Activities with Budget for Pond Conservation Measures

S. No	Activities	Physical Targets	Total Expenditure (Rs. Lakhs)
1	Conservation of Ponds	De-siltation of six ponds before monsoon	40.00
		Stabilization of earthen embankments with vegetative cover	20.00
		Silt barriers or sediment traps at suitable intervals for control of silt/waste	40.00
Total in Rs. Lakhs			100.00

iii. PP committed to develop greenbelt on approximately 38% of the lease area, i.e. 426.15 ha. This includes i) Progressive greenbelt development (Safety zone: 11.79 ha. will be developed as greenbelt within 01 year of commencement of mining operation & Backfilled and undisturbed areas: 209.12 ha in backfilled areas and undisturbed areas during the mining operation), ii) Forest restoration: Plantation will be carried out over 125.24 ha land and returned to forest department at the end of mining, iii) Greenbelt Development along Nallahs: A strip of 50 meters on both sides along diverted route of Gurudiah Nallah and Masania Nallah, and 50 meter in the southern side of Singhada Jhor Nallah, totalling around 80.00 ha will be developed as greenbelt within three years of nallah diversion. PP submitted that Native species like Siris, Neem, Palasa, Amaltas, Shisham, Amla, Jamun, Mango, Arjun, Karanja, Bija, etc. will be planted along with other species in consultation with the forest department. PP will ensure at least 70% survival rate carrying out gap plantation in case of mortality.

iv. PP submitted the updated EMP by including i) Fog cannon installation: to mitigate dust emissions, ii) Increased greenbelt development budget: aligned with the expanded plan and iii) 02 Continuous Ambient Air Quality Monitoring Stations (CAAQMS): for real-time air quality monitoring. The budget as per revised EMP is Rs 2995 Lakh (Capital) and Rs 201 Lakh (Recurring).

v. With respect to grazing land PP submitted that as per Govt. of Odisha, Revenue and Disaster Management Department circular no. 23629 dated 28.05.2008 issued by Commissioner cum Secretary to Government "...When the entire habitation of the village is going to be displaced due to land acquisition for establishment of industries, there seems to be no need for Gochar land in that village. In that case the Gochar land can be alienated in favour of IDCO or any agency.". PP also submitted that the entire habitation of concerned villages within the lease hold area of Subhadra OCP will be displaced. However, we will progressively develop grazing land within the mine site as per pre-mining land use.

vi. PP submitted that 35.36 ha water body will be left at the closure of mine as per the approved mine plan & mine closure plan of Subhadra OCP. The total depth of water body will be restricted to 30 meters. Safety measures like fencing, safety signage. etc. will be implemented to prevent any accidental situations.

vii. PP submitted that a minimal plastic waste (less than 1 ton per year) is anticipated from equipment packaging. This will be stored separately in isolated area and disposed of strictly adhering to the Plastic Waste Management Rules 2016. The Committee is of the view that in pursuant to Ministry's OM dated 18/07/2022 PP shall also create awareness among the people working in the project area as well as in its surrounding area on the ban on Single Use Plastic(SUP) in order to ensure compliance of Ministry's Notification published by the Ministry on 12/08/2021. A report along with photograph on the measures taken shall also be included in the six monthly compliance report being submitted by PP.

viii. PP submitted the revised budget to address the issues of PH by including the budget for construction of toilets. The revised budget is Rs 1235 Lakh.

ix. PP submitted that Wild life Conservation Plan has been submitted to DFO, Angul for approval with a budget of Rs. 43.60 Crores. PP undertake that they will bear any additional cost as approved by Chief Wildlife Warden, Odisha.

x. PP submitted that Ground water NOC has been granted by CGWA for 160 KLD domestic use through borewells and 1984 KLD from mine seepage/dewatering. In next few years, once the mine is fully operationalized, borewells for domestic use will be discontinued and all the water from mine seepage and mine pit with rainwater accumulation will be utilised. Water audit will be conducted on yearly basis by CGWA accredited water auditor and water requirement will be reduced as per the targets given to obtain water neutrality.

xi. PP submitted that Ministry of Coal vide allotment order no. NA-103/1/2021-NA dated 18.11.2021 has allocated this coal mine in favour of MCL. Annexure 1 part-A and part-B of the allotment order describe the details of Utkal-A and West of Gopalprasad West respectively. MCL has named Utkal-A and Western Part of Gopalprasad West as Subhadra Opencast Project vide their letter no. 539-H dated 26.9.2019. Total notified area U/s 11(1) of CBA (A&D) Act 1957 is 1558.4604 Ha. involving Utkal A and whole of Gopal Prasad Westout of which 1111.85 ha is acquired for Subhadra OCP. PP informed that in para 2.1.8 of the approved mining plan the mining lease area is mentioned as 1111.85 Ha. PP finally affirms to the fact that the total mining lease area of Subhadra OCP is 1111.85 Ha. PP also provided the justification for not executing a separate lease deed in pursuant to Section 10 &11 of CB(A&D),Act 1957.

In addition to above, the Committee noted that total 03 nos. of nallahs pass through the ML area i.e. Ghurudia Nallah, Singhada Jhor Nallah and Masania Jhor Nallah. Committee asked the PP to protect the Singhada Jhor Nallah and Masania Jhor Nallah for the next five years from the commencement of mining operations. For the Diversion of Ghurudia Nallah, PP shall obtain permission from the concerned state department. The diverted Nallah should be supported by width of atleast 50m thick plantation.

The Committee after deliberations observed that the instant proposal is a Greenfield Opencast coal mine project. PP had obtained ToR and amendment of ToR vide letter dated 22.11.2021 & 28.02.2022 respectively, followed by Public Hearing conducted on 25.08.2023. The baseline data has been collected during the Period/Season of October to December 2022. Committee has obtained satisfactory reply w.r.t. the query raised in the previous EAC meeting and information submitted by PP vide letter dated 17.01.2024 and email dated 18.01.2024, with respect to issues raised during the meeting.

