

**WESTERN COALFIELDS LIMITED  
(MINIRATNA COMPANY)**

**SIX MONTHLY ENVIRONMENTAL  
COMPLIANCE REPORT**  
(From 01/04/2023 to 30/09/2023)

*IN RESPECT OF*

**MAKARDHOKRA-I OPEN CAST  
PROJECT**

**UMRER SUB AREA  
UMRER AREA**

**Compliance of Environmental Clearance conditions in respect of Expansion of Makardhokra-I OC Mine (Phase-I) for increase of production capacity from 3.50 MTPA to 4.20 MTPA as on 30/09/2023**

Ref: MOEF Environment Clearance Letter No. J-11015/54/2006-IA-II (M) dt. 21/03/2022 for 4.20 MTPA

**A. Specific Conditions:**

Sl.no.	Compliance Condition	Status
i.	Project Proponent shall obtain the CTO for 4.2 MTPA capacity prior to mine production.	<p><b>Complied.</b></p> <p>Consent to Operate for 4.2 MTPA has been secured from MPCB vide letter no: Format1.0/CAC/UAN No. MPCB-CONSENT- 0000133816/ CO/ 2203001248 dated 24/03/2022, which was valid up to 31/03/2023.</p> <p>Subsequently, renewal of CTO is secured vide letter no:Format1.0/CAC/UANNo.0000160392/CR/230700 1141 dated 18/07/2023 valid upto 31/03/2026. Copy enclosed as Annexure-II.</p>
ii.	Further expansion in capacity will only be considered by EAC when at least 75 % of EC conditions are complied fully and PP obtains 5 - star rating from Ministry of Coal.	<p><b>Being complied.</b></p> <p>Site visit has been carried out on 15.01.2022 by IRO, MOEF &amp; CC, Nagpur and closure report over partially complied conditions w.r.t Certified Copy of compliance (issued on 05.11.2021), has been issued vide letter no. EC-1031/RON/2019-NGP/9190 dated 21.01.2022. Copy of the closure report is enclosed as Annexure-III.</p> <p>As directed all efforts are being made for compliance of EC Conditions. In this regard, it may be mentioned here that in compliance of EC condition, 10 nos. of long range fog canons have been put into operation in the mine for effective dust suppression. As such, other conditions are also being complied with.</p> <p>As per Ministry of Coal's letter dated 06.04.2021, Star rating performance for FY 2020-21 and 2021-22 has been applied and ratings for the said periods 2020-21 and 2021-22 are enclosed as Annexure-IV.</p>
iii.	PP must comply all the non-compliances and partial compliances of IRO CCR report dated 05th November, 2021 as per Action Taken	<p><b>Complied.</b></p> <p>Certified Copy of EC Compliance report has been secured from Integrated Regional office, MoEF &amp; CC,</p>

	<p>Report dated 09.11.2021 submitted to IRO. Status of which should be submitted to IRO, MOEF &amp; CC in 6 monthly report. IRO, MoEF &amp; CC, shall assess compliance status accordingly.</p>	<p>Nagpur vide letter no F. No EC-1031/RON/2019-NGP/8842 dated 05th Nov'2021.</p> <p>It may be mentioned here that, there was no non-Compliance reported, however three nos. of partial compliances were reported. As such, Action Taken report against the partial compliances were submitted to IRO, MOEF &amp; CC, Nagpur vide letter no. 1026 dated 09.11.2021.</p> <p>Subsequently, a site visit has been carried out on 15.01.2022 by IRO, MOEF &amp; CC, Nagpur and closure report over partially complied conditions w.r.t Certified Copy of compliance (issued on 05.11.2021), has been issued vide letter no. EC-1031/RON/2019-NGP/9190 dated 21.01.2022.</p>
iv.	<p>PP shall implement the work of in - pit Belt conveyor system with CHP and Silo loading system till October, 2023 and accordingly. SPCB shall not grant CTO for road transportation after October, 2023. In this regard, a detailed action plan with documentary proof of bidding process should be submitted to IRO, MoEF &amp; CC within 3 months from date of issue of EC.</p>	<p><b>Being complied.</b></p> <p>Regarding implementation of belt conveyor system, it is submitted that the proposed system will be coupled with upcoming CHP and silo loading system being installed at adjacent Dinesh OC Mine and all efforts will be made to adhere to the schedule directed by MoEF&amp;CC.</p> <p>Action plan was communicated to IRO, MOEF&amp;CC vide letter no: WCL/ SAM/ UMR/ ENVT/ 2022/ 64 dt. 20/06/2022.</p> <p>Revised Project Report for Makardhokra-I Expansion OC mine was approved with provision of Rs. 11551.97 lakhs for subject activity by WCL Board.</p> <p>Survey work for site selection and finalization of alignment is completed.</p> <p>In line with Revised Project Report, Notice Inviting Tender (NIT) for Belt conveyor system with CHP and Silo loading system has been prepared by CMPDIL and tender has been floated on 15.09.2023. The work will commence after award of work to the successful bidder.</p>
v.	<p>PP shall only use 40-50 tonne dumpers/trucks for transportation of coal from mine pit to railway siding till conveyor system is implemented i.e. till December, 2023.</p>	<p><b>Agreed to comply.</b></p> <p>Presently, the transportation of coal from mine pit to railway siding is being done through outsourcing i.e. by hiring contractor. In the said contract the provision is for 30 tonne trucks/ dumpers for coal transportation. This contract is valid upto June 2024.</p>

		<p>In the next contract, the condition imposed by MoEF&amp;CC shall be duly incorporated. Till such time, adequate control measures have been put in place to control emission of dust. The existing facilities at Makardhokra-I OCP are as follows:</p> <ul style="list-style-type: none"> <li>• 10 nos. trolley mounted mist/ fog generators are provided at CHP, siding, coal stock yard and transport road.</li> <li>• Water spraying on haul roads by 06 No. of mobile tankers (Capacity 28 KL to 12 KL)</li> <li>• 20 nos. Fixed sprinkler arrangement along weigh bridge and coal stock approach road.</li> <li>• 44 Nos. of fixed sprinklers have been provided at Wharf Wall.</li> <li>• Closed conveyer &amp; water spraying at all transfer points of CHP.</li> <li>• Automated Tyre wash system has been installed to reduce emission from movement of vehicles.</li> <li>• Regular covering of tarpaulin for Coal Transport Truck.</li> </ul>
vi.	PP shall make use of advanced computer simulation techniques for design and execution of blasting operation in the mine. PP shall make use of Electronic Delay Detonators for optimal blasting in coal and OB rock to minimize the environmental impacts of blasting such as ground vibration, fly rocks and excessive dust generation.	<p><b>Being complied.</b></p> <p>Efforts are being made for use of advanced computer simulation techniques for design and execution of blasting operation, with the help of CMPDIL which has a Blasting Cell consisting of experts of this field.</p> <p>All the arrangements are being done to make use of Electronic Delay Detonators in order to minimize the environmental impacts of blasting such as ground vibration, fly rocks and excessive dust generation. Trials will be carried out shortly.</p>
vii.	PP to construct a Motorable road between the Hawati to Makardhokra within 1 year.	<p><b>Complied.</b></p> <p>A blacktop road connecting Hewati village to Makardhokra village constructed by State Deptt already exists. This road does not come under the mining area and will not be affected in future.</p>
viii.	PP shall submit allocated fund for wildlife conservation plan within six months and compliance of the same should be submitted to Ministry's IRO.	<p><b>Being complied.</b></p> <p>The amount of Rs 14.0 lakhs for Conservation of Schedule I species is to be deposited to State Forest Department. The demand notice yet to be received from</p>

