

HALF YEARLY
ENVIRONMENT CLEARANCE COMPLIANCE REPORT
OF
CLUSTER 12
J-11015/76/2011-IA.II(M)
FOR THE PERIOD OF
APRIL 2023 TO SEPTEMBER 2023



Eastern Coalfields Limited
(A subsidiary of Coal India Ltd.)



EASTERN COALFIELDS LIMITED
(A Subsidiary of Coal India Limited)
O/o The Agent, Sonepur Bazari Project
PO: Sonepur-713378, Dist.: Paschim Bardhaman

Ref: GM/SBA/23-24/21


Date- 23/11/23

UNDERTAKING

Information provided in Half Yearly EC compliance report for the period April'2023 to Sept'2023 in respect of the following mines of Cluster no. 12 is true to the best of my knowledge:

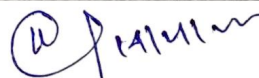
SL. NO.	MINES	NAME OF THE AGENT	SIGNATURE OF THE AGENT
1	Sonepur Bazari OCP	Shri Rajkishore Singh	


23/11/23
Agent/ Project Proponent / Agent,
(Sonepur Bazari Project)
General Manager (O) / Agent,
Sonepur Bazari Project
E. C. L.

<p>EASTERN COALFIELDS LIMITED (A Subsidiary of Coal India Limited <u>A Maharatna Company</u>)</p>		<p>OFFICE OF THE AGENT JHANJRA PROJECT COLLIERY PO – LAUDOHA (B. O.) -713385 Dist: Paschim Bardhaman, W. B. Ph: 0341-2670618, Fax : 0341- 2672352</p>
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UNDERTAKING

Information provided in Half Yearly EC compliance report for the period **1st April 23 to 30th September 2023** in respect of Jhanjra UGP of cluster no. 12 is true to the best of my knowledge:

S. No.	Manager of the Mine	Name of the Manager	Signature of the Manager
1.	Jhanjra UG	Kaushik Kumar Khan	


 Agent 20/11/23
 Jhanjra Project Colliery



Eastern Coalfields Limited

(A subsidiary of Coal India Limited)

Office of the Agent, Dalurband OCP

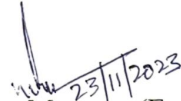
P.O. – Pandaveswar , Dist.- Paschim Bardhaman, PIN-713346,W.B.

Ref No.: ECL/PAND/AGT/DOCP/2023-24

Date: 23-11-2023

UNDERTAKING

Information provided in the Half yearly EC compliance report for the period of April 2023 to September 2023 in respect of Dalurband OCP mine under Pandaveswar-Dalurband UG & OC group of mines of Cluster no.12 is true to the best of my knowledge.


Dy. Manager (Env.)
Pandaveswar Area


Manager
Dalurband OCP


Dy. GM(Mining)/Agent
Dalurband OCP



Eastern Coalfields Limited

(A subsidiary of Coal India Limited)

Office of the Agent, Khottadih OCP

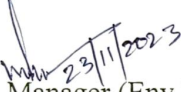
P.O. – Khottadih , Dist.- Paschim Bardhaman, PIN-713378

Ref No.: ECL/PAND/AGT/KTDOC/2023-24

Dated: 23-11-2023

UNDERTAKING

Information provided in Half yearly EC compliance report for the period of April 2023 to September 2023 in respect of Khottadih OCP under Khottadih UG&OC mine of Cluster no. 12 is true to the best of my knowledge.


Dy. Manager (Env.)
Pandaveswar Area


Manager
Khottadih OCP


Dy. GM(Mining)/Agent
Khottadih OCP



Eastern Coalfields Limited
(A subsidiary of Coal India Limited)
Office of the Agent, Khottadih UGP
Pandaveswar Area

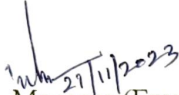
P.O. – Khottadih , Dist.- Paschim Bardhaman, PIN-713378

Ref. No.: ECL/PAND/AGT/KTDUG/2023-24

Dated: 21-11-2023

UNDERTAKING

Information provided in Half yearly EC compliance report for the period of April 2023 to September 2023 in respect of Khottadih UGP under Khottadih UG&OC mine of Cluster no.12 is true to the best of my knowledge.


Dy. Manager (Env.)
Pandaveswar Area


Manager
Khottadih UGP


Dy. GM(Mining)/Agent
Khottadih UGP



Eastern Coalfields Limited
(A subsidiary of Coal India Limited)
Office of the Agent, Madhaipur UG&OC
Pandaveswar Area

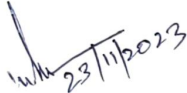
P.O. – Nutandanga , Dist.- Paschim Bardhaman, PIN-713381

Ref. No.: ECL/PAND/AGT/MDP/2023-24


Dated: 23-11-2023

UNDERTAKING

Information provided in Half yearly EC compliance report for the period April 2023 to September 2023 in respect of Madhaipur OC Patch under Madhaipur UG& OC mine of Cluster no.12 is true to the best of my knowledge.


Dy. Manager (Envt.)
Pandaveswar Area


Manager
Madhaipur UG&OC


Dy. GM(Mining)/Agent
Madhaipur UG&OC



Eastern Coalfields Limited
(A subsidiary of Coal India Limited)
Office of the Agent, Madhaipur UG&OC
Pandaveswar Area

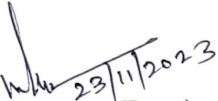
P.O. – Nutandanga , Dist.- Paschim Bardhaman, PIN-713381

Ref. No: ECL/PAND/AGT/MDP/2023-24

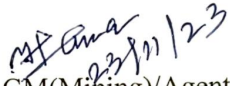
Dated:23-11-2023

UNDERTAKING

Information provided in Half yearly EC compliance report for the period of April 2023 to September 2023 in respect of Madhaipur UG under Madhaipur UG&OC mine of Cluster no.12 is true to the best of my knowledge.


Dy. Manager (Envt.)
Pandaveswar Area


Manager
Madhaipur UG&OC


Dy. GM(Mining)/Agent
Madhaipur UG&OC




Eastern Coalfields Limited
(A subsidiary of Coal India Limited)
Office of the Agent, Manderboni- South Samla (A) UG
Pandaveswar Area
P.O. – Gogla, Dist.- Paschim Bardhaman, PIN-713381

Ref. No.: ECL/PAND/AGT/MSAM/

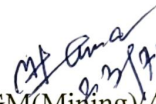
Dated: 23-11-2023

UNDERTAKING

Information provided in the Half yearly EC compliance report for the period of April 2023 to September 2023 in respect of Manderboni- South Samla Amalgamated UG mine of Cluster no.12 is true to the best of my knowledge.


23/11/2023
Dy. Manager (Envt.)
Pandaveswar Area


23/11/2023
Manager
Manderboni- South Samla (A) UG


23/11/2023
Dy. GM(Mining) Agent
Manderboni- South Samla (A) UG



Eastern Coalfields Limited
(A subsidiary of Coal India Limited)
Office of the Agent, Pandaveswar UG
Pandaveswar Area

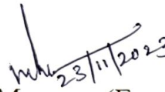
P.O. – Pandaveswar , Dist.- Paschim Bardhaman, PIN-713346


Ref. No.: ECL/PAND/AGT/PND/2023-24/


Dated: 23-11-2023

UNDERTAKING

Information provided in Half yearly EC compliance report for the period of April 2023 to September 2023 in respect of Pandaveswar UG mine under Pandaveswar-Dalurband UG&OC group of mines of Cluster no.12 is true to the best of my knowledge.


23/11/2023
Dy. Manager (Env.)
Pandaveswar Area


23/11/2023
Manager
Pandaveswar UG


23/11/23
Dy. GM(Mining)/Agent
Pandaveswar UG

EASTERN COALFIELDS LIMITED
(A Subsidiary of Coal India Limited)

Office of the Agent
Bankola Colliery




P.O. Ukhra
District : Paschim Burdwan
West Bengal-713363
CIN: U10101WB1975GOI030295
Ph.: No. 0341-2665491/492/493/494
Fax No. 0341-2665366

UNDERTAKING

Information provided in Half-yearly EC compliance report for the period April'23 to September'23 in respect of the Bankola UG of Cluster No. 12 is true to the best of my knowledge:


Agent
Bankola Colliery


Manager
Bankola Colliery

EASTERN COALFIELDS LIMITED
(A Subsidiary of Coal India Limited)

Office of the Agent
Kumardihi 'A' Colliery




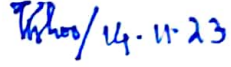
P.O. Ukhra
District : Paschim Burdwan
West Bengal-713363

CIN: U10101WB1975GOI030295
Ph.: No. 0341-2665491/492/493/494
Fax No. 0341-2665366

UNDERTAKING

Information provided in Half-yearly EC compliance report for the period April'23 to September'23 in respect of the Kumardihi 'A' UG of Cluster No. 12 is true to the best of my knowledge:


14/11/23
Agent
Kumardihi 'A' Colliery


14.11.23
Manager
Kumardihi 'A' Colliery

EASTERN COALFIELDS LIMITED

(A Subsidiary of Coal India Limited)

Office of the Agent
Nakrakonda-Kumardihi 'B' Colliery



P.O. Ukhra

District : Paschim Burdwan
West Bengal-713363

CIN: U10101WB1975GOI030295

Ph.: No. 0341-2665491/492/493/494

Fax No. 0341-2665366

UNDERTAKING

Information provided in Half-yearly EC compliance report for the period April'23 to September'23 in respect of the Nakrakonda-Kumardihi 'B' UG&OC of Cluster No. 12 is true to the best of my knowledge:

Agent
Nakrakonda-Kumardihi 'B'
Colliery

Manager
Nakrakonda-Kumardihi 'B'
Colliery



EASTERN COALFIELDS LIMITED
(A Subsidiary of Coal India Limited)

Office of the Agent
Shyamsundarpur Colliery



P.O. Ukhra

District : Paschim Burdwan
West Bengal-713363

CIN: U10101WB1975GOI030295

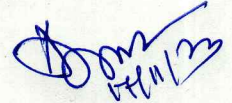
Ph.: No. 0341-2665491/492/493/494
Fax No. 0341-2665366

UNDERTAKING

Information provided in Half-yearly EC compliance report for the period April'23 to September'23 in respect of the Shyamsundarpur UG of Cluster No. 12 is true to the best of my knowledge:


Agent

Shyamsundarpur Colliery



Manager
Shyamsundarpur Colliery

EASTERN COALFIELDS LIMITED
(A Subsidiary of Coal India Limited)

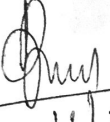
Office of the Agent
Tilaboni Colliery

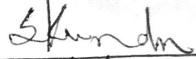


P.O. Ukhra
District : Paschim Burdwan
West Bengal-713363
CIN: U10101WB1975GOI030295
Ph.: No. 0341-2665491/492/493/494
Fax No. 0341-2665366

UNDERTAKING

Information provided in Half-yearly EC compliance report for the period April'23 to September'23 in respect of the Tilaboni UG of Cluster No. 12 is true to the best of my knowledge:


Agent
Tilaboni Colliery
11/11/23


11/11/23
Manager
Tilaboni Colliery

Half Yearly EC Compliance report Cluster No. 12 of ECL) Period:-April 2023-Sept. 2023

SPECIFIC CONDITIONS																																									
Condition (I)	Grant of EC is only for the non-forest area plus the forest area within the mining lease for which FC is available. No mining activities will be allowed in forest area for which FC is not available as per the following table:																																								
	<table border="1"> <thead> <tr> <th>S No.</th> <th>Name of Mine</th> <th>Forest Clearance Not available (Ha.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Jhanjra UGP (Expansion)</td> <td>99 Ha</td> </tr> <tr> <td>2</td> <td>Tilaboni UGP (Expansion)</td> <td>64.8 Ha</td> </tr> <tr> <td>3</td> <td>Rangamati A UGP</td> <td>91.0 Ha</td> </tr> <tr> <td>4</td> <td>Sonepur-Bazari OCP</td> <td>32.65 Ha</td> </tr> <tr> <td colspan="2">Total</td> <td>287.45 Ha</td> </tr> </tbody> </table>	S No.	Name of Mine	Forest Clearance Not available (Ha.)	1	Jhanjra UGP (Expansion)	99 Ha	2	Tilaboni UGP (Expansion)	64.8 Ha	3	Rangamati A UGP	91.0 Ha	4	Sonepur-Bazari OCP	32.65 Ha	Total		287.45 Ha																						
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4	Sonepur-Bazari OCP	32.65 Ha																																							
Total		287.45 Ha																																							
Compliance	<p>Sonepur Bazari-Stage-II Forest Clearance for 32.65 Ha Forest Land in Sonepur Bazari OCP has been obtained by MoEFCC vide reference no. 5-WBC063/2013-BHU Dated 28th March, 2017. Forest land handed over to ECL vide letter no. 01/8-3 Dated 21.07.2017.</p> <p>Jhanjra- FC of all Forest land within the leasehold boundary of Jhanjra Area has been obtained. Stage II Forest clearance has been obtained for diversion of 78 Ha forest land (vide 8-101/2014-FC dated 14th March, 2016) and renewal of lease of 90.30 Ha forest land (vide 8-68/1992-FC dated 16th August, 2016) at Jhanjra.</p> <p>Bankola- No mining activity is carried out in forest area before obtaining prior approval under FC Act 1980. At present, forest clearance of Tilaboni UG (39.98 Ha) for Stage-I FC under Process.</p>																																								
Condition (II)	The maximum production from the mine at any given time shall not exceed the limit as prescribed in the EC.																																								
Compliance	<p>The maximum production from the mine at any given time will be under the limit as prescribed in the EC. The production in FY 23-24 from the mines of Cluster 12 till 30.09.23 are as follows-</p> <table border="1"> <thead> <tr> <th>Name of mine</th> <th>EC capacity(MTPA)</th> <th>Prod. Till 30.09.2023</th> </tr> </thead> <tbody> <tr> <td>Sonepur Bazari</td> <td>12</td> <td>4.6 MTPA</td> </tr> <tr> <td>Jhanjra</td> <td>5</td> <td>1.398 MTPA</td> </tr> <tr> <td>Bankola UG</td> <td>0.3</td> <td>77482 (Te)</td> </tr> <tr> <td>Shyamsundarpur UG</td> <td>1.59</td> <td>359256(Te)</td> </tr> <tr> <td>Tilaboni UG</td> <td>2.14</td> <td>64408(Te)</td> </tr> <tr> <td>Kumardihi A UG</td> <td>0.2</td> <td>47081(Te)</td> </tr> <tr> <td>NKD-KUMB UG and OC</td> <td>4.12</td> <td>774188(Te)</td> </tr> <tr> <td>Pandaveswar-Dalurband UG &OC</td> <td>2.25</td> <td>0.276806</td> </tr> <tr> <td>Manderboni-South Samla UG</td> <td>0.28</td> <td>0.034339</td> </tr> <tr> <td>Madhaipur UG&OC</td> <td>0.65</td> <td>0.021421</td> </tr> <tr> <td>Samla UG &OC</td> <td>0.6</td> <td>nil</td> </tr> <tr> <td>Kottadih UG&OC</td> <td>2.7</td> <td>0.394626</td> </tr> </tbody> </table>		Name of mine	EC capacity(MTPA)	Prod. Till 30.09.2023	Sonepur Bazari	12	4.6 MTPA	Jhanjra	5	1.398 MTPA	Bankola UG	0.3	77482 (Te)	Shyamsundarpur UG	1.59	359256(Te)	Tilaboni UG	2.14	64408(Te)	Kumardihi A UG	0.2	47081(Te)	NKD-KUMB UG and OC	4.12	774188(Te)	Pandaveswar-Dalurband UG &OC	2.25	0.276806	Manderboni-South Samla UG	0.28	0.034339	Madhaipur UG&OC	0.65	0.021421	Samla UG &OC	0.6	nil	Kottadih UG&OC	2.7	0.394626
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Condition (III)	The validity of the EC is for the life of the mine or as specified in the EIA Notification, 2006, whichever is earlier.																																								
Compliance	Agreed.																																								
Condition (IV)	All safety measures shall be taken as per CMR, 1957 & related Circulars.																																								

Half Yearly EC Compliance report Cluster No. 12 of ECL) Period:-April 2023-Sept. 2023

Compliance	All safety measures are being taken as per CMR, 1957 and related Circulars.
Condition (V)	The production shall be within the same Mining Lease area.
Compliance	The production is within the same Mining Lease area.
Condition (VI)	Coal shall be transported by rail only. Coal transportation from mine to siding should be by conveyor belt. The loading to siding by pay loaders into railway wagons.
Compliance	<p>Complied.</p> <p>Sonepur Bazari- Coal is transported by rail through newly constructed railway siding within the mine premises of Sonepur Bazari. Rapid Loading system with Silo facility is constructed and is in operation for coal transportation and loading. Pay loaders are also used for loading into railway wagons.</p> <p>Jhanjra- Presently, Coal is transported by trucks covered by tarpaulin over black topped roads from mine to railway siding located at a distance of 4-6 kms from mine to POCP Railway Siding at Jhanjra. Construction of a dedicated railway siding at Jhanjra is under process. Estimated time of completion as per work order is 03 years. Expected date of completion is 31.12.2023. Also, the work order for construction of CHP of Capacity 5 MTY has been awarded. The construction work for CHP is under process and expected date of completion is 31.12.2023.</p> <p>Bankola- There are currently 2 nos. active railway sidings (Bankola I & Bankola II) and POCP-II siding serving for Bankola Area in Cluster 12. Coal is transported to railway sidings from the mines through dedicated black-topped road especially constructed for the purpose. Coal transportation from mine to siding is done through tarpaulin covered trucks.</p> <p>Pandaveswar- Coal from Khottadih OCP, Khottadih UGP, Dalurband OC Phase-III and Pandaveswar UG is transported by trucks covered with tarpaulin over black topped roads to Selected Samla Railway Siding, located at 1.5 to 4 kms distance from mines. Coal produced from Madhaipur UG & OC mine is transported by tarpaulin covered trucks to POCP Railway Siding which is present at a distance of 9.0 Km from Madhaipur UG&OC mine. Coal produced from Manderboni-South Samla UG is transported by tarpaulin covered trucks to POCP Railway Siding situated at a distance of 5 km from the mine.</p>
Condition (VII)	Independent network of railway siding inside cluster be developed. Railway sidings should be constructed at the earliest and till then proponent may use mechanically covered trucks for transportation of coal.
Compliance	Independent network of railway sidings have been developed within the cluster namely Bankola I & II, Purushottampur (POCP), Selected Samla and Sonepur Bazari serving to the mines in Cluster 12. Construction of a new railway siding at Jhanjra Area is under process.
Condition (VIII)	Three tier green belt shall be raised around the railway sidings and along the road sides to prevent dust and noise pollution.
Compliance	Sonepur Bazari siding- Continuous avenue plantation is being done along roadside. 9 Ha of plantation was done between NH 60 and railway siding in FY 2017-18 and 10 Ha roadside plantation was done FY 2015-16. 12 Ha plantation in around railway siding and roadside has been in the FY 2020-21. 7 Ha plantation has been done at OB dump beside new railway siding is planted in the FY 2021-2022. 400 numbers plants were planted at New CHP/ Silos in FY

Half Yearly EC Compliance report Cluster No. 12 of ECL) Period:-April 2023-Sept. 2023

