EASTERN COALFIELDS LIMITED
(A Subsidiary of Coal India Limited)
OFFICE OF THE GENERAL MANAGER, SODEPUR AREA
P.O. Sundarchak, Dist.: Burdwan, West Bengal-713360

ECL/SDPA/GM/2021/ 40 Dated-: 12.11.2021

To,

1. The Additional PCCF,
   Central MoEF, Regional Office, Govt. of India,
   Ministry of Environment and Forest, Eastern Region,
   A/3, Chandrasekharpur, Bhubaneswar-751023, Odisha

2. The Member Secretary,
   West Bengal Pollution Control Board,
   Paribesh Bhavan, 10A, Block- L.A, Sector-III, Bidhannagar, Kolkata-700106

3. The Regional Director,
   Central Pollution Control Board,
   Southern Conclave Block 502, 5TH & 6TH Floors,
   1582 Rajdanga Main Road Kolkata-700107, W.B

Sub-: Half yearly compliance report (April-21 to Sep-21) of Cluster 5 & 6 under Sodepur Area, ECL

Dear Sir,

Please find enclosed herewith the six monthly EC compliance report (April-21 to Sep-21) along with the environmental monitoring report, Satellite Monitoring Report and PME Details of the following mines under Sodepur Area, ECL.

1. Cluster 5 (Parbelia UG, Dubeswari UG)
2. Cluster 6 (Bejdih UG, Methani UG, Patmohna UG, Dhemomain UG, Narsamuda UG, Chinakuri III UG, Chinakuri I UG, Sodepur ® UG, Sheetalpur UG)

Enclosed-: As above

Yours sincerely,

General Manager 12/11/21
Sodepur Area

Copy-:

1) General Manager (Env&F), ECL HQ--- Kindly requested to upload the report Company's website

EASTERN COALFIELDS LIMITED
(A Subsidiary of Coal India Limited)
Office of the Agent,Sodepur Area

UNDERTAKING

Information provided in Half yearly EC compliance report for the period Apr-21 to Sep-21 in respect of the following mines of Cluster no.-5 is true to the best of my knowledge:

SL NO.	MINES	NAME OF THE MANAGER	SIGNATURE OF THE MANAGER	NAME OF THE AGENT	SIGNATURE OF THE Agent
1.	Parbelia UG	Anand Prakash		K.S.P Kaido	26/10/21
2	Parbelia OC patch				
3	Dubeshwari UG	Dinesh Prasad			
4	Dubeshwari OC patch				

EASTERN COALFIELDS LIMITED
HALF YEARLY EC COMPLIANCE REPORT
H/Y ENDING SEP'2021
CLUSTER NO.5, SODEPUR AREA
EC No. J-11015/288/2010-IA-II.(M) dt. 22-09-2014
Compliance of environment clearance conditions

Period: Half Yearly Report from 01.04.2021 to 30.09.2021

<table>
<tr><th>Sl no.</th><th>Specific Conditions</th><th>Compliance status</th></tr>
<tr><td>i.</td><td>The maximum production from the mine at any given time shall not exceed the limit as prescribed in the EC.</td><td>Regular monitoring of production data is done to comply with the condition. Monthly production from Apr-2021 to Sep-2021 is tabulated below:

<table>
<tr><td>Name of Mine</td><td>Annual Peak Capacity (MTY)</td><td>Production(Tes) From Apr-2021 to Sep 2021</td></tr>
<tr><td>Parbelia UG</td><td>0.19</td><td>22591</td></tr>
<tr><td>Parbelia OC Patch</td><td>0.13</td><td>0</td></tr>
<tr><td>Dubeshwari UG</td><td>0.18</td><td>31400</td></tr>
<tr><td>Dubeshwari OC patch</td><td>0.13</td><td>0</td></tr>
</table>

Regular monitoring of production data is done to comply with the condition.</td></tr>
<tr><td>ii.</td><td>The validity of the EC is for the life of the mine or as specified in the EIA Notification, 2006, whichever is earlier.</td><td>Noted and Agreed.</td></tr>
<tr><td>iii.</td><td>The opencast voids shall be completely backfilled after extraction of available coal reserves and there shall be no residual external dump.</td><td>Not Applicable as the mine is underground.</td></tr>
<tr><td>iv.</td><td>Total amount of OB produced shall be backfilled for both the proposed OC mines.</td><td>Not Applicable as the mine is underground. The mine in underground.</td></tr>
<tr><td>v.</td><td>Coal transportation in pit: Underground, mine- coal tubs at the phases are being hauled by tugger</td><td>Coal from underground is transported to surface through rope haulages and from surface to Parbelia and Dubeswari coal</td></tr>
</table>

	Haulage & Opencast mine – coal shall be proposed to be transported from pit to surface depot by tippers, surface to siding ; coal produced from Parbelia UG shall be transported by endless haulage to hoppers at Parbelia Railway Siding existing near the mine pits.They shall be no truck transportation. Coal produced from Parbelia OC Patch will be transported to Parbelia Railway Siding located at 3Kms away. Coal produced from Parbelia UG & OC will be transported by covered trucks to Parbelia Railway Siding and loading to siding. Coal shall be loaded by pay loaders into railway wagons. Transportation of coal from the mine to railway siding should be by mechanically covered trucks.	depot. Coal is carried from Parbelia and Dubeswari Coal depot to Chinakuri mine III railway siding for rail dispatch by tarpaulin covered truck/trippers. Coal is loaded to railway wagons by payloaders in Chinakuri Mine III Railway Siding.  Tarpaulin Covered Trucks
vi.	The production shall be within the Mining Lease area.	Complied.
vii.	The OB shall be completely re-handled at the end of the mining.	Not Applicable as the mine is underground.
viii.	There shall be no void.	Not Applicable as the mine is underground.
ix.	Coal extraction shall also be optimised in areas where agricultural production is continuing. Some pillars shall be left below the agricultural land. No depillaring and coal extraction should be carried out below habitation, H.T.Lines &beneath row, water bodies.	Complied.
x.	Subsidence shall be monitored closely and if subsidence is found exceeding the permitted limits, then the land owners shall be adequately compensated with mutual agreement with the land owners.	Subsidence is being monitored regularly by Surveyor. Mining is done in the land belonging to ECL.
xi.	Garland drains (size, gradient & length) around the safety areas such as mine shaft and low lying areas and sump capacity shall be resigned 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.	Garland Drains are provided wherever necessary to arrest rain water. Average Depth of garland drain is 1 mts. And average Width is 2 mts.

		  Garland drain At Parbelia and Dubeswari
xii.	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.	At present mobile water tankers are used to suppress the dust in roads from Radhanagar to Chinakuri Railway Siding. All approach roads are black topped. Fixed Water Sprinklers are installed at Railway Siding.  Water Sprinkling by Mobile Water Tanker at Chinakuri-Radhanagar Road
xiii.	Mining shall be carried out as per statuette at a safe distance from the river/nalla flowing adjacent to the lease boundary.	Complied. All applicable acts, rules and regulation and DGMS ordinances are being complied.
xiv.	The land after mining shall be brought back for agricultural purpose.	Agreed. It will be done as per Mine Closure Plan.

xv.	Mine water should be treated for discharge into the lagoons. The quality of lagoon water shall be regularly monitored And mitigation measures taken.	Mine discharge water is analyzed on regular basis by CMPDIL and found to be within the specified norms of CPCB. (Report Enclosed)
xvi.	High root density tree species shall be selected and planted over areas likely to be affected by subsidence.	Species selection and plantation is being done in consultation with forest department. Subsidence is being monitored regularly by surveyor. Some of the species are Karanj, Chatim, Mohaneem, Sisso etc.
xvii.	The CSR cost should be Rs. 5 per Tonnes of Coal produced which should be adjusted as per the annual inflation.	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 or Rs. 2 per Tonn of coal produced last year whichever is higher. The total CSR expenditure of Sodepur Area, ECL during First half of FY: 2021-22 is nearly Rs. 17497.00 and the work include. CIL Training scheme for PAP for Mining Sirdar.
xviii.	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 analysed and monitored for compliance of conditions, bearing with movement of wildlife and until such time they are closed/phased out.	Noted and Agreed. It shall be complied as per Mine Closure Plan (MCP).
xix.	Everybody in the core area should be provided with mask for protection against fugitive dust emissions.	Dust mask for protection against fugitive dust emissions is provided to the personnel working near dust producing sources. 839 Nos. of dust mask were issued from Area Store to mines of this cluster in FY: 2020-21.
xx.	Dust mask to be provided working in the mining area.	Provided.
xxi.	The supervisory staff should be held personally responsible for ensuring compulsory regarding wearing of dust mask in the core area.	Complied. Safety Officer of each mine ensures compulsory wearing of dust mask in the core area.
xxii.	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 mining area.	Followed. Health checkup along with lung disease is carries out on yearly basis. 20% of the worker are tested every year and all the workers are tested once in every five year at least. Total 350 people have gone through PME in calendar year 2021 till Sep-21. (PME Report Enclosed)
xxiii.	The mining area should be grounded	6.0 Ha of plantation has been done in

	by green belt having thick closed thick canopy of the tree cover.	Dubeswari Colliery in 2019-20. Around 15000 saplings has been planted with survival rate of 90%. Some species are (Shishu, Karanch, Mohaneem, Jarul and Chatim). Species planted will be maintained for 4 years to grow as a full tree. Currently Maintenance work is going on. 6 Hac. Plantation was done in Parbelia in 2018-19. Around 15000 saplings has been planted with survival rate of 90%. Some species are (Shishu, Karanch, Mohaneem, Jarul and Chatim). Species planted will be maintained for 4 years to grow as a full tree. Currently maintenance work is going on.  6 Hac. Plantation at Parbelia Colliery  6 Hac. Plantation done at Dubeswari 3 Hac. of Plantation is going on in FY: 2021-22 at Dubeswari Colliery.
xxiv.	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.	Not Applicable as the mine is underground.
xxv.	There shall be no over flow 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.	Not Applicable as the mine is underground.

xxvi.	Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flow from soil, OB and mineral dumps. The water so collected shall be regularly 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.	Not Applicable as the mine is underground.
xxvii.	Dimensions of the retaining wall at the toe of the dumps and OB benches within the mine to check rum-off and siltation shall be based on the rainfall data.	Not Applicable as the mine is underground.
xxviii.	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.	No Crusher in Cluster 5. Water Sprinkling is done at Coal Depot and from Radhanagar to Chinakuri Railway Siding by Mobile Water Tanker.
xxix.	Acid Water Treatment Plant, volume of water to be treated and disposal of brine should be provided.	Mine water is not acidic as indicated by the reports of CMPDIL, RI-1. (Report Enclosed)
xxx.	Mine Discharge water outside the ML shall be monitored, particularly for TDS and treated to conform to prescribed levels before discharge into the natural environment.	Mine water discharge is regularly monitored for TDS level and other parameters. Quality of mine water is within the permissible limits. (Report Enclosed)
xxxi.	Drills shall be wet operated.	Water spraying is done before and after drilling.

xxxii.	The project authorities shall undertake regular repairing and tarring of roads used for mineral transportation. A 3- tier green belt comprising of a mix of native species shall be developed all along the major approach roads.	Roads are repaired and tarred regularly. 400 mts. Of Cement Concrete Road has been constructed from Chinakuri Bazar to Chinakuri Railway Siding for control of dust during Transportation.  Cement Concrete Road At Chinakuri.
xxxiii.	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.	All the mines in this Cluster are Under Ground.
xxxiv.	A Progressive a forestation plan shall be implemented covering an area of 455.54 ha at the end of the mining which includes reclaimed excavation area (20.2 Ha), Mine infrastructure and built up area (120 Ha) and barren/ vacant land (315.34 Ha) and in township located outside the lease by planting native species in consultation with the local DFO/Agricultural dept. The density of the trees shall be around 2500 plants/ 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	No excavated area is present in this cluster as all the mines operational in this Cluster are underground.
xxxv.	The proponent should prepare restoration and reclamation plan for the degraded area. The land be used in a productive and sustainable manner.	Not Applicable as the mine is underground.
xxxvi.	Compensatory Ecological & Restoration of waste land, other degraded lands and OB dumps in lieu of breaking open the land be carried out.	Not Applicable as the mine is underground.
xxxvi	The mining should be phased out in	Not Applicable as the mine is underground.

i.	sustainable manner. No extra over burden dumps are permitted.	
xxxviii.	No groundwater shall be used for mining operations.	Noted and Agreed. For Mining Operation Pumped out water from Underground Mine is used.
xxxix.	Of the total quarry area 20.2 ha. The backfilled quarry area of 20.2 ha shall be reclaimed with plantation by planting native plant species in consultation with the local DFO/Agriculture Department. The density of the trees shall be around 2500 plants per ha	Not Applicable as the mine is underground.
xl.	Regular monitoring of groundwater level and quality shall be carried out by establishing a network of existing wells and construction of new peizometers. 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.	Monitoring of ground water table is being done by CMPDI to check the water table level. This is being done in Jan, May, Aug and Nov. (Ground Water Report Enclosed) Piezometer has been installed recently at Bhamaria in Cluster 5 of Sodepur Area. Drilling depth is 110 Mts.  Piezometric Borewell with Automatic Well Recorder at Bhamaria in Cluster 5
xli.	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.	Complied. Subsidence is monitored by Surveyor of the mines and till now no such case of subsidence has been encountered.
xlii.	If subsidence is found exceeding the permitted limits, then the landowners shall be adequately compensated with mutual agreement of the landowners.	Subsidence is monitored by Surveyor of the mines and till now no such case of subsidence has been encountered.
xliii.	The company shall put up artificial groundwater recharge measures for augmentation of groundwater resource in case monitoring indicates	Rooftop Rain Water Harvesting in installed at administrative buildings of Parbelia and Dubeswari for conservation of rain water and recharge of ground water.

	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.	 Rain Water Harvesting System at Parbelia Agent Office
xliv.	Sewage treatment plant shall be installed in the existing colony. ETP shall also be provided for workshop and CHP wastewater.	Septic tank is present in the colonies. There is no workshop and CHP in this cluster. Treatability Study has been done for construction of Sewage Treatment Plant at Parbelia.
xlv.	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 from occupational diseases and hearing impairment, if any, through an specialized agency /institution within the District/State and the results reported to this Ministry and to DGMS.	Health checkup is carried out on frequently as per norms and reported to DGMS. List of 10% workers has been prepared and sent to ECL HQ for further necessary action along with their year of service and age group for health check up from specialized agency.
xlvi.	Land ousters 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.	It is being complied as per R&R Policy of CIL/National R&R Policy.
xlvii.	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.	Changes in the land use pattern is being tracked by carrying out satellite imagery at every three years' interval. This is being done by CMPDI, Ranchi. Mines in this Cluster are Under Ground. It was last done in 2019 (Report Enclosed)

xlviii.	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 Environment Clearance.	Complied.
xlix.	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.	Followed. It is being done as per CIL CSR Policy.
xlx	Corporate Environment Responsibility:	
	a) The Company shall have a well laid down Environment Policy approved by the Board of Directors. b) The Environmental Policy shall prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions. 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. 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.	It is being complied with. a)Environment Policy of CIL: Coal India Limited (CIL) is committed to protect the environment through prevention, mitigation of pollution, proper disposal and recycling of wastes, conservation of biodiversity and bringing awareness among all its stakeholders for continual improvement in environmental performances following best practices. b)The environment policy ensures compliance of EC conditions and other statuary conditions issued by regulatory agencies. c)The Environment Department is headed by GM(Env) at HQ level and Environment Management Cell(EMC) has been established at each area of ECL which is responsible for looking after the compliances of the EC conditions of all the Clusters present in that area. The head of this EMC reports directly to the GM of the area. d)The Environment Audit Cell(EAC) has been established at area level for periodic audit of the Clusters for compliance of the EC conditions and other regulatory compliances. The non-compliances are being reported to the agents of the concerned cluster and also to the GM of the area. A copy of the audit report also being sent to the GM(Env), HQ. If the compliance is not done in the time bound manner then it is further reported to the higher authorities by GM(Env), HQ.