		<p>State Forest Department. The amount as per the demand note will be deposited to state Govt. without fail.</p> <p>The compliance of the same will be submitted to Ministry's IRO.</p>															
ix.	<p>PP shall plant additional 1,50,000 trees (other than already stipulated in earlier EC) in mine and by acquiring new land near villages and mark this as developed by M/s WCL for maintenance and authentication by IRO within 2 years. Further, separately 50 mts width peripheral tree plantation as committed shall be completed within 2 years.</p>	<p><b>Being complied.</b></p> <p>The additional plantation of 1,50,000 trees (other than already stipulated in earlier EC) will planned inside the mine lease area in coming 02 years with maintenance (for 04 years after each year of planting).</p> <p>The year wise plantation programme is as follows:</p> <table border="1"> <thead> <tr> <th>Year</th><th>Area in Ha.</th><th>No. of saplings</th></tr> </thead> <tbody> <tr> <td>2022-23</td><td>16.20</td><td>40,500 (Actual)</td></tr> <tr> <td>2023-24</td><td>9.00</td><td>22,500.00 (Actual)</td></tr> <tr> <td>2024-25</td><td>34.80</td><td>87,000.00</td></tr> <tr> <td><b>Total</b></td><td><b>60.00</b></td><td><b>1,50,000</b></td></tr> </tbody> </table> <p>It may be mentioned here that, WCL has already entered into a long-term MOU with Madhya Pradesh Rajya Van Vikas Nigam (MPRVVN), a State level Expert Agency for planation in its Mining areas with four years maintenance after each year of plantation.</p> <p>As per MoU, following species are to be planted:</p> <ul style="list-style-type: none"> <li>• Fruit Bearing Tree Species: Jamun, Imli, Ganga Imli, Bel, Mango, Sitaphal etc.,</li> <li>• Medicinal / Herbal Plants: Neem, Karanj, Harra, Bahera, Aonla (Amla), Arjun, Shekakai, Kusum, Mahua, etc.</li> <li>• Timber Value Trees: Teak, Shivan / Ghamar, Sissoo, Kala Sirus, SafedSirus, Bamboo, etc.</li> <li>• Ornamental / Avenue Plants (by the side of roads and colonies): Kachnar, Gulmohar, Amaltas, Saptaparni, Gravalia, Peepal, Palm tree etc.</li> </ul>	Year	Area in Ha.	No. of saplings	2022-23	16.20	40,500 (Actual)	2023-24	9.00	22,500.00 (Actual)	2024-25	34.80	87,000.00	<b>Total</b>	<b>60.00</b>	<b>1,50,000</b>
Year	Area in Ha.	No. of saplings															
2022-23	16.20	40,500 (Actual)															
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2024-25	34.80	87,000.00															
<b>Total</b>	<b>60.00</b>	<b>1,50,000</b>															
x.	<p>PP shall construct two additional water harvesting pond with the concurrence of gram Panchayat (other than already stipulated in earlier EC) within 2 years.</p>	<p><b>Being complied.</b></p> <p>Work for two additional water harvesting pond will be taken up in stipulated time after consultation and obtaining consent from nearby village Panchayats.</p>															

		Construction of 01 pond was completed in March' 2023 and work of 01 pond will be taken up in 2023-24, which will be completed by March' 2024.
xi.	PP shall install wind shield around the railway siding to prevent movement of dust through wind to sensitive areas like school, hospital etc.	<p><b>Being complied.</b></p> <p>Presently, coal produced from Umrer OC mine, MKD-I OC Mine and MKD-III OC Mine is being crushed and transported through common CHP and siding of Umrer Area.</p> <p>Work for in-pit conveyor belt, CHP and silo loading system is in progress at adjacent mine, Dinesh (Makardhokra-III) OC Mine and the work is likely to be completed by 30/09/2023. The same silo and CHP will be used for the coal transportation of MKD-I OC Mine.</p> <p>After commencement of this system, existing railway siding will be no longer used for the transportation of coal from MKD-I OC Mine and MKD-III OC Mine.</p> <p>As per EC and OM issued by MOEF&amp;CC, the balance life of Umrer OC is 01 year. i.e production will be stopped by 31/03/2024.</p> <p>Hence the wind barriers at siding will not be required in future.</p> <p>However, thick green belt has been developed all along the siding to provide a buffer against dust pollution.</p>
xii.	PP shall obtain No Objection Certificate (NOC) for extraction of Ground Water from Central Ground Water Authority for expansion capacity.	<p><b>Complied.</b></p> <p>NOC from CGWA has been secured for abstracting / dewatering of Ground Water (NOC No. CGWA/ NOC/ MIN/ ORIG/ 2020/ 8139) which was valid up to 08/06/2022. Renewal application is submitted to CGWA through NOCAP portal on 07/06/2022, which is under process.</p> <p>Copy of CGWA NOC is enclosed as Annexure-V.</p>
xiii.	Sewage treatment plant for industrial sewerage of capacity 25 KLD shall be installed by March 2023.	<p><b>Complied.</b></p> <p>There is no residential colony in mine lease area of Makardhokda-I OC mine. Employees of Makardhokda-I OC project reside in combined township of Umrer area.</p> <p>The domestic sewage disposal arrangement of 0.3 MLD capacity using Phytorid technology is provided in combined township</p>

xiv.	PP to provide drinking water facilities like installation of RO with proper water supply pipe fittings to nearby rural areas and also to install hand pumps by seeking consent from Panchayat of the nearby villages within two years. A copy of consultation proof shall be submitted to IRO, MoEF & CC within 1 month from date of issue.	<p><b>Complied.</b></p> <p>Proper drinking water facilities are provided in nearby villages. All these works are executed with due consultation of local bodies. Details of Drinking Water facility provided in last 02 years is given below:</p> <ul style="list-style-type: none"> <li>• Provision RO plant (1000 LPH) at Gram Panchayat campus of Waigaon - Ghoturli Village. Expenditure incurred: Rs.4.48 lakhs.</li> <li>• Provision drinking water arrangement with submersible pump, bore well &amp; pipeline at Shirpur Village. Expenditure incurred: Rs.8.55 lakhs.</li> <li>• RO plant of 1000 LPH and 25.0 LPH has been provided at Makardhokra Gram Panchayat and Makardhokra ZP School respectively.</li> <li>• Provision RO plant (1000 LPH) at Gram Panchayat Piraya Village.</li> <li>• RO plant of 25 LPH capacity provided at ZP School, Kanwa village.</li> </ul>
xv.	<p>PP to install solar lights within 1 year from the grant of this EC along the road used for transportation of minerals to avoid the accidents at night and also seek its maintenance.</p> <p>PP to also install solar light with its maintenance within the study area of 10 km radius buffer zone within one year.</p>	<p><b>Being complied.</b></p> <p>Adequate lighting arrangements are provided in mine premises to meet DGMS standards. These are monitored regularly by lux meter.</p> <p>Efforts will be made to install solar lights along coal transport road and in nearby villages within stipulated time period.</p>
xvi.	PP to install 1 more continuous ambient air quality monitoring stations at suitable locations preferably village side and with consultation of SPCB. The real time data so generated shall be uploaded on company website. In addition, data should also be displayed digitally at entry and exit gate of mine lease area for public display.	<p><b>Being complied.</b></p> <p>A continuous Online Ambient Air Quality Monitoring station is in operation at the common mine boundary of Makardhokra-I OC and Makardhokra-III OC, set up in consultation with MPCB. The real time data is being uploaded on the company website.</p> <p>Additionally, procurement of 01 no of CAAQMS is under process. Tender for the same has been floated on 08/09/2023 through GEM portal vide Bid No. GEM/2023/B/3879063. CAAQMS will be installed in current FY. i.e. in 2023-24.</p>

xvii.	PP to take grassing and vegetation of OB dump and PP must explore the possibilities of utilization of OB material for different purposes (in construction of roads / manufacture of artificial sand, aggregates / use for farmers etc.) and accordingly.	<p><b>Being complied.</b></p> <p>Makardhokra– I OC Mine commenced in the year 2014. 30,000 nos of plants were planted on 12.10 ha of existing external OB dump</p> <p>Further on the plantation work will be undertaken as per plantation program of EIA-EMP.</p> <p>Possibilities are being explored for utilization of OB material for different purposes (in construction of roads / manufacture of artificial sand, aggregates).</p>
xviii.	The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right for darkness and minimal noise levels at night. PPs must ensure that the biological clock of the villages is not disturbed; by orienting the floodlights / masks away from the villagers and keeping the noise levels well within the prescribed limits for day light / night hours.	<p><b>Being complied.</b></p> <p>Adequate measures are taken for control of noise levels as per Noise Pollution Rules, 2016 in the Work Environment by following regular maintenance schedule, providing vibration pads at the base and other technical measures. In addition, plantation is also being done to act as sound barrier.</p> <p>Noise monitoring of work zone is being done on monthly basis by noise meters for vulnerable points like inside and outside of HEMM such as PC, Tippers and Dozers.</p> <p>Noise level monitoring stations are established at Shirpur and Hewati village. Day time &amp; night time noise level data are monitored fortnightly as per Env. (Protection) Amendment Rule, 2000.</p> <p>In addition, Illumination survey and work monitoring of noise level at nearby villages is being carried out, departmentally.</p>