Based on the above discussions held in the EAC meeting, the EAC ***recommended*** *the Environmental*

Clearance for Subhadra Open Cast Mine with production capacity of 25 MTPA in mine lease area of 1111.85 ha of M/s Mahanadi Coalfield Limited located at Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil Tachler Sadar and Chhendipada, District Angul (Odisha) with the following specific conditions and standard conditions under the provisions of EIA Notification, 2006 and its amendments:

1) *Any activity of the forest land shall only be carried out after obtaining necessary forest clearance.*

2) *PP to obtain the CTO for 25 MTPA (peak) capacity after grant of EC.*

3) *PP shall deploy electric vehicles to the extent of 50% of transportation fleet for evacuation of coal through road up to Balaram Siding (Approx. 11 KM) till commencement of rail evacuation system with CHP of Subhadra OCP which is likely to commence from the fourth year of mining operations. PP shall monitor the EV usage through installation of adequate number of CCTV cameras. Till such time transportation from a dedicated road and village road shall not be used for the same.*

4) *PP shall adopt 6 ponds outside the lease area in different village and carry out the various activities for their protection and maintenance as proposed in the plan submitted for the same to Ministry The budget earmarked for water conservation plan for these ponds is Rs. 1.00 crores shall be kept in a spate account and audited annually. PP while submitting the compliance report to Regional Office and on Parivesh Portal as the case may be also submit evidence of implementation of the plan including geo tagged photographs.*

5) *PP shall develop greenbelt on approximately 38% of the lease area, i.e. on 426.15 ha of land as proposed in the plantation plan submitted to the Ministry and maintain a survival rate of at least 70% (after 10 years of the plantation) by carrying out gap plantation in case of mortality. The budget earmarked for the plantation shall be kept in a separate account. PP should annually submit the audited statement of expenditure along with proof of activities viz. photographs (before & after with geolocation date & time), details of expert agency engaged, details of species planted, number of species planted, survival rate, density of plantation etc. to the Regional Office of MoEF&CC and on PARIVESH Portal as the case may be for the activities carried out during previous year. Third party monitoring of the plantation shall be done preferably by an institution of MoEFCC (eg ICFRE).*

6) *PP shall maintain atleast10 mtrs width tree plantation of broad leaved species and wind break/greenshield of about 10 mts height along the boundary of coal storage yard.*

7) *PP shall implement the activities-wise proposed to address the issues raised during Public Hearing. The budget earmarked for the same is Rs 1235 lakhs and the same shall be kept in a separate account and audited annually. The details of activities undertaken, amount spent along with documentary proof shall be a part of report to be submitted to IRO, MoEF&CC. The maintenance of all activities shall be covered through recurring cost of Public Hearing, and continued as a part of CSR budget.*

8) *PP shall ensure that all type of plastic waste generated from the mines shall be stored separately in isolated area and disposed of strictly adhering to the Plastic Waste Management Rules 2016.*

In pursuant to Ministry's OM dated 18/07/2022 PP shall also create awareness among the people working in the project area as well as in its surrounding area on the ban on Single Use Plastic(SUP) in order to ensure compliance of Ministry's Notification published by the Ministry on 12/08/2021. A report along with photograph on the measures taken shall also be included in the six monthly compliance report being submitted by PP.

9) *All the mitigation measures committed / envisaged in the EIA/EMP report and subsequent submission shall be implemented which also includes i) Fog cannon installation: to mitigate dust emissions, ii) Increased greenbelt development budget: aligned with the expanded plan and iii) 02 Continuous Ambient Air Quality Monitoring Stations (CAAQMS): for real-time air quality monitoring. The budget as per revised EMP is Rs 2995 Lakh (Capital) and Rs 201 Lakh (Recurring) shall be kept in a separate account. PP should annually submit the audited statement along with proof of activities carried to the Regional Office of MoEF&CC and PARIVESH Portal as the case may be for the activities carried out during previous year.*

10) *PP to install 2 continuous ambient air quality monitoring stations at suitable locations preferably on village side with consultation of SPCB. The real time data so generated shall be uploaded on company website and linked with website of CPCB &SPCB. In addition, data should also be displayed digitally at entry and exit gate of mine lease area for public display.*

11) *PP shall implement Effluent Treatment Plant for wastewater generated from workshop and Sewage Treatment Plant for its colony. No untreated water shall be discharged from mine boundaries to ponds/nallah/river.*

12) *PP to install solar lights along the road used for transportation of minerals also take up installation of solar lights in rural areas with its maintenance within the study area of 10 km radius buffer zone within one year.*

13) *Proponent shall appoint an Occupational Health Specialist for Regular and Periodical medical examination of the workers engaged in the Project and maintain records accordingly; also, Occupational health check-ups for workers having some ailments like BP, diabetes, habitual smoking, etc. shall be undertaken once in six months and necessary remedial/preventive measures taken accordingly. The Recommendations of National Institute for ensuring good occupational environment for mine workers shall be implemented. The prevention measure for burns, malaria and provision of anti-snake venom including all other paramedical safeguards may be ensured before initiating the mining activities.*

14) *PP shall conduct feasibility studies for assessment of voids for backfilling of ash and mixing of ash with overburden, taking up backfilling ash and OB mixing activities during operations as well as post closure of mines in line with the Fly Ash Utilization Notification, 2021.*

15) *Hon'ble Supreme Court in an Writ Petition(s) Civil No. 114/2014, Common Cause vs Union of India &Ors vide its judgement dated 8th January, 2020 has directed the Union of India to impose a condition in the mining lease and a similar condition in the environmental clearance and the mining plan to the effect that the mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. Compliance of this condition after the mining activity is over at the cost of the*

mining lease holders/Project Proponent". The implementation report of the above said condition along with geo tagged photographs shall be sent to the Regional Office of the MoEF&CC.