B.	General Conditions	Compliance status
i.	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment, Forests & Climate Change.	No change in mining technology will be done without prior approval of the MoEF&CC.
ii.	No change in the calendar plan of production for quantum of mineral coal shall be made.	Production is being done according to the prior approved calendar plan and under the limit of EC as given in the Specific Condition no.(i).
iii.	Four ambient air quality monitoring stations shall be established in the core 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.	Regular Environmental monitoring is being carried out quarterly basis by CMPDI, Asansol. Monitoring stations have been located in consultation with officials of SPCB in accordance with the direction of the wind. Location of station changes in summer and winter season according to the direction of wind and monitoring is done as per the condition meeting the norms at upstream and downwind direction.
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 Central Pollution Control Board once in six months. Random verification of samples through analysis from independent laboratories recognised under the EPA rules, 1986 shall be furnished as part of compliance report.	Regular Environmental monitoring is being carried out on quarterly basis by CMPDI, Asansol. Same as per General Condition no.(iii)
v.	Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs/muffs.	Workers on pertinent activity are always provided with particular ear plugs/muffs.
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 19th May 1993 and 31st December 1993 or as	Agreed. No workshop is present in this Cluster.

	amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.	
vii.	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.	Vehicles are checked for PUC certificates. Vehicles used for transporting coal are covered with tarpaulins and optimally loaded.
viii.	Monitoring of environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring analysis equipment in consultation with the State Pollution Control Board and data got analyzed through a laboratory recognized under EPA Rules, 1986.	Environmental Laboratory with latest equipment has been established at CMPDI, RI – I, Asansol. Quarterly monitoring report of Air, Water, and Noise& Groundwater level is prepared at above laboratory and sent to West Bengal pollution control Board with Environmental Statement (Form-V) & by Six monthly compliance reports to the MoEF regional office Bhuwaneswar.
ix.	Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training information on safety and health aspects.	Protective wears are being supplied and used by workmen judiciously.
x.	Occupational health surveillance programme 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.	Followed. Health checkup along with lung disease is carries out on yearly basis. 20% of the worker are tested every year and all the workers are tested once in every five year at least. Total 350 people have gone through PME in calendar year 2021 till Sep-21. (PME Details enclosed)
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.	A separate environmental management cell at Company HQ, headed by GM (Env), and nine executives has been set up. For management at mine level a cell is also functional headed by Nodal Officer (A senior level Executive) Environment, who reports to Area General Manger with unit nodal officer at mine level. GM (Env) and Area General Manager reports directly to Director (Technical) of the company
xii.	The funds embarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall	The funds embarked for environmental protection measures for the year 2021-22 is 12 lakhs under EMP head (for Sodepur Area) and it is kept in separate account and shall not be diverted for other purpose.

	be reported to this Ministry and its concerned Regional Office.	Further 20 lakhs had been proposed for Plantation and its maintenance and 30 lakhs for other environmental measures in FY: 2021-22. In Current FY: 21-22 Rs. 11.96 Lakhs has been spent for Environment Protection Measures and Environment Awareness Programme like World Earth Day, World Environment Day and Vriksha Ropan Abhiyan.
xiii.	The project authorities shall advertise at least in two local newspapers widely circulated around the project, one of which shall be in 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, Forests & Climate Change at http://envfor.nic.in	Complied
xiv.	A copy of the environment clearance letter shall be marked to concern Panchayat/Zila Parishad, Municipal Corporation or Urban local body and local NGO, if any, from whom any suggestion/representation has been received while processing the proposal. A copy of the clearance letter shall also be displayed on company's website.	The copy of the clearance letter has been communicated to the Kulti Municipal Corporation and Asansol municipal Corporation of Burdwan Dist.(WB).The copy has also been displayed in Company' website.
xv.	A copy of the environment 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	Copy of EC letter sent to concerned panchayats and receiving copy with seal and signature of the Panchayat is available with the Environment Management Cell (EMC). EC letter displayed on company's website: http://www.easterncoal.gov.in/notices/env_update21102014.pdf
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	Complied.

	website and updated at least once every six months so as to bring the same in public domain. The monitoring data of environmental quality parameter (air, water, noise and 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 t the entrance of the project premises and mine office and in corporate office and on company's website	
xvii.	The project proponent shall submit six monthly compliance reports on status 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 SPCB.	The six-monthly compliance reports will be communicated to MOEF, respective Zonal Office in Bhubaneswar. The present report is the compliance report from Apr-2021 to Sep- 2021.
xviii.	The Regional Office of this Ministry located in the Region shall monitor compliance 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.	The project is always ready to co-operate with the Ministry whenever required.
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 with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MoEF&CC by e-mail.	The environmental statement for financial year 2020-21 ending 31st March 2021 in Form-V has been already submitted to West Bengal Pollution Control Board and mailed to the respective Regional Offices of the MoEF&CC.

PLANTATION AT CHATRAKANALI PARBELIA COLLIERY

PLANTATION AT DUBESWARI COLLIERY

RAIN WATER HARVESTING AT PARBELIA AGENT OFFICE BUILDING

PARBELIA FOOTBALL GROUND

PIEZOMETRIC BOREWELL ALONG WITH AUTOMATI WELL RECORDER AT BHAMARIA IN PARBELIA

GARLAND DRAIN AT PARBALI AND DUBESWARI

ENVIRONMENT MONITORING REPORT OF CLUSTER NO. 5

(FOR THE MONTH OF MAY, 2021)

(SODEPUR AREA)

Eastern Coalfields Limited

cmpdi
A Mini Ratna Company

Regional Institute-1
Asansol (WB)

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) **Ranipur village (5A1):** The sampler was placed at Ranipur village. This station was selected to assess the ambient air quality of residential area in the buffer zone of Kumardubi colliery

ii) **Dubeshwari Colliery (5A2):** The sampler was placed at Dubeshwari colliery. This station was selected to assess the ambient air quality of industrial area in the Core zone of Dubeshwari Colliery.

iii) **Raghunathpur village (5A6)**: The air sampler was placed at Raghunathpur village. This site was selected to assess the present ambient air quality status in residential area.

iv) **Sialdanga Pump House (5A7)**: The sampler was placed at pump house of ECL, Sialdanga. This site was selected to assess the present ambient air quality status in residential area of buffer zone of Sodepur Colliery.

v) **Sodepur 3A pit (5A8)**: The sampler was placed at pump house of Sodepur 3A pit. This site was selected to assess the present ambient air quality status in industrial area of core zone of Sodepur colliery.

2.1 Methodology of sampling and analysis: 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. Parameters chosen for assessment of ambient air quality are Particulate Matter (PM_{10}), Fine Particulate Matter ($PM_{2.5}$), Respirable Dust Sampler (RDS) & Fine Dust Sampler (FDS) were used for sampling of PM_{10} and $PM_{2.5}$ respectively. The samples were analysed in Environmental Laboratory of CMPDI, RI-I, Asansol.

2.2 Results & Interpretations: In industrial area PM_{10} varies from 136.4 to 158.3 µg/m^3 & in residential area from 95.3 to 131.3 µg/m^3. In industrial area $PM_{2.5}$ varies from 39.0 to 41.2 µg/m^3 & in residential area from 34.0 to 38.2 µg/m^3. In industrial area & in residential area SO_2 below 10 µg/m^3.In industrial area NO_x varies from 16.9 to 19.0 µg/m^3 & in residential area from 16.0 to 17.3 µg/m^3.

AMBIENT AIR QUALITY DATA

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

First fortnight:

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu g/m^3$)	Name of method	Detection limit ($\mu g/m^3$)
5A1	Ranipur village	Residential	4-May-21	PM_{10}	96.2	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	34.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	16.0	IS 5182 (Part 6): 2017	10
5A2	Dubeshwari Colliery	Industrial	4-May-21	PM_{10}	158.3	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	40.2	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	19.0	IS 5182 (Part 6): 2017	10
5A6	Raghunathpur village	Residential	4-May-21	PM_{10}	96.8	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	37.6	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	17.1	IS 5182 (Part 6): 2017	10
5A7	Sialdanga Pump House	Residential	5-May-21	PM_{10}	131.3	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	38.2	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	16.2	IS 5182 (Part 6): 2017	10
5A8	Sodepur 3A pit	Industrial	5-May-21	PM_{10}	136.4	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	39.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	16.9	IS 5182 (Part 6): 2017	10

Second fortnight:

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results (µg/m^3)	Name of method	Detection limit (µg/m^3)
5A1	Ranipur village	Residential	18-May-21	PM_{10}	96.8	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	34.4	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	16.2	IS 5182 (Part 6): 2017	10
5A2	Dubeshwari Colliery	Industrial	18-May-21	PM_{10}	153.7	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	40.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	18.6	IS 5182 (Part 6): 2017	10
5A6	Raghunathpur village	Residential	28-May-21	PM_{10}	95.3	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	36.5	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	17.3	IS 5182 (Part 6): 2017	10
5A7	Sialdanga Pump House	Residential	26-May-21	PM_{10}	126.5	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	37.9	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	16.9	IS 5182 (Part 6): 2017	10
5A8	Sodepur 3A pit	Industrial	26-May-21	PM_{10}	149.5	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	41.2	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	17.4	IS 5182 (Part 6): 2017	10

Environmental Standards for Ambient Air Quality (AAQ):

Station Category	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 (µg/m^3)			
	PM_{10}	SO_2	NO_x	$PM_{2.5}$
Industrial	300.0	120.0	120.0	60.0
Residential	100.0	80.0	80.0	

CHAPTER – III
WATER QUALITY MONITORING

3.1 Mine water sampling stations:

i) **Parbelia UG (5MW1):** This location has been selected to monitor the discharge quality of mine effluent after sedimentation tank.

ii) **Dubeswari UG (5MW2)**: This location has been selected to monitor the discharge quality of mine effluent from reservoir.

3.3 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.

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		General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit
	Station Code	5MW1	5MW2			
	Date of sampling	12-May-21	12-May-21			
1	pH	7.56	7.48	5.5 - 9.0	IS 3025 (Part 11): 2017	0.01
2	TSS	14.6	17.4	100	IS 3025 (Part 17): 2017	10.0
3	TDS	536	422	Not specified	IS 3025 (Part 16): 2017	25.0
4	Oil & Grease	BDL	BDL	10	IS 3025 (Part 39): 2019	2.0
5	COD	32	24	250	APHA, 5220 C: 23rd Edition	4.0

Second fortnight:

Sl. No.	Parameters	Analytical results		General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit
	Station Code	5MW1	5MW2			
	Date of sampling	31-May-21	31-May-21			
1	pH	7.88	7.68	5.5 - 9.0	IS 3025 (Part 11): 2017	0.01
2	TSS	13.8	18.1	100	IS 3025 (Part 17): 2017	10.0
3	TDS	544	438	Not specified	IS 3025 (Part 16): 2017	25.0
4	Oil & Grease	BDL	BDL	10	IS 3025 (Part 39): 2019	2.0
5	COD	28	20	250	APHA, 5220 C: 23rd Edition	4.0

GROUND WATER QUALITY

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

Name of station & code: 1. 5GW1- Dugwell at Kartick Banerjee house in Parbelia village.
2. 5GW2- Dugwell near Bhamaria star club.

Sl. No.	Parameters	Analytical Results		Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	5GW1	5GW3				
	Sampling Date	7-May-21	7-May-21	Acceptable Limit	Permissible Limit		
1	Colour, Hazen	3	2	5.0	15.0	Platinum Cobalt	1.0 Hazen
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		Physical	-
3	Taste	Agreeable	Agreeable	Agreeable		Physical	-
4	Turbidity, NTU	2.1	2.4	1	5	Nephelometric	1.0 NTU
5	pH	7.56	7.07	6.5-8.5	No relaxation	Electrometric	0.01
6	Total Hardness	130	197	300	600	EDTA	4.0
7	Iron	BDL	BDL	0.3	No relaxation	AAS Flame	0.06
8	Chlorides	23	41	250	1000	Argentometric	2.0
9	Res Free Chlorine	BDL	BDL	0.2	1	Spectrophotometric	0.02
10	Dissolved Solids	154	384	500	2000	Gravemetric	10.0
11	Calcium	72	57	75	200	EDTA	1.60
12	Copper	BDL	BDL	0.05	1.5	AAS Flame	0.03
13	Manganese	BDL	BDL	0.1	0.3	AAS Flame	0.02
14	Sulphate	68	178	200	400	Turbidity	2.0
15	Nitrate	12.60	4.14	45	No relaxation	Spectrophotometric	0.5
16	Fluoride	0.66	0.32	1	1.5	SPANDS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	AAS - GTA	0.002
18	Arsenic	BDL	BDL	0.01	0.05	AAS - VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	AAS - GTA	0.005
20	Zinc	BDL	BDL	5	15	AAS Flame	0.01
21	Hex Chromium	BDL	BDL	0.05	0.05	Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	Colorimetric Carmine	0.20
23	Coliforms (MPN)	NIL	NIL	Not Specified		Chloroform Extraction	1.0
24	Phenolics	NIL	NIL	0.001	0.002	Titrimetric Indicator	0.001
25	Alkalinity	140	220	200	600	Titrimetric	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	AAS - GTA	0.0005

All values are expressed in mg/l unless specified.

GROUNG WATER QUALITY

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

Name of station & code: 3. 5GW3- Dugwell near Shiv mandir in Digha village

Sl. No.	Parameters	Analytical Results	Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	5GW3				
	Sampling Date	28-May-21	Acceptable Limit	Permissible Limit		
1	Colour, Hazen	2	5.0	15.0	Platinum Cobalt	1.0 Hazen
2	Odour	Unobjectionable	Unobjectionable		Physical	-
3	Taste	Agreeable	Agreeable		Physical	-
4	Turbidity, NTU	2.6	1	5	Nephelometric	1.0 NTU
5	pH	7.45	6.5-8.5	No relaxation	Electrometric	0.01
6	Total Hardness	682	300	600	EDTA	4.0
7	Iron	BDL	0.3	No relaxation	AAS Flame	0.06
8	Chlorides	206	250	1000	Argentometric	2.0
9	Res Free Chlorine	BDL	0.2	1	Spectrophotometric	0.02
10	Dissolved Solids	996	500	2000	Gravemetric	10.0
11	Calcium	171	75	200	EDTA	1.60
12	Copper	BDL	0.05	1.5	AAS Flame	0.03
13	Manganese	BDL	0.1	0.3	AAS Flame	0.02
14	Sulphate	24	200	400	Turbidity	2.0
15	Nitrate	42.16	45	No relaxation	Spectrophotometric	0.5
16	Fluoride	0.38	1	1.5	SPANDS	0.02
17	Selenium	BDL	0.01	No relaxation	AAS - GTA	0.002
18	Arsenic	BDL	0.01	0.05	AAS - VGA	0.002
19	Lead	BDL	0.01	No relaxation	AAS - GTA	0.005
20	Zinc	BDL	5	15	AAS Flame	0.01
21	Hex Chromium	BDL	0.05	0.05	Colorimetric	0.01
22	Boron	BDL	0.5	1	Colorimetric Carmine	0.20
23	Coliforms (MPN)	NIL	Not Specified		Chloroform Extraction	1.0
24	Phenolics	NIL	0.001	0.002	Titrimetric Indicator	0.001
25	Alkalinity	352	200	600	Titrimetric	4.0
26	Cadmium	BDL	0.003	No relaxation	AAS - GTA	0.0005

All values are expressed in mg/l unless specified.

Ground water level for the month of May' 2021

Sl. No.	Station Code	Location of Dugwell	Date of measurement	Water level (in Meters) Below Ground Level	MP (m)	Depth (m)	Dia (m)	Owner
1	5GWL1	Dugwell at Kartick Banerjee house at Parbelia village	7-May-21	1.30	0.6	8.1	1.8	Private
2	5GWL2	Dugwell near Bhamaria Star Club	7-May-21	6.40	0.65	10.95	1.9	Govt.
3	5GWL3	Dugwell near Shiv Mandir in Digha village	12-May-21	3.60	0.5	18	2.05	Panchayat

Piezometer water level

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 Rajmahal OC Project:

i) **Sodepur (Bhamuria Unit Campus, (Downdip side of Parbelia UG) (5/SO/PP-01):** A piezometer has been constructed to measure the ground water level at Bhamuria Unit Campus downdip side of Parbelia UG of Sodepur Area

Sl. No.	Station Code	Location of Piezometer	Date of measurement	Water level (in Meters) Below Ground Level
1	5/SO/PP-01	Sodepur (Bhamuria Unit Campus, downdip side of Parbelia UG)	12-May-21	33.25

ENVIRONMENT MONITORING REPORT OF CLUSTER NO. 5

(FOR THE MONTH OF JULY, 2021)

(SODEPUR AREA)

Eastern Coalfields Limited

Regional Institute-1
Asansol (WB)

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) **Ranipur village (5A1):** The sampler was placed at Ranipur village. This station was selected to assess the ambient air quality of residential area in the buffer zone of Kumardubi colliery

ii) **Dubeshwari Colliery (5A2):** The sampler was placed at Dubeshwari colliery. This station was selected to assess the ambient air quality of industrial area in the Core zone of Dubeshwari Colliery.

iii) **Raghunathpur village (5A6)**: The air sampler was placed at Raghunathpur village. This site was selected to assess the present ambient air quality status in residential area.

iv) **Sialdanga Pump House (5A7)**: The sampler was placed at pump house of ECL, Sialdanga. This site was selected to assess the present ambient air quality status in residential area of buffer zone of Sodepur Colliery.

v) **Sodepur 3A pit (5A8)**: The sampler was placed at pump house of Sodepur 3A pit. This site was selected to assess the present ambient air quality status in industrial area of core zone of Sodepur colliery.

2.1 Methodology of sampling and analysis: 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. Parameters chosen for assessment of ambient air quality are Particulate Matter (PM_{10}), Fine Particulate Matter ($PM_{2.5}$), Respirable Dust Sampler (RDS) & Fine Dust Sampler (FDS) were used for sampling of PM_{10} and $PM_{2.5}$ respectively. The samples were analysed in Environmental Laboratory of CMPDI, RI-I, Asansol.

2.2 Results & Interpretations: In industrial area PM_{10} varies from 63.9 to 89.3 µg/m^3 & in residential area from 78.6 to 88.6 µg/m^3. In industrial area $PM_{2.5}$ varies from 25.0 to 27.6 µg/m^3 & in residential area from 20.2 to 28.2 µg/m^3. In industrial area & in residential area SO_2 below 10 µg/m^3.In industrial area NO_x varies from 14.2 to 16.2 µg/m^3 & in residential area from 14.0 to 15.3 µg/m^3.

AMBIENT AIR QUALITY DATA

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

First fortnight:

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu g/m^3$)	Name of method	Detection limit ($\mu g/m^3$)
5A1	Ranipur village	Residential	13-Jul-21	PM_{10}	83.4	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	22.2	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.0	IS 5182 (Part 6): 2017	10
5A2	Dubeshwari Colliery	Industrial	14-Jul-21	PM_{10}	77.1	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	25.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	16.2	IS 5182 (Part 6): 2017	10
5A6	Raghunathpur village	Residential	14-Jul-21	PM_{10}	84.0	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	25.6	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.3	IS 5182 (Part 6): 2017	10
5A7	Sialdanga Pump House	Residential	14-Jul-21	PM_{10}	88.6	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	28.2	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	14.4	IS 5182 (Part 6): 2017	10
5A8	Sodepur 3A pit	Industrial	14-Jul-21	PM_{10}	89.3	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	27.6	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	14.7	IS 5182 (Part 6): 2017	10

Second fortnight:

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results (µg/m^3)	Name of method	Detection limit (µg/m^3)
5A1	Ranipur village	Residential	29-Jul-21	PM_{10}	80.6	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	20.5	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	14.6	IS 5182 (Part 6): 2017	10
5A2	Dubeshwari Colliery	Industrial	29-Jul-21	PM_{10}	78.4	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	26.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.4	IS 5182 (Part 6): 2017	10
5A6	Raghunathpur village	Residential	29-Jul-21	PM_{10}	78.6	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	20.2	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.0	IS 5182 (Part 6): 2017	10
5A7	Sialdanga Pump House	Residential	26-Jul-21	PM_{10}	83.4	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	24.5	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	14.0	IS 5182 (Part 6): 2017	10
5A8	Sodepur 3A pit	Industrial	26-Jul-21	PM_{10}	63.9	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	27.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	14.2	IS 5182 (Part 6): 2017	10

Environmental Standards for Ambient Air Quality (AAQ):

Station Category	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 (µg/m^3)			
	PM_{10}	SO_2	NO_x	$PM_{2.5}$
Industrial	300.0	120.0	120.0	60.0
Residential	100.0	80.0	80.0	

CHAPTER – III
WATER QUALITY MONITORING

3.1 Mine water sampling stations:

i) **Parbelia UG (5MW1):** This location has been selected to monitor the discharge quality of mine effluent after sedimentation tank.

ii) **Dubeswari UG (5MW2)**: This location has been selected to monitor the discharge quality of mine effluent from reservoir.