**B. Standard Conditions:**

Sl. No.	Compliance Condition	Status
a)	<b>Statutory Compliance</b>	
i.	The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project.	Not applicable as no forest land is involved.
ii.	The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.	Not applicable as the project does not comes under any ESZ/Eco Park/Wildlife sanctuary etc.
iii.	The project proponent shall prepare a Site-Specific Conservation Plan/ Wildlife Management Plan and approved by the Chief Wildlife Warden. The recommendations of the approved Site-Specific Conservation Plan/ Wildlife Management Plan shall be implemented in consultation with the State Forest Department. The implementation report shall be furnished along with the six-monthly compliance report (in case of the presence of schedule-I species in the study area).	<p><b>Being complied.</b></p> <p>Conservation Plan is prepared with a budgetary provision of Rs 14.00 lakhs for protection of Varanus Bengalensis (Indian Monitor Lizard/ Ghorpad) and the same is submitted to the Office of Dy. Conservator of Forest, Nagpur Forest Division vide letter dated WCL/UA/AGM/ENV/2021/9095 dated 19-03-2021.</p> <p>Recommendations pertaining to approved Conservation Plan/Wildlife Management Plan for protection of Varanus Bengalensis (Indian Monitor Lizard/ Ghorpad) will be implemented in consultation with the State Forest Department.</p>
iv.	The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the concerned State Pollution Control Board/Committee.	<p><b>Complied.</b></p> <p>Consent to Operate for 4.2 MTPA has been secured from MPCB vide letter no: Format1.0/CAC/UAN No. MPCB-CONSENT-0000133816/ CO/ 2203001248 dated 24/03/2022, which was valid up to 31/03/2023.</p> <p>Subsequently, renewal of CTO is secured vide letter no: Format1.0/CAC/UANNo.0000160392/CR/2307001141 dated 18/07/23 valid upto 31/03/26. Copy enclosed as Annexure-II.</p>
v.	The project proponent shall obtain the necessary	<b>Complied.</b>



	permission from the Central Ground Water Authority.	<p>Obtained NOC from CGWA for abstracting Ground Water (NOC No. CGWA/ NOC/ MIN/ ORIG/ 2020/ 8139) which is valid up to 08/06/2022. Renewal application is submitted to CGWA through NOCAP portal on 07/06/2022, which is approved by CGWA. Formal letter is awaited.</p> <p>Copy of CGWA NOC is enclosed as Annexure-V.</p>
vi.	Solid/ Hazardous waste generated in the mines needs to addressed in accordance to the Solid Waste Management Rules, 2016/ hazardous & Other Waste Management Rules, 2016.	<p><b>Complied.</b></p> <p>Hazardous waste generated in the mines is being stored as per the hazardous &amp; Other Waste Management Rules, 2016 and disposed off within the stipulated time.</p> <p>Copy of Annual returns for Hazardous waste (Form-IV) for the FY 2022-23 is enclosed as Annexure-VI.</p>
<b>b)</b>	<b>Air Quality Monitoring and Preservation</b>	
i.	<p>Continuous Ambient Air Quality Monitoring Stations as prescribed in the statue be established in the Core Zone as well as in the Buffer zone for monitoring of pollutants, namely PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and NO<sub>x</sub>. 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. Online Ambient Air Quality Monitoring stations may also be installed in addition to the regular monitoring stations as per the requirement and/or in consultation with the SPCB.</p> <p>Monitoring of Heavy Metals such as Hg, As, Ni, Cd, Cr etc to be carried out at least once in six months.</p>	<p><b>Being complied.</b></p> <p>A continuous Online Ambient Air Quality Monitoring station is in operation at the common mine boundary of Makardhokra-I OC and Makardhokra-III OC, set up in consultation with MPCB. The real time data is being uploaded on the company website.</p> <p>Additionally, Procurement of 01 no of CAAQMS is under process. Tender for the same has been floated on 08/09/2023 through GEM portal vide Bid No. GEM/2023/B/3879063. CAAQMS will be installed in current FY. i.e. in 2023-24.</p> <p>At present, five nos. of ambient air quality monitoring stations have been established based on the meteorological data, Topographical features and environmentally and ecologically sensitive targets which are as follows:</p> <ul style="list-style-type: none"> <li>• Pit Office</li> <li>• Sirpur Village</li> <li>• Kalmana Village</li> <li>• Khursapur Village</li> <li>• Heoti Village</li> </ul> <p>Air quality parameters are being monitored by CMPDIL on fortnightly basis. Maximum and minimum concentration of parameters (SPM, PM<sub>10</sub>, NO<sub>x</sub>, SO<sub>x</sub> and PM<sub>2.5</sub>) as per Environmental monitoring report (from Apr'23 to Sep'23) is as follows:</p>

Parameters	Core Zone/ Buffer Zone	Permissible limit	Concentration (24 hourly values in $\mu\text{g}/\text{m}^3$ )	
			Min	Max
SPM	Core Zone	600	220	286
	Buffer Zone	-	110	156
PM <sub>10</sub>	Core Zone	300	135	196
	Buffer Zone	100	52	89
NO <sub>2</sub>	Core Zone	120	10	18
	Buffer Zone	80	06	16
SO <sub>x</sub>	Core Zone	120	BDL	13
	Buffer Zone	80	BDL	
PM <sub>2.5</sub>	Core Zone	-	42	64
	Buffer Zone	60	22	40



It may be seen from the data that the values are well within the permissible limits.

The Monitoring Report in respect of Makardhokra – I OCP is enclosed as annexure-VII.

Heavy metal monitoring in ambient air is carried out once in six months (Copy enclosed as annexure-VIII).

Environment Laboratory CMPDI RI-IV, NAGPUR		Test Report Ambient Air quality monitoring data for heavy metals						
TEST REPORT NO.	BIN/TR/LINE /HM23			DATE OF ISSUE				
NAME OF CUSTOMER	GM/ENV, WCLHD, NAGPUR			SAMPLE DESCRIPTION				
TEST REQUIRED	Heavy metals (As, Pb, Ni, Cr & Cd) in air samples (ASTM D 4185)							
NAME OF AREA	UNRER			SAMPLING METHOD : ISOP 4				
NAME OF PROJECT	MAKARDHOKRA-I OC			SAMPLING PLAN : LQR 47				
No. of Pages	1							
Sl No.	Name of location	Location Code	Date of sampling					
1	PIT OFFICE	UM10A-1	18-04-2023					
2	KALMANA VILLAGE	UM10A-2	18-04-2023					
3	SRIPUR VILLAGE	UM10A-3	20-04-2023					
4	KHURSAPAR VILLAGE	UM10A-4	20-04-2023					
5	HEOTI VILLAGE	UM10A-5	18-04-2023					
Sl. No.	Parameter	Method of analysis	Detection limit	Observed Value				
				UM10A-1	UM10A-2	UM10A-3	UM10A-4	UM10A-5
1	Arsenic, $\mu\text{g}/\text{m}^3$	ASTM D 4185	0.0007 $\mu\text{g}/\text{m}^3$	BDL	BDL	BDL	BDL	BDL
2	Lead, $\mu\text{g}/\text{m}^3$	IS 5182 PART 02	7.0 $\mu\text{g}/\text{m}^3$	BDL	BDL	BDL	BDL	BDL
3	Nickel, $\mu\text{g}/\text{m}^3$	ASTM D 4185	0.007 $\mu\text{g}/\text{m}^3$	BDL	BDL	BDL	BDL	BDL
4	Total Chromium, $\mu\text{g}/\text{m}^3$	ASTM D 4185	0.0045 $\mu\text{g}/\text{m}^3$	BDL	BDL	BDL	BDL	BDL
5	Cadmium, $\mu\text{g}/\text{m}^3$	ASTM D 4185	0.0015 $\mu\text{g}/\text{m}^3$	BDL	BDL	BDL	BDL	BDL
6	Mercury, $\mu\text{g}/\text{m}^3$	ASTM D 4185	0.0007 $\mu\text{g}/\text{m}^3$	BDL	BDL	BDL	BDL	BDL
BDL: BELOW DETECTION								
 SCIENTIFIC ASSISTANT				 DEEPANSHU AUTHORIZED				
1 This Report refers to the data related to the items tested. 2 This Report cannot be reproduced in part or full without written permission of the management. 3 ** This document is registered as per ISIAAQ								