16) PP shall strengthen the existing Environment Management division of the unit under intimation to the IRO

Agenda No 6.2

6.2 Amalgamated Yekona I & II OC (Phase-I) [Production capacity 2.75 MTPA/3.44 MTPA (Normative/Peak) ; Lease Area 1679.39 ha] of Western Coalfields Limited (WCL) located in Tehsil Warora, District Chandrapur (Maharashtra) – Reconsideration for Amendment of Environment Clearance dated 01.01.2021 – reg.

[Online Proposal No. IA/MH/CMIN/438539/2023; File No. J-11015/381/2015-IA. II(M)]

6.2.1 The proposal is for amendment in Environmental Clearance granted vide letter dated 01.01.2021 for Amalgamated Yekona I & II OC (Phase-I) for increase in production capacity from 1.0 MTPA to 2.75 MTPA/3.44 MTPA (Normative/Peak) of M/s Western Coalfields Limited and increase in land area from 680.06 ha to 1679.39 ha located in Tehsil Warora, District Chandrapur (Maharashtra).

2. The project proponent vide proposal no IA/MH/CMIN/438539/2023 applied for amendment in EC dated 1.1.2021. PP vide letter no. 5-G/969-970 dated 28.07.2023 requested Ministry for amendment of following specific condition no. 4 (vi) & 4 (xviii) of EC letter dated 01.01.2021 as:

Specific Condition as per EC dated 1.01.2021	Amendment Sought
(vi) "Transportation of coal from Coal Handling Plant shall be through mechanized covered trucks for 3 years. No transportation by trucks after 3 years and proposed railway siding/pipe conveyor system."	Transportation of Coal from the mine shall be through tarpaulin covered trucks till the commissioning of proposed railway Siding i.e by December 2026. No transportation by trucks after Dec'2026 except for small scale industry/ consumers.
Justification	
• The mechanized cover trucks are not feasible on techno economical basis. Thus, transportation of coal to be allowed from tarpaulin covered trucks.	

• The work of construction of Railway Siding in under process. However due to delay in land acquisition and other works, the Railway Siding could not be commissioned within 3 years i.e. 31.12.2023. Thus, additional three-year period upto 31.12.2026 may be provided for commissioning of Railway Siding. However, all efforts will be made for early commissioning of Railway Siding and avoiding road transportation of coal.

Specific Condition as per EC dated 1.01.2021	**Amendment Sought**
(xviii) "Toe wall of atleast 15 mts to 20 mts height should be constructed along the OB dump to protect yekona village."	Construction of toe wall with adequate dimensions along the OB dump to protect the Yekona village and check runoff and siltation in regard to the rainfall data.
Justification	
• The toe wall of 15-20 meters is not feasible to construct techno-economically in this mine. • There is a gap of about 100 mtrs between the OB/ Top soil dump and Yekona Village & the gap is also planted with tree plantation (10,000 nos. in an area of 4 ha). • Only Top Soil overburden dump is present against the habitation of Yekona Village. Height of Top Soil dump is only 36 mtrs & same is finalised, no further dumping or heightening will be done. Plantation and grass seeding of top soil dump is being done, which helps in stabilisation of the dump. • Garland Drains have been provided in mine for the length of about 4650 m with width of 2 m and depth of 2 m. Catch drains of dimension 3300 length, 2 m width and 2 m depth are also provided against OB dump. Dumps are provided with siltation pond at the bottom to prevent siltation in nearby water body. This help in arresting any loose material of the dump. • Dumping was done by removing the black cotton soil layer upto 3 mtr depth at the toe/ floor of the dump, this help in stabilisation and possibility of floor failure and upheaving is totally avoided. • A scientific study has been carried out for OB dump stability in the respective mine by IIT Kharagpur. The safety measures proposed in the report does not include the construction of toe wall. • In CMR, 2017 there is no mention of the dimensions for the construction of toe wall.	

6.2.2 Earlier the proposal was considered in the 48th EAC meeting held on 25th August, 2023 wherein the committee has deferred the proposal for want of requisite information. The PP has submitted the reply on Parivesh portal vide letter dated 18.12.2023 and proposal was considered in 6th EAC meeting

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held during 17-18 January,2024. The information submitted by the PP is as follows: as mentioned below:

S.No.	Observation of EAC	Reply by PP
1.	Current status and preparedness of proposed railway siding/pipe conveyor system as per specific condition no. 4 (vi) of EC letter dated 01.01.2021 with documentary proof (pipe conveyor plan comprising of layout, NIT and tendering details with date for the Railway siding alongwith Feasibility Study Report, Engineering Scale Plan, Detailed Project Report etc.)	The work order for construction of Railway Siding has been awarded to M/s Indian Port Rail & Ropeway Corporation Ltd (IPRCL), Mumbai vide letter Dt.07.05.2022 for a total value of Rs.80.74 Crore. However due to delay in land acquisition and other works, the Railway Siding could not be commissioned within 3 years i.e. 31.12.2023. Construction of the railway siding requires acquisition of 35.4 Ha land out of which 10.00 ha already belongs to WCL and the remaining land is to be acquired under 'Gati Shakti Multi Model Cargo Terminal Scheme" of Railways. Thus, additional period up to 10.12.2025 may be provided for commissioning of Railway Siding. <u>Present progress:</u> The construction work for railway siding has already commenced. The Centre line marking of Track has been completed by IPRCL. Civil work of the track laying is likely to be completed by Jan'2025. Subsequently, civil work of wharf wall siding platform will be commenced. Fixed sprinklers and wind barrier will be installed at the proposed railways siding by Dec'2025. Total award value for commissioning of Railway Siding is 80.74 crore to IPRCL. Till November, 2023, the bills of 24.63 crore has been processed by the project proponent. Remaining payment will be done after completion of civil work and commissioning of Railway Siding.