3.3 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.

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		General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit
	Station Code	5MW1	5MW2			
	Date of sampling	7-Jul-21	7-Jul-21			
1	pH	7.25	7.06	5.5 - 9.0	IS 3025 (Part 11): 2017	0.01
2	TSS	18.0	16.2	100	IS 3025 (Part 17): 2017	10.0
3	TDS	575	481	Not specified	IS 3025 (Part 16): 2017	25.0
4	Oil & Grease	BDL	BDL	10	IS 3025 (Part 39): 2019	2.0
5	COD	36	32	250	APHA, 5220 C: 23rd Edition	4.0

Second fortnight:

Sl. No.	Parameters	Analytical results		General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit
	Station Code	5MW1	5MW2			
	Date of sampling	16-Jul-21	16-Jul-21			
1	pH	7.60	7.68	5.5 - 9.0	IS 3025 (Part 11): 2017	0.01
2	TSS	17.6	16.4	100	IS 3025 (Part 17): 2017	10.0
3	TDS	568	473	Not specified	IS 3025 (Part 16): 2017	25.0
4	Oil & Grease	BDL	BDL	10	IS 3025 (Part 39): 2019	2.0
5	COD	32	36	250	APHA, 5220 C: 23rd Edition	4.0

*BDL-Below Detection Limit *All values are expressed in mg/l except pH.*

EASTERN COALFIELDS LIMITED
(A Subsidiary of Coal India Limited)
Office of the Agent,Sodepur Area

UNDERTAKING

Information provided in Half yearly EC compliance report for the period Apr-21 to Sep-21 in respect of the following mines of Cluster no.-6 is true to the best of my knowledge:

Sl. NO.	Name of the Mines	Name of the Manager	Signature of the Manager	Name of the Agent	Signature of the Agent
1.	Narsamuda UG	N.D. Singho		Binod Kumar.	
2.	Dhemomain UG	Manoj Kumar			
3.	Chinakuri I UG	Ajit Kumar.		D. Kundu	
4.	Chinakuri III UG	S. Das			
5	Chinakuri III OC Patch				
6.	Sodepur® UG	M.D Eklaque Khan			
7.	Sodepur OC Patch				
8.	Sheetapur UG				
9.	Bejdih UG	Manoj Kumar Mishra	27/10/21	Prabal Kumar Roy	
10.	Mithani UG	R.N. Tewari			
11.	Mithani OC Patch		27/10/21		
12.	Patmohna UG	Madhav Banerjee.	27/10/21		
13.	Patmohna OC Patch				

EASTERN COALFIELDS LIMITED
HALF YEARLY EC COMPLIANCE REPORT
H/Y ENDING SEP-2021
CLUSTER NO. 6, SODEPUR AREA
EC No. J-11015/385/2010-IA-II. (M) Dt. 16-01-2015

Compliance of environment clearance conditions
Period: Half Yearly Report from 1st April-2021 to 30th Sep-2021

<table>
<tr><th>Sl no.</th><th>Specific Conditions</th><th>Compliance status</th></tr>
<tr><td>i.</td><td>The maximum production from the mine at any given time shall not exceed the limit as prescribed in the EC.</td><td>
<table>
<tr><th>Name of the mines</th><th>Annual Peak Capacity(MTY)</th><th>Production(Te)
From 1st April to 30th Sep-2021</th></tr>
<tr><td>Bejdih</td><td>0.10</td><td>8254</td></tr>
<tr><td>Methani</td><td>0.20</td><td>25309</td></tr>
<tr><td>Patmohna</td><td>0.12</td><td>17220</td></tr>
<tr><td>Dhemomain</td><td>0.21</td><td>15938</td></tr>
<tr><td>Narsamuda</td><td>0.19</td><td>10609</td></tr>
<tr><td>Sodepur</td><td>0.15</td><td>Suspended</td></tr>
<tr><td>Sheetalpur</td><td>0.50</td><td>Abandoned</td></tr>
<tr><td>Chinakuri I</td><td>0.08</td><td>0</td></tr>
<tr><td>Chinakuri III</td><td>0.20</td><td>21186</td></tr>
</table>
Regular monitoring of production data is done to comply with the condition. Monthly production from April-21 to Sep-21 is tabulated below:
</td></tr>
<tr><td>ii.</td><td>The validity of the EC is for the life of the Mine or as specified in the EIA Notification, 2006, whichever is earlier.</td><td>Noted and Agreed.</td></tr>
<tr><td>iii.</td><td>All safety measures shall be taken as per CMR, 1957 & related circulars.</td><td>Complied (CMR, 2017)</td></tr>
<tr><td>iv.</td><td>The production shall be within the same Mining Lease area.</td><td>Complied.</td></tr>
</table>

v.	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.	Coal from all the mines under cluster-6 is transported through centralized railway siding present at Chinakuri III Rly. Siding. Coal transportation from mine to siding is done by tarpaulin covered trucks.  Tarpaulin Covered Trucks or Coal Transportation
vi.	Independent network of railway sidings 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.	Chinakuri III Railway Siding is being used for transportation of coal in this cluster.
vii.	Three tier green belts shall be raised around the railway sidings and along the road sides to prevent dust and noise pollution.	Plants and vegetation exist around the boundary of railway siding. More plantation will be done in the future as well.  Beautification work at Chinakuri Siding  Trees and Plants along the Railway Siding

viii.	Stowing and depillaring shall be as per the recommendations of the DGMS.	It is being done as per DGMS guideline.
ix.	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.	Not applicable.
x.	Trees with deep rooted system should be planted so as to prevent soil erosion.	Species selection and plantation is being done in consultation with forest department. Some of the species planted are Mohaneem, Karanj, Chatim, Sisso etc.
xi.	Proponent should plant additional 10 Ha/year over the next 10 years at various locations in this Cluster.	Agreed. Plantation is being done in phase manner in this cluster and according to availability of Land. 2 Hac. Plantation had been done in FY 20-21 in Patmohana Colliery. More plantation will be done as per availability of Land. 
xii.	River/nallahs shall be desilted	Agreed. Nallah is desilted as when required.

	and restored back to functional state.	
xiii.	Wild life conservation plan be prepared and submitted to MoEF&CC with the approval of The State Govt.	Work Order has been issued Vide No. ECL/ENV/20/228 Dated-: 27.08.2020. The Draft Report has been submitted to DFO, Durgapur for vetting.
xiv.	Proponent shall use high resolution image of all clusters for evaluating land use, plantation etc.	Changes in the land use pattern is being tracked by carrying out satellite imagery at every three years' interval. This is being done by CMPDI, Ranchi. Mines in this Cluster are Under Ground. (Report Enclosed)
xv.	Separate drainage pattern be provided.	Garland drain is constructed wherever necessary. Garland Drain at Narsamuda has average depth of 2.3m and average Width of 5.5 m.  Garland Drain at Narsamuda Colliery
xvi.	Sand stowing must be used as recommended by CMPDIL.	Sand stowing is being done as per recommendation of CMPDIL.
xvii.	Action Plan for prevention and mitigation of subsidence be prepared and implemented.	Subsidence is being monitored by Surveyor of the Mines. Project is always ready for any such encounter.
xviii.	The OC patches to be operated will be completely filled up after exhaustion of reserves and reclaimed with plantation.	Not Applicable as the mines are underground.
xix.	The OB shall be completely re-handled at the end of mining.	Not Applicable as the mines are underground.
xx.	There shall be no residual OB dump after the mining.	Not Applicable as the mines are underground.
xxi.	After completion of mining activities, the subsided areas shall be graded and planted upon.	Agreed. It will be done as per Mine closure Plan. All the Operational Mines in this Cluster are UG Mines.
xxii.	Coal extraction shall also be optimized in areas where	Complied.

	agricultural production is continuing. Some pillars shall be left below the agricultural land. No depillaring and coal extraction should be carried out below habitation, H.T.Lines &beneath row, water bodies.	
xxiii.	The rehabilitation of the household falling within this cluster to be carried out in two phases within 10 years.	Noted and Agreed.
xxiv.	The land excavated after mining must be brought back to original condition for agricultural/plantation purpose.	No Applicable as the mines are underground.
xxv.	The water discharged from the mines should be as good as surface drinking water.	Mine discharge water is analyzed on regular basis by CMPDIL and found to be within the specified norms of CPCB. (Report enclosed)
xxvi.	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 the loss of life and material. Cracks shall be effectively plugged with ballast and clay soil/suitable material.	No subsidence has been observed till date. Subsidence is being monitored by Surveyor of the Mines. Project is always ready for any such encounter.
xxvii.	If subsidence is found exceeding the permitted limits, then the land owners shall be adequately compensated with mutual agreement with the land owners.	Subsidence is being monitored by Surveyor of the Mines. Project is always ready for any such encounter.

xxviii.	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.	Fixed water sprinkler at Chinakuri Railway Siding has been installed. Mobile water tankers are used to suppress the dust in roads from Radhanagar More to Chinakuri Weighbridge. All approach roads are black topped. Sprinkling is done at Coal Depots.  Water Sprinkling at Radhanagar Road by Mobile Water Tanker
xxix.	The CSR cost should be Rs. 5 per Tones of Coal produced which should be adjusted as per the annual inflation.	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 or Rs. 2 per Tonn of coal produced last year whichever is higher. The total CSR expenditure of Sodepur Area, ECL during First half of FY: 2021-22 is nearly Rs. 17497.00 and the work include. 1) CIL Training scheme for PAP for Mining Sirdar.
xxx.	Mining in the existing mines should be phased out after expiry of the current mining lease and after reclamation of mined over areas. 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.	Noted and Agreed. It shall be complied as per Mine Closure Plan (MCP).
xxxi.	Everybody in the core area should be provided with mask for protection against fugitive dust emissions.	Dust mask for protection against fugitive dust emissions is provided to the personnel working near dust producing sources. 2582 Dust masks has been issued by Area Store to the mines in this cluster for FY: 2020-21.
xxxii.	Dust mask to be provided working in the mining area.	Provided.

xxxiii.	The supervisory staff should be held personally responsible for ensuring compulsory regarding wearing of dust mask in the core area.	Complied. Safety Officer of the Mines endures that all the workers wear Dust Mask.
xxxiv.	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 mining area.	Followed. Health checkup along with lung disease is carries out on yearly basis. 20% of the worker are tested every year and all the workers are tested once in every five year at least. Total 350 people have gone through PME in calendar year 2021 till Sep-21. (PME Report Attached)
xxxv.	The mining area should be grounded by green belt having thick closed thick canopy of the tree cover.	2 Hac. Plantation has been be done in FY: 20-21 in Patmohana Colliery Leasehold Area. Around 5000 saplings have been planted with survival rate of 90%. Some species are (Shishu, Karanch, Mohaneem, Jarul and Chatim). Species planted will be maintained for 4 years to grow as a full tree. 2 Hac. Plantation with fruits bearing species have been planted in Methani in the FY: 2014-15 which has grown into full trees of different fruits bearing species.  Plantation in Patmohana 2020-21 (2 Hac.)  Plantation at Methani 2014-15 (2 Hac.)
xxxvi.	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 checkup is carried out on frequently as per norms and reported to DGMS. List of 10% workers has been prepared and sent to ECL HQ for further necessary action along with their year of service and age group for health check-up from specialized agency.

	health check-up from occupational diseases and hearing impairment, if any, through an specialized agency /institution within the District/State and the results reported to this Ministry and to DGMS.	
xxxvii.	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.	Not applicable as the mines are underground
xxxviii.	There shall be no over flow 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.	Not applicable as the mines are underground
xxxix.	Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flow from soil, OB and mineral dumps. The water so collected shall be regularly 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.	Not applicable as the mines are underground
xl.	Garland drains(size, gradient and length) around the safety areas as mine shaft and low lying areas	Not Applicable as the mine is underground.

	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.	
xli.	Dimensions of the retaining wall at the toe of the dumps and OB benches within the mine to check rum-off and siltation shall be based on the rainfall data.	Not Applicable as the mines are underground.
xlii.	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.	No Crusher is there in this Cluster. Water spraying is done from Radhanagar More to CKI-III Railway Siding. Spraying of water is done at Coal Depots.
xliii.	Mine Discharge water outside the ML shall be monitored, particularly for TDS and treated to conform to prescribed levels before discharge into the natural environment.	Mine water discharge is regularly monitored for TDS level and other parameters. Quality of mine water is within the permissible limits. Report Enclosed
xliv.	Drills shall be wet operated.	Water spraying is done before and after drilling.
xlv.	The project authorities shall undertake regular repairing and tarring of roads used for mineral transportation. A 3- tier green belt comprising of a mix of native species shall be developed all along the major approach roads.	Roads are repaired and tarred regularly. 400 mts. Cement Concrete Road has been constructed from Chinakuri Bazar to Chinakuri Railway Siding for Coal Transportation and Minimizing the dust emission due to Transportation.

		 400 mts. Cement Concrete road Constructed for coal transportation. Water Sprinkling is done regularly for dust suppression.
xlvi.	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.	All the mines in this Cluster are Under Ground
xlvii.	A Progressive a forestation plan shall be implemented covering an area of 313.2 ha at the end of the mining which includes reclaimed external waste dump area (15Ha), excavation area (35.2 Ha), rail road area (20 Ha), Mine infrastructure area (97 Ha) and natural vegetation land (146 Ha) and in township located outside the lease by planting native species in consultation with the local DFO/Agricultural dept. The density of the trees shall be around 2500 plants/ 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.	Not applicable as the Mines are Underground.

xlviii.	The proponent should prepare restoration and reclamation plan for the degraded area. The land be used in a productive and sustainable manner	It shall be implemented as per MCP. Till now all the mines in this Cluster are Underground.
xlix.	Compensatory Ecological & Restoration of waste land, other degraded lands and OB dumps in lieu of breaking open the land be carried out.	Not Applicable as the mines are underground.
l.	No groundwater shall be used for mining operations.	Noted and Agreed.
li.	An estimated total 7.70 Mm^3 of OB will be generated during the entire life of the mine. There shall be no residual external dump left at the mined site after exhaustion of the quarries. The OB dump height is up to 60m. The maximum slope of the dump sites shall continue till the vegetation becomes self-sustaining and compliance status shall be submitted to MoEF&CC and its Regional Office on yearly basis.	Not Applicable as the mines are underground.
lii.	Of the total quarry area 35.2 ha. The backfilled quarry area of 35.2 ha shall be reclaimed with plantation by planting native plant species in consultation with the local DFO/Agriculture Department. The density of the trees shall be around 2500 plants per ha	Not applicable as the mines are underground.
liii.	Regular monitoring of groundwater level and quality shall be carried out by establishing a network of existing wells and construction of new peizometers. 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	Monitoring of ground water table is being done by CMPDI to check the water table level quarterly. This is done in Jan, May, Aug, Nov Piezometer has been installed at Sodepur 9/10 Colliery and Ranishayer with the drilling depth of 100 mts and 145 mts.in Cluster 6 respectively.

	be submitted to the Ministry of Environment, Forests & Climate Change and to the Central Pollution Control Board quarterly within one month of monitoring.	 Piezometric with Automatic Well Recorder At Sodepur Colliery  Piezometric at Ranishayer Bejdih Colliery
liv.	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.	Roof Top Rain Water Harvesting has been installed at Area Vocational Center, Sodepur Area, GM Bungalow, Chinakuri Guest House, Chinakuri Agent Office, Chinakuri Manager Offfice, Dhemomain Agen Office, Narsamuda Manager Office and Dhemomain Manager Office.  Rain Water Harvesting at Chinakuri Guest House
lv.	Sewage treatment plant shall be installed in the existing colony. ETP shall also be provided for workshop and CHP wastewater.	Septic tank is installed in all the colonies. There is no workshop and CHP in this cluster. Treatability Study has been done for construction of Sewage Treatment Plant at Dhemomain.

lvi.	Land ousters 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.	It is being complied as per R&R Policy of CIL/National R&R Policy.
lvii.	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.	Changes in the land use pattern is being tracked by carrying out satellite imagery at every three years' interval. This is being done by CMPDI, Ranchi.
lviii.	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 Environment Clearance.	Complied.
lix.	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.	It is being complied as per CIL CSR Policy.
lx.	Corporate Environment Responsibility:	It is being complied with. a)Environment Policy of CIL: Coal India Limited (CIL) is committed to protect the environment through prevention, mitigation of pollution, proper disposal and recycling of wastes, conservation of biodiversity and bringing awareness among all its stakeholders for continual improvement in environmental performances following best practices. b)The environment policy ensures compliance of EC conditions and other statuary conditions issued by regulatory agencies. c)The Environment Department is headed by GM(Env)
	a) The Company shall have a well laid down Environment Policy approved by the Board of Directors. b) The Environmental Policy shall prescribe for standard operating process/procedures to	

	bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions. 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. 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.	at HQ level and Environment Management Cell(EMC) has been established at each area of ECL which is responsible for looking after the compliances of the EC conditions of all the Clusters present in that area. The head of this EMC reports directly to the GM of the area. d)The Environment Audit Cell(EAC) has been established at area level for periodic audit of the Clusters for compliance of the EC conditions and other regulatory compliances. The non-compliances are being reported to the agents of the concerned cluster and also to the GM of the area. A copy of the audit report also being sent to the GM(Env), HQ. If the compliance is not done in the time bound manner then it is further reported to the higher authorities by GM(Env), HQ.
B.	**General conditions**	
i.	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment, Forests & Climate Change.	No change in mining technology will be done without prior approval of the MoEF&CC.
ii.	No change in the calendar plan of production for quantum of mineral coal shall be made.	Production is being done according to the prior approved calendar plan and under the limit of EC as given in the Specific Condition no.(i).
iii.	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM_{10}, PM2.5, SO2 and NO_x monitoring. Location of the stations shall be decided based	Regular Environmental monitoring is being carried out quarterly basis by CMPDI, Asansol. Monitoring stations have been located in consultation with officials of SPCB in accordance with the direction of the wind. Location of station changes in summer and winter season according to the direction of wind and monitoring is done as per the condition meeting the