ii.	<p>The Ambient Air Quality Monitoring in the core zone shall be carried out to ensure the Coal Industry Standards notified vide GSR 742(E) dated 25<sup>th</sup> September, 2000 and as amended from time to time by the Central Pollution Control Board. Data on ambient air quality and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly reported to the Ministry/Regional Office and to the CPCB/ SPCB.</p>	<p><b>Being complied.</b></p> <p>Five nos. of ambient air quality monitoring stations has been established based on the meteorological data. Topographical features and environmentally and ecologically sensitive targets which are as follows:</p> <ul style="list-style-type: none"><li>• Pit Office</li><li>• Sirpur Village</li><li>• Kalmana Village</li><li>• Khursapur Village</li><li>• Heoti Village</li></ul> <p>Air quality parameters are being monitored by CMPDIL on fortnightly basis. Maximum and minimum concentration of parameters (SPM, PM<sub>10</sub>, NO<sub>x</sub>, SO<sub>x</sub> and PM<sub>2.5</sub>) as per Environmental monitoring report (from April 2023 to Sep 2023) is as follows:</p> <table><tr><th rowspan="2">Parameters</th><th rowspan="2">Core Zone/ Buffer Zone</th><th rowspan="2">Permissible limit</th><th colspan="2">Concentration (24 hourly values in µg/m<sup>3</sup>)</th></tr><tr><th>Min</th><th>Max</th></tr><tr><td rowspan="2">SPM</td><td>Core Zone</td><td>600</td><td>220</td><td>286</td></tr><tr><td>Buffer Zone</td><td>-</td><td>110</td><td>156</td></tr><tr><td rowspan="2">PM<sub>10</sub></td><td>Core Zone</td><td>300</td><td>134</td><td>196</td></tr><tr><td>Buffer Zone</td><td>100</td><td>52</td><td>89</td></tr><tr><td rowspan="2">NO<sub>2</sub></td><td>Core Zone</td><td>120</td><td>10</td><td>18</td></tr><tr><td>Buffer Zone</td><td>80</td><td>06</td><td>16</td></tr><tr><td rowspan="2">SO<sub>x</sub></td><td>Core Zone</td><td>120</td><td>BDL</td><td>13</td></tr><tr><td>Buffer Zone</td><td>80</td><td colspan="2">BDL</td></tr><tr><td rowspan="2">PM<sub>2.5</sub></td><td>Core Zone</td><td>-</td><td>36</td><td>64</td></tr><tr><td>Buffer Zone</td><td>60</td><td>22</td><td>40</td></tr></table> <p>It may be seen from the data that the values are well within the permissible limits.</p> <p>The Monitoring Report in respect of Makardhokra – I OCP is enclosed as Annexure-VII.</p> <p>Heavy metal monitoring in ambient air is carried out once in six months (Copy enclosed as Annexure-VIII).</p>	Parameters	Core Zone/ Buffer Zone	Permissible limit	Concentration (24 hourly values in µg/m <sup>3</sup> )		Min	Max	SPM	Core Zone	600	220	286	Buffer Zone	-	110	156	PM <sub>10</sub>	Core Zone	300	134	196	Buffer Zone	100	52	89	NO <sub>2</sub>	Core Zone	120	10	18	Buffer Zone	80	06	16	SO <sub>x</sub>	Core Zone	120	BDL	13	Buffer Zone	80	BDL		PM <sub>2.5</sub>	Core Zone	-	36	64	Buffer Zone	60	22	40
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iii.	Transportation of coal, to the extent permitted by road and till the time granted in specific conditions as per recommendation of EAC, shall be carried out by covered trucks/ conveyors. Effective control measures such as regular water/ mist sprinkling/ rain gun etc shall be carried out in critical areas prone to air pollution (with higher values of PM 10 /PM 2.5) such as haul road, loading/ unloading and transfer points. Fugitive dust emissions from all sources shall be controlled regularly. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central/ State Pollution Control Board.	<b>Being complied.</b>  All the vehicles transporting coal are properly covered with tarpaulin and are loaded within permissible limit. Adequate control measures have been put in place to control fugitive emission of dust. The existing facilities at Makardhokra-I OCP are: <ul style="list-style-type: none"><li>10 nos. trolley mounted mist/ fog generators are provided at CHP, siding, coal stock yard and transport road.</li><li>Water spraying on haul roads by 06 No. of mobile tankers (Capacity 28 KL to 12 KL)</li><li>20 nos. Fixed sprinkler arrangement along weigh bridge and coal stock approach road.</li><li>44 Nos. of fixed sprinklers have been provided at Wharf Wall.</li><li>Closed conveyer &amp; water spraying at all transfer points of CHP.</li><li>Automated Tyre wash system has been installed to reduce emission from movement of vehicles.</li><li>Regular covering of tarpaulin for Coal Transport Truck.</li></ul>																																																																																																														
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	through the existing road passing through any village shall be avoided. In case, it is proposed to construct a 'bypass' road, it should be so constructed so that the impact of sound, dust and accidents could be appropriately mitigated.	<p>Approx. 75 - 80% coal is transported through rail to all the major consumers. The remaining 20 – 25% coal is transported through covered trucks. The coal transportation road is properly maintained and it is directly connected to State Highways (BT road). There is no village in the mine lease area and coal is not transported through any village/ habitation there is no need for bypass road.</p> <p>The nearest village structure is about 800 m from the mine boundary.</p>
v.	Vehicular emissions shall be kept under control and regularly monitored. All the vehicles engaged in mining and allied activities shall operate only after obtaining 'PUC' certificate from the authorized pollution testing centres.	<p><b>Being complied.</b></p> <p>As per the present practice, the PUC certificate are obtained for all light, passenger vehicles, transportation vehicles and the same will be continued.</p>
vi.	Coal stock pile/ crusher/ feeder and breaker material transfer points shall invariably be provided with dust suppression system. Belt- conveyors shall be fully covered to avoid air borne dust. Side cladding all along the conveyor shall be fully covered to avoid air borne dust. Drills shall be wet operated or fitted with dust extractors.	<p><b>Complied.</b></p> <p>Adequate control measures have already been put in place to control fugitive emission of dust. The existing facilities at Makardhokra-I OCP are:</p> <ul style="list-style-type: none"> <li>• 10 nos. trolley mounted mist/ fog generators are provided at CHP, siding, coal stock yard and transport road.</li> <li>• Water spraying on haul roads by 06 No. of mobile tankers (Capacity 28 KL to 12 KL)</li> <li>• 20 nos. Fixed sprinkler arrangement along weigh bridge and coal stock approach road.</li> <li>• 44 Nos. of fixed sprinklers have been provided at Wharf Wall.</li> <li>• Closed conveyer &amp; water spraying at all transfer points of CHP.</li> <li>• Automated Tyre wash system has been installed to reduce emission from movement of vehicles.</li> <li>• Regular covering of tarpaulin for Coal Transport Truck.</li> </ul>
vii.	Coal handling plant shall be operated with effective control measures w.r.t. various environmental parameters. Environmental friendly sustainable technology should be implemented for mitigating such parameters.	<p><b>Complied.</b></p> <p>Closed conveyer &amp; water spraying at all transfer points of CHP is provided. Mist Spray Arrangement system is provided at CHP. In addition to these 03 nos of trolley mounted mist generators are also provided for effective dust suppression at CHP.</p>

c)	Water Quality Monitoring and Preservation																																																
i.	<p>The effluent discharge (Mine Water, Workshop effluent) shall be monitoring in terms of the parameters notified under the Water Act, 1974 Coal Industry Standards vide GSR 742 (E) dated 25.9.2000 and as amended from time to time by the Central Pollution Control Board.</p>	<p><b>Being complied.</b></p> <p>Provision of Workshop Effluent Treatment Plant and Sedimentation Pond has been made in the EMP and the same has been constructed.</p> <p>The sedimentation tank of size 30 m x 8 m x 2.5 m (Capacity: 600m<sup>3</sup>) is provided for treatment of mine discharge, the quality of which is regularly monitored on fortnightly basis by CMPDIL.</p> <p>Maximum and minimum concentration of Water parameters of Mine Discharge water after treatment, as per Environmental monitoring reports (from April'23 to Sep'23) are as follows:</p> <table><tr><th rowspan="2">Parameters</th><th colspan="3">Concentration (mg/L)</th></tr><tr><th>Permissible Limit</th><th>Min</th><th>Max</th></tr><tr><td>pH</td><td>5.5 to 9.0</td><td>7.05</td><td>8.32</td></tr><tr><td>TSS</td><td>100</td><td>18</td><td>48</td></tr><tr><td>COD</td><td>250</td><td>28</td><td>64</td></tr><tr><td>O&amp;G</td><td>10</td><td>BDL</td><td>BDL</td></tr></table> <p>For workshop effluent treatment, ETP (capacity 100 KLD) is provided.</p> <p>ETP Effluent is analyzed fortnightly for the parameters –pH, TSS, Oil &amp; Grease and COD as per the Env. (Protection) Amendment Rules.</p> <p>Maximum and minimum concentration of Water parameters of Workshop effluent after treatment, as per Environmental monitoring reports (April'23 to Sep'23) are as follows:</p> <table><tr><th rowspan="2">Parameters</th><th colspan="3">Concentration (mg/L)</th></tr><tr><th>Permissible Limit</th><th>Min</th><th>Max</th></tr><tr><td>pH</td><td>5.5 to 9.0</td><td>7.32</td><td>8.14</td></tr><tr><td>TSS</td><td>100</td><td>22</td><td>44</td></tr><tr><td>COD</td><td>250</td><td>32</td><td>64</td></tr><tr><td>O &amp; G</td><td>10</td><td colspan="2">BDL</td></tr></table> <p>All parameters are well within the permissible limit.</p> <p>Adequate measures will be taken (if needed) to maintain the quality of water within the permissible limits. Copy of Monitoring report is enclosed as annexure-VII.</p>		Parameters	Concentration (mg/L)			Permissible Limit	Min	Max	pH	5.5 to 9.0	7.05	8.32	TSS	100	18	48	COD	250	28	64	O&G	10	BDL	BDL	Parameters	Concentration (mg/L)			Permissible Limit	Min	Max	pH	5.5 to 9.0	7.32	8.14	TSS	100	22	44	COD	250	32	64	O & G	10	BDL	
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ii.	<p>The monitoring data shall be updated on the company's website and displayed at the project site. The circular No:</p>	<p><b>Being complied.</b></p> <p>Environment monitoring reports are being uploaded on the company's website <a href="http://www.westerncoal.in">www.westerncoal.in</a>.</p>																																															