		The detailed timeline period for the construction of the railway siding is 10.12.2025 and enclosed.
2.	PP shall submit the plan for coal transportation upto 90% to its peak capacity i.e .3.44 MTPA to dedicated users only including M/s MAHAGENCO thermal power plant as proposed in EIAEMP report.	Prevailing EC has been granted for the production capacity of 2.75 MTPA (Normative). The coal production from the mine was 2.75 MTPA in FY 2022-23. The dispatch of coal in FY 2022- 23 from the mine was 3.50 MTPA due to liquidation of earlier coal stock in the mine. The coal transportation statistics to the dedicated users including M/S MAHAGENCO thermal power plant in FY 2022-23 has been enclosed. In FY 2022-23, Amalgamated Yekona-I&II OC has dispatched 3.50 MTPA of coal. GMR Warora and Sai Wardha Power Generation Ltd located near to the project purchases a total quantity of 2.0202 MT. Remaining 1.48 MTPA of coal was transported to other coal customers. The traffic study has been conducted considering the transportation of approx. 1.50 MTPA of coal to other coal customers.
3.	The Writ Petition No. 2470 of 2022 is sub-judice. However, the contentions alleged in the petition are authenticated by the site inspection report. Therefore, PP should plan to avoid the usage/construction of road for transportation of coal near the sensitive zone such as school, hospital, etc. and submit the alternative route till mechanised system is put in place. The proposed route should be supported by traffic study for one month (with baseline ambient air quality in alternate route) along with the mitigation measures to control the dust pollution till the period of completion of mechanised system.	In this project the coal is transported to either nearby thermal power plan (only 1.30 km away from project boundary) and other customers through Wani railway Siding (90 kms away from the project). Majri railway siding is located nearly 23 kms away from the project. However, due to lack of adequate road infrastructure for nearly 2.3 kms, the coal could not be transported to Majri Railway Siding. The route from the project site to Majri Railway Siding passes through the Warora Town. The Warora town does not have any peripheral road in west. Hence the coal could not be evacuated by the present route without entering Warora Township.

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		Hence, it was proposed to construct a by-pass road of 2.3 km length for Warora town connecting Warora – Madheli Road to Warora-Wani Road. This will provide an alternate coal evacuation route. Approval for construction of this road is issued by Dy. Secretary, Revenue and Forest Department, Govt. of Maharashtra, Mumbai vide letter no. संक$ण-२०२२/), this road will serve the purpose of local transport and public use also and decongest the traffic in Warora town. As per the affidavit submitted from the Collector Chandrapur, the present proposal of coal transportation route is found to be feasible and could be helpful in decongestion of existing traffic of Warora town. The other route proposed for evacuation of coal to Majri railway Siding through the north of Waroa town was not found to be feasible as per the affidavit based of the site visit. As other proposed route could not be widened due to 11 KV power line, low existing width and could create inconvenience to the farmers. As per affidavit, the proposed coal transportation route by constructing bypass road of 2.30 kms is most suitable. The one traffic study with ambient air quality baseline data has been conducted on this proposed route. The ambient air quality data has been generated at 12 locations in October, 2023. Out of 12 locations, 6 locations are near to the coal transportation route and others are located within buffer zone of the project. During the traffic study, the level of service of the proposed route was found to be in very good category. The v/c ratio (predicted volume/capacity) during peak period will be 0.23, 0.30 and 0.17 for Section A, Section B and Section C

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		respectively and the level of service falls under very good category in Section A & B and Section C as excellent. Vehicles carrying coal are being covered with tarpaulin to prevent spillage. Vehicles hired to carry coal will be meeting all air pollution control norms and at regular interval checks for the implementation of pollution under control (PCU) certificates. Additional road safety precaution like traffic police outpost, traffic signals, illumination, traffic science will be provided at the intersection of roads. The detailed traffic study report along with 1-month baseline ambient air quality data is enclosed.
4.	PP shall submit the drone video of OB dump along with the construction of Toe-wall all around the OB dump.	The drone video of the OB dump has been made and it has been sent through e-mail. Besides the drone video a scientific study has been conducted through reputed National Institute of Technology, Nagpur on "Feasibility study regarding toe wall and providing remedial measures for black cotton soil dump towards Yekona Village in Amalgamated Yekona I & II OC Mine". Based on the technical study the remedial measures proposed will be taken up in time bound manner. The report is enclosed.
5.	PP to submit copies of MoU signed for coal transportation to various user including thermal power plant.	The MoU/FSA copies signed for coal transportation with Major consumers deliberated under point no. 2 are enclosed.

6.2.2 The Committee deliberated on the various issues related to the proposal, i.e transportation of mineral outside the lease area, pollution due to transportation, stability of BC Dump, plantation, propose railway siding site and status of its construction, details of the court case on the issue of diversion of road near Warora town etc. and asked the PP to submit the details of proposed air pollution mitigative measures, expedite the plantation activities, expedite the installation of additional sprinklers, implementation of recommendation made by VNIT for the stability of the BC Dump.

During the meeting PP informed that supply of the coal (2.01 MT) is to the nearby thermal power plant (GMR and Sai Wardha TPPs) located at a distance of 5.5 KM and rest of the coal is supplied to other

customers in open market. PP submitted that they are just supplying the coal at pit head and the tippers are engaged by the thermal power plants and other customers and WCL is not engaging tippers for the transportation of the coal. However, in future when the mine will expand WCL is planning to supply coal to other long distance customers and for which they are in the process of setting up of railway siding. PP vide letter dated 18.01.2023 submitted a copy of Fuel Supply Agreement (FSA) and referred to clause 7.2.2 of the FSA wherein it has stated that *"..The purchaser shall arrange to place the required number/type of trucks to lift the coal as per such loading programme/schedule ...."* and the same is the case with all consumers.