	<p>2021-2022. 15 Ha plantation within the mine lease has been completed in the FY 2023-24. 5 Ha plantation along new railway siding completed in current FY.</p> <p>POCP siding catering to Pandaveswar and Jhanjra Area- POCP is bound by a wall of 10 feet height approx. Dust suppression system is installed at POCP siding. Plantation exists along the POCP Railway Siding. Also, plantation over 1 Ha. area has been carried out in the FY 2019-20 at POCP Siding. Also, a Park, namely Chandrashekhar Azad Udyan has also been developed at the POCP railway siding. Avenue plantation has been created along coal transportation road along a length of 2.5 KM in the FY 2023-24.</p> <p>Selected Samla siding of Pandaveswar Area- Selected Samla siding is bound by a wall of 10 feet height approx. Dust suppression system is installed at the siding. Plantation of 25000 saplings has been done over 10 Ha land next to the Selected Samla Railway Siding during the year 2018-19. Three tier plantations have been done over 2.5 Ha land along NH 60 in between NH60 and Bilpahari Rehabilitated Village.</p> <p>Bankola I& II sidings- Both sides of the connecting roadway are well vegetated naturally. Roadside Plantation along 5.5 km roadways has been done along coal transportation road and siding. A boundary wall is also constructed around Bankola Siding-I & Siding-II to prevent dust and noise pollution. Plantation of 1.78 km roadside completed in FY 23-24.</p>												
Condition (IX)	Stowing and depillaring shall be as per the recommendations of the DGMS.												
Compliance	Stowing and depillaring for the underground mines within the cluster is done as per the recommendations of the DGMS.												
Condition (X)	The proponent must comply with the Raniganj Action Plan. The unstable areas within the cluster will be brought under plantation after the population residing over these areas is rehabilitated under the Master plan for Raniganj Coalfield to be implemented by ADDA.												
Compliance	Agreed.												
Condition (XI)	Trees with deep rooted system should be planted so as to prevent soil erosion.												
Compliance	<p>Plantation work is being carried out each year by West Bengal Forest Department.</p> <p>Deep-rooted local mixed species such as Arjun (<i>Terminalia arjuna</i>), Sisoo (<i>Dalbergia sissoo</i>), Gama, Chhatim (<i>Alstonia scholaris</i>), Siris (<i>Albizia lebeck</i>), Krishnachura (<i>Delonix regia</i>), Radhachura (<i>Peltophorum pterocarpum</i>), Neem, Chatim, Karanj, Mehagini, Jamun, Kadam etc. are being planted to prevent soil erosion.</p>												
Condition (XII)	Proponent should plant additional 10 Ha/year over the next 10 years at various locations in the cluster.												
Compliance	<table border="1"> <thead> <tr> <th>Area name</th> <th>Year</th> <th>Plantation details</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Sonepur Bazari</td> <td>2015-16</td> <td>10 Ha road side plantation</td> </tr> <tr> <td>2017-18</td> <td>9 Ha miscellaneous</td> </tr> <tr> <td>2017-18 & 2018-19</td> <td>Plantation of vetiver (it has very deep roots) and other species by IIT Kharagpur on OB dump through a project on "Mine Site Restoration through Erosion Prevention and Soil Dump Stabilization and Development for horticulture</td> </tr> </tbody> </table>			Area name	Year	Plantation details	Sonepur Bazari	2015-16	10 Ha road side plantation	2017-18	9 Ha miscellaneous	2017-18 & 2018-19	Plantation of vetiver (it has very deep roots) and other species by IIT Kharagpur on OB dump through a project on "Mine Site Restoration through Erosion Prevention and Soil Dump Stabilization and Development for horticulture
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		and plantation for Economic post-mining land use"
	2020-21	12 Ha roadside and along railway siding. 12 Ha plantation on plain land. 8 Ha plantation on OB dump.
	2021-22	35 Ha plantation on OB dump
	2023-24	15 Ha plantation on OB dump.
Jhanjra	2019-20	10 Ha.
	2020-21	10 Ha.
	2021-22	10 Ha.
	2022-23	10 Ha. (5 Ha Miscellaneous and 5 Ha under Green India Mission)
	2023-24	15 Ha and 2.5 Km Avenue Plantation
Pandaveswar	2014-15	10 Ha at Khottadih OCP
	2015-16	20 Ha at Khottadih OCP
	2016-17	10 Ha at Khottadih OCP
	2017-18	16Ha at Khottadih OCP
	2018-19	15 Ha land
	2019-20	5Ha land
	2020-2021	plantation of 81250 nos of tree saplings has been done over 32.5 Ha land under Khottadih UG&OC
	2021-22	10 Ha backfilled land of Khottadih OCP 5 ha backfilled land of Dalurband OC Phase-III
	2022-2023	plantation of 20000 saplings of miscellaneous species has been done over 6.5 Ha and of Khottadih OCP 1.5 Ha land of Madhaipur OCP
	2023-2024	2.5 Ha OB dump land and 1 Ha roadside plantation at Khottadih OCP 2.3 km roadside plantation of miscellaneous species has been done at Manderboni-South Samla UG.
Bankola	2014-15	3 Ha at Area Office

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		2015-16	5 Ha at Kumardihi B	
		2016-17	12 Ha at Sankalpkhani	
		2020-21	10 Ha at Shyamsundarpur	
		2021-22	10.61 Ha at Shyamsundarpur and Kumardihi	
Condition (XIII)	River/Nallah shall be desilted and restored back to functional state.			
Compliance	No siltation is caused due to mining activities within the cluster to the nearby flowing Ajay River and Tumni Nallah. Garland drains and Catch drains and siltation sump of appropriate size has been constructed to arrest silt and sediment flows from soil, OB dump.			
Condition (XIV)	Wild life conservation plan be prepared and submitted to the MoEF & CC with the approval of the State Govt.			
Compliance	Final report of Wildlife Management Plan submitted to DFO Durgapur.			
Condition (XV)	Proponent shall use high resolution image of all clusters for evaluating land use, plantation etc.			
Compliance	Complied with. Satellite monitoring of Sonapur Bazari Mine is being done every year through CMPDIL.Reports are available- https://www.coalindia.in/departments/environment/environmental-policy/			
Condition (XVI)	Separate drainage pattern be provided.			
Compliance	Drains have been provided wherever required.			
Condition (XVII)	Sand stowing must be used as recommended by CMPDI.			
Compliance	Sand stowing is done as recommended by CMPDI			
Condition (XVIII)	Action plan for prevention and mitigation of subsidence be prepared and implemented.			
Compliance	Action plan for prevention and mitigation of subsidence has been prepared and implemented as per DGMS guidelines.			
Condition (XIX)	The OC patches to be operated will be completely filled-up after exhaustion of reserves and reclaimed with plantation.			
Compliance	Sonapur Bazari- OB is being concurrently backfilled into the decoaled areas. Plantation is also being done simultaneously as the dumping is completed. Total 1008.58 Ha area has been excavated till Sept. 2023 out of which backfilling is being carried out in 567.81.Plantation in 241.00 Ha area has been done on these backfilled dumps. Pandaveswar- Plantation has been done on 82 ha backfilled land.			
Condition (XX)	The OB shall be completely re-handled at the end of the mining.			
Compliance	The OB will be completely re-handled at the end of the mining.			
Condition (XXI)	There shall be no residual OB dump after the mining.			
Compliance	Noted an Agreed.			

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e													
Condition (XXII)	After completion of mining activities, the subsided areas shall be graded and planted upon.												
Compliance	Agreed.												
Condition (XXIII)	Coal Extraction shall also be optimized in areas where agricultural production is continuing. Some pillars shall be left below the agricultural land. No depillaring & coal extraction should be carried out below habitation, H.T. Lines & beneath road, water bodies.												
Compliance	Complied. No depillaring and coal extraction is being carried out below habitation, H.T. Lines & beneath road, water bodies.												
Condition (XXIV)	Rehabilitation of the households falling within this cluster to be carried out in two phases within 10 years.												
Compliance	<p>Sonepur Bazari- Phase-wise rehabilitation of the households is being carried out. Total 2069 PAFs have been shifted till now.</p> <table border="1"> <thead> <tr> <th>Sl No.</th> <th>Name of the village</th> <th>No. of PAFS (approx.)</th> <th>No. of PAFS shifted during 2020-21</th> <th>No. of PAFS shifted during 2021-22</th> <th>No. of PAFS shifted during 2022-23</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Bilpahari</td> <td>809</td> <td>395</td> <td>43</td> <td>371</td> </tr> </tbody> </table> <p>Rehabilitation done at Khottadih OCP under Pandaveswar Area is as follows: -</p> <p>There is no requirement of rehabilitation at Jhanjra and Bankola as of now.</p>	Sl No.	Name of the village	No. of PAFS (approx.)	No. of PAFS shifted during 2020-21	No. of PAFS shifted during 2021-22	No. of PAFS shifted during 2022-23	1	Bilpahari	809	395	43	371
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1	Bilpahari	809	395	43	371								
Condition (XXV)	The land excavated after mining must be brought back to original condition for agricultural/plantation purpose.												
Compliance	Agreed. Shall be done as per Mine Closure Plan.												
Condition (XXVI)	Water discharged from the mine should be as good as surface drinking water.												
Compliance	<p>Mine water discharged is used for HEMM washing, dust sprinkling etc. purposes. All the mine water is being used in the mine itself industrial purposes. No water is being discharged outside from the mine at Sonepur Bazari OC.</p> <p>Also, the discharged mine water from, other mines is treated through pressure filters and is fortnightly tested for parameters namely pH, TSS, TDS, Oil & Grease and COD and conforms to the MoEF Schedule-VI Standards.</p> <p>At Jhanjra, a part of mine water is also supplied for domestic purposes after treatment through water treatment plant and 5000 LPH Capacity RO Plant (4 nos. 1 No.each at MIC and 3-4 incline and 2 nos. at colony) .</p> <p>At Bankola, Mine discharge water is being treated in</p> <ol style="list-style-type: none"> i) Pressure filter – 1 unit each at Kumardihi ‘B’, Bankola, Shankarpur, Kumardihi ‘A’, and Tilaboni colliery. 2 units at SSP colliery. ii) Slow Sand Filter – 1 unit each at Moira Colliery, Khandra Colliery, and Area Complex. 2 units at SSP colliery. iii) Rapid Gravity Filter – 1 unit at Bankola Colliery. iv) Reverse Osmosis Plant – 1 unit each at Bankola, Colliery, Khandra Colliery, Shankarpur Colliery, and Shyamsundarpur Colliery. <p>At Pandaveswar, Mine water discharged is being treated in –</p> <ol style="list-style-type: none"> i) Pressure filters- Operating at Khottadih Colliery (UG) and Dalurband ii) Reverse osmosis plant-Functioning at Khottadih Colliery (UG) 												

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Condition (XXVII)	Final mine void 453 Ha and depth will not be more than 20-30 m. The void area will be converted into water body. The mine void should be used for pisciculture purpose.
Compliance	Agreed.
Condition (XXVIII)	Regular monitoring of subsidence movement on the surface over and around the working area and impact on natural drainage pattern, water bodies, vegetation, structure, roads, and surroundings shall be continued till movement ceases completely. In case of observation of any high rate of subsidence movement, appropriate effective corrective measures shall be taken to avoid loss of life and material. Cracks shall be effectively plugged with ballast and clayey soil/suitable material.
Compliance	Regular inspection is being carried out by the Safety committee headed by Safety Officer on the surface over and around the working area for any sign of subsidence. The underground mining is being carried out in conjunction with hydraulic sand stowing as per DGMS stipulations. Crack filling will also be carried out wherever required.
Condition (XXIX)	If subsidence is found exceeding the permitted limits, then the landowners shall be adequately compensated with mutual agreement of the landowners.
Compliance	Surface land is already acquired under CBA Act and Compensation as per Company's R&R Policy is given to the land owners prior to subsidence.
Condition (XXX)	Water sprinkling system shall be provided to check fugitive emissions from loading operations, conveyor system, haulage roads, transfer points, etc. Major approach roads shall be black topped and properly maintained.
Compliance	<p>Sonepur Bazari- Water sprinkling system has been provided to check fugitive emissions. Water sprinklers have been provided at input hopper, transfer point and discharge chutes Fixed Water sprinklers has been provided at new railway siding. Mobile sprinklers have also been provided on haulage road. Truck Mounted mist sprinkler are running within mines for dust suppression. Major approach roads are black topped. Proper maintenance of roads is done regularly. Water sprinkling on the roads is done with the help of mobile water sprinklers. Jhanjra-13 Nos Fixed water sprinklers have been installed at POCP I Railway Siding,</p> <p>Jhanjra UGP and 16 Nos Fixed water sprinklers have been installed at POCP-2 Railway Siding. Regular sprinkling of water is also carried out over the surface through fixed and 03 Nos mobile sprinklers to check fugitive emissions at Railway Siding, Transfer Points, Transport Roads etc</p> <p>Bankola- The coal transportation road from colliery to Railway Siding has been black topped in order to prevent fugitive dust emission. Water Sprinkling is being done on the approach road with Mobile Water tankers.</p> <p>Fog canon is installed at Bankola Railway siding. Regular sprinkling of water is carried out over the surface through fixed and mobile sprinklers to check fugitive emissions at Railway Siding, Fixed water sprinklers (22 nos) have been installed at Bankola I and Bankola II Railway Sidings.</p> <p>Pandaveswar- The coal transportation roads from colliery to Railway Siding are black topped and Water Sprinkling is being done on the approach road with Mobile Water tankers.Regular sprinkling of water is carried out over the surface through mobile sprinklers to check fugitive emissions at Railway Siding, Transfer Points, Haulage Roads etc.</p>
Condition (XXXI)	The CSR cost should be Rs 5 per Tonne of Coal produced which should be adjusted as per the annual inflation. Rs 1358 Lakh/annum shall be earmarked for holding medical camps from CSR fund.
Compliance	<p>As per the CSR policy of CIL, 2% of the average profit of preceding 3 years is the norms for CSR expenditure in the entire ECL command areas.</p> <p>Sonepur Bazari-</p>

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The CSR activities at Sonapur Bazari OCP are done under following heads:

- Food Distribution
- Heath Care
- Infrastructure
- Education Development
- Water Supply

Following activities are ongoing in CSR from April 2023- Sept. 2023:

1. Providing 4 no. of vehicles for transportation of villagers and school going children of Bhatmura and Madhudanga village involving a project cost of Rs. 2,691,921.00.
2. Construction of Auto Hub and Drain at Pandaveswar involving a project cost of Rs. 9,108,000.00
3. Supplying water to the 9 nos. of villages through water tanker involving a project cost of Rs. 24,09,163.00

Pandaveswar-

Details of CSR expenditure done in Pandaveswar Area is as follows-

SL No.	Year	Name of work	Expenditure in lakh Rs.
01	2016-17	construction of 1.38 Km concrete road was done inside Khottadih Village	Rs. 5748372.00.
01	2017-18	Solar Street light at Laskarbandh village	2.72 Lakh
02		Medical Activities under CSR	0.70 Lakh
01	2018-19	Construction of Boundary Wall at Gobindpur Village	16.67
02		Arrangement of Special Diet for Selected Players of ECL	1.51
03		Operational cost of MMV-6.	3.50
04		Operation of MMV-6 at 10 villages in command Areas of Pandaveswar, from 26-11-2018 to 25-03-2019	8.86
05		Health Awareness cum free Sanitary Napkin Distribution to School Girls of Rakhali Chandra Balika Vidyalaya Pandaveswar	0.34
06		Stipend for SC,ST Training	1.30
1	2019-20	Installation of Solar Street Light in Kendra(GP) & Baidyanathpur(GP)	40.0 Lakhs
2		Establishment of Mini science centre at Rakhali Chandra Balika Vidyalaya, Pandaveswar	5.0 Lakhs

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	3		Operation of Mobile Medical Van-6	25.0 Lakhs	
	1	2020-21	Distribution of food items	4.80 Lakhs	
	2		Operation of Mobile Medical Van	8.86 Lakhs	
	3		Training of 50 nos of mining sirdars of SC/ST community	0.23 Lakhs	
	1	2021-22	Installation and commissioning of water filtration plant at Sonabandhi Village under CSR scheme of ECL	95.0 Lakhs	
	1	2022-23	Distribution of National Flag	2.5 Lakhs	
Bankola Area		2022-23	Training on tailoring and jewellery maing in Ichapur panchayat	1.36 lakhs	
Jhanjra Area CSR Expenditure 2019-20					
	Sl No.	Sector	CSR Projects identified	Expenditure (in Rs. Lakhs)	Remarks
	1	Skill Development	Training of Kantha Stitch work to rural BPL women in nearby villages	2.92	Durgapur Sundaram Creative Welfare Society
	2	Healthcare	Mobile Medical Van Health Camps	80 camps	Project implemented through HQ, Around 4666 people benefitted
	3	Healthcare	Blood Donation Camp at Sirsha Village	1 camp	IQ City Narayana Hospital, Durgapur
	4	Healthcare	Cardiac Check-up camp at Jhanjra Area Hospital	1 camp	DESUN Hospital Kolkata
	5	Environment & Sustainability	Installation of Solar Street Lights 120 nos in 10 villages of Laudoha Panchayat	15.08	Direct
			TOTAL	18	
Jhanjra Area CSR Expenditure 2020-21					
	1	Healthcare	Mobile Medical Van Health Camps	77 camps	Project implemented through HQ, Around 3429 people benefitted

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	2	Healthcare	Food Packets distribution & running of Community Canteen	1	Around 300 food packets distributed. Community canteen run for 45 days.
	3	Healthcare	Purchase of Sanitizing Items as a precautionary measure to stop Covid 19 (Sodium Hypochloride and Handwash)	3	Nearby villages
			TOTAL	4	
Jhanjra Area CSR Expenditure 2021-22					
	1	Healthcare	Mobile Medical Van Health Camps	36 camps	Project implemented through HQ, Around 1923 people benefitted
	2	Rural Development	Construction of PCC Road 500 mtr at Tilaboni Village	8.05	Direct
			TOTAL	8.05	
Jhanjra Area CSR Expenditure 2022-23					
	1	National Integration	Har Ghar Tiranga	2.12	Distribution of flags to all employees and installation of flags at roof of all quarter blocks and service buildings
			TOTAL	2.12	
Condition (XXXII)	The mining in the existing mines should be phased out after expiry of the current mining lease and after reclamation of mined over area. The operating mines may be analyzed and monitored for compliance of conditions, bearing with movement of wildlife and until such time they are closed/phased out.				
Compliance	Noted and agreed. Shall be taken up as per Mine Closure Plan.				
Condition (XXXIII)	Everybody in the core area should be provided with mask for protection against fugitive dust emissions.				
Compliance	Dust masks have been provided to everybody in the core area. Protection against dust is provided as per the Regulation 143 of CMR, 2017				
Condition (XXXIV)	Dust mask to be provided to everyone working in the mining area.				
Compliance	Dust masks for protection against fugitive dust emissions have been provided to the personnel working in mining area.				
Condition (XXXV)	The supervisory staff should be held personally responsible for ensuring compulsory regarding wearing of dust mask in the core area.				

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Compliance	The Mining Sirdar & Overman are personally responsible for ensuring compulsory wearing of dust mask in the core area.
Condition (XXXVI)	People working in the core area should be periodically tested for the lung diseases and the burden of cost on account of working in the coal mine area.
Compliance	<p>PME is being carried out for all employees once in every 5 years (@ 20% employees/year). Special cases diagnosed during such PMEs are monitored at shorter intervals as directed by the PME Board of Doctors. All serious diseases and impairments are reported to DGMS at regular intervals.</p> <p>Total 228 PME/IME of departmental employees & contractual workers has been done from April 2023- Sept 2023 at Sonapur Bazari Area.</p> <p>PME of 848 employees and 108 contractual workers were conducted in Bankola Area in FY 2023-24 up to 30th September.</p> <p>PME of 854 employees were conducted in Pandaveswar Area in FY 2023-24 up to 30th September.</p>
Condition (XXXVII)	The mining area should be surrounded by green belt having thick closed thick canopy of the tree cover.
Compliance	<p>Noted and agreed.</p> <p>Plantation of 241 Ha in OB dump and 102.2 Ha at other area has been done till date. Plantation in 7.5 meter strip all along the boundary of the lease boundary within the mine lease area will be done. Rs. 1,23,75,000.00 have been deposited in Ad-hoc CAMPA A/c for this purpose. Plantation of 7.5 meter strip all along the boundary lease will be done by West Bengal Forest Department.</p>
Condition (XXXVIII)	Besides carrying out regular periodic health check-up of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, through a specialized agency /institution within the District/State and the results reported to this Ministry and to DGMS.
Compliance	<p>Complied. Besides regular periodic health checkup,10% of the workers identified from workforce engaged in active mining operations were subjected to occupational health check up by NIOH.</p> <p>In Sonapur Bazari OCP, health check-up of 81 employees were done by NIOH.</p> <p>At Jhanjra Area- health check-up of 156 employees were done by NIOH</p> <p>At Bankola Area- health check-up of 461employees were done by NIOH</p> <p>At Pandaveswar Area- health check-up of 173 employees were done by NIOH</p>
Condition (XXXIX)	The embankment constructed along the river boundary shall be of suitable dimensions and critical patches shall be strengthened by stone pitching on the river front side and stabilized with plantation so as to withstand the peak water flow and prevent mine inundation.
Compliance	There is no river boundary nearby.
Condition (XL)	There shall be no overflow of OB into the river and into the agricultural fields and massive plantation of native species shall be taken up in the area between the river and the project.
Compliance	Not applicable since there is no river nearby.