	J-20012/1/2006-IA.11 (M) dated 27 <sup>th</sup> May 2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regard for its compliance.	
iii.	Regular monitoring of ground water level and quality shall be carried out in and around the mine lease area by establishing a network of existing wells and constructing new piezometers during the mining operations. The monitoring of ground water levels shall be carried out four times a year i.e. pre-monsoon, monsoon, post-monsoon and winter. The ground water quality shall be monitored once year, and the data thus collected shall be sent regularly to MOEFCC/RO.	<p><b>Being complied.</b></p> <p>Regular monitoring of ground water level from existing wells at 33 locations of Buffer zone is done for four times a year i.e. during pre-monsoon (May), monsoon (August), post-monsoon (November), and winter (January).</p> <p>Quality of groundwater as per IS: 10500: 2012 is analysed once a year.</p> <p>2 nos of piezometers are installed in core zone for regular monitoring of ground water level.</p> <p>Ground water level and quality monitoring report is being sent to R.O., MoEF&amp; CC, Nagpur and CGWA along with the Six Monthly EC Compliance Report.</p> <p>Copy of groundwater Monitoring report is enclosed as Annexure-IX.</p>
iv.	Monitoring of water quality upstream and downstream of water bodies shall be carried out once in six months and record of monitoring data shall be maintained and submitted to the Ministry of Environment, Forest and Climate Change/Regional Office.	<p><b>Being complied.</b></p> <p>Monitoring of surface water quality is being done regularly by CMPDIL. Report enclosed as Annexure-X.</p>
v.	Ground water, excluding mine water, shall not be used for mining operations. Rainwater harvesting shall be implemented for conservation and augmentation of ground water resources.	<p><b>Complied.</b></p> <p>Mine Water pumped out from the mine is being used for mining and allied operations like dust suppression, washing of HEMM etc.</p> <p>The artificial recharge measures undertaken in the neighboring area can be summarized as below:</p> <ul style="list-style-type: none"> <li>• Roof Top Rain Water Harvesting at Area General Manager's office, Umrer area.</li> <li>• A Check Dam (Water Retaining Capacity: 31,350 CuM) is also provided at Lal Puliya Railway Bridge. Dimensions (Length-55 m, height-1.2m from river bed)</li> </ul>

vi.	<p>Catch/ garland drains and siltation ponds in adequate numbers and appropriate size shall be constructed around the mine working, coal heaps &amp; OB dumps to prevent run off of water and flow of sediments directly into the river and water bodies. Further, dump material shall be properly consolidated/ compacted and accumulation of water over dumps shall be avoided by providing adequate channels for flow of silt into the drains. The drains/ponds so constructed shall be regularly desilted particularly before onset of monsoon and maintained properly.</p> <p>Sump capacity should provide adequate retention period to allow proper settling of silt material. The water so collected in the sump shall be utilised for dust suppression and green belt development. Dimension of the retaining wall constructed, if any, at the toe of the OB dumps within the mine to check run-off and siltation should be based on the rainfall data. The plantation of native species to be made between toe of the dump and adjacent field/habitation/water bodies.</p>	<p><b>Complied.</b></p> <p>To arrest flow of silts and sediments garland drains/ catch drains have been constructed and maintained. Garland drains/catch drains of length 3.40 Km is provided around the quarry (top width 2 m, bottom width 1 m &amp; height 1 m) which are desilted before onset of every monsoon.</p> <p>The silt and sediment from OB benches are guided through cross drainage into the mine sump having sufficient capacity to allow settlement of suspended particles.</p> <p>The drain and sump sizes are based on the previous rainfall data of the area.</p> <p>Moreover, cross drainage is provided all along the OB Benches which carry all the silt and sediments into the mine sump. As such, there is no flow of silt and sediments into any natural water courses.</p> <p>Hence, separate construction of toe wall is not required at present.</p>
vii.	<p>Adequate groundwater recharge measures shall be taken up for augmentation of ground water. The project authorities shall meet water requirement of nearby village(s) after due treatment conforming to the specific requirement (Standards)</p>	<p><b>Complied.</b></p> <p>The project authorities will meet water requirement of nearby village(s) if needed.</p> <p>The artificial recharge measures undertaken in the neighboring area can be summarized as below:</p> <ul style="list-style-type: none"> <li>• Roof Top Rain Water Harvesting at Area General Manager's office, Umrer area.</li> </ul>

		<ul style="list-style-type: none"><li>A Check Dam (Water Retaining Capacity: 31,350 CuM) is also provided at Lal Puliya Railway Bridge. Dimensions (Length-55 m, height-1.2m from river bed)</li></ul>																							
viii.	Industrial waste water generated from CHP, Workshop and other waste water, shall be properly collected and treated so as to conform to the standards prescribed under the standards prescribed under Water Act 1974 and Environment (Protection) Act,1986 and the Rules made there under, and as amended from time to time. Adequate ETP/STP needs to be provided	<p><b>Complied.</b></p> <p>Provision of Workshop Effluent Treatment Plant has been made in the EMP and the same has been constructed.</p> <p>For workshop effluent treatment, ETP (capacity 100 KLD) is provided.</p> <p>ETP Effluent is analyzed fortnightly for the parameters –pH, TSS, Oil &amp; Grease and COD as per the Env. (Protection) Amendment Rules.</p> <p>Maximum and minimum concentration of Water parameters of Workshop effluent after treatment, as per Environmental monitoring reports (April’23 to Sep’23) are as follows:</p> <table><tr><th rowspan="2">Parameters</th><th colspan="3">Concentration (mg/L)</th></tr><tr><th>Permissible Limit</th><th>Min</th><th>Max</th></tr><tr><td>pH</td><td>5.5 to 9.0</td><td>7.32</td><td>8.14</td></tr><tr><td>TSS</td><td>100</td><td>22</td><td>44</td></tr><tr><td>COD</td><td>250</td><td>32</td><td>64</td></tr><tr><td>O &amp; G</td><td>10</td><td colspan="2">BDL</td></tr></table> <p>All parameters are well within the permissible limit.</p> <p>Adequate measures will be taken (if needed) to maintain the quality of water within the permissible limits. Copy of Monitoring report is enclosed as Annexure-VII.</p>	Parameters	Concentration (mg/L)			Permissible Limit	Min	Max	pH	5.5 to 9.0	7.32	8.14	TSS	100	22	44	COD	250	32	64	O & G	10	BDL	
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ix.	<p>The water pumped out from the mine, after siltation, shall be utilized for industrial purpose viz. watering the mine area, roads, green belt development etc.</p> <p>The drains shall be regularly desilted particularly after monsoon and maintained properly.</p>	<p><b>Complied.</b></p> <p>The strata seepage water gets first accumulated in the mine sump made at the floor of the seam. The sump capacity is adequate (135 million gallons) to provide sufficient time for settlement of suspended particles. The supernatant water from the sump is then pumped out on surface and fed into the surface sedimentation tank. The sedimentation tank of size 30 m x 8 m x 2.5 m (Capacity: 600m<sup>3</sup>) is provided for treatment of mine discharge, this mine water is used for industrial purposes such as dust suppression, firefighting and plantation etc.</p> <p>Garland drains/ catch drains of length 3.40 Km is provided around the quarry (top width 2 m, bottom width 1 m &amp; height 1 m) which are being desilted before onset of every monsoon.</p>																							

x.	<p>The surface drainage plan including surface water conservation plan for the area of influence affected by the said mining operations, considering the presence of any river/ rivulet/ pond/lake etc., shall be prepared and implemented by the project proponent. The surface drainage plan and/or any diversion of natural water courses shall be as per the approved Mining Plan/EIA/EMP report and with due approval of the concerned State/GoI Authority.</p> <p>The construction of embankment to prevent any danger against inrush of surface water into the mine should be as per the approved Mining Plan and as per the permission of DGMS or any authority as prescribed by the law.</p>	<p><b>Complied.</b></p> <p>The surface drainage plan considering the presence of any river/ rivulet/ pond/ lake etc., is prepared and implemented by the project proponent to withstand the peak water flow and prevent mine inundation.</p> <p>The HFL of Amb river is 274.68 meters at railway bridge and 270.63 meters at PWD bridge above mean sea level. The height of the embankment provided along the Amb river to protect the mine along its boundary has been kept 6.00 meters above the HFL of the river. The width of embankment has been kept 30.00 m which is sufficient to protect the mine from peak flow of the river. The embankment has been adequately strengthened so as to withstand the peak water flow and prevent inundation. In addition, during monsoon months, strict vigil is kept 24X7 against all dangers by monitoring through round the clock control room, physical inspection.</p>
xi.	<p>The project proponent shall take all precautionary measures to ensure riverine/riparian ecosystem in and around the coal mine up to a distance of 5 Km. A riverine/riparian ecosystem conservation and management plan should be prepared and implemented in consultation with the irrigation/ water resource department in the state government.</p>	<p><b>Complied.</b></p> <p>All precautionary measures are taken to ensure riverine /riparian ecosystem in and around the mine.</p> <p>riverine /riparian ecosystem conservation and management plan is prepared and being implemented.</p> <p>Copy enclosed as Annexure-XI.</p>
<b>d)</b>	<b>Noise and Vibration Monitoring and prevention</b>	
i.	<p>Adequate measures shall be taken for control of noise levels as per Noise Pollution Rules, 2016 in the work environment. Workers</p>	<p><b>Being complied.</b></p> <p>Adequate measures are taken for control of noise levels as per Noise Pollution Rules, 2016 in the Work Environment by following regular maintenance schedule, providing vibration pads</p>