The Committee is of the view even though PP is not transporting the mineral but they are required to take steps to mitigate pollution if any, caused due to transportation of mineral outside the lease area. The PP in its reply submitted vide letter dated 18.01.2024 submitted the following existing and proposed air pollution control measures.

Sl No.	Mitigation Measures	Existing		Proposed		
		Nos.	Expenditure	Nos.	Expenditure	Timeline
1	Mobile Water Sprinklers	06	Through revenue budget	04	Through revenue budget	Feb,2024
2	Fog Canons	05	33.05 Lakh	05	40 Lakh	March,2024
3	Fixed Sprinklers	36	40.59 Lakh	30	30 Lakh	June, 2024
4	Wind Barrier railway siding	-	-	700 meter wind barrier with height 6 mts	200 Lakh	After commission of railway siding i.e. Dec 2025
5	Tree Plantation	1,20,000	170.48 Lakh (along with 5 year maintenance)	80,000	240 Lakh	During Monsoon of 2024
Total			224.12 Lakh		510 Lakh	

PP also provide the details of the court case wherein the core issue is requirement of EC for bypass road for transportation of mineral near Warora Town and its impact on the school. The matter is still pending

and PP submitted an undertaking wherein it has mentioned that *"The Amalgamated Yekona I & II OC Mines, WCL does not envisage departmental coal transportation along the proposed by-pass road for which WP 2470/2022 has been filed before Hon'ble Bombay High Court, Nagpur Branch".* Committee observed that the case is not related to this EC rather it is related to construction of bypass road outside the lease area.

The Committee viewed the drone video submitted by the PP and deliberated on the requirement of toe wall around the OB dump. Committee observed that PP has reported that this dump is finalised and there would be no further dumping in the same. PP also submitted a feasibility study regarding toe wall and providing remedial measures for black cotton soil dump towards Yekona Village. The study was carried out by VNIT, Nagpur. The Committee is of the view that PP shall implement the recommendation made in the said report at the earliest. The PP vide his letter dated 18.01.2024 submitted that the recommendation will be implemented by June, 2024.

Based on the discussion held the Committee ***recommended*** *the following amendment in the EC dated 01.01.2021*

Specific Condition as per EC dated 1.01.2021	***Recommendation of EAC***
(vi) "Transportation of coal from Coal Handling Plant shall be through mechanized covered trucks for 3 years. No transportation by trucks after 3 years and proposed railway siding/pipe conveyor system."	*Transportation of Coal from the mine shall be through tarpaulin covered trucks till the commissioning of proposed railway Siding i.e. by December 2026. No transportation by trucks after Dec'2026 except for small scale industry/ consumers. PP shall implement the additional measures i.e i)Use upto 25% CNG/EV Tippers for the coal transportation, ii) ensure that transportation of mineral is in covered tippers, iii) regular water spraying on the road, iv) No overloading of the tippers, v) cleaning of the roads at least for a 5 KM span on the transportation route to thermal power plant, vi) allowing the vehicle having valid fitness certificate and PUC, vii) wheel washing facility and viii) installation of CCTV camera at mine entrance etc. PP shall also implement the measures proposed in letter dated 18.01.2024 submitted to the Ministry for mitigating air pollution.*

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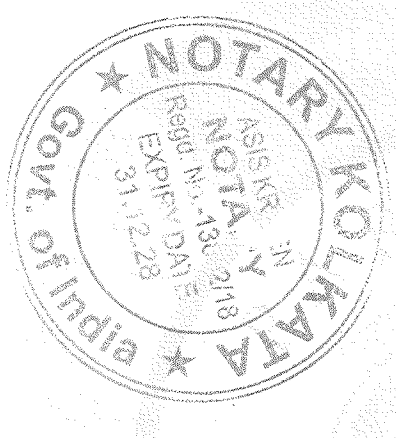
(xviii) "Toe wall of atleast 15 mts to 20 mts height should be constructed along the OB dump to protect yekona village."	*PP shall implement the recommendation made by VNIT by June 2024 for the stability of OB Dump and allied protection of Yekona village. There should not be any dumping toward the Yekona village side and additional measures be taken to ensure that the village is not endangered. With respect to other dump inside the mining lease area PP shall carry out the stability studies from the reputed institutes and implement the recomendations. PP shall submit the compliance of the same to RO, MoEF&CC along with documentary proof viz. photograph before and after implementation, ii) certificate from VNIT that the recommendation made by them has been implemented in letter and spirit and audited expenditure statement.* *Additional planting be done on the OB dump for densification of the vegetation and submit geo tagged proof on half yearly basis to IRO*



The Committee also prescribe an additional condition that: PP shall strengthen the existing Environment Management division of the unit under intimation to the IRO

Agenda No. 6.3

Tasra Coking Coal Washery with capacity of 3.5 MTPA in the project area of 21 ha. of M/s. Steel Authority of India Limited located at FCIL Campus, Town – Sindri, District Dhanbad (Jharkhand) - For Terms of Reference - reg.

[Online Proposal No. IA/JH/CMIN/455615/2023; File No. J-11015/122/ 2007-IA. II(M)]

6.3.1 The proposal is for Terms of Reference for Tasra Coking Coal Washery with capacity of 3.5 MTPA in the project area of 21 ha. of M/s. Steel Authority of India Limited located at FCIL Campus, Town – Sindri, District Dhanbad (Jharkhand). PP applied online vide proposal No IA/JH/CMIN/455615/2023 for grant of TOR and the proposal was placed in 5th EAC meeting held during 17-18 January, 2024.