	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.	norms at upstream and downwind direction.
iv.	Data on ambient air quality (PM_{10}, PM2.5, SO2 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 Central Pollution Control Board once in six months. Random verification of samples through analysis from independent laboratories recognised under the EPA rules, 1986 shall be furnished as part of compliance report.	Regular Environmental monitoring is being carried out on quarterly basis by CMPDI, Asansol. Same as per General Condition no.(iii)
v.	Adequate measures shall be taken for control of noise levels below 85 dB (A) in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs/muffs.	Workers on pertinent activity are always being equipped with particular ear plugs.
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 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.	Agreed. No workshop is present in this cluster.
vii.	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for	Vehicles are checked for PUC certificates. Vehicles used for transporting coal are covered with tarpaulins and optimally loaded.

	transporting the mineral shall be covered with tarpaulins and optimally loaded.	
viii.	Monitoring of environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring analysis equipment in consultation with the State Pollution Control Board and data got analyzed through a laboratory recognised under EPA Rules, 1986.	Environmental Laboratory with latest equipment has been established at CMPDI, RI – I, Asansol... Quarterly monitoring report of Air, Water, and Noise& Groundwater level is prepared at above laboratory and sent to West Bengal pollution control Board with Environmental Statement (Form-V) & by Six monthly compliance reports to the MoEF regional office Bhuwaneswar.
ix.	Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training information on safety and health aspects.	Protective wears are being supplied and used by workmen judiciously.
x.	Occupational health surveillance programme 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.	Occupational health surveillance i.e. Periodic Health Examination (PME) is being done as per norms at Central Hospital, Kalla. Total 350 workers have gone through PME in calendar year 2021 till Sep-2021. (PME Details Enclosed)
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.	A separate environmental management cell at Company HQ, headed by GM (Env), and nine executives has been set up. For management at mine level a cell is also functional headed by Nodal Officer (A senior level Executive) Environment, who reports to Area General Manger with unit nodal officer at mine level. GM (Env) and Area General Manager reports directly to Director (Technical) of the company
xii.	The funds embarked 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	The funds embarked for environmental protection measures for the year 2021-22 is 12 lakhs under EMP head (for Sodepur Area) and it is kept in separate account and shall not be diverted for other purpose. Further 20 lakhs had been proposed for Plantation and its maintenance and 30 lakhs for other environmental measures in FY: 2021-22.

	concerned Regional Office.	In Current FY: 21-22 Rs. 11.96 Lakhs has been spent for Environment Protection Measures and Environment Awareness Programmes like World Earth Day, World Environment Day and Vriksha Ropan Abhiyan.
xiii.	The project authorities shall advertise at least in two local newspapers widely circulated around the project, one of which shall be in 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, Forests & Climate Change at http://envfor.nic.in	Complied.
xiv.	A copy of the environment clearance letter shall be marked to concern Panchayat/Zila Parishad, Municipal Corporation or Urban local body and local NGO, if any, from whom any suggestion/representation has been received while processing the proposal. A copy of the clearance letter shall also be displayed on company's website.	The copy of the clearance letter has been communicated to the Kulti Municipal Corporation and Asansol municipal Corporation of Burdwan Dist.(WB).The copy has also been displayed in Company' website.
xv.	A copy of the environment 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	Copy of EC letter sent to concerned panchayats and receiving copy with seal and signature of the Panchayat is available with the Environment Management Cell (EMC). EC letter displayed on company's website: http://www.easterncoal.gov.in/notices/cancel04022015.pdf
xvi.	The clearance letter shall be uploaded on the company's website. The compliance status of the stipulated environmental clearance conditions shall also be	Complied.

	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 environmental quality parameter (air, water, noise and 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 t the entrance of the project premises and mine office and in corporate office and on company's website	
xvii.	The project proponent shall submit six monthly compliance reports on status 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 SPCB.	The six-monthly compliance reports will be communicated to MOEF, respective Zonal Office of the CPCB and SPCB. The present report is the compliance report from Apr-21 to Sep-21.
xviii.	The Regional Office of this Ministry located in the Region shall monitor compliance 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.	The project is always ready to co-operate with the Ministry whenever required.
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 with the status of compliance of EC conditions and shall be sent to	The environmental statement for financial year 2020-21 ending 31st March 2021 in Form-V has been already submitted to West Bengal Pollution Control Board and mailed to the respective Regional Offices of the MoEF&CC.

	the respective Regional Offices of the MoEF&CC by e-mail.	

Piezometric Borewell with Automatic Well Recorder at Sodepur 9/10 Pit.

Piezometric Borewell at Ranishayer Bejdih Colliery

RO PLANT AT CHINAKURI MINE I

RO PLANT AT SODEPUR 9/10 PIT.

RAIN WATER HARVESTING AT CHINKAURI GUEST HOUSE

SOLAR PANEL AT SODEPUR ARE OFFICE

SOLAR PANEL AT SODEPUR AREA VOACTIONAL TRAINING CENTER

SOLAR LIGHTS AT SODEPUR AREA OFFICE

PRESSURE FILTER AT BEJDIH COLLIERY

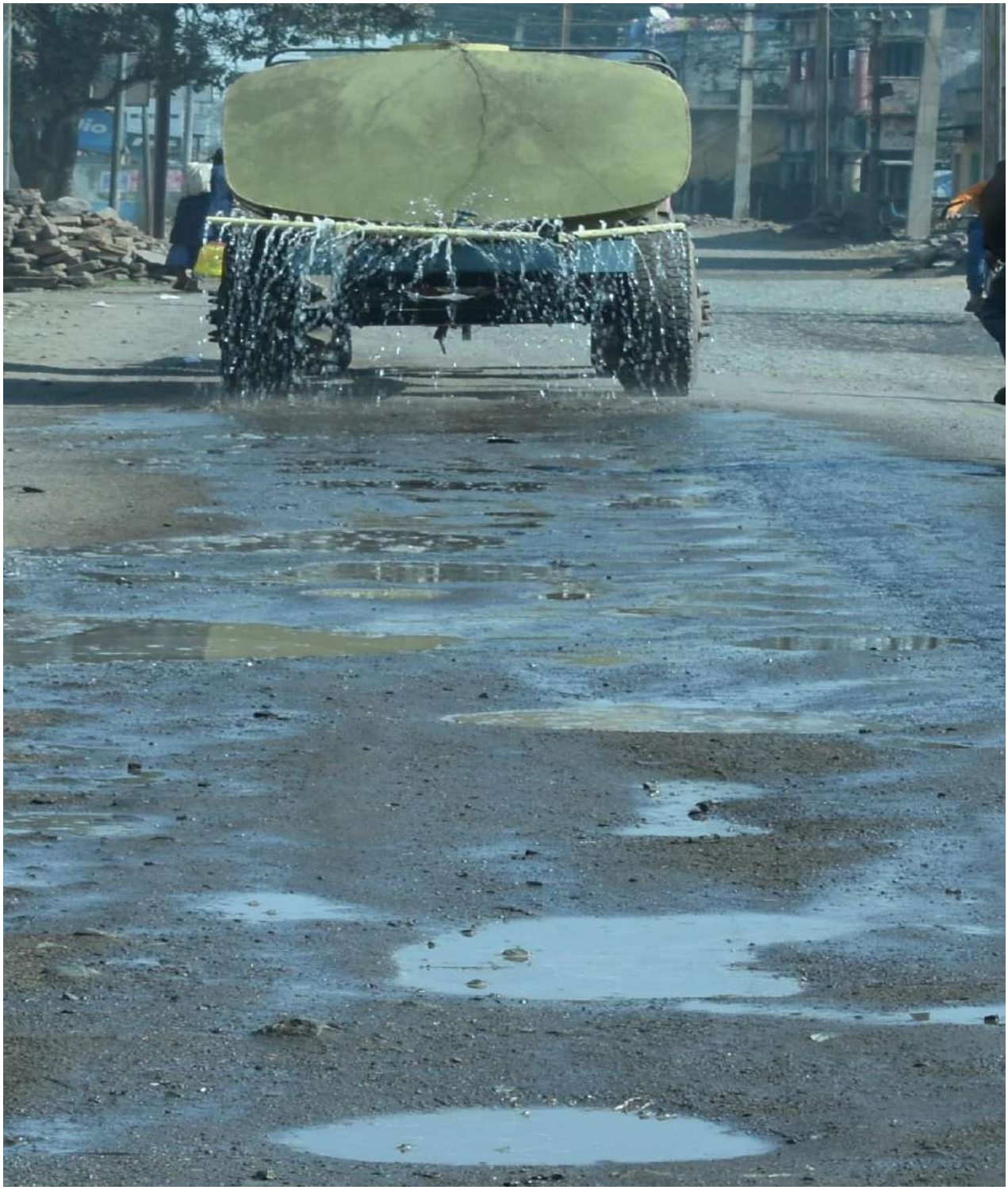
PRESSURE FILTER AT MITHANI COLLIERY

PLANTATION AT MITHANI COLLIERY

PLANTATION AT PATMOHANA COLLIERY

BEAUTIFICATION WORK IN MINE PREMISES

VARIUOS ENVIRONMENTAL AWARENESS PROGRAMMES AT SODEPUR AREA



WATER SPRINKLING AT RADHANAGAR ROAD BY MOBILE WATER TANKER

GARLAND DRAIN AT NARSAMUDA COLLIERY

ENVIRONMENT MONITORING REPORT OF CLUSTER NO. 6

(FOR THE MONTH OF MAY, 2021)

(SODEPUR AREA)

Eastern Coalfields Limited

cmpdi
A Mini Ratna Company

Regional Institute-1
Asansol (WB)

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) **Chhotadhemo primary school (6A1):** The sampler was placed at primary school of Chhotadhemo village to assess the ambient air quality of residential area.

ii) **Sodepur area guest house (6A2):** The sampler was placed at guest house of Sodepur area. This station was selected to assess the ambient air quality of residential area in the buffer zone of Sodepur area.

iii) **Mithani colliery office (6A3):** The sampler was placed at agent office of Mithani colliery. This station was selected to assess the ambient air quality of Industrial Area in the core zone where mining activities are in progress.

iv) **Kali mandir, Narsumada Colliery (6A4):** The sampler was placed at Kali mandir of Narsumada colliery. This station was selected to assess the ambient air quality of Industrial Area in the core zone where mining activities are in progress.

v) **Environment department, Borachak house ECL (6A5):** The sampler was placed at Borachak house, environment department, ECL to assess the present ambient air quality status.

vi) **Parbelia Colliery ECL (6A6):** The sampler was placed at Parbelia Colliery to assess the present ambient air quality status

vii) **Electric office, Mouthdih colliery (6A8):** The sampler was placed at Electric office, Mouthdih colliery. This site was selected to assess the present ambient air quality status in industrial area of core zone of the project.

viii) **DGMS office, Sitarampur (6A9)**: The sampler was placed at DGMS office, Sitarampur. This site was selected to assess the present ambient air quality status in residential area.

ix) **Marichkota Village (6A10)**: The sampler was placed at Marichkota village. This site was selected to assess the present ambient air quality status in buffer zone of Salanpur Area.

x) **Managers' office, Chinakuri pit no. 1 & 2 (6A11):** The sampler was placed at manager office of Chinakuri 1&2 pit. This site was selected to assess the present ambient air quality status in industrial area of core zone of the project.

xi) **CDS building, Chinakuri pit no. - 3 (6A12):** The sampler was placed near CDS building of Chinakuri 3 near railway siding. The station was selected to assess the impact of coal transport activities on present ambient air quality.

2.1 Methodology of sampling and analysis: 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. Parameters chosen for assessment of ambient air quality are Particulate Matter (PM_{10}), Fine Particulate Matter ($PM_{2.5}$), Respirable Dust Sampler (RDS) & Fine Dust Sampler (FDS) were used for sampling of PM_{10} and $PM_{2.5}$ respectively. The samples were analysed in Environmental Laboratory of CMPDI, RI-I, Asansol.

2.2 Results & Interpretations: In industrial area PM_{10} varies from 73.3 to 160.4 µg/m^3 & in residential area from 91.6 to 126.3 µg/m^3. In industrial area $PM_{2.5}$ varies from 25.1 to 47.3 µg/m^3 & in residential area from 32.4 to 37.6 µg/m^3. In industrial area & in residential area SO_2 below 10 µg/m^3.In industrial area NO_x varies from 14.5 to 17.6 µg/m^3 & in residential area from 15.1 to 16.5 µg/m^3.

AMBIENT AIR QUALITY DATA

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

First fortnight:

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results (µg/m³)	Name of method	Detection limit (µg/m³)
6A1	Chhotadhemo primary school	Residential	4-May-21	PM_{10}	95.7	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	33.2	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.6	IS 5182 (Part 6): 2017	10
6A2	Sodepur area guest house	Residential	4-May-21	PM_{10}	103.9	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	37.1	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	16.4	IS 5182 (Part 6): 2017	10
6A3	Mithani colliery office	Industrial	3-May-21	PM_{10}	135.8	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	42.7	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	16.8	IS 5182 (Part 6): 2017	10
6A4	Kali mandir, Narsumada Colliery	Industrial	3-May-21	PM_{10}	105.8	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	36.5	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	17.1	IS 5182 (Part 6): 2017	10
6A5	Environment department, Borachak house ECL	Residential	3-May-21	PM_{10}	126.3	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	35.2	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	16.4	IS 5182 (Part 6): 2017	10
6A6	Parbelia Colliery	Industrial	3-May-21	PM_{10}	160.4	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	42.1	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	17.6	IS 5182 (Part 6): 2017	10

6A8	Electric office, Mouthdih colliery	Industrial	5-May-21	PM_{10}	152.6	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	39.3	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	17.3	IS 5182 (Part 6): 2017	10
6A9	DGMS office, Sitarampur	Residential	5-May-21	PM_{10}	98.3	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	37.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.8	IS 5182 (Part 6): 2017	10
6A10	Marichkota Village	Residential	5-May-21	PM_{10}	91.6	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	32.7	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.1	IS 5182 (Part 6): 2017	10
6A11	Managers' office, Chinakuri pit no. 1 & 2	Industrial	6-May-21	PM_{10}	143.8	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	44.2	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	16.5	IS 5182 (Part 6): 2017	10
6A12	CDS building, Chinakuri pit no. - 3	Industrial	6-May-21	PM_{10}	151.7	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	47.3	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	17.5	IS 5182 (Part 6): 2017	10

Second fortnight:

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results (µg/m^3)	Name of method	Detection limit (µg/m^3)
6A1	Chhotadhemo primary school	Residential	24-May-21	PM_{10}	97.4	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	35.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.9	IS 5182 (Part 6): 2017	10
6A2	Sodepur area guest house	Residential	24-May-21	PM_{10}	102.8	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	37.5	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	16.5	IS 5182 (Part 6): 2017	10
6A3	Mithani colliery office	Industrial	28-May-21	PM_{10}	74.0	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	26.2	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	14.7	IS 5182 (Part 6): 2017	10
6A4	Kali mandir, Narsumada Colliery	Industrial	28-May-21	PM_{10}	73.3	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	25.1	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	14.5	IS 5182 (Part 6): 2017	10
6A5	Environment department, Borachak house ECL	Residential	28-May-21	PM_{10}	95.2	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	32.4	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.7	IS 5182 (Part 6): 2017	10
6A6	Parbelia Colliery	Industrial	28-May-21	PM_{10}	154.7	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	40.2	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	17.1	IS 5182 (Part 6): 2017	10
6A8	Electric office, Mouthdih colliery	Industrial	17-May-21	PM_{10}	149.3	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	39.0	IS 5182 (Part 24): 2019	2.0

				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	17.0	IS 5182 (Part 6): 2017	10
6A9	DGMS office, Sitarampur	Residential	17-May-21	PM_{10}	98.9	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	37.6	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.9	IS 5182 (Part 6): 2017	10
6A10	Marichkota Village	Residential	17-May-21	PM_{10}	92.8	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	33.1	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.3	IS 5182 (Part 6): 2017	10
6A11	Managers' office, Chinakuri pit no. 1 & 2	Industrial	17-May-21	PM_{10}	138.2	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	42.7	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	16.2	IS 5182 (Part 6): 2017	10
6A12	CDS building, Chinakuri pit no. - 3	Industrial	17-May-21	PM_{10}	145.8	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	45.8	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	17.3	IS 5182 (Part 6): 2017	10

Environmental Standards for Ambient Air Quality (AAQ):

Station Category	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 ($\mu g/m^3$)			
	PM_{10}	SO_2	NO_x	$PM_{2.5}$
Industrial	300.0	120.0	120.0	60.0
Residential	100.0	80.0	80.0	

CHAPTER – III
WATER QUALITY MONITORING

3.1 Mine water sampling stations:

i) **Dhemomain UG (6MW1):** This location has been selected to monitor the discharge quality of mine effluent after sedimentation tank.

ii) **Narsamuda UG (6MW3)**: This location has been selected to monitor the discharge quality of mine effluent to natural surface streams.

Iii) **Patmohana UG (6MW4)**: This location has been selected to monitor the discharge quality of mine effluent discharged to natural surface streams.

iv) **Chinakuri I & 2 UG (6MW5)**: This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.

v) **Chinakuri III UG (6MW6)**: This location has been selected to monitor the discharge quality of mine effluent after sedimentation tank

vi) **Mouthdih UG (6MW7)**: This location has been selected to monitor the discharge quality of mine effluent after sedimentation tank.

vii) **Bejdih UG (6MW8)**: This location has been selected to monitor the discharge quality of Mine effluent after sedimentation tank.

viii) **Methani UG (6MW9)**: This location has been selected to monitor the discharge quality of mine effluent after sedimentation tank**.**

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.