	<p>engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with personal protective equipments (PPE) like ear plugs/ muffs in conformity with the prescribed norms/ guidelines in this regard. Adequate awareness programme for users to be conducted. Progress in usage of such accessories to be monitored.</p>	<p>at the base and other technical measures. In addition, plantation is also being done to act as sound barrier.</p> <p>Personnel working in operating mines are being provided with PPE like Ear plugs/ muffs.</p> <p>Numbers of Ear plugs issued in last 9 years are given below:</p> <table><tr><th>Year</th><th>Ear Plugs Issued</th></tr><tr><td>2015</td><td>25</td></tr><tr><td>2016</td><td>28</td></tr><tr><td>2017</td><td>30</td></tr><tr><td>2018</td><td>33</td></tr><tr><td>2019</td><td>42</td></tr><tr><td>2020</td><td>52</td></tr><tr><td>2021</td><td>111</td></tr><tr><td>2022</td><td>129</td></tr></table> <p>As per statute all personnel working in mines is given training and retraining for safety aspects as being done presently in other operating mines of the company.</p> <p>Number of persons given training in last 8 year are given below:</p> <table><tr><th rowspan="2">Year</th><th colspan="3">No of workers</th></tr><tr><th>Departmental</th><th>Contractual</th><th>Total</th></tr><tr><td>2015-16</td><td>33</td><td>105</td><td>138</td></tr><tr><td>2016-17</td><td>77</td><td>204</td><td>281</td></tr><tr><td>2017-18</td><td>44</td><td>82</td><td>126</td></tr><tr><td>2018-19</td><td>41</td><td>55</td><td>96</td></tr><tr><td>2019-20</td><td>51</td><td>94</td><td>145</td></tr><tr><td>2020-21</td><td>57</td><td>325</td><td>382</td></tr><tr><td>2021-22</td><td>43</td><td>215</td><td>258</td></tr><tr><td>2022-23 (Till Sep' 23)</td><td>39</td><td>126</td><td>165</td></tr></table>	Year	Ear Plugs Issued	2015	25	2016	28	2017	30	2018	33	2019	42	2020	52	2021	111	2022	129	Year	No of workers			Departmental	Contractual	Total	2015-16	33	105	138	2016-17	77	204	281	2017-18	44	82	126	2018-19	41	55	96	2019-20	51	94	145	2020-21	57	325	382	2021-22	43	215	258	2022-23 (Till Sep' 23)	39	126	165
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ii.	<p>Controlled blasting techniques shall be practiced in order to mitigative ground vibrations and fly rocks, noise and air blast etc., as per the guidelines prescribed by the DGMS.</p>	<p><b>Complied.</b></p> <p>Controlled blasting techniques with use of delay detonators are practiced to control of ground vibration and to arrest the fly rock.</p>																																																									
iii.	<p>The noise level survey shall be carried out as per the prescribed guidelines to assess noise exposure of the workmen at vulnerable</p>	<p><b>Complied.</b></p> <p>Noise monitoring of work zone is being done on monthly basis by noise meters for vulnerable points like inside and outside of HEMM such as PC, Tippers and Dozers.</p>																																																									

	points in the mine premises and report in this regard shall be submitted to the Ministry/ RO on six-monthly basis.	Noise level monitoring station is established near pit office & Colony (Common for Umrer OC and MKD-I OC) and day time & night time noise level data are monitored fortnightly as per Env. (protection) Amendment Rule, 2000.
<b>e)</b>	<b>Mining Plan</b>	
i.	Mining shall be carried out under strict adherence to provisions of the Mines Act 1952 and subordinate legislations made thereunder as applicable.	<b>Agreed.</b> Mining is being carried out under strict adherence to provisions of the Mines Act 1952 and subordinate legislations made thereunder as applicable.
ii.	Mining shall be carried out as per the approved mining plan (including mine closure plan) abiding by mining laws related to coal mining and the relevant circulars issued by Directorate General Mines Safety (DGMS).	<b>Agreed.</b> Mining is being carried out as per the approved mining plan as well as by abiding to the relevant laws related to coal mining and the circulars issued by Directorate General Mines Safety (DGMS).
iii.	No mining activity shall be carried out in forest land without obtaining Forestry Clearance as per Forest (Conservation) Act, 1980.	Not applicable as the project does not have any forest land.
iv.	Efforts should be made to reduce energy and fuel consumption by conservation, efficiency improvements and use of renewable energy.	<b>Complied.</b> Efforts are being made for the uses of Solar energy and conventional light bulbs are replaced by LEDs to reduce energy consumption.  01 no of 40 KWp On-Grid-Connected Roof Top Mounted solar power plant is installed at AGM Office of Umrer area and 01 no of 12 KWp On-Grid-Connected Roof Top Mounted solar power plant is installed at Area Hospital, Umrer Area.
<b>f)</b>	<b>Land Reclamation</b>	
i.	Digital survey of entire lease hold area/ core zone using Satellite Remote Sensing Survey shall be carried out at least once in three years for monitoring land use pattern and report in 1:50,000 scale or as notified by Ministry of Environment, Forest and Climate Change (MOEFCC)	<b>Being complied.</b> Digital processing of the entire lease area using Remote sensing technique is being done once in 3 years.  Copy of Land Restoration / Reclamation monitoring report of MKD-I mine based on satellite data for the year 2022 is enclosed as annexure-XII.



	from time to time shall be submitted to MOEFCC/ Regional Office (RO).																									
ii.	The final mine void depth should preferably be as per the approved Mine Closure Plan, and in case it exceeds 40m, adequate engineering interventions shall be provided for sustenance of adequate life therein. The remaining area shall be backfilled and covered with thick and alive top soil. Post-mining land be rendered usable for agricultural/forestry purpose and shall be diverted. Further action will be treated as specified in the guidelines for preparation of mine closure plan issued by the ministry of coal dated 27 <sup>th</sup> August, 2009 and subsequent amendments.	<p><b>Being complied.</b></p> <p>Date of commencement of the mine is 28/11/14. The land after mining will be backfilled as per post mining land use plan in approved EMP. According to EMP, total quarry area will be 252.96 Ha, out of which 156.06 ha will be converted into water body and rest will be backfilled and brought to the ground level to reduce land degradation.</p>																								
iii.	The entire excavated area, backfilling, external OB dumping (including top soil) and afforestation plan shall be in conformity with the “during mining”/ “post mining” land-use pattern, which is an integral part of the approved Mining Plan and the EIA/EMP submitted to this Ministry. Progressive compliance status vis-a-vis the post mining land use pattern shall be submitted to this Ministry. Progressive compliance status vis-à-vis the post mining land use pattern shall be submitted to the MOEF&CC/RO.	<p><b>Being complied.</b></p> <p>The land after mining will be backfilled as per post mining land use plan in approved EMP. Progressive compliance status of land use pattern will be submitted to MOEF&amp;CC along with the six monthly compliance report.</p> <p>Land Use Plan During Mining (as on 30/09/2023)</p> <table border="1"> <thead> <tr> <th>Sl No.</th><th>Particulars</th><th>Area in Ha</th></tr> </thead> <tbody> <tr> <td>1</td><td>Quarry Area (Excavation area)</td><td>180.50</td></tr> <tr> <td>2</td><td>External OB dumps</td><td>24.84</td></tr> <tr> <td>3</td><td>Safety / Blasting zone</td><td>56.24</td></tr> <tr> <td>4</td><td>Green Belt</td><td>4.8</td></tr> <tr> <td>5</td><td>Infrastructure &amp; Roads</td><td>8.00</td></tr> <tr> <td>6</td><td>Other area</td><td>340.29</td></tr> <tr> <td colspan="2"><b>Total</b></td><td><b>614.69</b></td></tr> </tbody> </table> <p>Post Mining Land Use Plan as per Approved Mining plan is as follows:</p>	Sl No.	Particulars	Area in Ha	1	Quarry Area (Excavation area)	180.50	2	External OB dumps	24.84	3	Safety / Blasting zone	56.24	4	Green Belt	4.8	5	Infrastructure & Roads	8.00	6	Other area	340.29	<b>Total</b>		<b>614.69</b>
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Sl. No.	Land Use during Mining	Land use (ha)				
		Plantation	Water Body	Public use	Undis- turbed	Total
1	Excavated Area	0	252.96	0	0	252.96
2	Road	2	0	8	0	10
3	External OB dump	15	0	0	117.8	132.8
4	Infrastructure	1	0	4	0	5
5	Nala diversion Land	0	0	20	0	20
6	Miscellaneous (300m blasting zone, rationalization)	77.8	0	0	116.13	193.93
	<b>Total</b>	95.8	252.96	32	233.93	614.69