6.3.2 The Project Proponent made a detailed presentation on the salient features of the project and informed that:

PROJECT LOCATION:

- The project area is covered under Survey of India Topo sheet No. 73 I/6 (F45C6) and is bounded by the geographical coordinates ranging from 23°39'37.22"N to 23°39'51.23"Nandlongitudes86°28'59.45" E to 86°29'15.52" E.
- The project/activity is proposed by the PP is a Green filed project and covered under category A of item 2(a) 'Coal Washeries' of the Schedule to the Environmental Impact Assessment Notification, 2006 as the throughput of Coal is > 2.5 MTPA therefore, it requires appraisal at Central level by the sectoral EAC in the Ministry.
- Tasra Coal Washery had been granted EC for 3.5 MTPA of M/s Steel Authority of India Ltd., Vide letter no. J-11015/ 365/2009-IA.II(M) pt. Dated 30.03.2017 by the MoEF&CC. However, the Coal Washery could not be installed as land for installation of the Washery could not be acquired.
- The Fertilizer Corporation of India Limited (FCIL) has obtained in principle approval for leasing of **61 Acres (24.69 Ha) of FCIL Land (Old SMP Plant Area)** for setting up of a Coal Washery for Tasra Opencast Coal Project Vide Letter no. FCIL/Sindri/Tasra/2023/1810 dated 20th November 2023.
- PP submitted that there is no Wildlife Sanctuaries, National Park, Biosphere Reserve, exists within 10 Km radius of the project site.
- The area is not Falling under Critically Polluted Area.
- One small unnamed Protected forest exists at a distance of 9.5 Km.
- No R&R involved
- No Archeological/ Historical/ Ancient Monument within 10 KM of the project site
- No forest land is involved in the project.

LAND USE DETAILS OF PROJECT SITE:

The land usage pattern of the coal Washery project is as follows:

Sl. No.	Details	Area in Ha	% w.r.t. Total Area
1.	Main Plant Area	2.52	11.99
2.	Storage Area for Coal Stock	6.23	29.68
3.	Water Reservoir	0.62	2.94
4.	Green Belt	6.93	32.99
5.	Internal Roads	2.12	10.09
6.	Parking Area	1.48	7.05
7.	Misc Area	1.11	5.27
Total		**21.00**	**100.00**

TRANSPORTATION OF COAL:
• Transportation of raw coal from Mine Pit to the Coal Washery shall be through conveyor/private road and Clean/middling coal from the Washery to the Steel & power plants of SAIL will be through Rail. • **Quantity being transported by Road/Rail/Conveyor:** Washed coal & middling will be transported through Rail.
OTHER DETAILS:
• Total water requirement for the project is 966 m^3/day. • Application for obtaining the approval of the Central Ground Water Authority for NOC for water withdrawal will be submitted after the approval of ToR. • Damodar River is flowing at a distance of 2.3 Km from Southern Boundary of the lease area. No nala diversion is involved in the project. • No court cases, violation cases are pending against the project of the PP. • The project does not involve violation of the EIA Notification, 2006 and amendment issued thereunder. • The project involves no project affected families. R&R of the PAPs is not required. • Total cost of the project is Rs. 93,900 Lakhs.
BENEFITS OF THE PROJECT:
• The project is reported to be beneficial in terms of bigger exercise by Government of India to increase the washing capabilities of Indian coal in order to increase the supply of washed coking coal to steel plants thereby reduce the outgo of valuable foreign currency. This will also help in reducing the prices of steel product so vital for Indian economy.

6.3.3 *The proposal was considered in EAC meeting held during 17-18 January, 2024 wherein the Committee deliberated on the various issues related to site selection, habitation around the project site, transportation route for the coal etc. The Committee also noted that coal for the Washery will come from the Tasra Coal Block for which EC was granted on 13.10.2009. During the meeting Committee deliberated on the feasibility of setting up of the project within the mining lease area and observed that*

this aspect is not considered while site selection. The Committee therefore ***deferred*** *the proposal and is of the view the proposal can considered only after the PP submits the following information:*

1) *PP shall conduct detailed alternate site selection study for at least 3 sites including the existing mining site.*

2) *PP shall confirm the minimum area required for setting up of the Washery.*

3) *PP shall submit transportation plan for each site selection (preferably through rail mode and belt conveyor combination).*

4) *PP shall submit the habitation details around each of the alternate site considered for setting up of the plant.*

Agenda No. 6.4

Kolgaon OC Project with increase in production capacity from 0.6 MPTA to 0.8 MTPA and increase in ML area from 397.25 ha to 545.41 ha by M/s Western Coalfields Ltd. located in Tehsil Wani, District Yeotmal (Maharashtra) - For Terms of Reference – reg.

[Online Proposal No. IA/MH/CMIN/451775/2023; File No. J-11015/228/ 2009-IA. II(M)]

6.4.1 The proposal is for Terms of Reference for Kolgaon OC Expansion Project for increase in production capacity from 0.6 MPTA to 0.8 MTPA with increase in the Mining lease project area from 397.25 ha to **545.41 ha**. Located in Tehsil Wani, District Yavatma (Maharashtra).

The project/activity is proposed by the PP is an expansion project and covered under category A of item 1(a) 'Mining of Minerals Coal' of the Schedule to the Environmental Impact Assessment Notification, 2006 as the mining lease area is > 500 Ha. Therefore, it requires appraisal at Central level by the sectoral EAC in the Ministry. PP applied online vide proposal No IA/MH/CMIN/451775/2023 for grant of TOR and the proposal was placed in 5th EAC meeting held during 17-18 January, 2024.

6.4.2 The Project Proponent made a detailed presentation on the salient features of the project and informed that:

6.4.2.1: Location:

i) PP submitted that the Kolgaon Opencast Mine is located on the Wani Tahsil of Yeotmal District of Maharashtra. The block is adjacent to mugoli and nirguda blocks of WCL. It is bounded by North Latitude 190 5' 41" to 190 6' 20" and east Longitude 790 50' 49" to 790 52' 00" and is covered in the Survey of India Toposheet No. 56 M/1.

ii) PP submitted that the Project does not fall in the Critically Polluted Area (CPA), where the MoEF&CC's vide its OM dated 11.04.2022 & 07.05.2022 has imposed moratorium on grant of EC. There is no forest land involved in the project. The project does not require recommendation of NBWL. No National Parks, Wildlife Sanctuaries and Eco-Sensitive Zones fall within 10 km boundary of the project.