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Condition (XLI)	Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected shall be utilized for watering the mine area, roads, green belt development, etc. The drains shall be regularly desilted and maintained properly. Garland drains (size, gradient and length) and sump capacity shall be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity shall also provide adequate retention period to allow proper settling of silt material.
Compliance	<p>Catch drains are made all along the office road and Silt Settling Pond is constructed to arrest silt from soil & OB. Garland drain has been provided along the toe of the external dump for collecting and discharging rainwater from soil & OB dumps.</p> <p>Drain is being maintained properly & cleaning is being done regularly. Garland Drain is constructed keeping sufficient margin and above the peak sudden rainfall and maximum discharge. The drains are cleared of debris before the start of the monsoon season as part of annual monsoon preparation program.</p> <p>Garland drain has been constructed keeping sufficient safety margin over and above the peak sudden rainfall with an average width of 3m & average depth of 1.5 to 2.5 m at Sonepur Bazari OCP.</p> <p>Permanent masonry drains of size range 200 to 600 m, 0.90 m to 2 m and 0.6 m to 2 m depth and 1 in 30 gradients, depending on the catchment have been constructed for evacuation of rain water are present in the mines of Bankola Area. Garland drain is present at Sarpi sub-station, Sarpi pumping station, ESP pit, transformer room, incline mouth and CHP. Total length of the garland drain is about 5 km. Width of garland drains are 0.90 m while depth of the drain varies from 0.6 m to 1.5 m depending on the catchment and gradient of the drain.</p> <p>In Pandaveswar Area garland drains have been constructed at Madhaipur OC Patch, Khottadih OCP and Dalurband OC Phase-III for containment of storm water. Total length of garland drain at Khottadih OCP is about 2 km and that of Dalurband OC Phase-III is 0.5 Km. Width of garland drains are usually kept at 0.90 m while depth of the drain varies from 0.6 m to 1.5 m depending on the catchment and gradient of the drain.</p>
Condition (XLII)	Garland drains (size, gradient and length) around the safety areas such as mine shaft and low-lying areas and sump capacity shall be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine sites. Sump capacity shall also provide adequate retention period to allow proper settling of silt material.
Compliance	<p>Catch drains are made all along the office road and Silt Settling Pond is constructed to arrest silt from soil & OB. Garland drain has been provided along the toe of the external dump for collecting and discharging rainwater from soil & OB dumps.</p> <p>Drain is being maintained properly & cleaning is being done regularly. Garland Drain is constructed keeping sufficient margin and above the peak sudden rainfall and maximum discharge. The drains are cleared of debris before the start of the monsoon season as part of annual monsoon preparation program.</p> <p>Garland drain has been constructed keeping sufficient safety margin over and above the peak sudden rainfall with an average width of 3m & average depth of 1.5 to 2.5 m at Sonepur Bazari OCP.</p> <p>Permanent masonry drains of size range 200 to 600 m, 0.90 m to 2 m and 0.6 m to 2 m depth and 1 in 30 gradients, depending on the catchment have been constructed for evacuation of rain water are present in the mines of Bankola Area. Garland drain is present at Sarpi sub-station, Sarpi pumping station, ESP pit, transformer room, incline mouth and CHP. Total length of the garland drain is about 5 km. Width of garland drains are 0.90 m while depth of the drain varies from 0.6 m to 1.5 m depending on the catchment and gradient of the drain.</p>

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Condition (XLIII)	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation shall be based on the rainfall data.																
Compliance	<p>To check run-off and siltation proper benching has been done over dumps at Sonepur Bazari OCP, Khottadih OCP, Madhaipur OC Patch and Dalurband OC Phase-III while maintaining slope stability as per norms to check run-off from OB dumps. Also, regular plantation on OB dumps is carried out to stabilize the dumps and check run-off.</p> <p>Future plan for Construction of Retaining wall/ Toewall at OB dumps of OC mines under Pandaveswar Area under Cluster no. 12 is provided below:</p> <table border="1"> <thead> <tr> <th>S No</th> <th>OB dump location for construction of Toe wall</th> <th>Dimension of Toe Wall</th> <th>Year of construction</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Khottadih OB dump</td> <td>1m (high) x 0.5 m (thick)x 200 m</td> <td>2023-24</td> </tr> <tr> <td>2</td> <td>Dalurband OB dump</td> <td>1m (high) x 0.5 m (thick)x 168 m</td> <td>2023-24</td> </tr> <tr> <td>3</td> <td>Madhaipur OB dump</td> <td>1m (high) x 0.5 m (thick)x 50 m</td> <td>2023-24</td> </tr> </tbody> </table>	S No	OB dump location for construction of Toe wall	Dimension of Toe Wall	Year of construction	1	Khottadih OB dump	1m (high) x 0.5 m (thick)x 200 m	2023-24	2	Dalurband OB dump	1m (high) x 0.5 m (thick)x 168 m	2023-24	3	Madhaipur OB dump	1m (high) x 0.5 m (thick)x 50 m	2023-24
S No	OB dump location for construction of Toe wall	Dimension of Toe Wall	Year of construction														
1	Khottadih OB dump	1m (high) x 0.5 m (thick)x 200 m	2023-24														
2	Dalurband OB dump	1m (high) x 0.5 m (thick)x 168 m	2023-24														
3	Madhaipur OB dump	1m (high) x 0.5 m (thick)x 50 m	2023-24														
Condition (XLIV)	Crushers at the CHP of adequate capacity for the expansion project shall be operated with high efficiency bag filters, water sprinkling system shall be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc.																
Compliance	<p>Three (03) CHPs are present in the cluster-</p> <p>Sonepur Bazari- Water sprinklers with mist formation have been installed at input hopper, transfer point and discharge Chutes in the CHP to check fugitive emissions. New Silo with environment protection measures and sprinkling system is in operation.</p> <p>Pandaveswar- There is only one CHP existing under Pandaveswar Area which is at Khottadih Colliery and is equipped with water sprinkler to arrest fugitive emissions.</p> <p>Bankola- The CHP of Shyamsundarpur Colliery under Bankola Area is equipped with water sprinklers to arrest fugitive emissions. Sprinkling on CHP approach road is being done through mobile water sprinklers.</p>																
Condition (XLV)	Mine discharge water outside the mining lease shall be monitored, particularly for TDS and treated to conform to prescribed levels before discharge into the natural environment.																
Compliance	Regular monitoring is done by CMPDIL. Mine water discharge quality complies with prescribed standards as per General Standards for Discharge of Effluent (Schedule VI).																
Condition (XLVI)	Drills shall be wet operated.																
Compliance	<p>Wet drilling is being carried out.</p> <p>Total population of drills with such arrangement is given below:</p> <p>Model 70E – 9 (nine) nos,</p> <p>Model 650D – 4 (four) nos</p> <p>Dust guards are also provided in the drills.</p>																
Condition	The project authorities shall undertake regular repairing and tarring of roads used for mineral																

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(XLVII)	transportation. A 3-tier green belt comprising of a mix of native species shall be developed all along the major approach roads.																					
Compliance	<p>Regular repairing & maintenance of roads is being done. Tree plantation along the approach roads is being carried out. 12 Ha road side plantation of mix native species is completed along NH-60 and railway siding on the FY 2020-21. 5 Ha plantation along railway siding has been done in FY 2023-24.</p> <p>Details of Existing 3 tier plantation along roadside in Pandaveswar Area is as follows:</p> <table border="1"> <thead> <tr> <th>S No.</th> <th>Name of the Site planted</th> <th>Year of Plantation</th> <th>Area Planted</th> <th>No. of Saplings Planted</th> <th>Latitude</th> <th>Longitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Plantation over 2.50 Ha land of ECL between NH60 in Pandaveswar Area.</td> <td>2019-20</td> <td>2.50 Ha</td> <td>6250</td> <td>23.72477559</td> <td>87.22833042</td> </tr> <tr> <td>2</td> <td>Transportation road of Khottadih OCP from workshop to Khottadih C type Quarter in Pandaveswar Area.</td> <td>2020-21</td> <td>1.00 Km</td> <td>2500</td> <td>23.72044135</td> <td>87.23982604</td> </tr> </tbody> </table>	S No.	Name of the Site planted	Year of Plantation	Area Planted	No. of Saplings Planted	Latitude	Longitude	1	Plantation over 2.50 Ha land of ECL between NH60 in Pandaveswar Area.	2019-20	2.50 Ha	6250	23.72477559	87.22833042	2	Transportation road of Khottadih OCP from workshop to Khottadih C type Quarter in Pandaveswar Area.	2020-21	1.00 Km	2500	23.72044135	87.23982604
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Condition (XLVIII)	Controlled blasting shall be practiced with use of delay detonators and only during daytime. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders shall be implemented.																					
Compliance	Controlled blasting is being done with help of delay detonators (using Nonel system). Blasting is done only in day time. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders are being taken.																					
Condition (XLIX)	A Progressive afforestation plan shall be implemented covering an area of 6215.5 ha at the end of mining, which includes reclaimed external OB dump area (404.74 Ha), internal dump area (1856.54 ha), and Green belt land (364.57 ha), and in township located outside the lease by planting native species in consultation with the local DFO/Agriculture Department. The density of the trees shall be around 2500 plants per ha. Massive plantation shall be carried out in open spaces in and around the mine and a 3-tier avenue plantation along the main approach roads to the mine.																					
Compliance	<p>Sonepur Bazari- Plantation is being done on reclaimed external dumps, internal dumps, in the plain land including CHP, along the approach roads, townships etc. through Forest Department, Durgapur & Green Projects Wing. Density of the trees is maintained at 2500 plants per Ha. Total plantation in 343.20 Ha has been done till now. Details of which are given in the following table:</p> <table border="1"> <thead> <tr> <th>S No.</th> <th>Location</th> <th>Plantation</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>External OB Dumps</td> <td>69.0 Hec.</td> </tr> <tr> <td>2</td> <td>Internal OB Dumps</td> <td>172.0 Hec</td> </tr> <tr> <td>3</td> <td>Plain Land (including CHP, along approach roads etc.)</td> <td>102.2 Hec.</td> </tr> <tr> <td colspan="2">Total</td> <td>343.20 Hec</td> </tr> </tbody> </table> <p>15 Ha land on OB dumps was done in FY 2019-2020.20 Ha roadside and OB plantation was done in FY 2020-2021. 35 Ha plantation has been completed in FY 2021-2022. 15 Ha plantation in the FY 2022-23. 15 Ha plantation completed in the current FY.</p> <p>Jhanjra- A total plantation of more than 80 Ha has been carried out since 2015-16 at Jhanjra</p>	S No.	Location	Plantation	1	External OB Dumps	69.0 Hec.	2	Internal OB Dumps	172.0 Hec	3	Plain Land (including CHP, along approach roads etc.)	102.2 Hec.	Total		343.20 Hec						
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	Area up to 2023-24 in which, Plantation over 15 Ha subsidized area and 2.5 Km avenue plantation has been carried out at Jhanjra Area.		
	Pandaveswar	2014-15	10 Ha at Khottadih OCP
		2015-16	20 Ha at Khottadih OCP
		2016-17	10 Ha at Khottadih OCP
		2017-18	16Ha at Khottadih OCP
		2018-19	15 Ha land
		2019-20	5Ha land
		2020-2021	plantation of 81250 nos of tree saplings has been done over 32.5 Ha land under Khottadih UG&OC
		2021-22	10 Ha backfilled land of Khottadih OCP
			5 ha backfilled land of Dalurband OC Phase-III
		2022-2023	plantation of 20000 saplings of miscellaneous species has been done over 6.5 Ha and of Khottadih OCP
	1.5 Ha land of Madhaipur OCP		
	2023-2024	2.5 Ha OB dump land and 1 Ha roadside plantation at Khottadih OCP	
		2.3 km roadside plantation of miscellaneous species has been done at Manderboni-South Samla UG.	
	Bankola	2014-15	3 Ha at Area Office
2015-16		5 Ha at Kumardihi B	
2016-17		12 Ha at Sankalpkhani	
2020-21		10 Ha at Shyamsundarpur	
2021-22		10.61 Ha at Shyamsundarpur and Kumardihi	
Condition (L)	The proponent should prepare restoration and reclamation plan for the degraded area. The land be used in a productive and sustainable manner.		
Compliance	Being complied with. Concurrent reclamation of the decoaled area is being carried out using the land in a sustainable manner.		
Condition (LI)	Compensatory Ecological & Restoration of waste land, other degraded land and OB dumps in lieu of breaking open the land be carried out.		
Compliance	Being complied with. Compensatory Ecological & Restoration of waste land is being carried out by spreading top soil & plantation over it.		

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Condition (LII)	No groundwater shall be used for mining operations.
Compliance	Being complied with. No ground water is used for mining operations.
Condition (LIII)	Quarry area is 2325 Ha. Backfilled quarry area of 1856 Ha shall be reclaimed with plantation by planting native plant species in consultation with the local DFO/Agriculture Department. The density of trees shall be around 2500 plants per ha.
Compliance	Continuous backfilling is being done in the quarried area. At Sonapur Bazari- Total 1008.58 Ha area has been excavated till March 2023 out of which backfilling is being carried out in 567.81 Ha area. Dumps are being finally reclaimed by planting native species through Forest Department & West Bengal Wasteland Development Corporation Limited under the supervision of DFO Durgapur. Density of the trees is kept 2500 plants per Ha. Plantation in 241.0 Ha area has been done so far OB Dumps till date. Pandaveswar Area- Plantation has been done on 82 ha backfilled land.
Condition (LIV)	Regular monitoring of groundwater level and quality shall be carried out by establishing a network of existing wells and construction of new piezometers. The monitoring for quantity shall be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for quality in May. Data thus collected shall be submitted to the Ministry of Environment, Forests & Climate Change and to the Central Pollution Control Board quarterly within one month of monitoring.
Compliance	Ground water level monitoring is being done regularly by CMPDIL through piezometric borewells. Ground water quality is tested and compared to Indian Drinking Water Standard (IS-10500) by CMPDIL. Piezometer for continuous monitoring of ground water levels has also been installed.
Condition (LV)	The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource in case monitoring indicates a decline in water table. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.
Compliance	Sonapur Bazari-Rainwater Water Harvesting system is installed in Project Office of Sonapur Bazari Area and different colonies under S.B Area. Artificial water recharge system like pond has been made in nearby villages. Tanker water is provided to nearby needy villages on demand basis regularly. Financial help is also provided on opening of new wells, their maintenance and installation of hand pumps. Jhanjra Area-The total domestic water demand of Jhanjra Area is met by rainwater harvesting project at Purushottampur OCP. Rain water harvesting system has also been setup at Jhanjra Area Office, Jhanjra Guest House, Chinese Hostel and Jhanjra DAV School. The water requirement of local villages is being fulfilled by the project authorities. 4 dedicated R.O. Plant of Capacity 5000 LPH for drinking water supply has also been set up at Jhanjra. Bankola Area- Rainwater Harvesting system near- 1) SSpur Agent Office (Approximate quantity of the area covered: 1600 sqm), SSpur village at Shyamsundarpur UG. 2) Bankola Area Hospital (Approximate quantity of the area covered: 2500 sqm) under Tilaboni UG 3) Nakrakonda-Kumardihi B UG&OC - 1 nos. 4) Bankola Area Office Mine discharged water is supplied by tanker or pipeline to Ukhra village, Shankarpur Village, Kumardihi village, Lal Bangla, Shyamsundarpur village and other locations.

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	<p>Pandaveswar- Rooftop rain water harvesting system has set up at Pandaveswar Area Office premises. No declining trend has been noticed in the water table in the mines leasehold. The mine discharge is effectively being utilized to meet the domestic demands of the community thus reducing the strain on ground water resources. In Pandaveswar Area mine water is supplied to Khottadih, Aam Bagan and Dalurband villages after treatment of mine water by Pressure filters present at Khottadih and Dalurband Villages.</p>
Condition (LVI)	Sewage treatment plant shall be installed in the existing colony. ETP shall also be provided for workshop and CHP wastewater.
Compliance	<p>A Sewage Treatment Plant with capacity 600 cum/d is present at R.N. Colony of and an Effluent Treatment Plant with capacity 7200 cum/d is present at workshop for treating workshop and CHP waste water effluent.</p> <p>Oil & grease traps are present in the following mines - Bankola UG, Shyamsundarpur UG, Tilaboni UG, Nakrakonda Kumardihi B UG. Sewage generated from residential colonies goes through Septic Tank and soak pit. The feasibility study for STP conducted by IIT-ISM Dhanbad has been obtained. Construction of STP of 15 KLD capacity is in progress in Bankola Area Complex.</p> <p>Pandaveswar-Colonies under mines are situated in scattered way and at present sewage generated in the colonies goes through septic tanks. Survey work has been done for the installation of sewage treatment plant at the colony of Khottadih UG & OC and at present proposal is being prepared for the same. ETP has been constructed at Khottadih UG & OC mine for the treatment of effluent.</p>
Condition (LVII)	Land oustees shall be compensated as per the norms laid out R&R Policy of CIL or the National R&R Policy or R&R Policy of the State Government whichever is higher.
Compliance	<p>Complied with.</p> <p>Land outsees are being compensated as per the norms laid out under R&R Policy of CIL.</p>
Condition (LVIII)	For monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery (on a scale of 1: 5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in 3 years (for any one particular season which is consistent in the time series), and the report submitted to MOEF&CC and its concerned Regional office.
Compliance	Complied. Reports are available at CIL website. Link is given below- https://www.coalindia.in/departments/environment/environmental-policy/
Condition (LIX)	A detailed Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment, Forest & Climate Change within 6 months of grant of Environmental Clearance.
Compliance	MCP for all mines have been prepared and approved.
Condition (LX)	The project authorities shall in consultation with the Panchayats of the local villages and administration identify socio-economic and welfare measures under CSR to be carried out over the balance life of the mine.
Compliance	<p>Socio-economic and other welfare measures under CSR are identified in consultation with the Panchayats of the local villages and administration.</p> <p>Socio-economic study of following 07 Tribal villages has been completed :</p> <p>i) Arsola, ii) Kuchibeda, iii) Banghat iv) Bangapada v) Basak danga</p>

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	<p>vi) Nichu Basak Danga vii) Chatim Danga viii) Sonepur</p> <p>As per the revised CSR policy of CIL 2% of the average profit of preceding 3 years is the norms for CSR expenditure in the entire ECL command areas.</p>
Condition (LXI)	<p>Corporate Environment Responsibility:</p> <p>a) The Company shall have a well laid down Environment Policy approved by the Board of Directors.</p> <p>b) The Environment Policy shall prescribe for standard operating process/procedures to bring into focus any infringements/ deviation /violation of the environmental or forest norms/conditions.</p> <p>c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished.</p> <p>d) To have proper checks and balances, the company shall have a well laid down system of reporting of non-compliances /violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.</p>
Compliance	Complied.
GENERAL CONDITIONS	
Condition (I)	No. change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment, Forest & Climate Change
Compliance	Being strictly followed.
Condition (II)	No change in the calendar plan of production of quantum of mineral cost shall be made.
Compliance	Production of coal as well as OB is done as per the calendar plan.
Condition (III)	Four ambient air quality monitoring stations shall be established in the core s\zone as well as in the buffer zone for PM ₁₀ , PM _{2.5} , SO ₂ and NO _x monitoring. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months.
Compliance	Ambient air quality monitoring is being done at cluster level. 14 (fourteen) ambient air quality monitoring stations have been established within cluster 12, after detailed study of the project area and local meteorology. Quarterly monitoring is carried out on the above stations regularly through CMPDIL.
Condition (IV)	Data on ambient air quality (PM ₁₀ , PM _{2.5} , SO ₂ and NO _x) and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly submitted to the Ministry including its concerned Regional Office and to the State Pollution Control Board and the Central Pollution Control Board once in six months. Random verification Of samples through analysis from independent laboratories recognized under the EPA rules, 1986 shall be furnished as part of compliance report.
Compliance	Ambient air quality monitoring for PM ₁₀ , PM _{2.5} , SO ₂ and NO _x and heavy metals such as Hg, As, Ni, Cd, Cr is being carried out on regular basis. Monitoring data are sent to the Ministry including its concerned Regional Office and to the State Pollution Control Board and the Central Pollution Control Board once in six months with six monthly EC Compliance.
Condition (V)	Adequate measures shall be taken for control of noise levels below 85dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc

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	shall be provided with ear plugs/muffs.
Compliance	<p>Adequate measures are being taken for control of noise levels below 85 dBA in the work environment.</p> <ul style="list-style-type: none"> • All HEMM and light vehicles are provided with silencers • Noise monitoring is being carried out regularly and found to be within permissible levels. • Workers exposed to high sound levels are provide with ear muffs and their working hours are reduced to prevent long exposure time. • Periodical Medical Examinations of workers is also being carried out at 5 year intervals in which audiometric tests are carried out.
Condition (VI)	Industrial Wastewater (workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422(E) dated 19 th May 1993 and 31 st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.
Compliance	<p>Sedimentation of mine water takes place in the mine sump where sufficient retention time for siltation process is given to set down properly.</p> <p>Effluent Treatment Plant is present at workshop for treatment of waste water from workshop & CHP.</p>
Condition (VII)	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the minerals shall be covered with tarpaulins and optimally loaded.
Compliance	Vehicles are tested for proper emission standards on routine basis and reports are being maintained.
Condition (VIII)	Monitoring of environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board and data got analyzed through a laboratory recognized under EPA rules, 1986
Compliance	<p>Monitoring of environmental quality parameters is being done by RI-I, CMPDIL, who has well equipped laboratories with skilled manpower.</p> <p>List of monitoring stations in cluster 12 is being attached as annexure – I.</p>
Condition (IX)	Personnel working under dusty area shall wear protective respiratory devices and they shall also be provided with adequate training and information and information safety and health aspects.
Compliance	<p>Protective wears are being supplied and used by workmen judiciously. Adequate trainings and safety week programme are being provided to increase the awareness and to provide necessary information on safety.</p> <p>Occupational health surveillance i. e. Periodic Health Examination (PME) are being done as per norms at Central Hospital, Kalla.</p>
Condition (X)	Occupational health surveillance program of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed and records maintained thereof. The quality of Environment due to outsourcing and the health and safety issues of the outsourced manpower should be addressed by the company while outsourcing.
Compliance	<p>Regular PME/IME of employees, workers is done for any contractions due to exposure to dust and for other health related issues.</p> <p>PME of employees is being done regularly. Total 228 PME/IME of employees' departmental & contractual workers has been done from April 2023- Sept 2023.</p>
Condition (XI)	A separate environmental management cell with suitable qualified personnel shall be set up under the control of a senior executive, who will report directly to the Head of the Company.
Compliance	Environment Management Cell has been formed.