iv.	<p>Fly ash shall be used for external dump of overburden, backfilling, or stowing of mine as per provisions contained in clause (i) and (ii) of sub paragraph (8) of fly ash notification issued vide SO 2804 (E) dated 3<sup>rd</sup> November, 2009 as amended from time to time. Efforts shall be made to utilize gypsum generated from of overburden, backfilling of mines. Compliance report shall be submitted to Regional Office of MOEF&amp;CC, CPCB and SPCB.</p>	<p>There is no such power plant in the close vicinity of Makardhokra-I Mine. However, NTPC, Mouda (53 kms from the subject mine), has approached WCL (vide letter dated 01/10/2021) for ash utilization in backfilling of mines. The scope this will be assessed and will be implemented after thorough study.</p>
v.	<p>Further, it may be ensured that as per the time schedule specified in mine closure plan it should remain live till the point of utilization. The topsoil shall temporarily be stored at earmarked site(s) only and shall not be kept unutilized. The top soil shall be used for land reclamation and plantation purposes. Active OB dumps shall be stabilised with native grass species to prevent erosion and surface run off. The other overburden dumps shall be vegetated with native flora species. The excavated area shall be backfilled and afforested in line with the</p>	<p><b>Being complied.</b></p> <p>The detailed Final Mine Closure Plan has been incorporated in the approved Project Report along with a provision of Corpus Fund. The Escrow Account has been opened, progressive balance as on 31/03/2023 is Rs.47,63,41,967.</p> <p>Dumping of useful top soil is being done at earmarked site with proper slope. This soil will be used for reclamation and development of green belt.</p> <p>Till date 30,000 nos of plants were planted on 12.10 ha of existing external OB dump and 12,000 nos of saplings were planted along the project boundary side of the road during FY 2021-22 monsoon.</p> <p>During this monsoon i.e. FY 2023-24, 35,000 nos of saplings, FY 2022-23, 40,500 nos of saplings and FY 2023-24, 22,500 nos were planted along the project boundary.</p>

	approved Mine Closure Plan. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment, Forest and Climate Change/ Regional Office.	Further on the plantation work will be undertaken as per plantation program of EMP.
vi.	The project proponent shall make necessary alternative arrangements, if grazing land is involved in core zone, in consultation with the State Government to provide alternate area for livestock grazing, if any. In this context, the project proponent shall implement the directions of Hon'ble Supreme Court with regard to acquiring grazing land.	<b>Not applicable.</b>  There is no grazing land in the core zone of the project. So, there is no necessity of making alternate arrangement for livestock grazing.
<b>g)</b>	<b>Green Belt</b>	
i.	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered/endemic flora/fauna, if any, spotted/reported in the study area. Action plan, in this regard, if any, shall be prepared and implemented in consultation with the State Forest and Wildlife Department.	<b>Complied.</b>  Baseline data for flora and fauna has been generated covering core and buffer zone (i.e. project area and 10 km radius around the same). During the study, in buffer area one specie namely Varanus Bengalensis (Indian Monitor Lizard/ Ghorpad) has been observed which is falling in Schedule-I species under Wildlife Protection Act, 1972.  For protection and conservation of Schedule-I species (Varanus Bengalensis - Indian Monitor Lizard/ Ghorpad), a conservation plan has been prepared with a budgetary provision of Rs 14.00 lakhs and the same is submitted to the Office of Dy. Conservator of Forest, Nagpur Forest Division vide letter dated WCL/UA/AGM/ENV/2021/9095 dated 19-03-2021.  Recommendations pertaining to approved Conservation Plan/Wildlife Management Plan for protection of Varanus Bengalensis (Indian Monitor Lizard/ Ghorpad) will be implemented in consultation with the State Forest Department.
ii.	Greenbelt, consisting of 3-tier plantation, of width not	<b>Being complied.</b>

	<p>less than 7.5m, shall be developed all along the mine lease area in a phased manner.</p> <p>The green belt comprising of a mix of native species shall be developed all along the major approach / coal transportation roads.</p>	<p>The area surrounding the subject mine has two mines in the very close vicinity viz. Umrer OC (in the last phase of life) &amp; Makardhokra – II OC (already exhausted and closed). There are adequate plantations in the mining area of these two mines. As such the surrounding of the subject mine is already covered with adequate plantation/ thick canopy of tree cover.</p> <p>Makardhokra – I OC Mine commenced in the year 2014. Till date 75,000 nos of saplings were planted along the project boundary side during this monsoon. Species planted includes Jamun, Amla, Bahera, Neem, Karanj, Harra, Arjun, Siwan, Siras, Sisoo, Gulmohar etc.</p> <p>In addition, 30,000 nos of plants were planted on 12.10 ha of existing external OB dump.</p> <p><b><u>Photos of Plantation FY 2016-17 (30,000 nos in 12 ha at External OB Dump)</u></b></p> <div style="text-align: center;">   </div> <p>Further on the plantation work will be undertaken as per plantation program of EMP.</p>
<b>h)</b>	<b>Public hearing and Human health issues</b>	
i.	<p>Adequate illumination shall be ensured in all mine locations (as per DGMS standards) and monitored weekly. The report on the same shall be submitted to</p>	<p><b>Complied.</b></p> <p>Adequate lighting arrangements are provided in mine premises to meet DGMS standards. These are monitored regularly by lux meter.</p>

	this ministry & its RO on six-monthly basis.	
ii.	<p>The project Proponent shall undertake occupational health survey for initial and periodical medical examination of the personnel engaged in the project and maintain records accordingly as per the provisions of the Mines Rules, 1955 and DGMS Circulars. Besides regular periodic health check-up, 20% of the workers identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, as amended time to time.</p>	<p><b>Being complied.</b></p> <p>For surveillance of occupational health among workers, Periodical Medical Examination (PME) is carried out compulsorily for each employee once in three year with the purpose of detecting and keeping records of diseases with specific importance of Coal Workers Pneumoconiosis. This is covered under Statute.</p> <p>Moreover, for every new employee Initial Medical Examination (IME) is also carried out for both departmental and contractual employee as per the provisions of the statute.</p> <p>During PME, the candidates are subjected to complete clinical examination (including acuity of vision and hearing) radiological examination of chest and routine examination of blood and urine. All the activities within the mine are carried out with complying safety aspect and regular awareness is created among employees regarding safety and to avoid any accidents. All the employees working in projects are provided with PPE like mask, ear muffs, helmets and protective shoes.</p> <p>Various national and International Days are observed to increase awareness and educate general population (e.g. No Tobacco Day/ No Smoking Day, World AIDS day, World Breast Feeding Week etc.).</p> <p>Regular Family Welfare (L.T.T.) Camps organized with the help of State Govt. Full Co-operation is extended to State Govt. for Pulse Polio immunization. Medical facilities are being extended to non-employees in all sorts of acute emergencies.</p> <p>The details of the set up at Umrer Area Hospital are as follows:</p> <ul style="list-style-type: none"> <li>• Periodical Medical Examination (PME) Centres: 1 (Occupational Health Centres)</li> <li>• No. of Doctor engaged in Periodical Medical Examination: 3</li> <li>• No. of Doctor trained in Periodical Medical Examination: 2</li> <li>• No. of X-Ray machines (500 mA): 1</li> <li>• No. of Audiometer units: 1</li> <li>• No. of Spirometer units: 1</li> <li>• No. of pathology Labs: 1</li> <li>• No. of X-Ray Technicians: 1</li> <li>• No. of Laboratory Technicians: 3</li> <li>• No of ECG Technicians: 2</li> </ul> <p>As seen from the above details that Area Hospital, Umrer Area, WCL is having all the infrastructural facilities to comply all the</p>

		<p>statutory obligations regarding occupational health survey of all employees.</p> <p>Details of IME/PME done in last 5 years are given below:</p> <table><tr><th rowspan="2">Year</th><th colspan="2">No of workers</th></tr><tr><th>PME</th><th>IME</th></tr><tr><td>2015-16</td><td>48</td><td>-</td></tr><tr><td>2016-17</td><td>81</td><td>79</td></tr><tr><td>2017-18</td><td>49</td><td>53</td></tr><tr><td>2018-19</td><td>52</td><td>39</td></tr><tr><td>2019-20</td><td>45</td><td>198</td></tr><tr><td>2020-21</td><td>46</td><td>310</td></tr><tr><td>2021-22</td><td>54</td><td>322</td></tr><tr><td>2022-23</td><td>60</td><td>87</td></tr></table>	Year	No of workers		PME	IME	2015-16	48	-	2016-17	81	79	2017-18	49	53	2018-19	52	39	2019-20	45	198	2020-21	46	310	2021-22	54	322	2022-23	60	87										
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iii.	<p>Personnel (including outsourced employees) working in core zone shall wear protective respiratory devices and shall also be provided with adequate training and information on safety and health aspects.</p>	<p><b>Being complied.</b></p> <p>As per statute all personnel working in mines is given training and retraining for safety aspects as being done presently in other operating mines of the company.</p> <p>Number of persons given training in last 8 year are given below:</p> <table><tr><th rowspan="2">Year</th><th colspan="3">No of workers</th></tr><tr><th>Departmental</th><th>Contractual</th><th>Total</th></tr><tr><td>2015-16</td><td>33</td><td>105</td><td>138</td></tr><tr><td>2016-17</td><td>77</td><td>204</td><td>281</td></tr><tr><td>2017-18</td><td>44</td><td>82</td><td>126</td></tr><tr><td>2018-19</td><td>41</td><td>55</td><td>96</td></tr><tr><td>2019-20</td><td>51</td><td>94</td><td>145</td></tr><tr><td>2020-21</td><td>57</td><td>325</td><td>382</td></tr><tr><td>2021-22</td><td>43</td><td>215</td><td>258</td></tr><tr><td>2022-23</td><td>39</td><td>126</td><td>165</td></tr></table>	Year	No of workers			Departmental	Contractual	Total	2015-16	33	105	138	2016-17	77	204	281	2017-18	44	82	126	2018-19	41	55	96	2019-20	51	94	145	2020-21	57	325	382	2021-22	43	215	258	2022-23	39	126	165
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iv.	<p>Implementation of Action Plan on the issues raised during the Public Hearing shall be ensured. The Project Proponent shall undertake all the tasks/measures as per the Action Plan submitted with budgetary provisions during the Public Hearing.</p> <p>Land oustees shall be compensated as per the norms laid out R&amp;R Policy of the Company/ or the National R&amp;R Policy/R&amp;R Policy of the State Government, as applicable.</p>	<p><b>Being Complied.</b></p> <p>Commitments made during public consultation process are being adhered to.</p> <p>Land oustees are compensated as per R&amp;R Policy of CIL.</p> <ul style="list-style-type: none"><li>• Employment sanctioned: 452 nos.</li><li>• Monetary compensation provided in lieu of employment: 68 nos.</li><li>• Employment provided till date (Total): 322 nos.</li><li>• Total number of R&amp;R Benefits provided: 390 nos.</li><li>• Compensation paid till date: 114.01 Crs</li><li>• Monetary compensation paid till date: 15.86 Crs.</li></ul> <p>Land compensation of 509.02 ha tenancy land has been approved by MOC on 17.09.2014 for Rs. 114 Crs and disbursement of cheques to land Ousteers are under progress.</p>																																							