6.4.2.2: Previous Approval & Past Production details:

iii) PP submitted that the project has been granted Environmental Clearance for production capacity of 0.6 MTPA (Peak) with ML area of 397.25 ha (392.67 ha within mine lease area and 4.58 ha outside mine lease area) vide Ministry's letter no. J-11015/228/2009-IA. II(M) dated 16.02.2012.

iv) PP submitted that the past production details as per which the production is well within the EC capacity.

Year	EC Sanctioned capacity(MTPA)	Actual production (MTPA)	Excess production beyond the EC sanctioned capacity
2005-06	0.40	NIL	Nil
2006-07	0.40	0.1	Nil
2007-08	0.40	0.32	Nil
2008-09	0.40	0.36	Nil
2009-10	0.40	0.31	Nil
2010-11	0.40	0.36	Nil
2011-12	0.60	0.60	Nil
2012-13	0.60	0.56	Nil
2013-14	0.60	0.03	Nil
2014-15	0.60	0.46	Nil
2015-16	0.60	0.12	Nil
2016-17	0.60	0.00	Nil
2017-18	0.60	0.26	Nil
2018-19	0.60	0.50	Nil
2019-20	0.60	0.0000040	Nil
2020-21	0.60	0.4524	Nil
2021-22	0.60	0.599	Nil
2022-23	0.60	0.60	Nil

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6.4.2.3: Mining Details:

v) PP submitted that the total Mining lease area as per block allotment is 545.41 Ha. The revised Project Report (Including Mining plan) and Mine closure plan for Kolgaon Expansion (Deep) Opencast Mine was approved by WCL Board in its 348th meeting held on 28th January, 2023 and circulated vide Board resolution no. WCL /office of CS/BM-348/2022-23/1012 dated 17.02.2023.

vi) PP submitted the Method of mining operations envisages by opencast with shovel Dumper Combination. Total geological reserve reported in the mine lease area is 27.982MT, with mineable reserves are 16.29 MT. Total extractable reserves are 15.48 MT. Balance extractable reserve as on 01.04.2025 is 8.74Mt. Four composite seam with thickness ranging from 0.34 to

Sl. No.	Land use post mining	Land use (ha)				
		Plantation	Water Body	Public use	Undisturbed	Total
1	External OB Dump	159.29	0.00	0.00	0.00	159.29
2	Excavation	91.58	125.22	0.00	0.00	216.80
3	Infrastructure like Sub-station, CHP Service Buildings etc.	3.00	0.00	5.00	0.00	8.00
4	Undisturbed area (brought under plantation)	65.00	0.00	0.00	45.30	110.300
6	Road	2.00	0.00	2.92	0.00	4.92
7	Green Belt Area	5.00	0.00	0.00	0.00	5.0
8	flood Protection Embankment	4.00	-	28.75	8.35	41.10
	Total	329.87	125.22	36.67	53.65	545.41

11.85. Grade of coal is G-10 stripping ratio 1: 10.87 m^3/t, while gradient is 1 in 2.4 to 1 in 5. The Life of mine is 12 years.

vii) PP submitted that the total quarry area is 216.8 ha with a depth of 200m. Final mine void of 125.22 ha will be converted to water body. Post mining land use will be as follows:

viii) PP submitted that the Transportation of coal is being done by dumpers in mine pit head, from surface to sidings by tippers and at sidings to loading by pay loaders. Transportation of coal has been proposed through belt conveyor.

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ix) PP submitted that the ground water level has been reported to be varying between 4.5 m to 7.0 m during pre-monsoon and between 2.3 m to 3.5 m during post-monsoon in core zone. The ground water level has been reported to be varying between 4.3 m to 11.8 m during pre-monsoon and between 1.7 m to 5.4 m during post-monsoon in buffer zone. Total water requirement for the project is 408 KLD.

x) PP submitted that the NOC has been secured from CGWA for abstraction/ dewatering of mine discharge in respect of subject mine vide NOC no. CGWA/NOC/MIN/ORIG/2021/13912 valid upto 02/12/2023. Renewal application is in process vide application no. 21-4/761/MH/MIN/2017.

6.4.2.3: Project Cost & Benefit:

xi) The project involves 187 project affected families. No village rehabilitation is involved in the project only land outside is involved for which a cost of Rs. 42.9635 cr has been kept in the approved project report.

xii) Total capital cost of the project is ₹ 206.1941 crores. Cost of production is Rs. ₹ **2889.08/t**(at 85%), CSR cost is Rs. 2 per tonne. Environment Management Cost in Rs crores; Capital 12.7773 cr. & Recurring cost is ₹6/tonne of coal production.

6.4.3 The Committee after deliberations noted the followings:

i. EC for Kolgaon OC for capacity 0.40 MTPA within ML area of 349.00 Ha has been granted vide letter no. J-11015/29/2001-IA. II(M) dated 12.04.2002.
ii. EC for enhancement in capacity upto 0.6 MTPA within project area 397.25 ha has been granted vide letter no. J-11015/228/2009-IA. II(M) dated 16.02.2012.
iii. Total Mining lease area as per block allotment is 545.41 Ha.
iv. Mining plan and Mine closure plan for Kolgaon Expansion (Deep) Opencast Mine was approved by WCL Board in its 348th meeting held on 28th January, 2023 and circulated vide Board resolution no. WCL /office of CS/BM-348/2022-23/1012 dated 17.02.2023.
v. No National Parks, Wildlife Sanctuaries and Eco-Sensitive Zones fall within 10 km boundary of the project.
vi. Application for renewal of Groundwater NOC from CGWA has been submitted vide application no. 21- 4/761/MH/MIN/2017 dated 01.12.2023.
vii. Production is well within the EC Capacity.