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Condition (XII)	The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this Ministry and its Regional Office.			
Compliance	The funds earmarked for environmental protection measures are kept in separate account and are not diverted for other purpose. Year-wise expenditure details of environment protection measure in Pandaveswar Area is as follows: -			
	SL No.	Year	Name of Work	Expenditure (in Rs.)
	1.	2017-18	Plantation of 40000 nos. saplings in 16 Ha Reclaimed Land at Khottadih OCP	2827200.00
	2.	2018-19	Plantation of total 37500 nos. of saplings in 10 Ha and 5 Ha land of Pandaveswar UG and Dalurband OC Phase-III respectively.	2704500.00
	3.	2019-20	Creation and maintenance of Plantation	3516105.00
	4.		Installation and commissioning of fixed water sprinkler system at SS Railway Siding under Khottadih OCP, Pandaveswar Area	1900000.00
	5.	2020-21	Plantation over 32.5 Ha land and maintenance of plantation	8246250.00
	6.		Construction of Rainwater Harvesting Structure at Khottadih Hostel, Panthnagar Hospital and at DAV School, Pandaveswar	500000.00
	7.		Construction of Oil and Grease trap at Khottadih UG	109000.00
	8.	2021-22	Plantation over 10 Ha Internal OB Dump Land under Khottadih OCP, Pandaveswar Area	2187000.00
	9.		Plantation over 5 Ha Internal OB Dump Land under Dalurband OC Phase-III, Pandaveswar Area	1093500.00
	10	2022-23	Plantation over 8 Ha land and maintenance of previous years plantation	4848553.00
	11		Dust suppression through mobile tanker	2289609.075
12	Installation and commissioning of Air pollution control Device at AB Pit of Pandaveswar UG		975769.14	

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	13	Total		2,83,70,286.215
Expenditure of Bankola Area given below-				
		Bankola Area	F/Y	Capital Expenditure
			2021-22	Rs 120.95 lac
			2022-23 (inc. liability)	Rs 88.53 lac
Condition (XIII)	The Project authorities shall advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and may also be seen at the website of the Ministry of Environment, Forest and Climate Change at http://envfor.nic.in .			
Compliance	Complied with. It has been published in two local newspapers.			
Condition (XIV)	A copy of the environmental clearance letter shall be marked to concern Panchayat/Zila Parishad, Municipal Corporation or Urban local body and local NGO, if any, from whom any suggestions/representation has been received while processing the proposal. A copy of the clearance letter shall also be displayed on Company's website.			
Compliance	Copies were made available to Panchayats/ local NGO etc. It is also made available at Area Office, Sonepur Bazari and ECL Headquarters, Sanctoria.			
Condition (XV)	A copy of the environmental clearance letter shall also be displayed on the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the regional office, District Industry Sector and Collector's Office/Tehsildar's Office for 30 days.			
Compliance	Agreed.			
Condition (XVI)	The clearance letter shall be uploaded on the Company's website. The compliance status of the stipulated environmental clearance conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same in public domain. The monitoring data of the environmental quality parameters (air, water, noise & soil) and critical pollutant such as PM ₁₀ , PM _{2.5} , SO ₂ and NO _x (ambient) and critical sectoral parameters shall also be displayed at the entrance of the project premises and mine office and in corporate office and on Company's website.			
Compliance	Being complied. The clearance letter has been uploaded on the company's website. The compliance status of the stipulated environmental clearance conditions is being regularly uploaded on the website.			
Condition (XVII)	The Project Proponent shall submit six monthly compliance reports on statue of compliance of the stipulated environmental clearance conditions (both in hard copy and in e- mail) to the respective Regional Office of the Ministry, respective Zonal Offices of CPCB and the SPCB.			
Compliance	Being complied. The six monthly compliance reports on status of compliance of the stipulated environmental clearance conditions is regularly being submitted (both in hard copy and in e-mail) to MoEF & CC RO Bhubaneswar & WBPCB.			
Condition (XVIII)	The Regional Office of the Ministry located in the Region shall monitor compliances of the stipulated conditions. The Project authorities shall extend full cooperation to the office(s) of the Regional Office by furnishing the requisite data/information/monitoring reports.			
Compliance	Noted and agreed.			

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Condition (XIX)	The environmental statement for each financial year ending 31 march in form-V is mandated to be submitted by the project proponent for the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on the Company's website along the status of the EC conditions and shall be sent to the respective Regional Offices of the MOEFCC by e-mail.
Compliance	Being complied. Environmental Statement for each financial year is being submitted regularly.

ADDITIONAL CONDITIONS

Condition (i)	Production from Jhanjra shall be increased from 3.50 MTPA to 4.0 MTPA. However, the silo loading facilities at Jhanjra should be completed within three years and the production from Jhanjra should be enhanced to 5 MTPA only after commissioning of both the new railway siding, and the silo loading facilities. Also, PP should not seek further extension and expansion without completion of this condition.
Compliance	Agreed. The production from 4 MTY to 5 MTY shall be increased only after the commissioning of new railway siding and the silo loading facility. The DPR has been approved by Eastern Railway on 05.12.2019. Further, work Order for construction of railway siding has been given to RITES Ltd on 08.01.2020 of Rs. 241.01 Crores. Expected date of completion is 31.12.2023. Also, the work order for construction of CHP of Capacity 5 MTY has been awarded to M/s Shapporji Pallonji Ltd for Rs. 233.69 Crore on 23.12.2020. Expected date of completion is 31.12.2023.
Condition (ii)	The project proponent shall obtain Consent to establish/Operate from the State Pollution Control Boards for the proposed changes in production capacity prior to commencement of the increased production.
Compliance	Consent to Establish and Consent to Operate has been granted from State Pollution Control Board.
Condition (iii)	Transportation of coal from Coal Handling Plant shall be through covered trucks.
Compliance	Transportation of Coal from Coal Handling Plant to railway siding is being done through covered trucks.
Condition (iv)	To control the production of dust at source, the crusher and in-pit belt conveyors shall be provided with mist type sprinklers.
Compliance	Water sprinklers have been provided at input hopper, transfer point and discharge chutes of Coal Handling Plant. Silo loading System is also provided with dust suppression mechanism.
Condition (v)	Mitigating measures shall be undertaken to control dust and other fugitive emissions all along the roads by providing sufficient water sprinklers. Adequate corrective measures shall be undertaken to control dust emissions, which would include mechanized sweeping, water sprinkling/mist spraying on haul roads and loading sites, long range misting/fogging arrangement, wind barrier wall and vertical greenery system, green belt, dust suppression arrangement at loading and

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	unloading points, etc																							
Compliance	<p>Mobile Water Sprinklers are available to control dust and other fugitive emissions all along the road. Plantation is being carried out each year to control dust emissions. Construction of wind barrier along new railway siding is in progress. Fixed sprinkler has been installed at railway sidings. Time bound action plan for development of 3 tier green belt and vertical greenery system in under Cluster no. 12 is tabulated below:</p> <table border="1"> <thead> <tr> <th>S No</th> <th>Activity description</th> <th>Location for plantation</th> <th>Creation year</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Development of Plantation over 2.50 Ha of dump.</td> <td>Internal OB dump of Khottadih OCP</td> <td>2023-24</td> </tr> <tr> <td>2</td> <td>Development of Plantation over plain land</td> <td>Plain land of Bilpahari rehab site.</td> <td>2023-24</td> </tr> <tr> <td>3</td> <td>Development of Plantation over 2.30 Km of avenue road</td> <td>Avenue road at Manderboni-S Samla UG</td> <td>2023-24</td> </tr> <tr> <td>4</td> <td>Construction of Vertical Green Barrier</td> <td>Select Samla Railway Siding Pandaveswar Area.</td> <td>2024-25</td> </tr> </tbody> </table>				S No	Activity description	Location for plantation	Creation year	1	Development of Plantation over 2.50 Ha of dump.	Internal OB dump of Khottadih OCP	2023-24	2	Development of Plantation over plain land	Plain land of Bilpahari rehab site.	2023-24	3	Development of Plantation over 2.30 Km of avenue road	Avenue road at Manderboni-S Samla UG	2023-24	4	Construction of Vertical Green Barrier	Select Samla Railway Siding Pandaveswar Area.	2024-25
S No	Activity description	Location for plantation	Creation year																					
1	Development of Plantation over 2.50 Ha of dump.	Internal OB dump of Khottadih OCP	2023-24																					
2	Development of Plantation over plain land	Plain land of Bilpahari rehab site.	2023-24																					
3	Development of Plantation over 2.30 Km of avenue road	Avenue road at Manderboni-S Samla UG	2023-24																					
4	Construction of Vertical Green Barrier	Select Samla Railway Siding Pandaveswar Area.	2024-25																					
Condition (vi)	Continuous monitoring of occupational safety and other health hazards, and the corrective actions need to be ensured.																							
Compliance	Continuous monitoring of occupational safety and other health hazards is done. Monthly PME is done for this purpose for departmental as well as contractual workers for all the mines in the cluster.																							
Condition (vii)	Persons of nearby villages shall be given training on livelihood and skill development to make them employable.																							
Compliance	<p>Persons from nearby villages were trained for AC repairing, electrical fittings and automobile repairing to make them employable. Also, the following trainings have been given- the details of which is as follows-</p> <table border="1"> <thead> <tr> <th>SL No.</th> <th>Year of Skill Development training</th> <th>Institute at which training given</th> <th>No. of candidates participated from the nearby villages of Pandaveswar Area</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>2015-16</td> <td>CIPET, Bhubaneswar</td> <td>40</td> </tr> <tr> <td>02</td> <td>2021-22</td> <td>CIPET, Haldia</td> <td>40</td> </tr> </tbody> </table>				SL No.	Year of Skill Development training	Institute at which training given	No. of candidates participated from the nearby villages of Pandaveswar Area	01	2015-16	CIPET, Bhubaneswar	40	02	2021-22	CIPET, Haldia	40								
SL No.	Year of Skill Development training	Institute at which training given	No. of candidates participated from the nearby villages of Pandaveswar Area																					
01	2015-16	CIPET, Bhubaneswar	40																					
02	2021-22	CIPET, Haldia	40																					
Condition	Thick green belt of adequate width at the final boundary in the down wind direction of the																							

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(viii)	project site shall be developed to mitigate/check the dust pollution.
Compliance	Plantation is being done on reclaimed external dumps, internal dumps, in the plain land including CHP, along the approach roads, townships etc. through Forest Department, Durgapur & Green Projects Wing. Density of the trees is maintained at 2500 plants per Ha. Thick Plantation has been created in and around mine lease area.
Condition (ix)	Efforts shall be made for utilizing alternate sources of surface water, abandoned mines or else whatsoever and thus minimizing the dependability on a single source.
Compliance	Water is utilized from discharge from running UG mines namely Khottadih UG, Madhaipur UG and Purushottampur abandoned OC mine and Ramnagar abandoned UG mine.
Condition (x)	Distance from the mine and OB Dump shall be 150 m away from river all along the bank of river.
Compliance	Complied. Ajay river is the nearest river which is 150m away from the mines of cluster.
Condition (xi)	Continuous monitoring of occupational safety and other health hazards, and the corrective actions need to be ensured.
Compliance	Monthly PME/IME is done for departmental as well as contractual workers.
Condition (xii)	A third-party assessment of EC compliance shall be undertaken once in three years through reputed Government Institutes or any other expert agency identified by the Ministry.
Compliance	Third Party EC compliance has been undertaken at Sonepur Bazari Area by Indian Council of Forestry Research and Education. EC Compliance assessment through third party will be done in respect of mines under Pandaveswar Area, Jhanjra Area and Bankola Area and the report will be submitted to Regional office.
Condition (xiii)	Active OB Dump should not be kept barren/open and should be covered by temporary grass to avoid air born of particles
Compliance	Active OB Dump is being covered with Saccharum spontaneum (Kans Grass) to avoid air born of particles.
Condition (xiv)	Project proponent to plant 100,000 nos. of native trees with broad leaves along the villages and 50,000 nos of native trees along transportation route to prevent the effect of air pollution in 2 years. After completion of tree plantation, number of trees shall be duly endorsed from District Forest Officer and Ministry's Regional Office.
Compliance	9 Ha (22,500 nos) plantation in FY 2017-2018 in between new railway siding and NH 60 and 12 Ha (30,000 nos) plantation along road and new railway siding has been carried out in FY 2020-2021. 400 nos plantation were carried out along New CHP/Silos in FY 2021-2022. 5Ha area (12500 Nos) trees planted in the FY 2023-24 along the railway siding. In Pandaveswar Area, during the year 2021-22, 25000 nos of native tree species have been planted along Bilpahari Village nearby Khottadih OCP and 2500 nos of native tree species have been planted along the coal transportation road of Khottadih OCP during 2020-21. During the

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	year 2022-23, plantation of 20000 saplings of miscellaneous species has been done over 6.5 Ha and 1.5 Ha land of Khottadih OCP and Madhaipur OCP respectively. During the year 2023-24, a total of 6070 nos of native tree saplings have been planted at different locations of Pandaveswar Area.
Condition (xv)	Project Proponent shall obtain blasting permission from DGMS for conducting mining operation near villages and also explore deployment of rock breakers of suitable capacity in the project to avoid blasting very near to villages. There shall be no damages caused to habitation/structures due to blasting activity.
Compliance	Blasting permission have been obtained from DGMS for conducting mining operation near villages for the mines.
Condition (xvi)	The Project Proponent shall complies with all the statutory requirements and judgment of Hon’ble Supreme Court dated the 2nd August 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors. State Government shall ensure that the entire compensation levied, if any, for illegal mining paid by the Project Proponent through their respective Department in strict compliance of judgment of Hon’ble Supreme Court dated the 2 nd August 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors.
Compliance	Noted and Agreed.
Condition (xvii)	Proponent shall appoint an Occupational Health Specialist for Regular and Periodical medical examination of the workers engaged in the Project and maintain records accordingly; also, Occupational health check-ups for workers having some ailments like BP, diabetes, habitual smoking, etc. shall be undertaken once in six months and necessary remedial/preventive measures taken accordingly. The Recommendations of National Institute for ensuring good occupational environment for mine workers shall be implemented; The prevention measure for burns, malaria and provision of anti-snake venom including all other paramedical safeguards may be ensured before initiating the mining activities.
Compliance	Periodic Medical Examination is being carried out each month for both contractual and departmental workers involved in active mining.
Condition (xviii)	Project Proponent shall follow the mitigation measures provided in Office Memorandum No. Z-11013/57/2014-IA. II (M), dated 29th October, 2014, titled “Impact of mining activities on Habitations-Issues related to the mining Projects wherein Habitations and villages are the part of mine lease areas or Habitations and villages are surrounded by the mine lease area”.
Compliance	Noted and agreed all conditions under office Memorandum No. Z- 11013/57/2014-IA. II (M), dated 29th October, 2014 will be strictly followed.
Condition (xix)	The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right for darkness and minimal noise levels at night. PPs must ensure that the biological clock of the villages is not disturbed; by orienting the floodlights/ masks away from the villagers and keeping the noise levels well within the prescribed limits for day light/night hours.

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Condition (xix)	Mine is away from village, while working at night it is kept in mind that illumination and sound at night don't disturb both human and animal population. Industrial Noise level is measured each month by CMPDIL which indicates noise level is well below prescribed limit.
Condition (xx)	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna, if any, spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. A copy of action plan shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office.
Compliance	Work Order of Wild Life Management Plan for Raniganj coalfield has been submitted to DFO, Durgapur. Also, a wildlife plan is prepared by Divisional Forest Officer, Durgapur and is being implemented at Jhanjra at a cost of Rs. Rs. 53,64,500/-. The amount has already been deposited to adhoc CAMPA.
Condition (xxi)	Honorable Supreme Court in an Writ Petition(s) Civil No. 114/2014, Common Cause vs Union of India & Ors vide its judgement dated 8th January, 2020 has directed the Union of India to impose a condition in the mining lease and a similar condition in the environmental clearance and the mining plan to the effect that the mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. Compliance of this condition after the mining activity is over at the cost of the mining lease holders/Project Proponent". The implementation report of the above said condition shall be sent to the Regional Office of the MoEFCC.
Compliance	Noted and Agreed.

Jhanjra UG – EC Compliance dated 3rd March, 2016

Condition	The silo loading facilities at Jhanjra Should be completed within three years, and the production from Jhanjra should be enhanced to 5 MTPA only after the commission both of the new railway siding, and the silo loading facilities
Compliance	Agreed. The production from 4 MTY to 5 MTY shall be increased only after the commissioning of new railway siding and the silo loading facility. The DPR has been approved by Eastern Railway on 05.12.2019. Further, work Order for construction of railway siding has been given to RITES Ltd on 08.01.2020 of Rs. 241.01 Crores. Expected date of completion is 31.12.2023. Also, the work order for construction of CHP of Capacity 5 MTY has been awarded to M/s Shapporji Pallonji Ltd for Rs. 233.69 Crore on 23.12.2020. Expected date of completion is 31.12.2023.
Condition	In view of high levels of PM10 around Basabdaga and some other villages, immediate steps should be taken to make water sprinkling arrangements and to provide an adequate and effective green belt around these villages, so that the PM 10 levels are reduced

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Compliance	Regular water sprinkling is done at transportation roads, coal handling points, sidings etc for dust suppression within the cluster. .
Condition	After a period of six months from the date of issue of the amended EC, the PP shall report to the ministry the implementation status of the control measures mentioned at (ii) above, and the data on air quality as a result of the control measured taken till that time
Compliance	Agreed.

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**ENVIRONMENT MONITORING REPORT
OF
CLUSTER NO. 12**

(FOR THE MONTH OF APRIL, 2023)

**(BANKOLA, JHANJRA, PANDVESHWAR
AND SONEPUR BAZARI AREA)**

Eastern Coalfields Limited



cmpdi
A Mini Ratna Company

**Regional Institute-1
Asansol (WB)**



cmpdi
A Mini Ratna Company

ISO 9001: 2015 Certified Company
Environment Laboratory, CMPDIL, RI-I, Asansol

CHAPTER - I

INTRODUCTION

- 1.0 The environmental monitoring has been carried out as per conditions laid down by MoEF&CC while granting environmental clearance to different projects. CMPDIL has trained manpower and well equipped laboratory to carry out monitoring, analysis and R&D work in the field of environment. Reports have been prepared for submission to MoEF&CC, SPCB and other statutory authorities.