v.	The project proponent shall follow the mitigation measures provided in the Ministries OM No. Z-11013/57/2014-IA.II (M), dated 29 <sup>th</sup> October, 2014, titled “Impact of mining activities on Habitations-Issues related to the mining Projects wherein Habitations and villages are the part of mine lease areas or Habitations and villages are surrounded by the mine lease area”.	<p><b>Complied.</b></p> <p>There is no village in the mine lease area or surrounded by the mine lease area.</p> <p>75 – 80% coal is transported through rail to all the major consumers. The remaining 20 – 25% coal is transported through covered trucks. The coal transportation road is properly maintained and it is directly connected to State Highways (BT road).</p> <p>The nearest village structure is about 800 m from the mine boundary.</p>
<b>i)</b>	<b>Corporate Environment Responsibility</b>	
i.	The Company shall have a well laid down Environment Policy duly approved by the Board of Directors. The Environment Policy should prescribe for standard operating procedures to have proper checks & balances and to bring into focus any infringements/deviation/violation of the environment/forest/wildlife norms/ conditions and/ or shareholders/ stake holders.	<p><b>Complied.</b></p> <p>Coal India Limited has framed an Environment Policy which is being complied with in all the mines. Copy of Corporate Environment Policy is enclosed as annexure-XIII.</p>
ii.	A separate environmental cell, both at the project I and company headquarter level, with suitable qualified personnel shall be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization.	<p><b>Complied.</b></p> <p>To deal with environmental issues and for ensuring compliance with environmental clearance conditions, At corporate level (at HQ), there is a fully fledged Environment Department which is headed by General Manager (Env.) with a multi-disciplinary team of qualified and experienced engineers. The head of Corporate Environment department reports directly the Director (Tech), who is nominated owner of the company.</p> <p>At Area level, the Environmental management cell is headed by Area General Manager, Umrer Area, assisted by Area Nodal Officer (Environment) Umrer Area, Project Officer/Sub Area Manager, Umrer Sub Area, Staff Officer (Civil), Umrer Area.</p> <p>At Project level, it is headed by Sub-Area Manager, Umrer Sub Area and assisted by Mine Manager/Safety Officer, Umrer Sub Area, Survey Officer, Umrer Sub Area and Nodal Officer (Environment) of the project.</p>

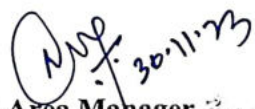
iii.	Action plan for implementing the EMP and environmental clearance conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by the competent authority. The Year-wise funds earmarked for environmental protection measures shall be kept in separate account and not be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry / Regional Office along with the Six Monthly Compliance Report.	<p><b>Agreed.</b></p> <p>The funds earmarked for environmental protection measure is kept in separate account and is not diverted for other purpose. Capital expenditure till date is given below:</p> <table border="1"> <thead> <tr> <th>Year</th><th>Expenditure (Rs. Lakhs)</th><th>Remarks</th></tr> </thead> <tbody> <tr> <td>2016-17</td><td>18.76</td><td>Concrete Sedimentation tank constructed</td></tr> <tr> <td>2017-18</td><td>55.46</td><td>Tyre washing system at main check post</td></tr> <tr> <td>2018-19</td><td>30.89</td><td>Fixed sprinklers along coal stock yard</td></tr> <tr> <td rowspan="2">2021-22</td><td>9.38</td><td>Construction of 02 nos piezometers</td></tr> <tr> <td>66.10</td><td>Procurement of 10 nos of trolley mounted mist/fog generator.</td></tr> <tr> <td>2022-23</td><td>3.01</td><td>Procurement of digital water meter with telemetry</td></tr> </tbody> </table>	Year	Expenditure (Rs. Lakhs)	Remarks	2016-17	18.76	Concrete Sedimentation tank constructed	2017-18	55.46	Tyre washing system at main check post	2018-19	30.89	Fixed sprinklers along coal stock yard	2021-22	9.38	Construction of 02 nos piezometers	66.10	Procurement of 10 nos of trolley mounted mist/fog generator.	2022-23	3.01	Procurement of digital water meter with telemetry
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iv.	Self environment audit shall be conducted annually. Every three years third party environmental audit shall be carried out.	<p><b>Being complied.</b></p> <p>Internal environmental audit system has been setup in the company recently. At Area level, a multi-disciplinary committee has been constituted by order of competent authority to review the compliance status through a formatted checklist. Inter-area inspection to review compliance status is being done.</p> <p>Every three years the third party assessment of EC compliance will be carried out.</p>																				
j)	<b>Miscellaneous</b>																					
i.	The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project	<p><b>Complied.</b></p> <p>The same had been done after receipt of EC.</p> <p>Advertisements are given in the following News Papers:</p> <ul style="list-style-type: none"> <li>Indian Express (English daily, Nagpur) dated 25/03/22</li> <li>Punya Nagri (Marathi daily, Nagpur) dated 25/03/22</li> </ul>																				

	proponent's website permanently.	
ii.	The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.	<b>Complied.</b>  A copy of Environmental Clearance letter is marked to concerned Panchayat. Copy is enclosed as annexure-XV.
iii.	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.	<b>Complied.</b>  Six monthly compliance report and Monitoring reports is being uploaded on the company's website.
iv.	The project proponent shall monitor the criteria pollutants level namely; PM <sub>10</sub> , SO <sub>2</sub> , NO <sub>x</sub> (ambient levels) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company.	<b>Complied.</b>  Environment monitoring reports are being uploaded on the company's website on regular basis.
v.	The project proponent shall submit six -monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the Ministry of Environment, Forest and Climate Change at Environmental Clearance Portal.	<b>Complied.</b>  The six monthly reports on the status of compliance of the stipulated environmental clearance conditions is being submitted regularly to the MOEF&CC's Regional Office, Nagpur as being practiced in all operating mines.
vi.	The project proponent shall follow the mitigation measures provided in the	<b>Not applicable.</b>  There is no village in the mine lease area or surrounded by the mine


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vii.	The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the Company.	<p><b>Complied.</b></p> <p>The environmental statement for each financial year is submitted regularly to the MPCB and Regional Office of the MoEF&amp; CC as being practiced in all operating mines.</p> <p>The Audit report for the year 2022-23 is submitted on 28/09/2023 on MPCB’s web portal. Copy of Audit report is enclosed as annexure-XVI.</p>
iii.	The project authorities shall inform to the Regional Office of the MOEFCC regarding commencement of mining operations.	Agreed.
ix.	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.	Noted and agreed
x.	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the Expert Appraisal Committee.	Noted and agreed
xi.	No further expansion or modifications in the plant	Noted and agreed

	shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change.	
iii.	Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (protection) Act, 1986.	Noted.
iii.	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	Noted.
iv.	The Ministry reserves the right to stipulate additional conditions if found necessary. The company in a time bound manner shall implement these conditions.	Noted.
xv.	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full co-operation to the officer(s) of the Regional Office by furnishing the requisite data/information/monitoring reports.	Noted and agreed.
vi.	The above conditions shall be enforced, inter-alia under the provisions of the Water (prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Trans boundary Movement) Rules, 2016 and	Noted and agreed.

	<p>the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India/ High Courts and any other Court of Law relating to the subject matter.</p>	
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**Sub Area Manager**  
 Makardhokra-I OC  
 Umrer Sub Area

  
**Colliery Manager**  
 Makardhokra-I OC  
 Umrer Sub Area

  
**Nodal Officer (Env.)**  
 Makardhokra-I OC  
 Umrer Sub Area