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				General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit
	Station Code	6MW1	6MW3	6MW4	6MW5			
	Date of sampling	11-May-21	11-May-21	12-May-21	12-May-21			
1	pH	8.26	7.88	8.18	8.33	5.5 - 9.0	IS 3025 (Part 11): 2017	0.01
2	TSS	15.6	18.0	16.6	17.2	100	IS 3025 (Part 17): 2017	10.0
3	TDS	754	738	714	737	Not specified	IS 3025 (Part 16): 2017	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 2019	2.0
5	COD	28	20	20	12	250	APHA, 5220 C: 23rd Edition	4.0

Sl. No.	Parameters	Analytical results				General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit
	Station Code	6MW6	6MW7	6MW8	6MW9			
	Date of sampling	11-May-21	12-May-21	12-May-21	11-May-21			
1	pH	8.39	7.51	7.42	7.40	5.5 - 9.0	IS 3025 (Part 11):2017	0.01
2	TSS	20.0	18.0	17.9	18.2	100	IS 3025 (Part 17):2017	10.0
3	TDS	728	752	637	578	Not specified	IS 3025 (Part 16): 2017	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 2019	2.0
5	COD	20	36	32	24	250	APHA, 5220 C: 23rd Edition	4.0

All values are expressed in mg/l unless specified.

Second fortnight:

Sl. No.	Parameters	Analytical results				General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit
	Station Code	6MW1	6MW3	6MW4	6MW5			
	Date of sampling	20-May-21	20-May-21	20-May-21	20-May-21			
1	pH	6.98	7.87	7.52	7.07	5.5 - 9.0	IS 3025 (Part 11):2017	0.01
2	TSS	15.1	16.2	17.4	17	100	IS 3025 (Part 17):2017	10.0
3	TDS	762	748	735	742	Not specified	IS 3025 (Part 16): 2017	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 2019	2.0
5	COD	32	24	16	20	250	APHA, 5220 C: 23rd Edition	4.0

Sl. No.	Parameters	Analytical results				General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit
	Station Code	6MW6	6MW7	6MW8	6MW9			
	Date of sampling	20-May-21	20-May-21	31-May-21	20-May-21			
1	pH	7.02	7.65	7.62	7.02	5.5 - 9.0	IS 3025 (Part 11):2017	0.01
2	TSS	17.9	16.4	16.6	17.8	100	IS 3025 (Part 17):2017	10.0
3	TDS	754	722	618	564	Not specified	IS 3025 (Part 16): 2017	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 2019	2.0
5	COD	24	32	24	28	250	APHA, 5220 C: 23rd Edition	4.0

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.

Name of station & code: 1. 6GW1- Dugwell at Chhotadhemo village near Kamala.
2. 6GW2- Dugwell at Chinakuri village.

Sl. No.	Parameters	Analytical Results		Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	6GW1	6GW2				
	Sampling Date	28-May-21	10-May-21	Acceptable Limit	Permissible Limit		
1	Colour, Hazen	3	3	5.0	15.0	Platinum Cobalt	1.0 Hazen
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		Physical	-
3	Taste	Agreeable	Agreeable	Agreeable		Physical	-
4	Turbidity, NTU	1.8	2.3	1	5	Nephelometric	1.0 NTU
5	pH	6.68	7.29	6.5-8.5	No relaxation	Electrometric	0.01
6	Total Hardness	226	329	300	600	EDTA	4.0
7	Iron	BDL	BDL	0.3	No relaxation	AAS Flame	0.06
8	Chlorides	43	46	250	1000	Argentometric	2.0
9	Res Free Chlorine	BDL	BDL	0.2	1	Spectrophotometric	0.02
10	Dissolved Solids	254	960	500	2000	Gravimetric	10.0
11	Calcium	65	71	75	200	EDTA	1.60
12	Copper	BDL	BDL	0.05	1.5	AAS Flame	0.03
13	Manganese	BDL	BDL	0.1	0.3	AAS Flame	0.02
14	Sulphate	36	36	200	400	Turbidity	2.0
15	Nitrate	1.72	6.96	45	No relaxation	Spectrophotometric	0.5
16	Fluoride	0.26	0.72	1	1.5	SPANDS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	AAS - GTA	0.002
18	Arsenic	BDL	BDL	0.01	0.05	AAS - VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	AAS - GTA	0.005
20	Zinc	BDL	BDL	5	15	AAS Flame	0.01
21	Hex Chromium	BDL	BDL	0.05	0.05	Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	Colorimetric Carmine	0.20
23	Coliforms (MPN)	NIL	NIL	Not Specified		Chloroform Extraction	1.0
24	Phenolics	NIL	NIL	0.001	0.002	Titrimetric Indicator	0.001
25	Alkalinity	192	288	200	600	Titrimetric	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	AAS - GTA	0.0005

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.

Name of station & code: 3. 6GW3- Dugwell near Mazumder Industries in Sanmara village.

Sl. No.	Parameters	Analytical Results	Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	6GW3				
	Sampling Date	10-May-21	Acceptable Limit	Permissible Limit		
1	Colour, Hazen	3	5.0	15.0	Platinum Cobalt	1.0 Hazen
2	Odour	Unobjectionable	Unobjectionable		Physical	-
3	Taste	Agreeable	Agreeable		Physical	-
4	Turbidity, NTU	1.6	1	5	Nephelometric	1.0 NTU
5	pH	7.39	6.5-8.5	No relaxation	Electrometric	0.01
6	Total Hardness	570	300	600	EDTA	4.0
7	Iron	BDL	0.3	No relaxation	AAS Flame	0.06
8	Chlorides	152	250	1000	Argentometric	2.0
9	Res Free Chlorine	BDL	0.2	1	Spectrophotometric	0.02
10	Dissolved Solids	970	500	2000	Gravimetric	10.0
11	Calcium	129	75	200	EDTA	1.60
12	Copper	BDL	0.05	1.5	AAS Flame	0.03
13	Manganese	BDL	0.1	0.3	AAS Flame	0.02
14	Sulphate	122	200	400	Turbidity	2.0
15	Nitrate	18.28	45	No relaxation	Spectrophotometric	0.5
16	Fluoride	0.66	1	1.5	SPANDS	0.02
17	Selenium	BDL	0.01	No relaxation	AAS - GTA	0.002
18	Arsenic	BDL	0.01	0.05	AAS - VGA	0.002
19	Lead	BDL	0.01	No relaxation	AAS - GTA	0.005
20	Zinc	BDL	5	15	AAS Flame	0.01
21	Hex Chromium	BDL	0.05	0.05	Colorimetric	0.01
22	Boron	BDL	0.5	1	Colorimetric Carmine	0.20
23	Coliforms (MPN)	NIL	Not Specified		Chloroform Extraction	1.0
24	Phenolics	NIL	0.001	0.002	Titrimetric Indicator	0.001
25	Alkalinity	296	200	600	Titrimetric	4.0
26	Cadmium	BDL	0.003	No relaxation	AAS - GTA	0.0005

All values are expressed in mg/l unless specified.

Ground water level for the month of May' 2021

Sl. No.	Station Code	Location of Dugwell	Date of measurement	Water level (in Meters) Below Ground Level	MP (m)	Depth (m)	Dia (m)	Owner
1	6GWL1	Dugwell at chhota dhemo village near Kamala	11-May-21	5.90	1.5	14.9	1.3	Panchayat
2	6GWL2	Dugwell at Chinakuri village	11-May-21	5.75	0.88	8.4	2.9	Panchayat
3	6GWL3	Dugwell near Mazumder Industries in Sanmara village	12-May-21	4.90	0.85	16.3	1.9	Panchayat

Piezometer water level

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 Rajmahal OC Project:

i) **Sodepur (Bejdih Colliery) (6/SO/BP-02):** A piezometer has been constructed to measure the ground water level at Bejdih Colliery of Sodepur area.

ii) **Sodepur (Sodepur colliery) (6/SO/SP-03):** A piezometer has been constructed to measure the ground water level at Sodepur Colliery of Sodepur area

Sl. No.	Station Code	Location of Piezometer	Date of measurement	Water level (in Meters) Below Ground Level
1	6/SO/BP-02	Sodepur (Bejdih Colliery)	4-May-21	94.60
2	6/SO/SP-03	Sodepur (Sodepur colliery)	11-May-21	21.80

STRICTLY RESTRICTED
FOR COMPANY USE ONLY RESTRICTED
The information given in this report is not to be communicated either directly or indirectly to the press or to any person not holding an official position in the CIL / GOVERNMENT.

ENVIRONMENT MONITORING REPORT OF CLUSTER NO. 6

(FOR THE MONTH OF JULY, 2021)

(SODEPUR AREA)

Eastern Coalfields Limited

cmpdi
A Mini Ratna Company

Regional Institute-1
Asansol (WB)

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) **Chhotadhemo primary school (6A1):** The sampler was placed at primary school of Chhotadhemo village to assess the ambient air quality of residential area.
ii) **Sodepur area guest house (6A2):** The sampler was placed at guest house of Sodepur area. This station was selected to assess the ambient air quality of residential area in the buffer zone of Sodepur area.
iii) **Mithani colliery office (6A3):** The sampler was placed at agent office of Mithani colliery. This station was selected to assess the ambient air quality of Industrial Area in the core zone where mining activities are in progress.
iv) **Kali mandir, Narsumada Colliery (6A4):** The sampler was placed at Kali mandir of Narsumada colliery. This station was selected to assess the ambient air quality of Industrial Area in the core zone where mining activities are in progress.
v) **Environment department, Borachak house ECL (6A5):** The sampler was placed at Borachak house, environment department, ECL to assess the present ambient air quality status.
vi) **Parbelia Colliery ECL (6A6):** The sampler was placed at Parbelia Colliery to assess the present ambient air quality status
vii) **Electric office, Mouthdih colliery (6A8):** The sampler was placed at Electric office, Mouthdih colliery. This site was selected to assess the present ambient air quality status in industrial area of core zone of the project.
viii) **DGMS office, Sitarampur (6A9)**: The sampler was placed at DGMS office, Sitarampur. This site was selected to assess the present ambient air quality status in residential area.
ix) **Marichkota Village (6A10)**: The sampler was placed at Marichkota village. This site was selected to assess the present ambient air quality status in buffer zone of Salanpur Area.
x) **Managers' office, Chinakuri pit no. 1 & 2 (6A11):** The sampler was placed at manager office of Chinakuri 1&2 pit. This site was selected to assess the present ambient air quality status in industrial area of core zone of the project.
xi) **CDS building, Chinakuri pit no. - 3 (6A12):** The sampler was placed near CDS building of Chinakuri 3 near railway siding. The station was selected to assess the impact of coal transport activities on present ambient air quality.

2.1 Methodology of sampling and analysis: 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. Parameters chosen for assessment of ambient air quality are Particulate Matter (PM_{10}), Fine Particulate Matter ($PM_{2.5}$), Respirable Dust Sampler (RDS) & Fine Dust Sampler (FDS) were used for sampling of PM_{10} and $PM_{2.5}$ respectively. The samples were analysed in Environmental Laboratory of CMPDI, RI-I, Asansol.

2.2 Results & Interpretations: In industrial area PM_{10} varies from 69.7 to 98.3 µg/m^3 & in residential area from 62.0 to 86.5 µg/m^3. In industrial area $PM_{2.5}$ varies from 16.0 to 30.8 µg/m^3 & in residential area from 17.0 to 27.4 µg/m^3. In industrial area & in residential area SO_2 below 10 µg/m^3.In industrial area NO_x varies from 14.8 to 16.4 µg/m^3 & in residential area from 13.0 to 15.0 µg/m^3.

AMBIENT AIR QUALITY DATA

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

First fortnight:

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results ($\mu g/m^3$)	Name of method	Detection limit ($\mu g/m^3$)
6A1	Chhotadhemo primary school	Residential	6-Jul-21	PM_{10}	83.2	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	26.7	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	14.6	IS 5182 (Part 6): 2017	10
6A2	Sodepur area guest house	Residential	6-Jul-21	PM_{10}	62.4	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	17.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.0	IS 5182 (Part 6): 2017	10
6A3	Mithani colliery office	Industrial	7-Jul-21	PM_{10}	79.0	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	28.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	16.3	IS 5182 (Part 6): 2017	10
6A4	Kali mandir, Narsumada Colliery	Industrial	7-Jul-21	PM_{10}	69.7	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	18.2	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	16.0	IS 5182 (Part 6): 2017	10
6A5	Environment department, Borachak house ECL	Residential	15-Jul-21	PM_{10}	64.2	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	27.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	13.0	IS 5182 (Part 6): 2017	10
6A6	Parbelia Colliery	Industrial	15-Jul-21	PM_{10}	96.3	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	30.2	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.4	IS 5182 (Part 6): 2017	10

6A8	Electric office, Mouthdih colliery	Industrial	5-Jul-21	PM_{10}	97.2	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	30.8	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	16.4	IS 5182 (Part 6): 2017	10
6A9	DGMS office, Sitarampur	Residential	5-Jul-21	PM_{10}	86.5	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	27.4	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	13.2	IS 5182 (Part 6): 2017	10
6A10	Marichkota Village	Residential	5-Jul-21	PM_{10}	80.6	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	23.2	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	13.8	IS 5182 (Part 6): 2017	10
6A11	Managers' office, Chinakuri pit no. 1 & 2	Industrial	5-Jul-21	PM_{10}	80.6	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	30.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.2	IS 5182 (Part 6): 2017	10
6A12	CDS building, Chinakuri pit no. - 3	Industrial	6-Jul-21	PM_{10}	98.3	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	24.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.6	IS 5182 (Part 6): 2017	10

Second fortnight:

Station Code	Station Name	Category of station	Date of Sampling	Parameter (µg/m^3)	Analytical Results	Name of method	Detection limit (µg/m^3)
6A1	Chhotadhemo primary school	Residential	27-Jul-21	PM_{10}	78.2	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	21.6	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	14.0	IS 5182 (Part 6): 2017	10
6A2	Sodepur area guest house	Residential	27-Jul-21	PM_{10}	62.0	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	20.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	14.5	IS 5182 (Part 6): 2017	10
6A3	Mithani colliery office	Industrial	28-Jul-21	PM_{10}	77.4	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	16.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.4	IS 5182 (Part 6): 2017	10
6A4	Kali mandir, Narsumada Colliery	Industrial	28-Jul-21	PM_{10}	70.1	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	18.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.6	IS 5182 (Part 6): 2017	10
6A5	Environment department, Borachak house ECL	Residential	30-Jul-21	PM_{10}	65.6	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	18.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	13.2	IS 5182 (Part 6): 2017	10
6A6	Parbelia Colliery	Industrial	30-Jul-21	PM_{10}	85.7	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	26.9	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.2	IS 5182 (Part 6): 2017	10
6A8	Electric office, Mouthdih colliery	Industrial	30-Jul-21	PM_{10}	87.2	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	28.0	IS 5182 (Part 24): 2019	2.0

				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	16.1	IS 5182 (Part 6): 2017	10
6A9	DGMS office, Sitarampur	Residential	30-Jul-21	PM_{10}	82.4	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	21.7	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	13.0	IS 5182 (Part 6): 2017	10
6A10	Marichkota Village	Residential	26-Jul-21	PM_{10}	74.2	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	19.4	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	13.4	IS 5182 (Part 6): 2017	10
6A11	Managers' office, Chinakuri pit no. 1 & 2	Industrial	27-Jul-21	PM_{10}	78.5	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	22.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	14.8	IS 5182 (Part 6): 2017	10
6A12	CDS building, Chinakuri pit no. - 3	Industrial	29-Jul-21	PM_{10}	75.0	IS 5182 (Part 23): 2017	3.5
				$PM_{2.5}$	21.0	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2017	10
				NO_x	15.2	IS 5182 (Part 6): 2017	10

Environmental Standards for Ambient Air Quality (AAQ):

Station Category	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 ($\mu g/m^3$)			
	PM_{10}	SO_2	NO_x	$PM_{2.5}$
Industrial	300.0	120.0	120.0	60.0
Residential	100.0	80.0	80.0	

CHAPTER – III
WATER QUALITY MONITORING

3.1 Mine water sampling stations:

i) **Dhemomain UG (6MW1):** This location has been selected to monitor the discharge quality of mine effluent after sedimentation tank.

ii) **Narsamuda UG (6MW3)**: This location has been selected to monitor the discharge quality of mine effluent to natural surface streams.

Iii) **Patmohana UG (6MW4)**: This location has been selected to monitor the discharge quality of mine effluent discharged to natural surface streams.

iv) **Chinakuri I & 2 UG (6MW5)**: This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.

v) **Chinakuri III UG (6MW6)**: This location has been selected to monitor the discharge quality of mine effluent after sedimentation tank

vi) **Mouthdih UG (6MW7)**: This location has been selected to monitor the discharge quality of mine effluent after sedimentation tank.

vii) **Bejdih UG (6MW8)**: This location has been selected to monitor the discharge quality of Mine effluent after sedimentation tank.

viii) **Methani UG (6MW9)**: This location has been selected to monitor the discharge quality of mine effluent after sedimentation tank

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.

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				General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit
	Station Code	6MW1	6MW3	6MW4	6MW5			
	Date of sampling	7-Jul-21	7-Jul-21	7-Jul-21	7-Jul-21			
1	pH	7.00	7.13	7.79	7.80	5.5 - 9.0	IS 3025 (Part 11): 2017	0.01
2	TSS	14.2	16.4	17.6	17.2	100	IS 3025 (Part 17): 2017	10.0
3	TDS	765	755	748	759	Not specified	IS 3025 (Part 16): 2017	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 2019	2.0
5	COD	36	40	28	32	250	APHA, 5220 C: 23rd Edition	4.0

Sl. No.	Parameters	Analytical results				General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit
	Station Code	6MW6	6MW7	6MW8	6MW9			
	Date of sampling	7-Jul-21	7-Jul-21	7-Jul-21	7-Jul-21			
1	pH	7.66	7.40	7.16	6.91	5.5 - 9.0	IS 3025 (Part 11):2017	0.01
2	TSS	18.4	15.2	16.4	16.2	100	IS 3025 (Part 17):2017	10.0
3	TDS	751	794	628	534	Not specified	IS 3025 (Part 16): 2017	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 2019	2.0
5	COD	36	40	28	32	250	APHA, 5220 C: 23rd Edition	4.0

*BDL-Below Detection Limit

All values are expressed in mg/l except pH.