CHAPTER-II AMBIENT AIR QUALITY MONITORING

2.0 Ambient air quality sampling stations: Ambient air quality monitoring stations have been classified in to residential and industrial based on their locations in different clusters of mines. The following sampling stations have been selected to monitor the ambient air quality in cluster no. 12:

- i) **Agent office, Kottadih OCP (12A1):** The sampler was placed at agent office of Kottadih OCP. This site was selected to assess the present ambient air quality status in core zone of Kottadih OCP.
- ii) **Kumardihi A colliery store (12A2):** The sampler was placed at store office of Kumardihi colliery. This station was selected to assess the ambient air quality in the core zone where mining activities are in progress.
- iii) **Danya village (12A3):** The air sampler was placed at Danya village to assess the present ambient air quality status in residential area.
- iv) **Durga mandir, Charai village (12A7):** The sampler was placed Durga mandir of Chrai village. This site was selected to assess the present ambient air quality status.
- v) **Dispensary of Konda village (12A8):** The sampler was placed at Konda Dispensary to assess the present ambient air quality status.
- vi) **Chapla village (12A9):** The sampler was placed at Chapla village to assess the present ambient air quality status.
- vii) **Dalurband colliery office (12A10):** The sampler was placed at agent office of Dalurband colliery. This station was selected to assess the ambient air quality in the core zone where mining activities are in progress.
- viii) **Manderboni colliery office near railway siding (12A11):** The sampler was placed at pit office of Manderboni colliery. This station was selected to assess the ambient air quality in the core zone where mining activities are in progress.
- ix) **Pandaveshwar pit office near railway siding (12A12):** The sampler was placed at pit office of Pandaveshwar colliery. This station was selected to assess the ambient air quality in the core zone where mining activities are in progress.
- x) **Managers' office Madhaipur colliery near railway siding (12A13):** The sampler was placed at Managers' Office of Madhaipur Colliery. This station was selected to assess the ambient air quality in the core zone where mining activities are in progress.
- xi) **Bankola workshop near railway siding (12A14):** The sampler was placed at Bankola workshop. This station was selected to assess the ambient air quality in the core zone.

2.1 Methodology of sampling and analysis: The air quality sampling stations have been chosen keeping in view predominant wind direction and have been classified as permanent, pre monsoon (April – September) & post monsoon (October – March) air sampling stations. Particulate Matter (PM₁₀), Fine Particulate Matter (PM_{2.5}), Suspended Particulate Matter (SPM), Sulphur Dioxide (SO₂) and Oxides of Nitrogen (NO_x) are monitored on fortnight basis. A few polluted sampling stations are monitored twice in week. Heavy metals like Arsenic (As), Cadmium (Cd), Chromium (Cr), Mercury (Hg), Nickel (Ni) and Lead (Pb) are monitored half yearly.

The Respirable Suspended Particulate Matter (RSPM) Sampler & PM_{2.5} Sampler machines are used for sampling of ambient air. The samples are collected and transported to Environmental Laboratory of CMPDI, RI-I, Asansol for analysis work.

2.2 Results & Interpretations: The observed value of Suspended Particulate Matter (SPM) varies from 249.4 to 542.6 µg/m³ in industrial areas. The observed value of Particulate Matter (PM₁₀) varies from 168.1 to 447.8 µg/m³ in industrial areas & from 136.9 to 269.6 µg/m³ in residential areas. The observed value of Fine Particulate Matter (PM_{2.5}) varies from 44.6 to 76.6 µg/m³ in industrial area & from 36.5 to 54.9 µg/m³ in residential area. The observed value of Sulphur Dioxide (SO₂) has been found below 10 µg/m³ in industrial areas & in residential areas. The observed value of Oxides of Nitrogen (NO_x) varies from 18.0 to 39.0 µg/m³ in industrial areas & from 14.0 to 22.0 µg/m³ in residential areas.



AMBIENT AIR QUALITY DATA

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

First fortnight:

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
12A1	Agent office, Kottadih OCP	Industrial	13-Apr-23	SPM	542.6	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	447.8	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	76.6	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	21.0	IS 5182 (Part 6): 2006	10
12A2	Kumardihi A colliery store	Industrial	12-Apr-23	SPM	449.2	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	354.7	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	75.9	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	26.0	IS 5182 (Part 6): 2006	10
12A3	Danya village	Residential	12-Apr-23	PM ₁₀	148.2	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	40.6	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	17.0	IS 5182 (Part 6): 2006	10
12A7	Durga mandir, Charai village	Residential	13-Apr-23	PM ₁₀	143.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	40.9	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	22.0	IS 5182 (Part 6): 2006	10
12A8	Dispensary of Konda village	Residential	13-Apr-23	PM ₁₀	269.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	54.9	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	20.0	IS 5182 (Part 6): 2006	10
12A9	Chapla village	Residential	12-Apr-23	PM ₁₀	136.9	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	38.4	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	22.0	IS 5182 (Part 6): 2006	10
12A10	Dalurband colliery office	Industrial	13-Apr-23	SPM	442.6	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	340.5	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	72.3	IS 5182 (Part 24): 2019	2.0



Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	35.0	IS 5182 (Part 6): 2006	10
12A13	Managers' office Madhaipur colliery near railway siding	Industrial	13-Apr-23	SPM	307.2	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	218.1	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	59.8	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	34.0	IS 5182 (Part 6): 2006	10
12A14	Bankola workshop near railway siding	Industrial	11-Apr-23	SPM	426.9	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	344.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	65.1	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	39.0	IS 5182 (Part 6): 2006	10

Second fortnight:

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
12A1	Agent office, Kottadih OCP	Industrial	20-Apr-23	SPM	498.5	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	402.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	74.1	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	18.0	IS 5182 (Part 6): 2006	10
12A2	Kumardihi A colliery store	Industrial	20-Apr-23	SPM	377.4	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	294.2	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	53.2	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	23.0	IS 5182 (Part 6): 2006	10
12A3	Danya village	Residential	20-Apr-23	PM ₁₀	150.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	41.8	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	14.0	IS 5182 (Part 6): 2006	10
12A7	Durga mandir, Charai village	Residential	20-Apr-23	PM ₁₀	146.4	IS 5182 (Part 23): 2006	3.5



Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
				PM _{2.5}	43.4	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	17.0	IS 5182 (Part 6): 2006	10
12A8	Dispensary of Konda village	Residential	20-Apr-23	PM ₁₀	234.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	49.8	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	18.0	IS 5182 (Part 6): 2006	10
12A9	Chapla village	Residential	20-Apr-23	PM ₁₀	139.2	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	36.5	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	20.0	IS 5182 (Part 6): 2006	10
12A10	Dalurband colliery office	Industrial	19-Apr-23	SPM	429.5	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	332.2	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	74.8	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	30.0	IS 5182 (Part 6): 2006	10
12A13	Managers' office Madhaipur colliery near railway siding	Industrial	19-Apr-23	SPM	305.4	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	224.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	57.2	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	24.0	IS 5182 (Part 6): 2006	10
12A14	Bankola workshop near railway siding	Industrial	19-Apr-23	SPM	494.3	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	400.1	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	68.2	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	34.0	IS 5182 (Part 6): 2006	10



Twice in a week Monitoring

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
12A11	Manderboni colliery office near railway siding	Industrial	6-Apr-23	SPM	248.6	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	189.5	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	33.5	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	34.0	IS 5182 (Part 6): 2006	10
			7-Apr-23	SPM	276.3	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	206.7	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	48.6	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	30.0	IS 5182 (Part 6): 2006	10
			13-Apr-23	SPM	356.9	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	293.4	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	45.0	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	35.0	IS 5182 (Part 6): 2006	10
			14-Apr-23	SPM	286.9	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	217.3	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	45.9	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	30.0	IS 5182 (Part 6): 2006	10
			20-Apr-23	SPM	328.6	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	245.2	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	57.1	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	26.0	IS 5182 (Part 6): 2006	10
			21-Apr-23	SPM	303.5	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	231.8	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	45.9	IS 5182 (Part 24): 2019	2.0
SO ₂	BDL	IS 5182 (Part 2): 2001		10			
NO _x	28.0	IS 5182 (Part 6): 2006		10			
27-Apr-23	SPM	256.2	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	170.6	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	61.1	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	31.0	IS 5182 (Part 6): 2006	10			
28-Apr-23	SPM	204.8	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	119.6	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	59.7	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	31.0	IS 5182 (Part 6): 2006	10			

*BDL- Below Detection Limit.



Twice in a week Monitoring

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
12A12	Pandaveshwar pit office near railway siding	Industrial	6-Apr-23	SPM	366.5	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	288.0	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	56.7	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	39.0	IS 5182 (Part 6): 2006	10
			7-Apr-23	SPM	346.7	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	272.8	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	55.3	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	36.0	IS 5182 (Part 6): 2006	10
			13-Apr-23	SPM	429.2	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	353.0	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	54.3	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	37.0	IS 5182 (Part 6): 2006	10
			14-Apr-23	SPM	391.5	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	307.2	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	52.6	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	33.0	IS 5182 (Part 6): 2006	10
			20-Apr-23	SPM	323.8	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	248.3	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	47.5	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	29.0	IS 5182 (Part 6): 2006	10
			21-Apr-23	SPM	328.6	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	252.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	49.3	IS 5182 (Part 24): 2019	2.0
SO ₂	BDL	IS 5182 (Part 2): 2001		10			
NO _x	37.0	IS 5182 (Part 6): 2006		10			
27-Apr-23	SPM	268.5	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	195.5	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	45.8	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	32.0	IS 5182 (Part 6): 2006	10			
28-Apr-23	SPM	314.6	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	229.2	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	62.7	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	32.0	IS 5182 (Part 6): 2006	10			

*BDL- Below Detection Limit.



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Environmental Standards for Ambient Air Quality (AAQ):

Environmental standard for Raniganj Coalfield vide MOEF, Govt. of India, Gazette Notification No. GSR 742 (E) dated 25.09.2000 for 24 hourly samples at 500 meters from dust generating point					National Ambient Air Quality Standards (NAAQS), 2009 for industrial, residential and rural areas for 24 hours samples				
Pollutant Concentration ($\mu\text{g}/\text{m}^3$)					Pollutant Concentration ($\mu\text{g}/\text{m}^3$)				
SPM	PM ₁₀	PM _{2.5}	SO ₂	NO _x	SPM	PM ₁₀	PM _{2.5}	SO ₂	NO _x
600.0	300.0	Not Specified	120.0	120.0	Not Specified	100.0	60.0	80.0	80.0



CHAPTER – III WATER QUALITY MONITORING

3.1 Mine water sampling stations:

- i) **Pandaveswar UG (12MW1):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.
- ii) **Dalurband OC Phase-III (12MW2):** This location has been selected to monitor the discharge quality of mine effluent used for sprinkling at road and mining area
- iii) **Manderboni UG (12MW3):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams.
- iv) **South Samla UG (12MW4):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams.
- v) **Madhaipur UG (12MW5):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.
- vi) **Sonepur Bazari OC (12MW6):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after siltation pond.
- vii) **Kumardihi B UG (12MW7):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank
- x) **Jhanjra UG (12MW10):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.
- x) **Tilaboni UG (12MW11):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank
- xi) **Shyamsundarpur UG (12MW12):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.
- xii) **Bankola UG (12MW13):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams
- xiii) **Kottadih UG & OC (12MW14):** This location has been selected to monitor the discharge quality of mine effluent use for boiler and remaining discharge to natural surface streams after sedimentation tank.
- xiv) **Kumardihi A UG (12MW15):** This location has been selected to monitor the discharge quality of mine effluent use for boiler and remaining discharge to natural surface streams after sedimentation tank.
- xv) **Madhaipur OC (12MW16):** This location has been selected to monitor the discharge quality of mine effluent discharge to natural surface streams.

3.2 Methodology of sampling and analysis: The water samples are collected as per standard practice and transported to environment laboratory for analysis work.
The mine water samples are collected and analysed for five parameters on fortnightly basis except during the month of March and September when mine water samples are analysed for 29 parameters. The ground water samples were collected and analysed for 26 parameters during the month of May. Drinking water samples are collected and analysed during the month of March and September. Water samples from filter plants are collected and analysed quarterly in the month of June, September, December and March.

3.3 Results & Interpretations: The results are given in tabular form along with the applicable standards. Results are compared with General Standards for Discharge of Effluent (Schedule VI) in case of effluent/mine water sample and compared with IS.10500: 2012 in case of drinking/ground water samples.



First fortnight:

Sl. No	Parameters	Analytical results (mg/l)					General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)	
		Station Code	12MW1	12MW2	12MW3	12MW4				12MW5
		Date of sampling	14-Apr-23	14-Apr-23	14-Apr-23	15-Apr-23				14-Apr-23
1	pH value	7.81	8.22	8.14	7.85	7.59	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0	
2	TSS	BDL	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0	
3	TDS	407	251	518	632	417	Not specified	IS 3025 (Part 16): 1984	25.0	
4	Oil & Grease	BDL	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0	
5	COD	8	24	12	8	16	250	APHA 5220C Closed Reflux	4.0	

Sl. No	Parameters	Analytical results (mg/l)					General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)	
		Station Code	12MW6	12MW7	12MW10	12MW11				12MW12
		Date of sampling	13-Apr-23	13-Apr-23	15-Apr-23	15-Apr-23				15-Apr-23
1	pH value	7.63	7.42	7.67	8.02	8.18	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0	
2	TSS	BDL	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0	
3	TDS	432	547	526	242	507	Not specified	IS 3025 (Part 16): 1984	25.0	
4	Oil & Grease	BDL	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0	
5	COD	8	12	8	12	16	250	APHA 5220C Closed Reflux	4.0	



Sl. No.	Parameters	Analytical results (mg/l)				General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
		12MW13	12MW14	12MW15	12MW16			
		Station Code	Date of sampling	15-Apr-23	15-Apr-23			
1	pH value	8.05	7.69	7.69	8.23	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0
2	TSS	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0
3	TDS	374	513	548	414	Not specified	IS 3025 (Part 16): 1984	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0
5	COD	20	12	8	16	250	APHA 5220C Closed Reflux	4.0

*BDL-Below Detection Limit

All values are expressed in mg/l except pH.

Second fortnight:

Sl. No	Parameters	Analytical results (mg/l)					General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
		12MW1	12MW2	12MW3	12MW4	12MW5			
		Station Code	Date of sampling	25-Apr-23	25-Apr-23	25-Apr-23			
1	pH value	7.83	7.89	7.97	7.58	7.59	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0
2	TSS	BDL	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0
3	TDS	418	240	526	638	405	Not specified	IS 3025 (Part 16): 1984	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0
5	COD	8	16	20	12	12	250	APHA 5220C Closed Reflux	4.0



Sl. No.	Parameters	Analytical results (mg/l)					General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
	Station Code	12MW6	12MW7	12MW10	12MW11	12MW12			
	Date of sampling	25-Apr-23	28-Apr-23	27-Apr-23	27-Apr-23	25-Apr-23			
1	pH value	8.01	7.38	7.66	7.69	8.02	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0
2	TSS	BDL	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0
3	TDS	446	456	519	252	543	Not specified	IS 3025 (Part 16): 1984	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0
5	COD	8	8	12	16	16	250	APHA 5220C Closed Reflux	4.0

Sl. No.	Parameters	Analytical results (mg/l)				General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
	Station Code	12MW13	12MW14	12MW15	12MW16			
	Date of sampling	28-Apr-23	25-Apr-23	28-Apr-23	28-Apr-23			
1	pH value	8.21	7.68	7.89	8.17	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0
2	TSS	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0
3	TDS	360	508	493	405	Not specified	IS 3025 (Part 16): 1984	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0
5	COD	16	20	12	8	250	APHA 5220C Closed Reflux	4.0

*BDL-Below Detection Limit.

All values are expressed in mg/l except pH.

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**ENVIRONMENT MONITORING REPORT
OF
CLUSTER NO. 12**

(FOR THE MONTH OF MAY, 2023)

**(BANKOLA, SONEPUR BAZARI,
PANDAVESWAR & JHANJHRA AREA)**

Eastern Coalfields Limited



cmpdi
A Mini Ratna Company

**Regional Institute-1
Asansol (WB)**



cmpdi
A Mini Ratna Company

ISO 9001: 2015 Certified Company
Environment Laboratory, CMPDIL, RI-I, Asansol

CHAPTER - I

INTRODUCTION

1.0 The environmental monitoring has been carried out as per conditions laid down by MoEF&CC while granting environmental clearance to different projects. CMPDIL has trained manpower and well equipped laboratory to carry out monitoring, analysis and R&D work in the field of environment. Reports have been prepared for submission to MoEF&CC, SPCB and other statutory authorities.



CHAPTER-II AMBIENT AIR QUALITY MONITORING

2.0 Ambient air quality sampling stations: Ambient air quality monitoring stations have been classified in to residential and industrial based on their locations in different clusters of mines. The sampling stations are as described below:

- i) **Agent office, Kottadih OCP (12A1):** The sampler was placed at agent office of Kottadih OCP. This site was selected to assess the present ambient air quality status in core zone of Kottadih OCP.
- ii) **Kumardihi A colliery store (12A2):** The sampler was placed at store office of Kumardihi colliery. This station was selected to assess the ambient air quality in the core zone where mining activities are in progress.
- iii) **Danya village (12A3):** The air sampler was placed at Danya village to assess the present ambient air quality status in residential area.
- iv) **Durga mandir, Charai village (12A7):** The sampler was placed Durga mandir of Charai village. This site was selected to assess the present ambient air quality status.
- v) **Dispensary of Konda village (12A8):** The sampler was placed at Konda Dispensary to assess the present ambient air quality status.
- vi) **Chapla village (12A9):** The sampler was placed at Chapla village to assess the present ambient air quality status.
- vii) **Dalurband colliery office (12A10):** The sampler was placed at agent office of Dalurband colliery. This station was selected to assess the ambient air quality in the core zone where mining activities are in progress.
- viii) **Manderboni colliery office near railway siding (12A11):** The sampler was placed at pit office of Manderboni colliery. This station was selected to assess the ambient air quality in the core zone where mining activities are in progress.
- ix) **Pandaveshwar pit office near railway siding (12A12):** The sampler was placed at pit office of Pandaveshwar colliery. This station was selected to assess the ambient air quality in the core zone where mining activities are in progress.
- x) **Managers' office Madhaipur colliery near railway siding (12A13):** The sampler was placed at Managers' Office of Madhaipur Colliery. This station was selected to assess the ambient air quality in the core zone where mining activities are in progress.
- xi) **Bankola workshop near railway siding (12A14):** The sampler was placed at Bankola workshop. This station was selected to assess the ambient air quality in the core zone.

2.1 Methodology of sampling and analysis: The air quality sampling stations have been chosen keeping in view predominant wind direction and have been classified as permanent, pre monsoon (April – September) & post monsoon (October – March) air sampling stations. Particulate Matter (PM₁₀), Fine Particulate Matter (PM_{2.5}), Sulphur Dioxide (SO₂) and Oxides of Nitrogen (NO_x) are monitored on fortnight basis. Heavy metals like Arsenic (As), Cadmium (Cd), Chromium (Cr), Mercury (Hg), Nickel (Ni) and Lead (Pb) are monitored half yearly.

The Respirable Suspended Particulate Matter (RSPM) Sampler & PM_{2.5} Sampler machines are used for sampling of ambient air. The samples are collected and transported to Environmental Laboratory of CMPDI, RI-I, Asansol for analysis work.

2.2 Results & Interpretations: The observed value of Suspended Particulate Matter (SPM) varies from 192.8 to 410.3 µg/m³ in industrial areas. The observed value of Particulate Matter (PM₁₀) varies from 138.9 to 304.8 µg/m³ in industrial areas & from 134.6 to 227.4 µg/m³ in residential areas. The observed value of Fine Particulate Matter (PM_{2.5}) varies from 25.8 to 74.2 µg/m³ in industrial area & from 32.9 to 47.2 µg/m³ in residential area. The observed value of Sulphur Dioxide (SO₂) has been found to be below 10 µg/m³ in both industrial & residential areas. The observed value of Oxides of Nitrogen (NO_x) varies from 20.0 to 36.0 µg/m³ in industrial areas & from 16.0 to 25.0 µg/m³ in residential areas.



