 lakhs.
12	Holding medical camps	Medical camps are held regularly, frequency will be increased		Will be spent from CSR fund.	Progressive. Medical Camps is being organized at regular interval at local villages. Further periodic medical checkup of contractual and departmental workers is being done regularly. Work Order for carrying out regular periodic health check-up of workforce engaged in active mining operations has

Sl. No.	Key Issues / demands	PP's Remarks	Provisions made in the EIA & EMP		Present Status
			Capital Provisions (₹ Lakh)	Annual Provisions (₹ Lakh / year)	
					been awarded to National Institute for Occupational Safety & Health (NIOSH).
13	Further employment to local youth	Direct and indirect employments are being provided to a large section of youth in the area			Progressive Till date 1939 direct employment is given to local project affected people. Further Sonepur Bazari Open Cast mine has created numerous indirect employment at Raniganj Coal Field Belt.
14	Compensation to land losers	Compensations are speedily processed. Land losers are provided employment as per CIL's R & R Policy.			Progressive. Compensation as per R&R policy of CIL being given to land losers.

B. Fresh Public Consultation including Public Hearing is required as per the provisions laid down in EIA Notification, 2006 and subsequent amendments since there is increase in the cluster area and capacity.