Second fortnight:

Sl. No.	Parameters	Analytical results				General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit
	Station Code	6MW1	6MW3	6MW4	6MW5			
	Date of sampling	20-Jul-21	20-Jul-21	20-Jul-21	16-Jul-21			
1	pH	7.22	7.50	7.11	7.96	5.5 - 9.0	IS 3025 (Part 11):2017	0.01
2	TSS	15.4	16.2	16.4	18.6	100	IS 3025 (Part 17):2017	10.0
3	TDS	758	744	763	778	Not specified	IS 3025 (Part 16): 2017	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 2019	2.0
5	COD	32	36	32	36	250	APHA, 5220 C: 23rd Edition	4.0

Sl. No.	Parameters	Analytical results				General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit
	Station Code	6MW6	6MW7	6MW8	6MW9			
	Date of sampling	16-Jul-21	16-Jul-21	16-Jul-21	20-Jul-21			
1	pH	8.01	7.30	7.47	7.17	5.5 - 9.0	IS 3025 (Part 11): 2017	0.01
2	TSS	17.2	16.4	17.2	16.0	100	IS 3025 (Part 17): 2017	10.0
3	TDS	765	774	642	554	Not specified	IS 3025 (Part 16): 2017	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39): 2019	2.0
5	COD	40	36	32	36	250	APHA, 5220 C: 23rd Edition	4.0

*BDL-Below Detection Limit

All values are expressed in mg/l except pH.

ECL

Eastern Coalfields Limited
(A subsidiary of Coal India Limited)
ईस्टर्न कोलफील्ड्स लिमिटेड
(कोल इंडिया का एक अंग)

Office of the
Chief of Medical Services
Sanctoria, ECL (HQ)
Dishergarh, Burdwan 713333
Ph. No. 0341-2520813

Ref. No:- ECL/C-5 (E)/CMS(I/C)HQ/PME/21/ 10

Date: 05-10-2021

To

The GM (T&MS)/TS to CMD
ECL, Sanctoria

Sub: IME/PME report for the month of September 2021

Dear Sir,

Please find the IME/PME Performance Report for the Month of September 2021 as per the records received from respective area PME Centres and two Central Hospitals of ECL as mentioned below:

Sl. No.	Name of the PME Centre (Cov Area)	Periodical Medical Examination (PME) of Company Workers September 2021					Initial Medical Examination (IME) before employement as Company Workers September 2021		PME/IME of Contractual Worker September 2021			
		PME Yearly Target for 2021 (1/5th of the total manpower)	PME Achieve-ment Above 45 yrs	PME Achieve-ment Below 45 yrs	Total Achieve-ment	Cumu-lative upto Sep-21	IME Com-pany workers	Cumula-tive upto Sep-21	PME Contractor worker	Cumula-tive upto Sep-21	IME Contractor worker	Cumula-tive upto Sep-21
1	CMD Office + HRD Office + Sanctoria Hospital+ ECL Sales Office + Pipe Line/Transit + Sodepur Central Store + Sodepur Central Workshop + Neamatpur Workshop + Mines Rescue Station Sitarampur	364	0	0	0	6	0	83	0	0	0	0
2	Central Hospital Kalla	79	2	3	5	39	65	103	0	0	0	28
3	Bankola Area + Ukhra Workshop	1323	88	33	121	1054	23	86	0	34	22	94
4	Jhanjra Area	587	56	18	74	516	12	75	2	84	23	352
5	Kajora Area + JK Ropeway	1178	143	31	174	889	12	51	9	33	0	0
6	Kenda Area	986	68	17	85	557	5	26	2	32	0	3
7	Kunustoria Area	1014	92	47	139	572	14	87	6	10	0	15
8	Mugma Area + Mugma Workshop + BEFW	949	65	39	104	550	0	32	0	15	0	11
9	Pandaveswar Area	939	90	36	126	476	14	64	1	176	19	31
10	Rajmahal Area	436	24	28	52	414	10	56	1	63	44	136
11	Salanpur Area	252	1	4	5	154	10	96	2	11	0	0
12	Satgram Area + Ratibati Workshop	1074	106	21	127	1035	0	43	0	46	7	7
13	Sodpeur Area	1041	0	0	0	350	0	25	0	24	0	0
14	Sonepur Bazari Area	281	0	0	0	21	6	37	0	0	0	0
15	SP Mines Area	205	0	0	0	75	2	29	0	0	0	0
16	Sripur Area + Ponihati Workshop	397	64	6	70	268	4	63	11	58	0	0
	TOTAL	11104	799	283	1082	6976	177	956	34	586	115	677

This for your kind information and necessary action.

Yours faithfully,

CMO (I/C), ECL

Copy to through email:
CGM/GM all Area, CMO (I/C) CH Kalla, Sanctoria Hospital
GM, Safety, ECL,HQ
TS to D(T) OP, TS to DT(P&P) TS to D(P), ECL
MS, ECL HQ with all office papers.

EASTERN COALFIELDS LIMITED

10.0 Land Reclamation Status in Eastern Coalfields Limited

10.1 Following 04 Cluster comprising Opencast and Underground mines producing less than 5 million m^3. (Coal + OB together) of Eastern Coalfields Ltd. have been taken up during the year 2018-19 for land reclamation monitoring:

Cluster V	Parbelia UG & OC, Dubeshwari UG& OC
Cluster VI	Dhemomain UG, Sodepur UG & OC, Narsamuda UG, Patmohana UG & OC Patch, Chinakuri I UG and Chinakuri III UG & OC Patch, Bejidih UG, Methani UG & OC Patch, Sheetalpur UG.
Cluster VII	Barmondia UG, Chakballavpur UG, Manoharbahal UG, Bhanora West UG & OCP
Cluster VIII	Bhanora UG, Girmint /KDI UG, Sirpur UG, Sirpur Seam Incline UG, Ningah UG, Mithapur West UG & Mithapur West OC Patch, Satgram UG.

10.2 Cluster wise Land Reclamation status of above mentioned projects in ECL is given in Table 10.1 and also shown graphically in Fig 10.1.Area statistics of different land use class present in the leasehold of the above clusters for the year 2018 are shown in the Table - 10.2. Land use maps derived from satellite data are shown in Plate 10.1 – 10.4. Different land use classes based on satellite data are depicted in Bar Charts in Fig. 10.2 – 10.5.

10.3 Study reveals that majority of the mines under clusters considered for monitoring are of underground mine type with few opencast patches. Out of total mine leasehold area of 18339.00 Hectares of the above mentioned 04 clusters of mines in ECL taken up for this study in 2018-19; total excavated area is 35.76 hectares

out of which 9.43 Ha. (26.37%) is under backfilling *(Technical Reclamation)* and balance 26.33 hectares (73.63%) is under active mining. As such these clusters mostly consists of Underground mines and few OC mines and patches. It is also evident from Table-10.1 that Technical reclamation is found only in cluster VII whereas no Biological reclamation is observed in all cluster i,e V,VI,VIII and VIII. Total area under plantation (green cover) is 978.53 Ha (5.34%).

10.4 Out of four clusters of mines i.e Cluster V, VI, VII, VIII in ECL, 9.43 Ha (28.05%) technical reclamation is observed for Cluster VII only in the year 2018.

10.5 This study will again will be carried out after an interval of three years to assess the land reclamation status in the above projects.

Table: 10.1

Cluster wise Land Reclamation Status in Opencast Projects of ECL based on the Satellite data of the year 2018

(For projects/Clusters producing Less than 5 mcm Coal+OB)

Sl. No.	Cluster No.	Total Leasehold Area	Technical Reclamation	Plantation			Area under Active Mining	Total Excavated Area	Total Area under Plantation (%Green Cover Generated in Leasehold)	Total Area under Reclamation
				Biological Reclamation	Other Plantations					
			Area under Backfilling	Plantation on Excavated / Backfilled Area	Plantation on External Over Burden Dumps	Social Forestry, Avenue Plantation				
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9 (=4+5+8)*	*10 (=5+6+7)*	*11(=4+5)*
			2018	*2018*	*2018*	*2018*	*2018*	*2018*	*2018*	*2018*
1	Cluster V	2970.00	0.00	0.00	0.00	119.94	0	0.00	119.94	0.00
			0.00%	0.00%			0.00%		4.04%	0.00%
2	Cluster VI	4775.00	0.00	0.00	0.00	519.02	2.14	2.14	519.02	0.00
			0.00%	0.00%			100.00%		10.87%	0.00%
3	Cluster VII	2313.00	9.43	0.00	0.00	143.21	24.19	33.62	143.21	9.43
			28.05%	0.00%			71.95%		6.19%	28.05%
3	Cluster VIII	8281.00	0.00	0.00	0.00	196.36	0.00	0.00	196.36	0.00
			0.00%	0.00%			0.00%		2.37%	0.00%
	TOTAL	**18339.00**	**9.43**	**0.00**	**0.00**	**978.53**	**26.33**	**35.76**	**978.53**	**9.43**
			26.37%	**0.00%**			**73.63%**		**5.34%**	**26.37%**

Note: In reference of the above Table, different parameters are classified as follows:

1. Area under Biological Reclamation includes Areas under Plantation done on Backfilled Area Only.
2. Area under Technical Reclamation includes Area under Backfilling only
3. Area under Active Mining Includes Coal Quarry, Advance Quarry Site and Quarry filled with water etc., if any.
4. Social Forestry and Plantation on External OB Dumps are not included in Biological Reclamation and are put under separate categories as shown in the above Table.
5. (%) calculated in the above Table is in respect to Total Excavated Area except for “”Total Area under Plantation”’ where % is in terms of “Leasehold Area”’.

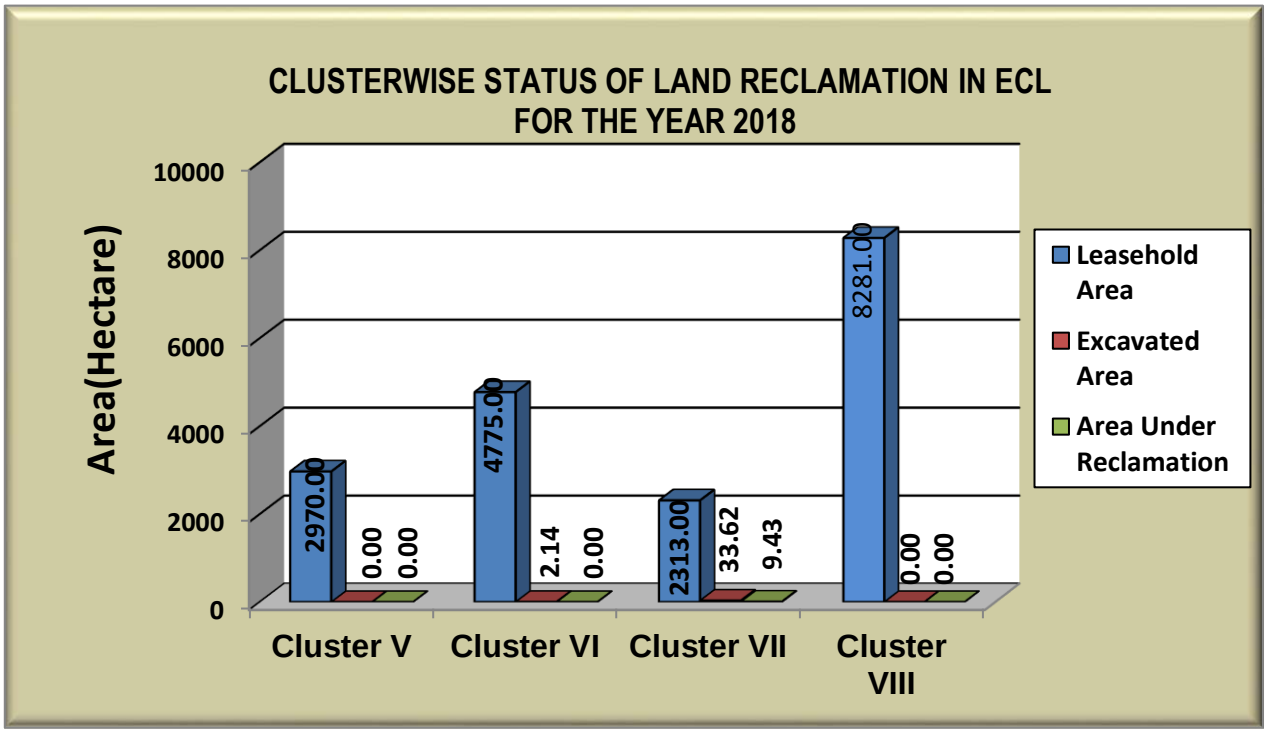
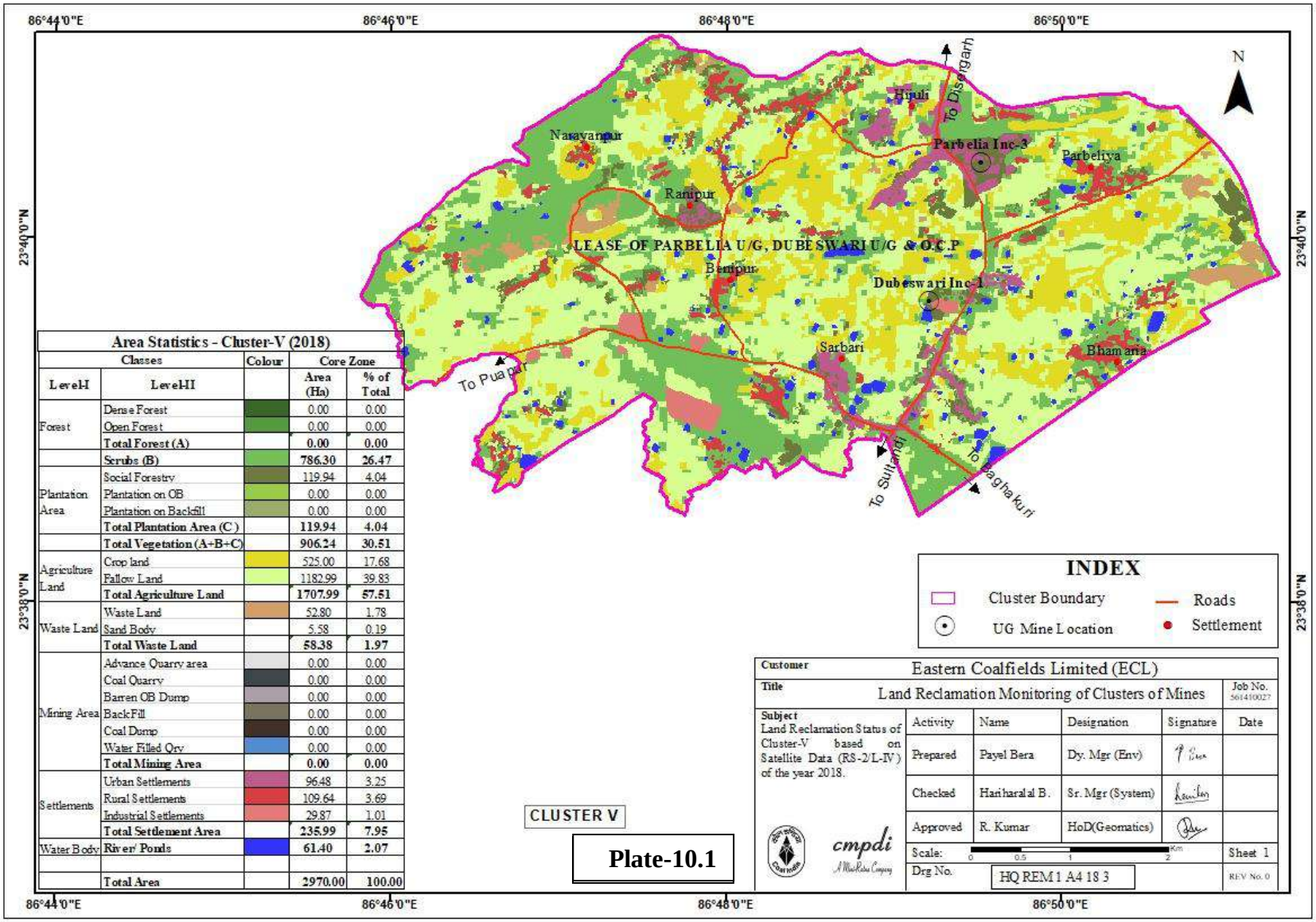


Figure-10.1 **Cluster wise Land Reclamation Status -2018 (ECL)**

Table: 10.2
Cluster wise area statistics of Land use/Cover classes in cluster of mines producing <5m.cm of (Coal +OB) of ECL based on Satellite data of the year 2018

(Area in Hectare)