AMBIENT AIR QUALITY DATA

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

First fortnight:

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
12A1	Agent office, Kottadih OCP	Industrial	15-May-23	SPM	354.6	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	270.7	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	62.5	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	20.0	IS 5182 (Part 6): 2006	10
12A2	Kumardihi A colliery store	Industrial	02-May-23	SPM	244.3	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	160.3	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	55.3	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	26.0	IS 5182 (Part 6): 2006	10
12A3	Danya village	Residential	08-May-23	PM ₁₀	147.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	40.4	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	16.0	IS 5182 (Part 6): 2006	10
12A7	Durga mandir, Charai village	Residential	08-May-23	PM ₁₀	142.8	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	38.6	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	19.0	IS 5182 (Part 6): 2006	10
12A8	Dispensary of Konda village	Residential	08-May-23	PM ₁₀	227.4	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	46.4	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	16.0	IS 5182 (Part 6): 2006	10
12A9	Chapla village	Residential	08-May-23	PM ₁₀	134.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	34.8	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	25.0	IS 5182 (Part 6): 2006	10
12A10	Dalurband colliery office	Industrial	12-May-23	SPM	324.3	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	235.4	IS 5182 (Part 23): 2006	3.5



Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
				PM _{2.5}	67.8	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	27.0	IS 5182 (Part 6): 2006	10
12A13	Managers' office Madhaipur colliery near railway siding	Industrial	12-May-23	SPM	235.2	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	164.7	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	33.4	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	33.0	IS 5182 (Part 6): 2006	10
12A14	Bankola workshop near railway siding	Industrial	02-May-23	SPM	254.3	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	183.4	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	48.3	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	30.0	IS 5182 (Part 6): 2006	10

Second fortnight:

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
12A1	Agent office, Kottadih OCP	Industrial	16-May-23	SPM	322.5	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	240.7	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	49.6	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	26.0	IS 5182 (Part 6): 2006	10
12A2	Kumardihi A colliery store	Industrial	16-May-23	SPM	289.1	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	196.2	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	54.9	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	34.0	IS 5182 (Part 6): 2006	10
12A3	Danya village	Residential	16-May-23	PM ₁₀	145.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	40.0	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	18.0	IS 5182 (Part 6): 2006	10



Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
12A7	Durga mandir, Charai village	Residential	16-May-23	PM ₁₀	143.9	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	37.6	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	21.0	IS 5182 (Part 6): 2006	10
12A8	Dispensary of Konda village	Residential	16-May-23	PM ₁₀	219.7	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	47.2	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	19.0	IS 5182 (Part 6): 2006	10
12A9	Chapla village	Residential	16-May-23	PM ₁₀	135.8	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	32.9	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	20.0	IS 5182 (Part 6): 2006	10
12A10	Dalurband colliery office	Industrial	16-May-23	SPM	410.3	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	304.8	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	74.2	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	25.0	IS 5182 (Part 6): 2006	10
12A13	Managers' office Madhaipur colliery near railway siding	Industrial	16-May-23	SPM	264.5	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	189.4	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	43.6	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	31.0	IS 5182 (Part 6): 2006	10
12A14	Bankola workshop near railway siding	Industrial	31-May-23	SPM	296.2	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	223.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	41.1	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	32.0	IS 5182 (Part 6): 2006	10



Twice in a week Monitoring

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
12A11	Manderboni colliery office near railway siding	Industrial	04-May-23	SPM	272.1	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	203.5	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	49.4	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	28.0	IS 5182 (Part 6): 2006	10
			05-May-23	SPM	272.5	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	209.8	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	42.3	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	28.0	IS 5182 (Part 6): 2006	10
			11-May-23	SPM	208.5	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	141.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	29.2	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	35.0	IS 5182 (Part 6): 2006	10
			12-May-23	SPM	218.6	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	152.3	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	39.6	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	35.0	IS 5182 (Part 6): 2006	10
			18-May-23	SPM	209.6	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	153.2	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	27.3	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	34.0	IS 5182 (Part 6): 2006	10
			19-May-23	SPM	192.8	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	138.9	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	25.8	IS 5182 (Part 24): 2019	2.0
SO ₂	BDL	IS 5182 (Part 2): 2001		10			
NO _x	32.0	IS 5182 (Part 6): 2006		10			
25-May-23	SPM	242.6	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	148.6	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	51.2	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	31.0	IS 5182 (Part 6): 2006	10			
26-May-23	SPM	265.2	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	196.3	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	43.6	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	36.0	IS 5182 (Part 6): 2006	10			



Twice in a week Monitoring

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
12A12	Pandaveshwar pit office near railway siding	Industrial	04-May-23	SPM	235.4	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	172.2	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	36.2	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	30.0	IS 5182 (Part 6): 2006	10
			05-May-23	SPM	277.6	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	213.1	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	43.7	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	35.0	IS 5182 (Part 6): 2006	10
			11-May-23	SPM	316.2	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	247.1	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	41.4	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	36.0	IS 5182 (Part 6): 2006	10
			12-May-23	SPM	271.4	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	201.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	45.6	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	36.0	IS 5182 (Part 6): 2006	10
18-May-23	SPM	245.3	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	176.9	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	38.4	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	25.0	IS 5182 (Part 6): 2006	10			
19-May-23	SPM	298.2	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	225.1	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	42.8	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	33.0	IS 5182 (Part 6): 2006	10			
25-May-23	SPM	216.5	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	141.8	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	47.4	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	32.0	IS 5182 (Part 6): 2006	10			
26-May-23	SPM	255.4	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	179.3	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	43.2	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	29.0	IS 5182 (Part 6): 2006	10			



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A Mini Ratna Company

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Environment Laboratory, CMPDIL, RI-I, Asansol

Environmental Standards for Ambient Air Quality (AAQ):

Environmental standard for Raniganj Coalfield vide MOEF, Govt. of India, Gazette Notification No. GSR 742 (E) dated 25.09.2000 for 24 hourly samples at 500 meters from dust generating point					National Ambient Air Quality Standards (NAAQS), 2009 for industrial, residential and rural areas for 24 hours samples				
Pollutant Concentration ($\mu\text{g}/\text{m}^3$)					Pollutant Concentration ($\mu\text{g}/\text{m}^3$)				
SPM	PM ₁₀	PM _{2.5}	SO ₂	NO _x	SPM	PM ₁₀	PM _{2.5}	SO ₂	NO _x
600.0	300.0	Not Specified	120.0	120.0	Not Specified	100.0	60.0	80.0	80.0



CHAPTER – III WATER QUALITY MONITORING

3.1 Mine water sampling stations:

- i) **Pandaveswar UG (12MW1):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.
- ii) **Dalurband OC Phase-III (12MW2):** This location has been selected to monitor the discharge quality of mine effluent used for sprinkling at road and mining area
- iii) **Manderboni UG (12MW3):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams.
- iv) **South Samla UG (12MW4):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams.
- v) **Madhaipur UG (12MW5):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.
- vi) **Sonepur Bazari OC (12MW6):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after siltation pond.
- vii) **Kumardihi B UG (12MW7):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank
- x) **Jhanjra UG (12MW10):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.
- x) **Tilaboni UG (12MW11):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank
- xi) **Shyamsundarpur UG (12MW12):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.
- xii) **Bankola UG (12MW13):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams
- xiii) **Kottadih UG & OC (12MW14):** This location has been selected to monitor the discharge quality of mine effluent use for boiler and remaining discharge to natural surface streams after sedimentation tank.
- xiv) **Kumardihi A UG (12MW15):** This location has been selected to monitor the discharge quality of mine effluent use for boiler and remaining discharge to natural surface streams after sedimentation tank.
- xv) **Madhaipur OC (12MW16):** This location has been selected to monitor the discharge quality of mine effluent discharge to natural surface streams.

3.2 Methodology of sampling and analysis:

The water samples are collected as per standard practice and transported to environment laboratory for analysis work.

The mine water samples are collected and analysed for five parameters on fortnightly basis except during the month of March and September when mine water samples are analysed for 29 parameters.

The ground water samples were collected and analysed for 26 parameters during the month of May. Drinking water samples are collected and analysed during the month of March and September. Water samples from filter plants are collected and analysed quarterly in the month of June, September, December and March.

3.3 Results & Interpretations:

The results are given in tabular form along with the applicable standards. Results are compared with General Standards for Discharge of Effluent (Schedule VI) in case of effluent/mine water sample and compared with IS10500: 2012 in case of drinking/ground water samples.



First fortnight:

Sl. No	Parameters	Analytical results (mg/l)					General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
		12MW1	12MW2	12MW3	12MW4	12MW5			
		Station Code	Date of sampling	12-May-23	12-May-23	12-May-23			
1	pH value	7.19	7.70	7.63	7.52	8.17	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0
2	TSS	BDL	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0
3	TDS	431	263	507	620	436	Not specified	IS 3025 (Part 16): 1984	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0
5	COD	12	16	4	8	4	250	APHA 5220C Closed Reflux	4.0

Sl. No.	Parameters	Analytical results (mg/l)					General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
		12MW6	12MW7	12MW10	12MW11	12MW12			
		Station Code	Date of sampling	12-May-23	08-May-23	08-May-23			
1	pH value	7.76	7.87	7.13	7.27	7.58	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0
2	TSS	BDL	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0
3	TDS	426	443	516	247	537	Not specified	IS 3025 (Part 16): 1984	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0
5	COD	12	12	8	16	4	250	APHA 5220C Closed Reflux	4.0



Sl. No.	Parameters	Analytical results (mg/l)				General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
	Station Code	12MW13	12MW14	12MW15	12MW16			
	Date of sampling	08-May-23	12-May-23	08-May-23	12-May-23			
1	pH value	8.20	7.96	7.35	7.27	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0
2	TSS	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0
3	TDS	352	508	481	406	Not specified	IS 3025 (Part 16): 1984	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0
5	COD	8	4	8	8	250	APHA 5220C Closed Reflux	4.0

*BDL-Below Detection Limit.

All values are expressed in mg/l except pH.

Second fortnight:

Sl. No	Parameters	Analytical results (mg/l)					General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
	Station Code	12MW1	12MW2	12MW3	12MW4	12MW5			
	Date of sampling	31-May-23	31-May-23	31-May-23	31-May-23	31-May-23			
1	pH value	7.27	7.68	7.72	7.43	8.08	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0
2	TSS	BDL	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0
3	TDS	424	270	515	612	443	Not specified	IS 3025 (Part 16): 1984	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0
5	COD	8	12	4	8	12	250	APHA 5220C Closed Reflux	4.0



Sl. No.	Parameters	Analytical results (mg/l)					General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
	Station Code	12MW6	12MW7	12MW10	12MW11	12MW12			
	Date of sampling	30-May-23	17-May-23	22-May-23	22-May-23	22-May-23			
1	pH value	7.85	7.79	7.22	7.36	7.49	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0
2	TSS	BDL	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0
3	TDS	418	437	525	252	524	Not specified	IS 3025 (Part 16): 1984	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0
5	COD	12	4	4	12	8	250	APHA 5220C Closed Reflux	4.0

Sl. No.	Parameters	Analytical results (mg/l)				General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
	Station Code	12MW13	12MW14	12MW15	12MW16			
	Date of sampling	17-May-23	31-May-23	17-May-23	31-May-23			
1	pH value	8.13	7.85	7.53	7.92	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0
2	TSS	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0
3	TDS	341	519	472	424	Not specified	IS 3025 (Part 16): 1984	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0
5	COD	4	8	12	12	250	APHA 5220C Closed Reflux	4.0

*BDL-Below Detection Limit.

All values are expressed in mg/l except pH.



GROUND WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

Name of station & code: **12GW1-Dugwell at NHS quarters Khottadih beside primary school.**
12GW2- Dugwell at Konda regional hospital.

Sl. No.	Parameters	Analytical Results		Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit	
		Sample code	12GW1	12GW2	Acceptable Limit			Permissible Limit
		Sampling Date	31-May-23	31-May-23				
1	Colour, Hazen	2	1	5.0	15.0	IS 3025 (Part 6): 2018	1.0 Hazen	
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 2018	-	
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-	
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984	1.0 NTU	
5	pH	7.58	7.11	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983	2.0	
6	Total Hardness	542.52	95.04	300	600	IS 3025 (Part 21): 2009	4.0	
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003	0.06	
8	Chlorides	35.32	22	250	1000	IS 3025 (Part 32): 1988	2.0	
9	Residual Free Chlorine	0.04	0.04	0.2	1	APHA 4500F DPD Ferrous Titrimetric	0.02	
10	Dissolved Solids	770	209	500	2000	IS 3025 (Part 16): 1984	10.0	
11	Calcium	74.59	20.63	75	200	IS 3025 (Part 40): 1991	1.60	
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03	
13	Manganese	BDL	BDL	0.1	0.3	APHA 3111B AAS Flame	0.02	
14	Sulphate	122.40	44.36	200	400	APHA 4500D Turbidimetric	2.0	
15	Nitrate	10.22	9.58	45	No relaxation	IS 3025 (Part 34): 1988	0.5	
16	Fluoride	0.35	0.20	1	1.5	APHA 4500D SPANDS	0.02	
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002	
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002	
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005	
20	Zinc	0.01	BDL	5	15	APHA 3111B AAS Flame	0.01	
21	Hex Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01	
22	Boron	BDL	BDL	0.5	1	IS 3025 (Part 57): 2005	0.20	
23	Coliforms (MPN)	Nil	Nil	Not Specified		APHA Multiple Tube Fermentation	1.0	
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 1992	0.001	
25	Alkalinity	396.00	92.78	200	600	IS 3025 (Part 23): 1986	4.0	
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005	

*BDL-Below Detection Limit.

All values are expressed in mg/l unless specified.



GROUND WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

Name of station & code: **12GW3- Dugwell at NHS quarters of Danya village.**
12GW4- Dugwell at Ichhapur high school.

Sl. No.	Parameters	Analytical Results		Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
		Sample code	12GW3	12GW4	Acceptable Limit		
	Sampling Date	29-May-23	29-May-23				
1	Colour, Hazen	1	1	5.0	15.0	IS 3025 (Part 6): 2018	1.0 Hazen
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984	1.0 NTU
5	pH	6.82	6.74	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983	0.01
6	Total Hardness	166.32	43.56	300	600	IS 3025 (Part 21): 2009	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003	0.06
8	Chlorides	15	6	250	1000	IS 3025 (Part 32): 1988	2.0
9	Residual Free Chlorine	0.04	0.03	0.2	1	APHA 4500F DPD Ferrous Titrimetric	0.02
10	Dissolved Solids	304	184	500	2000	IS 3025 (Part 16): 1984	10.0
11	Calcium	34.91	11.11	75	200	IS 3025 (Part 40): 1991	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	BDL	0.02	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	68.22	43.44	200	400	APHA 4500D Turbidimetric	2.0
15	Nitrate	12.36	14.22	45	No relaxation	IS 3025 (Part 34): 1988	0.5
16	Fluoride	0.49	0.32	1	1.5	APHA 4500D SPANDS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	BDL	BDL	5	15	APHA 3111B AAS Flame	0.01
21	Hex Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	IS 3025 (Part 57): 2005	0.20
23	Coliforms (MPN)	Nil	Nil	Not Specified		APHA Multiple Tube Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 1992	0.001
25	Alkalinity	68.00	16.00	200	600	IS 3025 (Part 23): 1986	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL-Below Detection Limit.

All values are expressed in mg/l unless specified.



GROUND WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

Name of station & code: 12GW5- Dugwell at Kumardih "A" colliery.

Sl. No.	Parameters	Analytical Results	Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	12GW5	Acceptable Limit	Permissible Limit		
	Sampling Date	29-May-23				
1	Colour, Hazen	3	5.0	15.0	IS 3025 (Part 6): 2018	1.0 Hazen
2	Odour	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 2018	-
3	Taste	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	1	5	IS 3025 (Part 10): 1984	1.0 NTU
5	pH	7.99	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983	2.0
6	Total Hardness	166.32	300	600	IS 3025 (Part 21): 2009	4.0
7	Iron	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003	0.06
8	Chlorides	81.79	250	1000	IS 3025 (Part 32): 1988	2.0
9	Residual Free Chlorine	0.03	0.2	1	APHA 4500F DPD Ferrous Titrimetric	0.02
10	Dissolved Solids	432	500	2000	IS 3025 (Part 16): 1984	10.0
11	Calcium	34.91	75	200	IS 3025 (Part 40): 1991	1.60
12	Copper	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	BDL	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	85.10	200	400	APHA 4500D Turbidimetric	2.0
15	Nitrate	14.83	45	No relaxation	IS 3025 (Part 34): 1988	0.5
16	Fluoride	0.30	1	1.5	APHA 4500D SPANDS	0.02
17	Selenium	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	BDL	5	15	APHA 3111B AAS Flame	0.01
21	Hex. Chromium	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	0.5	1	IS 3025 (Part 57): 2005	0.20
23	Coliforms (MPN)	Nil	Not Specified		APHA Multiple Tube Fermentation	1.0
24	Phenolics	BDL	0.001	0.002	IS 3025 (Part 43): 1992	0.001
25	Alkalinity	209.88	200	600	IS 3025 (Part 23): 1986	4.0
26	Cadmium	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL-Below Detection Limit.

All values are expressed in mg/l unless specified.



Ground water level for the month of May, 2023

Sl. No.	Station Code	Location of Dugwell	Date of measurement	Water level below ground level (mtr.)	Measurement point above ground level (mtr.)	Depth of dugwell (mtr.)	Diameter of dugwell (mtr.)	Owner of dugwell	Utility of dugwell
1	12GWL1	Dugwell at NHS quarters Khottadih beside primary school	24-May-23	2.40	0.6	4.5	1.6	Govt. School	Domestic
2	12GWL2	Dugwell at Konda regional hospital	29-May-23	6.20	0.85	12.5	2.4	ECL	Domestic
3	12GWL3	Dugwell at NHS quarters of Danya village	29-May-23	4.10	0.95	6.9	1.05	ECL	Domestic
4	12GWL4	Dugwell at Ichhapur high school	29-May-23	4.30	0.6	18.5	1.8	Govt. School	Domestic
5	12GWL5	Dugwell at Kumardih "A" colliery	29-May-23	3.40	1.2	8.2	2.05	ECL	Domestic



Piezometer water level for the month of May, 2023

3.4 **Location of Piezometer sites and their rationale:** Total 30 nos. of piezometers have been constructed by ECL at different locations in clusters and standalone projects for measurement of ground water level. Ground water level is measured in all piezometers on quarterly basis to assess the impact of mining activities on ground water level. The following piezometer has been constructed in cluster no 12:

- i) **Jhanjra (Area office) (12/JH/JP-01):** A piezometer has been constructed to measure the ground water level at Jhanjra MIC of Jhanjra area.
- ii) **Pandaveswar (Madhaipur UG) (12/SB/SP-03):** A piezometer has been constructed to measure the ground water level at Madhaipur UG Colliery of Pandaveswar area
- iii) **Pandaveswar (Pandaveswar UG) (12/PD/MP-08):** A piezometer has been constructed to measure the ground water level at Pandaveswar UG Colliery of Pandaveswar area
- iv) **Bankola (Tilaboni (12/PD/PP-10):** A piezometer has been constructed to measure the ground water level at Tilaboni Colliery of Bankola area.
- v) **Sonepur Bazari (Near Magazine house) (12/BN/TP-11):** A piezometer has been constructed to measure the ground water level at Sonepur Bazari Magazine house of Sonepur Bazari area

Sl. No.	Station Code	Location of Piezometer	Date of measurement	Water level below ground level (mtr.)
1	12/JH/JP-01	Jhanjra (Area office)	29-May-23	5.55
2	12/SB/SP-03	Sonepur Bazari (Near Magazine house)	23-May-23	13.90
3	12/PD/MP-08	Pandaveswar (Madhaipur UG)	29-May-23	4.60
4	12/PD/PP-10	Pandaveswar (Pandaveswar UG)	24-May-23	5.55
5	12/BN/TP-11	Bankola (Tilaboni)	29-May-23	17.95

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**ENVIRONMENT MONITORING REPORT
OF
CLUSTER NO. 12**

(FOR THE MONTH OF JUNE, 2023)

**(BANKOLA, SONEPUR BAZARI,
PANDAVESWAR & JHANJRA AREA)**

Eastern Coalfields Limited



**Regional Institute-1
Asansol (WB)**



cmpdi
A Mini Ratna Company

ISO 9001: 2015 Certified Company
Environment Laboratory, CMPDIL, RI-I, Asansol

CHAPTER - I

INTRODUCTION

1.0 The environmental monitoring has been carried out as per conditions laid down by MoEF&CC while granting environmental clearance to different projects. CMPDIL has trained manpower and well equipped laboratory to carry out monitoring, analysis and R&D work in the field of environment. Reports have been prepared for submission to MoEF&CC, SPCB and other statutory authorities.