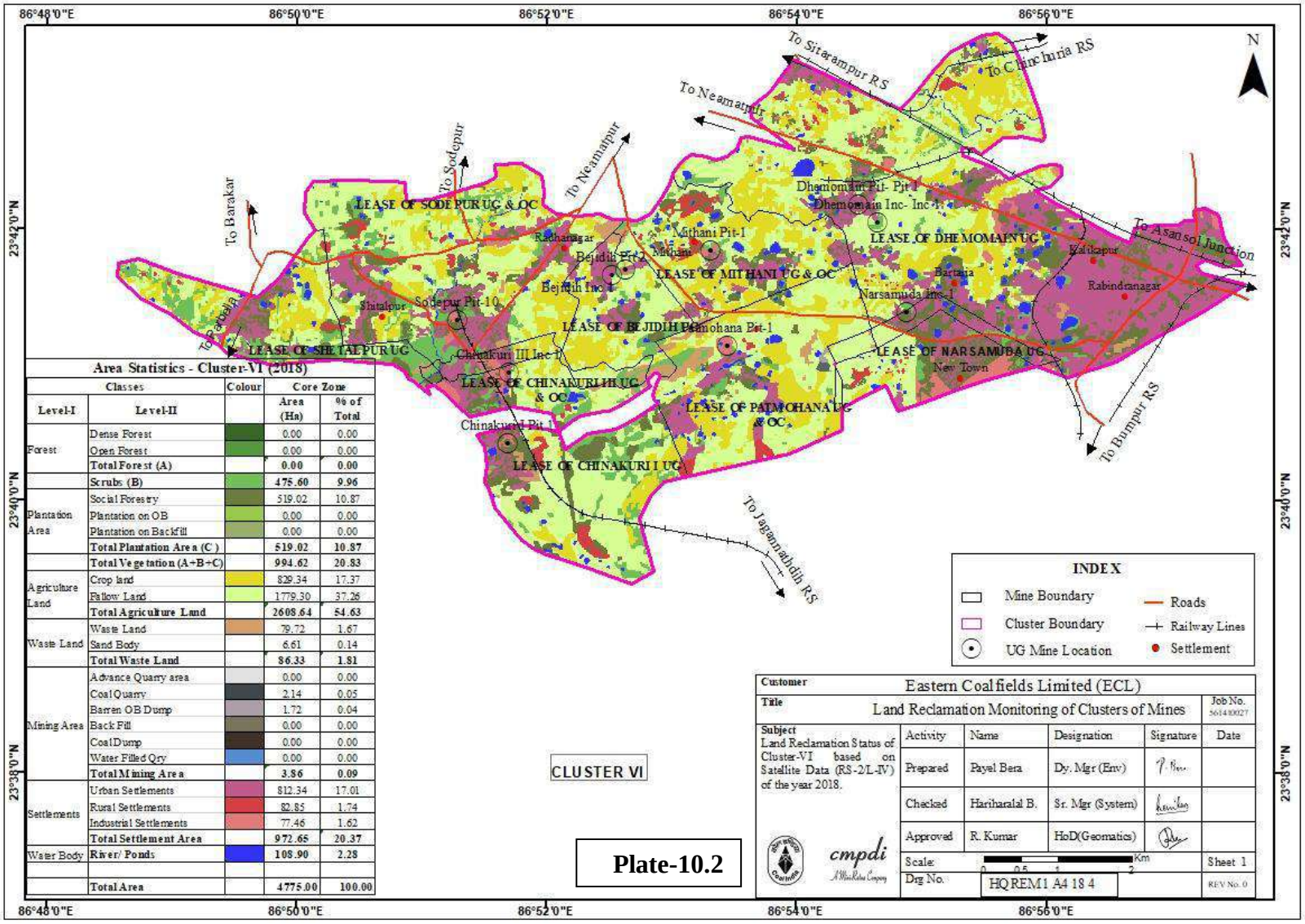
		CLUSTER V		CLUSTER VI		CLUSTER VII		CLUSTER VIII		TOTAL	
		Area	%	Area	%	Area	%	Area	%	Area	%
FORESTS	Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Open Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SCRUBS	Scrubs	786.30	26.47	475.60	9.96	126.72	5.48	502.38	6.07	1891.00	10.31
PLANTATION	Social Forestry	119.94	4.04	519.02	10.87	143.21	6.19	196.36	2.37	978.53	5.34
	Plantation on OB Dump	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Plantation on Backfill (Biological Reclamation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Plantation	119.94	4.04	519.02	10.87	143.21	6.19	196.36	2.37	978.53	5.34
	Total Vegetation	**906.24**	**30.51**	**994.62**	**20.83**	**269.93**	**11.67**	**698.74**	**8.44**	**2869.53**	**15.65**
	Coal Dump	0.00	0.00	0.00	0.00	6.49	0.28	0.00	0.00	6.49	0.04
ACTIVE MINING	Coal Quarry	0.00	0.00	2.14	0.05	18.93	0.82	0.00	0.00	21.07	0.11
	Advance Quarry Site	0.00	0.00	0.00	0.00	5.26	0.23	0.00	0.00	5.26	0.03
	Quarry Filled With Water	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Area under *Active Mining*	**0.00**	**0.00**	**2.14**	**0.05**	**24.19**	**1.05**	**0.00**	**0.00**	**26.33**	**0.14**
	Barren OB Dump	0.00	0.00	1.72	0.04	30.96	1.34	0.00	0.00	32.68	0.18
RECLAIMED	Area Under Backfilling (Technical Reclamation)	0.00	0.00	0.00	0.00	9.43	0.41	0.00	0.00	9.43	0.05
	Total Area under *Technical Reclamation*	**0.00**	**0.00**	**0.00**	**0.00**	**9.43**	**0.41**	**0.00**	**0.00**	**9.43**	**0.05**
	Total Area under Mine Operation	**0.00**	**0.00**	**3.86**	**0.09**	**71.07**	**3.08**	**0.00**	**0.00**	**74.93**	**0.41**
WASTELAND	Waste Lands	52.80	1.78	79.72	1.67	40.26	1.74	412.61	4.98	585.39	3.19
	Fly Ash Pond / Sand Body	5.58	0.19	6.61	0.14	0.00	0.00	0.00	0.00	12.19	0.07
	Total Wasteland	**58.38**	**1.97**	**86.33**	**1.81**	**40.26**	**1.74**	**412.61**	**4.98**	**597.58**	**3.26**
WATERBODIES	Reservoir, nallah, ponds	61.40	2.07	108.90	2.28	66.01	2.85	320.05	3.87	556.36	3.03
	Total Waterbodies	**61.40**	**2.07**	**108.90**	**2.28**	**66.01**	**2.85**	**320.05**	**3.87**	**556.36**	**3.03**
AGRICULTURE	Crop Lands	525.00	17.68	829.34	17.37	741.37	32.05	2407.89	29.08	4503.60	24.56
	Fallow Lands	1182.99	39.83	1779.30	37.26	859.25	37.15	3498.69	42.25	7320.23	39.92
	Total Agriculture	**1707.99**	**57.51**	**2608.64**	**54.63**	**1600.62**	**69.20**	**5906.58**	**71.33**	**11823.83**	**64.47**
SETTLEMENTS	Urban Settlement	96.48	3.25	812.34	17.01	161.69	6.99	690.18	8.33	1760.69	9.60
	Rural Settlement	109.64	3.69	82.85	1.74	79.81	3.45	189.79	2.29	462.09	2.52
	Industrial Settlement	29.87	1.01	77.46	1.62	23.61	1.02	63.05	0.76	193.99	1.06
	Total Settlement	**235.99**	**7.95**	**972.65**	**20.37**	**265.11**	**11.46**	**943.02**	**11.38**	**2416.77**	**13.18**
	Grand Total	**2970.00**	**100.00**	**4775.00**	**100.00**	**2313.00**	**100.00**	**8281.00**	**100.00**	**18339.00**	**100.00**



Area Statistics - Cluster-V (2018)

Classes		Colour	Core Zone	
Level-I	Level-II		Area (Ha)	% of Total
Forest	Dense Forest		0.00	0.00
	Open Forest		0.00	0.00
	Total Forest (A)		**0.00**	**0.00**
	Scrubs (B)		**786.30**	**26.47**
Plantation Area	Social Forestry		119.94	4.04
	Plantation on OB		0.00	0.00
	Plantation on Backfill		0.00	0.00
	Total Plantation Area (C)		**119.94**	**4.04**
	Total Vegetation (A+B+C)		**906.24**	**30.51**
Agriculture Land	Crop land		525.00	17.68
	Fallow Land		1182.99	39.83
	Total Agriculture Land		**1707.99**	**57.51**
Waste Land	Waste Land		52.80	1.78
	Sand Body		5.58	0.19
	Total Waste Land		**58.38**	**1.97**
Mining Area	Advance Quarry area		0.00	0.00
	Coal Quarry		0.00	0.00
	Barren OB Dump		0.00	0.00
	Back Fill		0.00	0.00
	Coal Dump		0.00	0.00
	Water Filled Qry		0.00	0.00
	Total Mining Area		**0.00**	**0.00**
Settlements	Urban Settlements		96.48	3.25
	Rural Settlements		109.64	3.69
	Industrial Settlements		29.87	1.01
	Total Settlement Area		**235.99**	**7.95**
Water Body	River/ Ponds		61.40	2.07
	Total Area		**2970.00**	**100.00**

Customer	Eastern Coalfields Limited (ECL)				
Title	Land Reclamation Monitoring of Clusters of Mines				Job No. 561410027
Subject: Land Reclamation Status of Cluster-V based on Satellite Data (RS-2/L-IV) of the year 2018.	Activity	Name	Designation	Signature	Date
	Prepared	Payel Bera	Dy. Mgr (Env)		
	Checked	Hariharalal B.	Sr. Mgr (System)		
	Approved	R. Kumar	HoD(Geomatics)		
	Scale: 0 0.5 1 2 Km				Sheet 1
	Drg No. HQ REM 1 A4 18 3				REV No. 0



Area Statistics - Cluster-VI (2018)

Classes		Colour	Core Zone	
Level-I	Level-II		Area (Ha)	% of Total
Forest	Dense Forest		0.00	0.00
	Open Forest		0.00	0.00
	Total Forest (A)		**0.00**	**0.00**
	Scrubs (B)		**475.60**	**9.96**
Plantation Area	Social Forestry		519.02	10.87
	Plantation on OB		0.00	0.00
	Plantation on Backfill		0.00	0.00
	Total Plantation Area (C)		**519.02**	**10.87**
	Total Vegetation (A+B+C)		**994.62**	**20.83**
Agriculture Land	Crop land		829.34	17.37
	Fallow Land		1779.30	37.26
	Total Agriculture Land		**2608.64**	**54.63**
Waste Land	Waste Land		79.72	1.67
	Sand Body		6.61	0.14
	Total Waste Land		**86.33**	**1.81**
Mining Area	Advance Quarry area		0.00	0.00
	Coal Quarry		2.14	0.05
	Barren OB Dump		1.72	0.04
	Back Fill		0.00	0.00
	Coal Dump		0.00	0.00
	Water Filled Qry		0.00	0.00
	Total Mining Area		**3.86**	**0.09**
Settlements	Urban Settlements		812.34	17.01
	Rural Settlements		82.85	1.74
	Industrial Settlements		77.46	1.62
	Total Settlement Area		**972.65**	**20.37**
Water Body	River/ Ponds		108.90	2.28
	Total Area		**4775.00**	**100.00**

INDEX

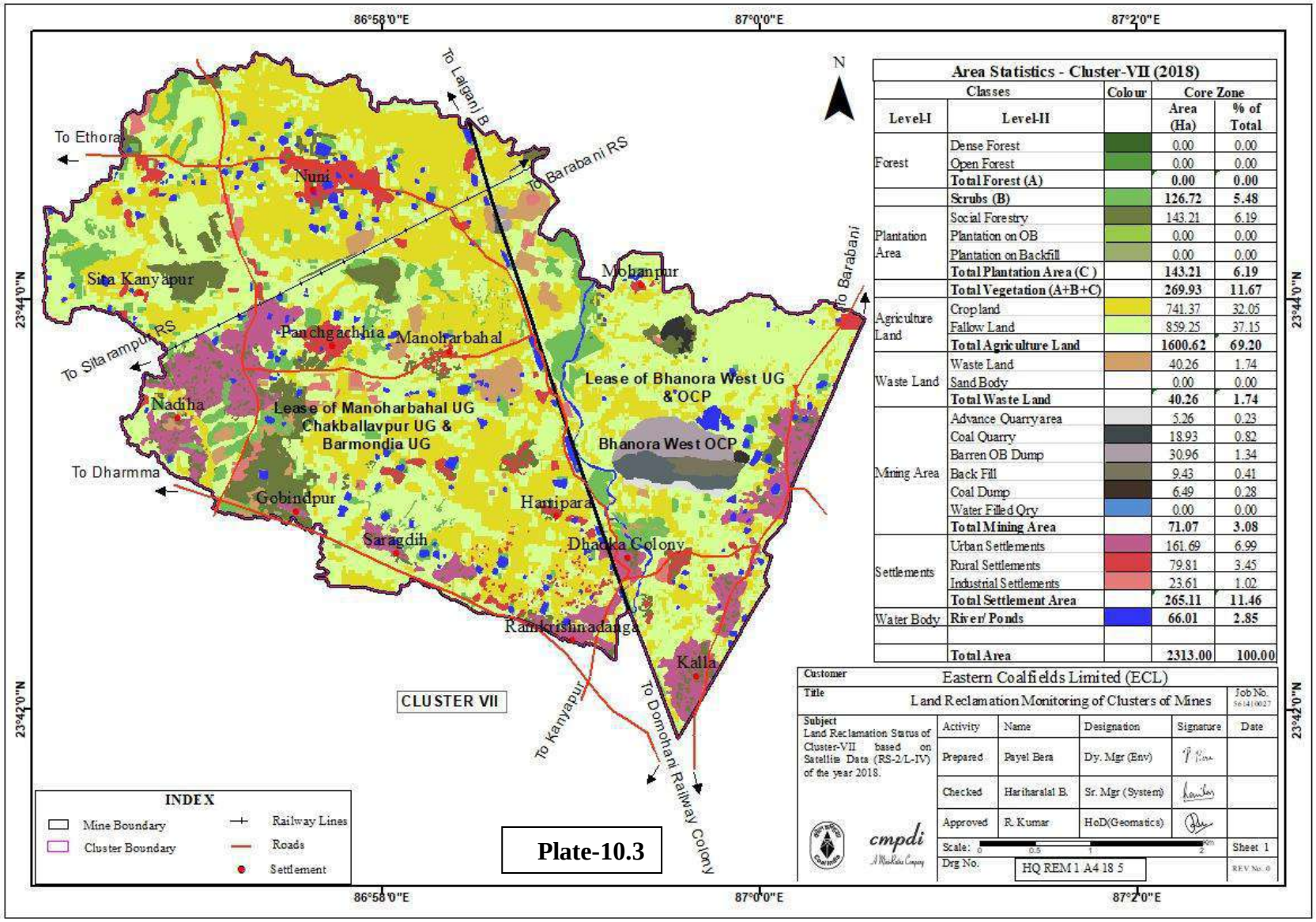
- Mine Boundary
- Cluster Boundary
- UG Mine Location
- Roads
- Railway Lines
- Settlement

CLUSTER VI

Plate-10.2

Customer	Eastern Coalfields Limited (ECL)			
Title	Land Reclamation Monitoring of Clusters of Mines			Job No. 561410027
Subject: Land Reclamation Status of Cluster-VI based on Satellite Data (RS-2/L-IV) of the year 2018.	Activity	Name	Designation	Signature / Date
	Prepared	Payel Bera	Dy. Mgr (Env)	
	Checked	Hariharalal B.	Sr. Mgr (System)	
	Approved	R. Kumar	HoD(Geomatics)	
	Scale: 0 0.5 1 2 Km			Sheet 1
	Drg No. HQREM1 A4 18 4			REV No. 0

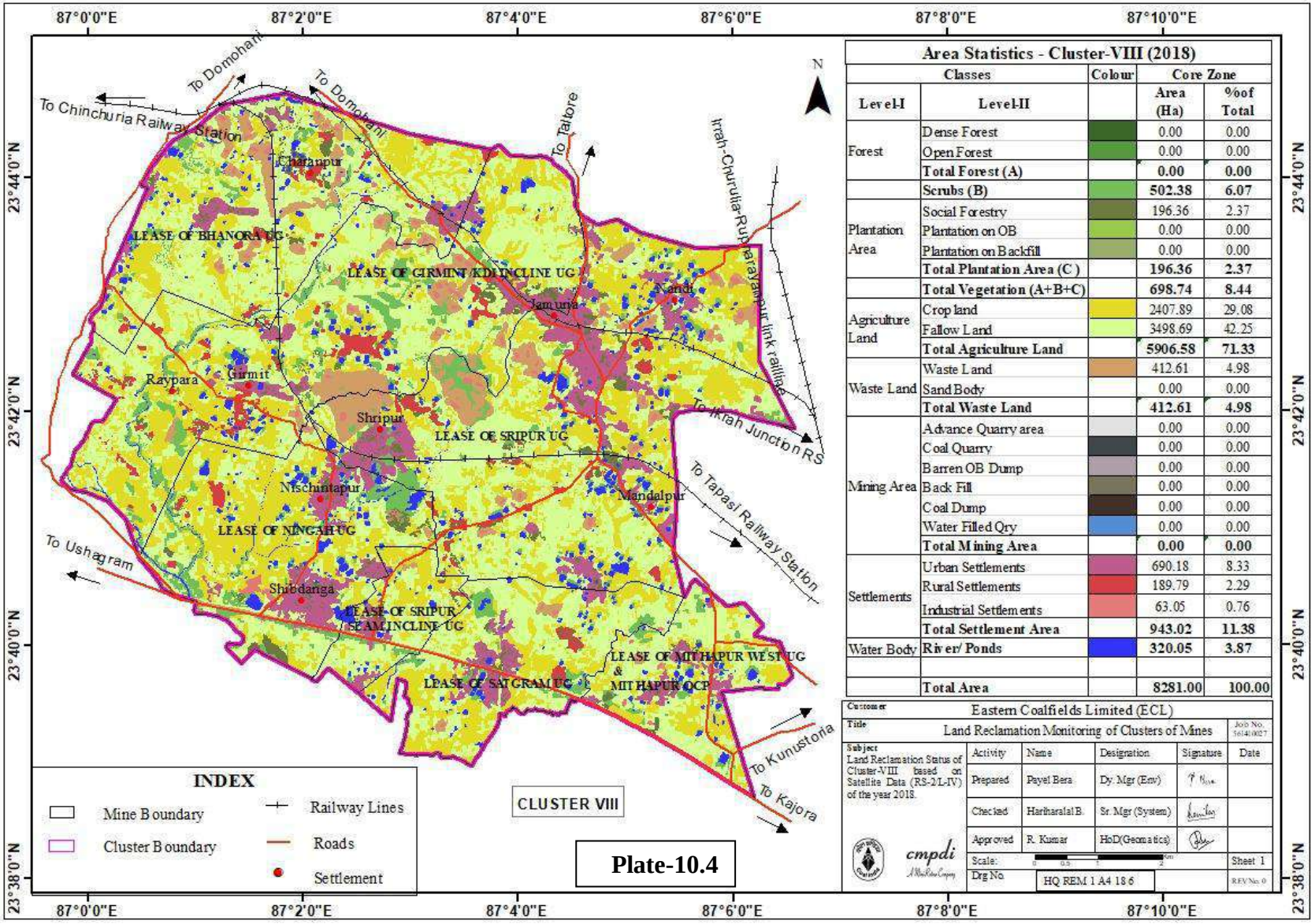
cmpdi — A Mini Ratna Company



Area Statistics - Cluster-VII (2018)