CHAPTER-II AMBIENT AIR QUALITY MONITORING

2.0 Ambient air quality sampling stations: Ambient air quality monitoring stations have been classified in to residential and industrial based on their locations in different clusters of mines. The sampling stations are as described below:

- i) **Agent office, Kottadih OCP (12A1):** The sampler was placed at agent office of Kottadih OCP. This site was selected to assess the present ambient air quality status in core zone of Kottadih OCP.
- ii) **Kumardihi A colliery store (12A2):** The sampler was placed at store office of Kumardihi colliery. This station was selected to assess the ambient air quality in the core zone where mining activities are in progress.
- iii) **Danya village (12A3):** The air sampler was placed at Danya village to assess the present ambient air quality status in residential area.
- iv) **Durga mandir, Charai village (12A7):** The sampler was placed Durga mandir of Chrai village. This site was selected to assess the present ambient air quality status.
- v) **Dispensary of Konda village (12A8):** The sampler was placed at Konda Dispensary to assess the present ambient air quality status.
- vi) **Chapla village (12A9):** The sampler was placed at Chapla village to assess the present ambient air quality status.
- vii) **Dalurband colliery office (12A10):** The sampler was placed at agent office of Dalurband colliery. This station was selected to assess the ambient air quality in the core zone where mining activities are in progress.
- viii) **Manderboni colliery office near railway siding (12A11):** The sampler was placed at pit office of Manderboni colliery. This station was selected to assess the ambient air quality in the core zone where mining activities are in progress.
- ix) **Pandaveshwar pit office near railway siding (12A12):** The sampler was placed at pit office of Pandaveshwar colliery. This station was selected to assess the ambient air quality in the core zone where mining activities are in progress.
- x) **Managers' office Madhaipur colliery near railway siding (12A13):** The sampler was placed at Managers' office of Madhaipur colliery. This station was selected to assess the ambient air quality in the core zone where mining activities are in progress.
- xi) **Bankola workshop near railway siding (12A14):** The sampler was placed at Bankola workshop. This station was selected to assess the ambient air quality in the core zone.

2.1 Methodology of sampling and analysis: The air quality sampling stations have been chosen keeping in view predominant wind direction and have been classified as permanent, pre monsoon (April – September) & post monsoon (October – March) air sampling stations. Particulate Matter (PM₁₀), Fine Particulate Matter (PM_{2.5}), Sulphur Dioxide (SO₂) and Oxides of Nitrogen (NO_x) are monitored on fortnight basis. Heavy metals like Arsenic (As), Cadmium (Cd), Chromium (Cr), Mercury (Hg), Nickel (Ni) and Lead (Pb) are monitored half yearly.

The Respirable Suspended Particulate Matter (RSPM) Sampler & PM_{2.5} Sampler machines are used for sampling of ambient air. The samples are collected and transported to Environmental Laboratory of CMPDI, RI-I, Asansol for analysis work.

2.2 Results & Interpretations: The observed value of Suspended Particulate Matter (SPM) varies from 121.9 to 329.7 µg/m³ in industrial areas. The observed value of Particulate Matter (PM₁₀) varies from 84.6 to 265.9 µg/m³ in industrial areas & from 77.3 to 178.2 µg/m³ in residential areas. The observed value of Fine Particulate Matter (PM_{2.5}) varies from 12.7 to 63.8 µg/m³ in industrial area & from 20.0 to 28.4 µg/m³ in residential area. The observed value of Sulphur Dioxide (SO₂) has been found to be below 10 µg/m³ in both industrial & residential areas. The observed value of Oxides of Nitrogen (NO_x) varies from 16.0 to 32.0 µg/m³ in industrial areas & from 10.0 to 24.0 µg/m³ in residential areas.



AMBIENT AIR QUALITY DATA

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

First fortnight:

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
12A1	Agent office, Kottadih OCP	Industrial	08-Jun-23	SPM	252.6	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	192.5	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	38.9	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	23.0	IS 5182 (Part 6): 2006	10
12A2	Kumardihi A colliery store	Industrial	08-Jun-23	SPM	329.7	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	254.0	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	58.0	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	20.0	IS 5182 (Part 6): 2006	10
12A3	Danya village	Residential	08-Jun-23	PM ₁₀	119.5	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	26.6	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	22.0	IS 5182 (Part 6): 2006	10
12A7	Durga mandir, Charai village	Residential	08-Jun-23	PM ₁₀	121.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	27.3	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	18.0	IS 5182 (Part 6): 2006	10
12A8	Dispensary of Konda village	Residential	08-Jun-23	PM ₁₀	178.2	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	26.3	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	16.0	IS 5182 (Part 6): 2006	10
12A9	Chapla village	Residential	08-Jun-23	PM ₁₀	116.5	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	28.4	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	BDL	IS 5182 (Part 6): 2006	10
12A10	Dalurband colliery office	Industrial	08-Jun-23	SPM	252.6	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	186.3	IS 5182 (Part 23): 2006	3.5



Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
				PM _{2.5}	42.5	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	16.0	IS 5182 (Part 6): 2006	10
12A13	Managers' office Madhaipur colliery near railway siding	Industrial	08-Jun-23	SPM	208.9	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	145.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	40.3	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	18.0	IS 5182 (Part 6): 2006	10
12A14	Bankola workshop near railway siding	Industrial	08-Jun-23	SPM	248.4	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	185.1	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	45.2	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	BDL	IS 5182 (Part 6): 2006	10

*BDL-Below Detection Limit

Second fortnight:

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
12A1	Agent office, Kottadih OCP	Industrial	22-Jun-23	SPM	203.5	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	158.7	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	30.6	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	22.0	IS 5182 (Part 6): 2006	10
12A2	Kumardihi A colliery store	Industrial	23-Jun-23	SPM	155.2	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	117.7	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	12.7	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	21.0	IS 5182 (Part 6): 2006	10
12A3	Danya village	Residential	23-Jun-23	PM ₁₀	80.3	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	24.6	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	24.0	IS 5182 (Part 6): 2006	10



Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
12A7	Durga mandir, Charai village	Residential	23-Jun-23	PM ₁₀	84.7	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	25.5	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	22.0	IS 5182 (Part 6): 2006	10
12A8	Dispensary of Konda village	Residential	29-Jun-23	PM ₁₀	165.1	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	20.0	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	18.0	IS 5182 (Part 6): 2006	10
12A9	Chapla village	Residential	29-Jun-23	PM ₁₀	77.3	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	21.6	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	10.0	IS 5182 (Part 6): 2006	10
12A10	Dalurband colliery office	Industrial	22-Jun-23	SPM	198.4	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	145.9	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	30.1	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	17.0	IS 5182 (Part 6): 2006	10
12A13	Managers' office Madhaipur colliery near railway siding	Industrial	22-Jun-23	SPM	188.3	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	107.3	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	55.3	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	16.0	IS 5182 (Part 6): 2006	10
12A14	Bankola workshop near railway siding	Industrial	23-Jun-23	SPM	132.5	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	90.3	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	27.3	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	28.0	IS 5182 (Part 6): 2006	10

*BDL-Below Detection Limit.



Twice in a week Monitoring

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
12A11	Manderboni colliery office near railway siding	Industrial	01-Jun-23	SPM	265.2	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	178.4	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	63.8	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	22.0	IS 5182 (Part 6): 2006	10
			02-Jun-23	SPM	256.4	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	172.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	60.2	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	29.0	IS 5182 (Part 6): 2006	10
			08-Jun-23	SPM	226.8	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	162.0	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	43.2	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	24.0	IS 5182 (Part 6): 2006	10
			09-Jun-23	SPM	210.4	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	149.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	38.5	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	20.0	IS 5182 (Part 6): 2006	10
16-Jun-23	SPM	202.6	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	159.6	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	21.1	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	26.0	IS 5182 (Part 6): 2006	10			
22-Jun-23	SPM	145.3	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	100.9	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	27.4	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	26.0	IS 5182 (Part 6): 2006	10			
29-Jun-23	SPM	168.3	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	128.0	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	18.8	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	27.0	IS 5182 (Part 6): 2006	10			
30-Jun-23	SPM	121.9	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	84.6	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	18.1	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	24.0	IS 5182 (Part 6): 2006	10			

*BDL-Below Detection Limit



Twice in a week Monitoring

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu\text{g}/\text{m}^3$)	Name of method	Detection limit ($\mu\text{g}/\text{m}^3$)
12A12	Pandaveshwar pit office near railway siding	Industrial	01-Jun-23	SPM	306.5	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	227.5	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	60.6	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	32.0	IS 5182 (Part 6): 2006	10
			02-Jun-23	SPM	294.8	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	213.4	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	57.8	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	30.0	IS 5182 (Part 6): 2006	10
			08-Jun-23	SPM	323.4	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	252.6	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	46.4	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	18.0	IS 5182 (Part 6): 2006	10
			09-Jun-23	SPM	294.3	IS 5182 (Part 4): 2019	5.0
				PM ₁₀	228.5	IS 5182 (Part 23): 2006	3.5
				PM _{2.5}	42.4	IS 5182 (Part 24): 2019	2.0
				SO ₂	BDL	IS 5182 (Part 2): 2001	10
				NO _x	22.0	IS 5182 (Part 6): 2006	10
16-Jun-23	SPM	319.3	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	265.9	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	36.5	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	30.0	IS 5182 (Part 6): 2006	10			
22-Jun-23	SPM	156.5	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	106.5	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	28.2	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	20.0	IS 5182 (Part 6): 2006	10			
29-Jun-23	SPM	205.4	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	151.0	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	30.6	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	24.0	IS 5182 (Part 6): 2006	10			
30-Jun-23	SPM	230.6	IS 5182 (Part 4): 2019	5.0			
	PM ₁₀	184.5	IS 5182 (Part 23): 2006	3.5			
	PM _{2.5}	25.4	IS 5182 (Part 24): 2019	2.0			
	SO ₂	BDL	IS 5182 (Part 2): 2001	10			
	NO _x	28.0	IS 5182 (Part 6): 2006	10			

*BDL-Below Detection Limit.



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Environmental Standards for Ambient Air Quality (AAQ):

Environmental standard for Raniganj Coalfield vide MOEF, Govt. of India, Gazette Notification No. GSR 742 (E) dated 25.09.2000 for 24 hourly samples at 500 meters from dust generating point					National Ambient Air Quality Standards (NAAQS), 2009 for industrial, residential and rural areas for 24 hours samples				
Pollutant Concentration ($\mu\text{g}/\text{m}^3$)					Pollutant Concentration ($\mu\text{g}/\text{m}^3$)				
SPM	PM ₁₀	PM _{2.5}	SO ₂	NO _x	SPM	PM ₁₀	PM _{2.5}	SO ₂	NO _x
600.0	300.0	Not Specified	120.0	120.0	Not Specified	100.0	60.0	80.0	80.0



CHAPTER – III WATER QUALITY MONITORING

3.1 Mine water sampling stations:

- i) **Pandaveswar UG (12MW1):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.
- ii) **Dalurband OC Phase-III (12MW2):** This location has been selected to monitor the discharge quality of mine effluent used for sprinkling at road and mining area
- iii) **Manderboni UG (12MW3):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams.
- iv) **South Samla UG (12MW4):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams.
- v) **Madhaipur UG (12MW5):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.
- vi) **Sonepur Bazari OC (12MW6):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after siltation pond.
- vii) **Kumardihi B UG (12MW7):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank
- x) **Jhanjra UG (12MW10):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.
- x) **Tilaboni UG (12MW11):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank
- xi) **Shyamsundarpur UG (12MW12):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.
- xii) **Bankola UG (12MW13):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams
- xiii) **Kottadih UG & OC (12MW14):** This location has been selected to monitor the discharge quality of mine effluent use for boiler and remaining discharge to natural surface streams after sedimentation tank.
- xiv) **Kumardihi A UG (12MW15):** This location has been selected to monitor the discharge quality of mine effluent use for boiler and remaining discharge to natural surface streams after sedimentation tank.
- xv) **Madhaipur OC (12MW16):** This location has been selected to monitor the discharge quality of mine effluent discharge to natural surface streams.

3.2 Methodology of sampling and analysis:

The water samples are collected as per standard practice and transported to environment laboratory for analysis work.

The mine water samples are collected and analysed for five parameters on fortnightly basis except during the month of March and September when mine water samples are analysed for 29 parameters.

The ground water samples were collected and analysed for 26 parameters during the month of May. Drinking water samples are collected and analysed during the month of March and September. Water samples from filter plants are collected and analysed quarterly in the month of June, September, December and March.

3.3 Results & Interpretations:

The results are given in tabular form along with the applicable standards. Results are compared with General Standards for Discharge of Effluent (Schedule VI) in case of effluent/mine water sample and compared with IS.10500: 2012 in case of drinking/ground water samples.



First fortnight:

Sl. No	Parameters	Analytical results (mg/l)					General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
		12MW1	12MW2	12MW3	12MW4	12MW5			
		Station Code	Date of sampling						
1	pH value	7.79	8.23	7.88	7.58	7.43	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0
2	TSS	BDL	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0
3	TDS	463	292	553	661	451	Not specified	IS 3025 (Part 16): 1984	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0
5	COD	12	8	12	4	12	250	APHA 5220C Closed Reflux	4.0

Sl. No.	Parameters	Analytical results (mg/l)					General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
		12MW6	12MW7	12MW10	12MW11	12MW12			
		Station Code	Date of sampling						
1	pH value	7.36	7.24	7.76	7.59	8.07	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0
2	TSS	BDL	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0
3	TDS	407	421	560	271	517	Not specified	IS 3025 (Part 16): 1984	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0
5	COD	8	12	8	4	8	250	APHA 5220C Closed Reflux	4.0

*BDL-Below Detection Limit

All values are expressed in mg/l except pH



Sl. No.	Parameters	Analytical results (mg/l)				General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
		12MW13	12MW14	12MW15	12MW16			
		Station Code	Date of sampling					
1	pH value	7.96	7.84	8.11	8.29	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0
2	TSS	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0
3	TDS	381	554	498	437	Not specified	IS 3025 (Part 16): 1984	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0
5	COD	16	16	8	12	250	APHA 5220C Closed Reflux	4.0

*BDL-Below Detection Limit.

All values are expressed in mg/l except pH.

Second fortnight:

Sl. No.	Parameters	Analytical results (mg/l)					General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
		12MW1	12MW2	12MW3	12MW4	12MW5			
		Station Code	Date of sampling						
1	pH value	7.97	7.33	7.81	7.85	7.57	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0
2	TSS	BDL	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0
3	TDS	454	282	542	650	431	Not specified	IS 3025 (Part 16): 1984	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0
5	COD	8	12	4	16	8	250	APHA 5220C Closed Reflux	4.0

*BDL-Below Detection Limit

All values are expressed in mg/l except pH



Sl. No.	Parameters	Analytical results (mg/l)					General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
		12MW6	12MW7	12MW10	12MW11	12MW12			
		Station Code	Date of sampling						
		21-Jun-23	21-Jun-23	30-Jun-23	26-Jun-23	26-Jun-23			
1	pH value	7.34	7.63	7.33	7.67	7.95	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0
2	TSS	BDL	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0
3	TDS	428	441	548	290	508	Not specified	IS 3025 (Part 16): 1984	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0
5	COD	12	8	4	4	8	250	APHA 5220C Closed Reflux	4.0

Sl. No.	Parameters	Analytical results (mg/l)				General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
		12MW13	12MW14	12MW15	12MW16			
		Station Code	Date of sampling					
		21-Jun-23	21-Jun-23	26-Jun-23	30-Jun-23			
1	pH value	7.99	8.03	7.83	8.22	5.5 - 9.0	IS 3025 (Part 11): 2003	2.0
2	TSS	BDL	BDL	BDL	BDL	100	IS 3025 (Part 17): 1984	10.0
3	TDS	392	573	479	422	Not specified	IS 3025 (Part 16): 1984	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 1991	2.0
5	COD	16	4	8	12	250	APHA 5220C Closed Reflux	4.0

*BDL-Below Detection Limit

All values are expressed in mg/l except pH.



DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman.

Name of station & code: **12FDW01- 0.66 MGD RGSF at Jhanjra officers' colony**
12FDW02- 5000 LPH RO plant at Jhanjra colony

Sl. No.	Parameters	Analytical Results		Indian Standard Drinking Water (IS-10500: 2012)		Method of detection	Detection Limit
	Sample code	12FDW01	12FDW02	Acceptable Limit	Permissible Limit		
	Sampling Date	07-Jun-23	07-Jun-23				
1	Colour, Hazen	3	6	5.0	15.0	IS 3025 (Part 6): 2018	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984	1.0
5	pH	8.19	7.62	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983	2.0
6	Total Hardness	245.52	71.28	300	600	IS 3025 (Part 21): 2009	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003	0.06
8	Chlorides	33.46	13.01	250	1000	IS 3025 (Part 32): 1988	2.0
9	Res Free Chlorine	0.03	0.03	0.2	1	APHA 4500F DPD Ferrous Titrimetric	0.02
10	Dissolved Solids	423	117	500	2000	IS 3025 (Part 16): 1984	10.0
11	Calcium	57.13	9.52	75	200	IS 3025 (Part 40): 1991	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	0.03	0.03	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	76.24	36.14	200	400	APHA 4500D Turbidimetric	2.0
15	Nitrate	2.98	2.18	45	No relaxation	IS 3025 (Part 34): 1988	0.5
16	Fluoride	0.54	0.52	1	1.5	APHA 4500D SPANDS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	BDL	BDL	5	15	APHA 3111B AAS Flame	0.01
21	Hex. Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	IS 3025 (Part 57): 2005	0.20
23	Coliforms (MPN)	NIL	NIL	Not Specified		APHA Multiple Tube Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 1992	0.001
25	Alkalinity	150.48	35.64	200	600	IS 3025 (Part 23): 1986	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL -Below Detection Limit.

All values are expressed in mg/l unless specified.



DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman.

Name of station & code: **12FDW03- RO plant at Khottadih colony**
12FDW04- Rapid sand filter near officer's colony

Sl. No.	Parameters	Analytical Results		Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	12FDW03	12FDW04	Acceptable Limit	Permissible Limit		
	Sampling Date	05-Jun-23	05-Jun-23				
1	Colour, Hazen	4	3	5.0	15.0	IS 3025 (Part 6): 2018	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984	1.0
5	pH	8.23	8.32	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983	2.0
6	Total Hardness	150.48	455.40	300	600	IS 3025 (Part 21): 2009	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003	0.06
8	Chlorides	48.33	11.15	250	1000	IS 3025 (Part 32): 1988	2.0
9	Residual Free Chlorine	0.04	0.04	0.2	1	APHA 4500F DPD Ferrous Titrimetric	0.02
10	Dissolved Solids	538	551	500	2000	IS 3025 (Part 16): 1984	10.0
11	Calcium	22.22	49.20	75	200	IS 3025 (Part 40): 1991	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	0.03	0.03	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	66.14	254.16	200	400	APHA 4500D Turbidimetric	2.0
15	Nitrate	2.10	1.30	45	No relaxation	IS 3025 (Part 34): 1988	0.5
16	Fluoride	0.64	0.28	1	1.5	APHA 4500 D SPANDS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	BDL	BDL	5	15	APHA 3111B AAS Flame	0.01
21	Hex. Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	IS 3025 (Part 57): 2005	0.20
23	Coliforms (MPN)	NIL	NIL	Not Specified		APHA Multiple Tube Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 1992	0.001
25	Alkalinity	324.72	261.36	200	600	IS 3025 (Part 23): 1986	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL -Below Detection Limit

All values are expressed in mg/l unless specified.



DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman.

Name of station & code: 12FDW05- Rapid sand pressure filter near Dalurband Railway siding
12FDW06- Haripur colony filtration plant

Sl. No.	Parameters	Analytical Results		Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	12FDW05	12FDW06	Acceptable Limit	Permissible Limit		
	Sampling Date	05-Jun-23	05-Jun-23				
1	Colour, Hazen	6	4	5.0	15.0	IS 3025 (Part 6): 2018	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984	1.0
5	pH	8.32	8.04	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983	2.0
6	Total Hardness	447.48	190.08	300	600	IS 3025 (Part 21): 2009	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003	0.06
8	Chlorides	9.29	85.51	250	1000	IS 3025 (Part 32): 1988	2.0
9	Residual Free Chlorine	0.03	0.03	0.2	1	APHA 4500F DPD Ferrous Titrimetric	0.02
10	Dissolved Solids	528	463	500	2000	IS 3025 (Part 16): 1984	10.0
11	Calcium	41.26	34.91	75	200	IS 3025 (Part 40): 1991	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	0.03	0.02	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	180.10	74.66	200	400	APHA 4500D Turbidimetric	2.0
15	Nitrate	4.28	7.58	45	No relaxation	IS 3025 (Part 34): 1988	0.5
16	Fluoride	0.38	0.64	1	1.5	APHA 4500 D SPANDS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	BDL	BDL	5	15	APHA 3111B AAS Flame	0.01
21	Hex Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	IS 3025 (Part 57): 2005	0.20
23	Coliforms (MPN)	NIL	NIL	Not Specified		APHA Multiple Tube Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 1992	0.001
25	Alkalinity	257.40	201.96	200	600	IS 3025 (Part 23): 1986	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL -Below Detection Limit.

All values are expressed in mg/l unless specified.



DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman.

Name of station & code: **12FDW07- Filter plant at S. B. project glass house**
12FDW08 - Filter plant at S. B. area office canteen

No.	Parameters	Analytical Results		Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	12FDW07	12FDW08	Acceptable Limit	Permissible Limit		
	Sampling Date	05-Jun-23	05-Jun-23				
1	Colour, Hazen	5	6	5.0	15.0	IS 3025 (Part 6): 2018	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984	1.0
5	pH	8.45	8.01	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983	2.0
6	Total Hardness	43.56	114.84	300	600	IS 3025 (Part 21): 2009	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003	0.06
8	Chlorides	39.03	22.31	250	1000	IS 3025 (Part 32): 1988	2.0
9	Residual Free Chlorine	0.04	0.04	0.2	1	APHA 4500F DPD Ferrous Titrimetric	0.02
10	Dissolved Solids	489	216	500	2000	IS 3025 (Part 16): 1984	10.0
11	Calcium	11.11	28.57	75	200	IS 3025 (Part 40): 1991	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	0.02	0.02	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	BDL	46.26	200	400	APHA 4500D Turbidimetric	2.0
15	Nitrate	5.44	4.32	45	No relaxation	IS 3025 (Part 34): 1988	0.5
16	Fluoride	0.52	0.46	1	1.5	APHA 4500 D SPANDS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	BDL	BDL	5	15	APHA 3111B AAS Flame	0.01
21	Hex Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	IS 3025 (Part 57): 2005	0.20
23	Coliforms (MPN)	NIL	NIL	Not Specified		APHA Multiple Tube Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 1992	0.001
25	Alkalinity	352.44	87.12	200	600	IS 3025 (Part 23): 1986	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL -Below Detection Limit.

All values are expressed in mg/l unless specified.



DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman.

Name of station & code: **12FDW09- Pressure filter at Sankarpur Colliery**
12FDW10-Pressure filter at Sarpi Colliery

Sl. No.	Parameters	Analytical Results		Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	12FDW09	12FDW10	Acceptable Limit	Permissible Limit		
	Sampling Date	08-Jun-23	08-Jun-23				
1	Colour, Hazen	4	3	5.0	15.0	IS 3025 (Part 6): 2018	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984	1.0
5	pH	7.95	8.50	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983	2.0
6	Total Hardness	99.00	79.20	300	600	IS 3025 (Part 21): 2009	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003	0.06
8	Chlorides	16.73	87.37	250	1000	IS 3025 (Part 32): 1988	2.0
9	Residual Free Chlorine	0.03	0.04	0.2	1	APHA 4500F DPD Ferrous Titrimetric	0.02
10	Dissolved Solids	182	686	500	2000	IS 3025 (Part 16): 1984	10.0
11	Calcium	23.81	7.94	75	200	IS 3025 (Part 40): 1991	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	0.03	0.03	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	36.12	60.44	200	400	APHA 4500D Turbidimetric	2.0
15	Nitrate	1.96	4.60	45	No relaxation	IS 3025 (Part 34): 1988	0.5
16	Fluoride	0.42	0.52	1	1.5	APHA 4500 D SPANDS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	BDL	BDL	5	15	APHA 3111B AAS Flame	0.01
21	Hex Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	IS 3025 (Part 57): 2005	0.20
23	Coliforms (MPN)	NIL	NIL	Not Specified		APHA Multiple Tube Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 1992	0.001
25	Alkalinity	79.20	451.44	200	600	IS 3025 (Part 23): 1986	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL -Below Detection Limit.

All values are expressed in mg/l unless specified.



DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman.

Name of station & code: **12FDW11- Pressure filter at Symsundarpur ESP & 12FDW12- Pressure filter at Nakrakonda Kumardih B RO plant at Symsundarpur-Sarpi.**

Sl. No.	Parameters	Analytical Results		Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	12FDW11	12FDW12	Acceptable Limit	Permissible Limit		
	Sampling Date	07-Jun-23	08-Jun-23				
1	Colour, Hazen	7	8	5.0	15.0	IS 3025 (Part 6): 2018	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	3.28	BDL	1	5	IS 3025 (Part 10): 1984	1.0
5	pH	8.46	8.02	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983	2.0
6	Total Hardness	83.16	87.12	300	600	IS 3025 (Part 21): 2009	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003	0.06
8	Chlorides	74.36	67.00	250	1000	IS 3025 (Part 32): 1988	2.0
9	Residual Free Chlorine	0.03	0.03	0.2	1	APHA 4500F DPD Ferrous Titrimetric	0.02
10	Dissolved Solids	692	421	500	2000	IS 3025 (Part 16): 1984	10.0
11	Calcium	9.52	17.46	75	200	IS 3025 (Part 40): 1991	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	0.03	0.02	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	148.38	68.82	200	400	APHA 4500D Turbidimetric	2.0
15	Nitrate	1.46	2.10	45	No relaxation	IS 3025 (Part 34): 1988	0.5
16	Fluoride	0.58	0.60	1	1.5	APHA 4500 D SPANDS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	BDL	BDL	5	15	APHA 3111B AAS Flame	0.01
21	Hex Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	IS 3025 (Part 57): 2005	0.20
23	Coliforms (MPN)	NIL	NIL	Not Specified		APHA Multiple Tube Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 1992	0.001
25	Alkalinity	443.52	118.00	200	600	IS 3025 (Part 23): 1986	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL -Below Detection Limit.

All values are expressed in mg/l unless specified.



DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman

Name of station & code: **12FDW13- RO plant at Symsundarpur-Sarpi**
12FDW14- Pressure filter at Bankola Area

Sl. No.	Parameters	Analytical Results		Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	12FDW13	12FDW14	Acceptable Limit	Permissible Limit		
	Sampling Date	08-Jun-23	05-Jun-23				
1	Colour, Hazen	5	4	5.0	15.0	IS 3025 (Part 6): 2018	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984	1.0
5	pH	7.96	7.93	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983	2.0
6	Total Hardness	190.08	249.48	300	600	IS 3025 (Part 21): 2009	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003	0.06
8	Chlorides	24.50	66.92	250	1000	IS 3025 (Part 32): 1988	2.0
9	Res Free Chlorine	0.04	0.04	0.2	1	APHA 4500F DPD Ferrous Titrimetric	0.02
10	Dissolved Solids	210	511	500	2000	IS 3025 (Part 16): 1984	10.0
11	Calcium	34.91	42.85	75	200	IS 3025 (Part 40): 1991	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	0.03	0.02	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	14.31	22.46	200	400	APHA 4500D Turbidimetric	2.0
15	Nitrate	4.82	4.48	45	No relaxation	IS 3025 (Part 34): 1988	0.5
16	Fluoride	0.58	0.64	1	1.5	APHA 4500 D SPANDS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	BDL	BDL	5	15	APHA 3111B AAS Flame	0.01
21	Hex Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	IS 3025 (Part 57): 2005	0.20
23	Coliforms (MPN)	NIL	NIL	Not Specified		APHA Multiple Tube Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 1992	0.001
25	Alkalinity	92.10	233.64	200	600	IS 3025 (Part 23): 1986	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL -Below Detection Limit.

All values are expressed in mg/l unless specified.



DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman.

Name of station & code: **12FDW15- Filter plant.RO plant at Kumardih 'A'**
12FDW16- Pressure filter at Tilaboni

Sl. No.	Parameters	Analytical Results		Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	12FDW15	12FDW16	Acceptable Limit	Permissible Limit		
	Sampling Date	07-Jun-23	07-Jun-23				
1	Colour, Hazen	5	4	5.0	15.0	IS 3025 (Part 6): 2018	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984	1.0
5	pH	7.89	8.19	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983	2.0
6	Total Hardness	35.64	170.28	300	600	IS 3025 (Part 21): 2009	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003	0.06
8	Chlorides	9.29	31.60	250	1000	IS 3025 (Part 32): 1988	2.0
9	Residual Free Chlorine	0.02	0.02	0.2	1	APHA 4500F DPD Ferrous Titrimetric	0.02
10	Dissolved Solids	157	308	500	2000	IS 3025 (Part 16): 1984	10.0
11	Calcium	12.70	38.09	75	200	IS 3025 (Part 40): 1991	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	0.03	0.03	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	16.44	64.40	200	400	APHA 4500D Turbidimetric	2.0
15	Nitrate	2.48	6.46	45	No relaxation	IS 3025 (Part 34): 1988	0.5
16	Fluoride	0.48	0.52	1	1.5	APHA 4500D SPANDS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	BDL	BDL	5	15	APHA 3111B AAS Flame	0.01
21	Hex Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	IS 3025 (Part 57): 2005	0.20
23	Coliforms (MPN)	NIL	NIL	Not Specified		APHA Multiple Tube Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 1992	0.001
25	Alkalinity	39.60	150.40	200	600	IS 3025 (Part 23): 1986	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL -Below Detection Limit.

All values are expressed in mg/l unless specified.



DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman.

Name of station & code: **12FDW17- Pressure filter at Moira Colliery**
12FDW18-Pressure filter at Khandra Colliery

Sl. No.	Parameters	Analytical Results		Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	12FDW17	12FDW18	Acceptable Limit	Permissible Limit		
	Sampling Date	10-Jun-23	07-Jun-23				
1	Colour, Hazen	3	7	5.0	15.0	IS 3025 (Part 6): 2018	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984	1.0
5	pH	8.50	8.20	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983	2.0
6	Total Hardness	99.00	332.64	300	600	IS 3025 (Part 21): 2009	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003	0.06
8	Chlorides	92.94	83.67	250	1000	IS 3025 (Part 32): 1988	2.0
9	Residual Free Chlorine	0.03	0.03	0.2	1	APHA 4500F DPD Ferrous Titremetric	0.02
10	Dissolved Solids	721	611	500	2000	IS 3025 (Part 16): 1984	10.0
11	Calcium	12.70	85.70	75	200	IS 3025 (Part 40): 1991	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	0.03	0.03	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	6.12	300.24	200	400	APHA 4500D Turbidimetric	2.0
15	Nitrate	8.64	6.20	45	No relaxation	IS 3025 (Part 34): 1988	0.5
16	Fluoride	0.48	0.48	1	1.5	APHA 4500 D SPANDS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	0.01	BDL	5	15	APHA 3111B AAS Flame	0.01
21	Hex Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	IS 3025 (Part 57): 2005	0.20
23	Coliforms (MPN)	NIL	NIL	Not Specified		APHA Multiple Tube Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 1992	0.001
25	Alkalinity	522.72	126.72	200	600	IS 3025 (Part 23): 1986	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL -Below Detection Limit.

All values are expressed in mg/l unless specified.



DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman.

Name of station & code: **12FDW19- RO plant at Bankola & 12FDW20- RO plant at Sankarpur Colliery**

Sl. No.	Parameters	Analytical Results		Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	12FDW19	12FDW20	Acceptable Limit	Permissible Limit		
	Sampling Date	10-Jun-23	08-Jun-23				
1	Colour, Hazen	6	4	5.0	15.0	IS 3025 (Part 6): 2018	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984	1.0
5	pH	7.80	7.97	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983	2.0
6	Total Hardness	51.48	43.56	300	600	IS 3025 (Part 21): 2009	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003	0.06
8	Chlorides	18.00	3.72	250	1000	IS 3025 (Part 32): 1988	2.0
9	Residual Free Chlorine	0.02	0.02	0.2	1	APHA 4500F DPD Ferrous Titrimetric	0.02
10	Dissolved Solids	252	105	500	2000	IS 3025 (Part 16): 1984	10.0
11	Calcium	9.52	BDL	75	200	IS 3025 (Part 40): 1991	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	0.02	0.03	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	24.16	BDL	200	400	APHA 4500D Turbidimetric	2.0
15	Nitrate	BDL	1.44	45	No relaxation	IS 3025 (Part 34): 1988	0.5
16	Fluoride	0.38	0.36	1	1.5	APHA 4500 D SPANDS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	0.02	BDL	5	15	APHA 3111B AAS Flame	0.01
21	Hex Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	IS 3025 (Part 57): 2005	0.20
23	Coliforms (MPN)	NIL	NIL	Not Specified		APHA Multiple Tube Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 1992	0.001
25	Alkalinity	78.00	7.92	200	600	IS 3025 (Part 23): 1986	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL -Below Detection Limit.

All values are expressed in mg/l unless specified.



DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman.

Name of station & code: **12FDW21 - RO plant at Khandra UG**
12FDW22 - Pressure Filter at Kumardihi A

Sl. No.	Parameters	Analytical Results		Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	12FDW21	12FDW22	Acceptable Limit	Permissible Limit		
	Sampling Date	07-Jun-23	07-Jun-23				
1	Colour, Hazen	5	6	5.0	15.0	IS 3025 (Part 6): 2018	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984	1.0
5	pH	7.96	8.17	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983	0.01
6	Total Hardness	15.84	162.36	300	600	IS 3025 (Part 21): 2009	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003	0.06
8	Chlorides	3.72	63.20	250	1000	IS 3025 (Part 32): 1988	2.0
9	Residual Free Chlorine	0.02	0.03	0.2	1	APHA 4500F DPD Ferrous Titrimetric	0.02
10	Dissolved Solids	114	526	500	2000	IS 3025 (Part 16): 1984	10.0
11	Calcium	BDL	14.28	75	200	IS 3025 (Part 40): 1991	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	0.03	0.03	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	14.44	134.24	200	400	APHA 4500D Turbidimetric	2.0
15	Nitrate	BDL	1.18	45	No relaxation	IS 3025 (Part 34): 1988	0.5
16	Fluoride	0.42	0.46	1	1.5	APHA 4500 D SPANDS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	BDL	BDL	5	15	APHA 3111B AAS Flame	0.01
21	Hex Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	IS 3025 (Part 57): 2005	0.20
23	Coliforms (MPN)	NIL	NIL	Not Specified		APHA Multiple Tube Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 1992	0.001
25	Alkalinity	7.92	253.44	200	600	IS 3025 (Part 23): 1986	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL -Below Detection Limit.

All values are expressed in mg/l unless specified.



NOISE LEVEL MONITORING

4.1 Location of sampling sites and their rationale:

- i) **Pandaveswar UG (12N1)**: Noise level meter placed at Pandaveswar UG pit - top to assess the noise level at workplace.
- ii) **Dalurband OCP (12N2)**: Noise level meter placed at mine site to assess the noise level at workplace.
- iii) **Manderboni UG (12N3)**: Noise level meter placed at Manderboni UG pit - top to assess the noise level at workplace.
- iv) **South Samla UG (12N4)**: Noise level meter placed at South Samla UG pit - top to assess the noise level at workplace.
- v) **Madhaipur UG (12N5)**: Noise level meter placed at Madaipur UG pit - top to assess the noise level at workplace.
- vi) **Sonepur Bazari OC (12N6)**: Noise level meter placed at mine site to assess the noise level at workplace.
- vii) **Kumardihi B UG (12N7)**: Noise level meter placed at Kumardihi UG pit - top to assess the noise level at workplace.
- viii) **Khotadih OCP (12N8)**: Noise level meter placed at mine site to assess the noise level at workplace.
- ix) **Nakrakonda UG (12N9)**: Noise level meter placed at Nakrakonda UG pit - top to assess the noise level at workplace.
- x) **Jhanjra 1 & 2 Incline (12N10)**: Noise level meter placed at Jhanjra 1 & 2 Incline pit - top to assess the noise level at workplace.
- xi) **Tilaboni UG (12N11)**: Noise level meter placed at Tilaboni UG pit - top to assess the noise level at workplace.
- xii) **Shyamsundarpur UG (12N12)**: Noise level meter placed at Shyamsundarpur UG pit - top to assess the noise level at workplace.
- xiii) **Bankola UG (12N13)**: Noise level meter placed at Bankola UG pit - top to assess the noise level at workplace.
- xiv) **Kottadih UG (12N14)**: Noise level meter placed at Kottadih UG pit - top to assess the noise level at workplace.
- xv) **Kumardihi A UG (12N15)**: Noise level meter placed at Kumardihi A UG pit - top to assess the noise level at workplace.
- xvi) **Jhanjra MIC Incline (12N16)**: Noise level meter placed at Jhanjra MIC pit - top to assess the noise level at workplace.
- xvii) **Jhanjra 3 & 4 Incline (12N17)**: Noise level meter placed at Jhanjra 3 & 4 Incline pit - top to assess the noise level at workplace.
- xviii) **Madhaipur OCP (12N18)**: Noise level meter placed at mine site to assess the noise level at workplace.

4.2 Methodology of sampling and analysis: Noise level monitoring is being carried out on quarterly basis at designated monitoring stations. The noise level is observed at the monitoring stations during day and night time. Noise level measurements are taken in form of 'Leq' using Integrated Data Logging Sound Level Meter. Noise levels are measured in decibels, 'A' weighted average, i.e. dB(A).

4.3 Results & Interpretations: The observed values of noise level measurements are compared with Noise Pollution (Regulation and Control) Rules, 2000. The observed values of noise level are as shown in table below:



NOISE LEVEL REPORT

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

Station Code	Station Name	Date of sampling	Sampling duration (hrs.)	Day – time Noise Level dB(A) Leq	Night – time Noise Level dB(A) Leq	Day – Night Noise Level dB(A) Leq
12N1	Pandaveswar UG Pit Top	26-Apr-23	16.18 to 14.42	68.52	58.34	66.88
12N2	Dalurband UG Pit Top	17-Apr-23	15.48 to 14.38	60.24	53.21	58.82
12N3	Manderboni UG Pit Top	15-Apr-23	16.28 to 14.46	58.94	51.26	57.38
12N4	South Samla UG Pit Top	19-Apr-23	16.47 to 14.46	68.46	58.34	66.73
12N5	Madhaipur UG Pit Top	29-Apr-23	15.32 to 14.22	62.34	59.34	61.51
12N6	Sonepur Bazari OC	30-Apr-23	15.49 to 14.38	71.24	57.42	69.48
12N7	Kumardihi B UG Pit Top	26-Jun-23	16.24 to 15.22	63.58	52.34	61.89
12N8	Khottadih OCP	27-Jun-23	16.34 to 15.28	64.28	56.34	62.78
12N9	Nakrakonda UG Pit Top	19-Jun-23	16.22 to 14.36	63.45	55.42	61.86
12N10	Jhanjra 1&2 Incline Pit Top	10-Jun-23	15.47 to 14.52	62.34	54.25	60.83
12N11	Tilaboni UG Pit Top	27-Jun-23	15.38 to 14.32	60.25	57.34	59.44
12N12	Shyamsundarpur UG Pit Top	13-Jun-23	16.48 to 14.46	62.35	53.64	60.71
12N13	Bankola UG Pit Top	14-Jun-23	16.48 to 15.28	65.45	54.26	63.77
12N14	Khottadih UG & OC	16-May-23	15.34 to 14.28	63.24	52.34	61.57
12N15	Kumardihi A UG Pit Top	21-May-23	16.37 to 15.32	62.45	59.64	61.66
12N16	Jhanjra MIC Incline Pit Top	22-May-23	15.32 to 14.22	68.71	54.34	66.94
12N17	Jhanjra 3 & 4 Incline Pit Top	21-May-23	15.46 to 15.18	62.34	52.34	60.79
12N18	Madhaipur OCP	23-May-23	15.52 to 14.32	59.48	53.64	58.19

Noise Pollution (Regulation and Control) Rules published in Gazette of India, vide S. O. 123 (E) dated 14.02.2000 under Environment Protection Act, 1986.

Station Category	Limits for noise (Leq dB (A))	
	Day Time: 6.00 AM to 10.00 PM	Night Time: 10.00 PM to 6.00 AM.
Industrial	75.0	70.0
Commercial	65.0	55.0
Residential	55.0	45.0
Silence Zone	50.0	40.0