Classes		Colour	Core Zone	
Level-I	Level-II		Area (Ha)	% of Total
Forest	Dense Forest		0.00	0.00
	Open Forest		0.00	0.00
	Total Forest (A)		**0.00**	**0.00**
	Scrubs (B)		**126.72**	**5.48**
Plantation Area	Social Forestry		143.21	6.19
	Plantation on OB		0.00	0.00
	Plantation on Backfill		0.00	0.00
	Total Plantation Area (C)		**143.21**	**6.19**
	Total Vegetation (A+B+C)		**269.93**	**11.67**
Agriculture Land	Crop land		741.37	32.05
	Fallow Land		859.25	37.15
	Total Agriculture Land		**1600.62**	**69.20**
Waste Land	Waste Land		40.26	1.74
	Sand Body		0.00	0.00
	Total Waste Land		**40.26**	**1.74**
Mining Area	Advance Quarry area		5.26	0.23
	Coal Quarry		18.93	0.82
	Barren OB Dump		30.96	1.34
	Back Fill		9.43	0.41
	Coal Dump		6.49	0.28
	Water Filled Qry		0.00	0.00
	Total Mining Area		**71.07**	**3.08**
Settlements	Urban Settlements		161.69	6.99
	Rural Settlements		79.81	3.45
	Industrial Settlements		23.61	1.02
	Total Settlement Area		**265.11**	**11.46**
Water Body	**River/ Ponds**		**66.01**	**2.85**
	Total Area		**2313.00**	**100.00**

Customer	Eastern Coalfields Limited (ECL)				
Title	Land Reclamation Monitoring of Clusters of Mines				Job No. 561410027
Subject: Land Reclamation Status of Cluster-VII based on Satellite Data (RS-2/L-IV) of the year 2018.	Activity	Name	Designation	Signature	Date
	Prepared	Payel Bera	Dy. Mgr (Env)		
	Checked	Hariharalal B.	Sr. Mgr (System)		
	Approved	R. Kumar	HoD(Geomatics)		
	Scale: 0 0.5 1 2 Km				Sheet 1
	Drg No. HQ REM 1 A4 18 5				REV No. 0



Area Statistics - Cluster-VIII (2018)

Classes		Colour	Core Zone	
Level-I	Level-II		Area (Ha)	%of Total
Forest	Dense Forest		0.00	0.00
	Open Forest		0.00	0.00
	Total Forest (A)		**0.00**	**0.00**
	Scrubs (B)		**502.38**	**6.07**
Plantation Area	Social Forestry		196.36	2.37
	Plantation on OB		0.00	0.00
	Plantation on Backfill		0.00	0.00
	Total Plantation Area (C)		**196.36**	**2.37**
	Total Vegetation (A+B+C)		**698.74**	**8.44**
Agriculture Land	Crop land		2407.89	29.08
	Fallow Land		3498.69	42.25
	Total Agriculture Land		**5906.58**	**71.33**
Waste Land	Waste Land		412.61	4.98
	Sand Body		0.00	0.00
	Total Waste Land		**412.61**	**4.98**
Mining Area	Advance Quarry area		0.00	0.00
	Coal Quarry		0.00	0.00
	Barren OB Dump		0.00	0.00
	Back Fill		0.00	0.00
	Coal Dump		0.00	0.00
	Water Filled Qry		0.00	0.00
	Total Mining Area		**0.00**	**0.00**
Settlements	Urban Settlements		690.18	8.33
	Rural Settlements		189.79	2.29
	Industrial Settlements		63.05	0.76
	Total Settlement Area		**943.02**	**11.38**
Water Body	River/ Ponds		**320.05**	**3.87**
	Total Area		**8281.00**	**100.00**

Customer	Eastern Coalfields Limited (ECL)				
Title	Land Reclamation Monitoring of Clusters of Mines				Job No. 561410027
Subject: Land Reclamation Status of Cluster-VIII based on Satellite Data (RS-2/L-IV) of the year 2018.	Activity	Name	Designation	Signature	Date
	Prepared	Payel Bera	Dy. Mgr (Env)		
	Checked	Hariharalal B.	Sr. Mgr (System)		
	Approved	R. Kumar	HoD(Geomatics)		
cmpdi	Scale:				Sheet 1
	Drg No.	HQ REM 1 A4 18 6			REV No. 0

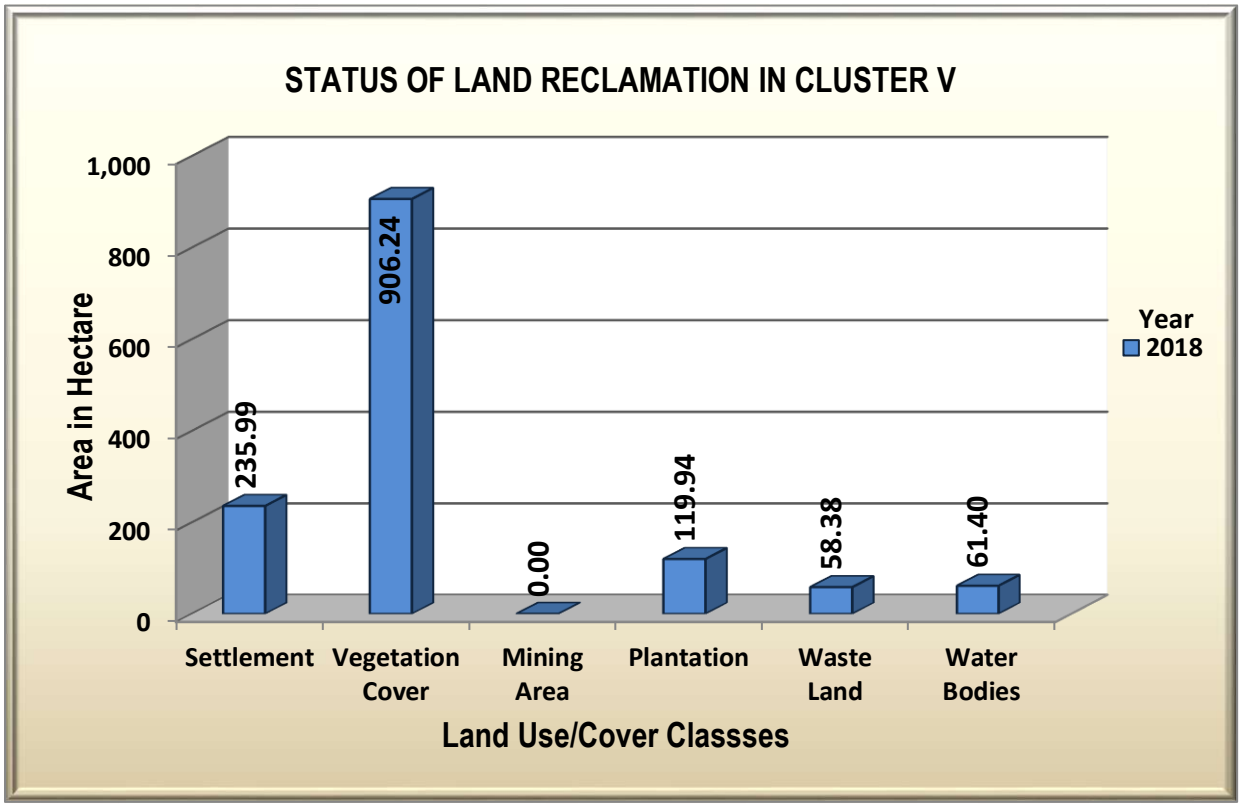


Figure-10.2

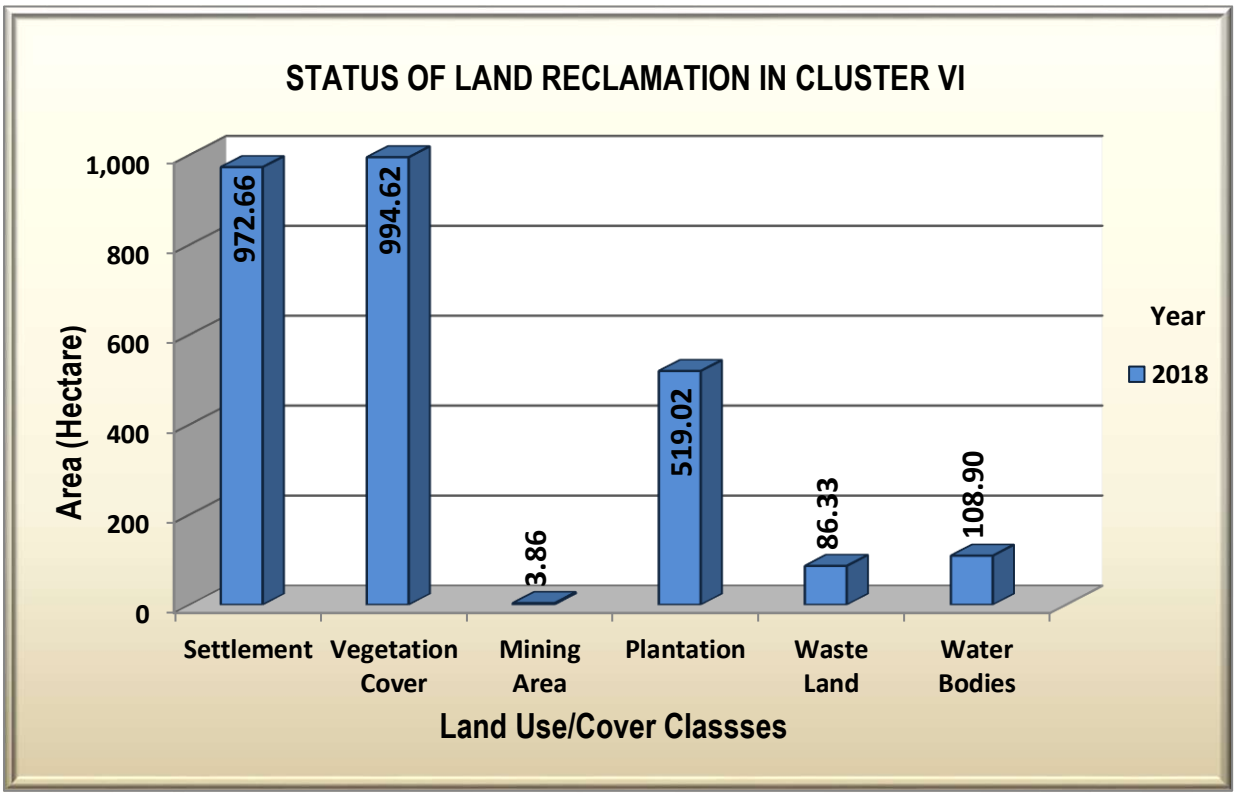


Figure-10.3

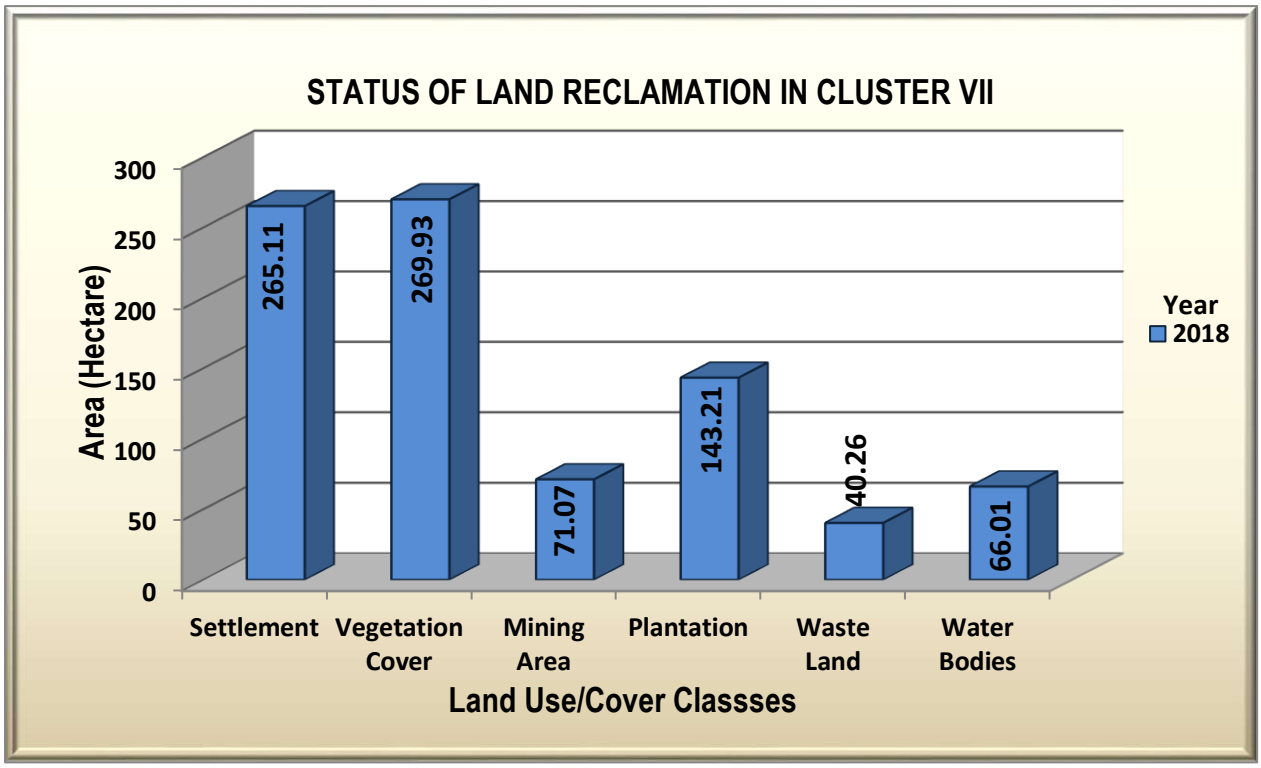


Figure-10.3

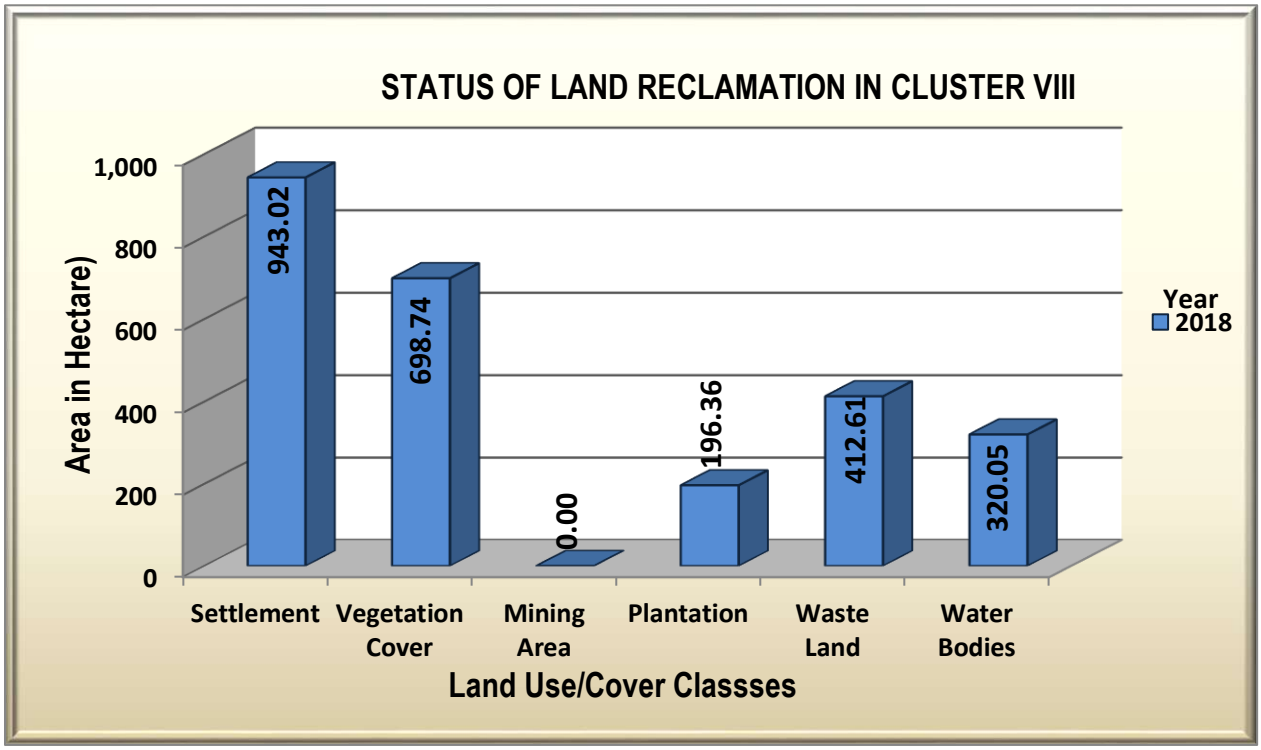


Figure-10.4

Photograph 10.1: Bhanora West OCP, Cluster VII, ECL

Photograph10.2: Social Forestry Plantation in Cluster VI, ECL

Central Mine Planning & Design Institute Ltd.
(A Subsidiary of Coal India Ltd.)
Gondwana Place, Kanke Road, Ranchi 834031, Jharkhand
Phone : (+91) 651 2230001, 2230002, 2230483, FAX (+91) 651 2231447, 2231851
Wesite : www.cmpdi.co.in, Email : cmpdihq@cmpdi.co.in