6.4.4 *The Committee after deliberations noted that the instant proposal is for expansion in production capacity from 0.6 to 0.8 MTPA and increase in ML area from 397.25 ha to 545.41 ha. The Committee is of the view that as there is an increase mine lease area along with production capacity therefore, PP shall prepare fresh EIA/EMP based on the ToR prescribed and also conduct fresh public hearing.*

Based on the above, EAC ***recommended*** *the proposal for grant of Terms of reference for expansion of Kolgaon OC Project with increase in production capacity from 0.6 MPTA to 0.8 MTPA and increase in ML area from 397.25 ha to 545.41 ha by M/s Western Coalfields Ltd. located in Tehsil Wani, District Yeotmal (Maharashtra) under EIA Notification, 2006 and its amendments therein with following additional specific conditions in addition to generic ToR:*

1) *PP shall modify its Mine Plan w.r.t to mine lease area i.e. 545.41 ha for its peak production and get it approved from Ministry of Coal along with PMCP. No mining activity shall be conducted beyond this area.*

2) *The total excavation (minerals, waste, top soil) to be excavated needs to bring out clearly in production and development plan. The mineable reserves, blocked reserves need to be mentioned along with life of mine. PP should add an annexure in the mining plan clearly showing the year-wise production and development plan (tabular format) till the end of life of mine. The location of mineral stacking, dumping sites, plantation and other infrastructures needs to bring out clearly in the mining plan. PP needs to bring out the waste to be generated during the entire life of mine and where it will be dumped/backfilled.*

3) *PP has to prepare EIA-EMP report by taking fresh baseline data and thereafter conduct the Public Consultation, including public hearing, through concerned SPCB in the concerned districts as per the provisions/procedure contained in the EIA Notification, 2006 for information of the stakeholders about the present coal mining operations inviting comments and their redressal.*

4) *PP should provide in the EIA Report details of all the statutory clearances, permissions, no objection certificates, consents etc. required for this project under various Acts, Rules and regulations and their status or estimated timeline after grant of EC.*

5) *PP shall submit the drone video & photographs of mined area, fresh lease area to be mined and existing and proposed transportation route.*

6) *PP should submit the detailed plan in tabular format (year-wise for life of mine) for afforestation and green belt development in and around the mining lease. The PP should submit the number of saplings to be planted, details of native species, area to be covered under afforestation & green belt, location of plantation, target for survival rate and budget earmarked for the afforestation & green belt development. In addition to this PP should show on a surface plan (5-year interval for life of mine) of suitable scale the area to be covered under afforestation & green belt clearly mentioning the latitude and longitude of the area to be covered during each 5 years. The capital and recurring expenditure to be incurred needs to be submitted. Plantation plan should be prepared in such a way that 80% of the plantation to be carried out in first 5 years and for the remaining years the proposal for gap filling. The seedling of height not less than 2 meters to be selected and accordingly cost of plantation needs to be decided. In addition to this, plantation in the safety zone at lease boundary the plantation should be planned in such a way that it should be completed within 2 years only.*

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7) *PP should submit the quantity of surface or ground water to be used for this project. The complete water balance cycle need to be submitted. In addition to this PP should submit a detailed plan for rain water harvesting measures to be taken. The PP should submit the year wise target for reduction in consumption of the ground/surface water by developing alternative source of water through rain water harvesting measures. The capital and recurring expenditure to be incurred needs to be submitted.*

8) *PP should clearly bring out the details of the manpower to be engaged for this project with their roles /responsibilities/designations. In addition to this PP should mention the number and designation of person to be engaged for implementation of environmental management plan (EMP). The capital and recurring expenditure to be incurred needs to be submitted.*

9) *PP should submit the year-wise, activity wise and time bound budget earmarked for EMP, occupational health surveillance, and activities proposed to address the issues raised during Public Hearing. The capital and recurring expenditure to be incurred needs to be submitted.*

10) *PP shall 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 Plan shall be included in EIA/EMP Report.*

11) *PP shall provide the details of mining technology/methodology proposed to be adopted for coal mining operations and its associated environmental benefits of using from Climate Change perspective.*

12) *In case of ground water abstraction/intersection. The PP shall comply with the Ministry's OM dated 23/05/2019. Compliance status needs to be presented before EAC at the time of appraisal.*

13) *PP should clearly bring out that what is the specific diesel consumption ~ (Liters/Tonne of total excavation & mineral) and steps to be taken for reduction of the same. Year-wise target for reduction in the specific diesel consumption needs to be submitted. PP shall also explore the possibility of using e-vehicles/LNG/CNG based mining machineries and trucks for mining operation and transportation of coal.*

14) *PP shall submit detailed project report for implementation of in-pit conveyor belt with silo loading till railway siding for evacuation of coal with its target date of completion.*

15) *All the certificates viz. Involvement of Forest land, distance from protected area, list of flora & fauna should be duly authenticated by Forest Department. The Certificate should bear the name, designation, official seal of the person signing the certificate and dispatch number.*

16) *PP shall submit the measures to be taken for stability of dumps already existing and proposed to be developed during the mining operation. In case the height of the any dump is more than 60 meters than PP shall get the study done from reputed institute in this regard.*

17) *The budget to be earmarked for the various activities shall be decided after perusal of the*

Standard EC Conditions published by the Ministry.

18) *PP should clearly show the transport route of the mineral and protection and mitigative measure to be adopted while transportation of the mineral. The impact from the center line of the road on either side should be clearly brought out supported with the line source modelling and isopleth. Further, frequency of testing of Poly Achromatic Hydrocarbon needs to be submitted along with budget. Based on the above study the compensation to be paid in the event of damage to the crop and land on the either side of the road needs to be mentioned. The PP should provide the source of equations used and complete calculations for computing the emission rate from the various sources. The Ground level concentration of various pollutants in worst case and control case scenario needs to be submitted. The cumulative impact of other activities needs to be considered in EIA/EMP Report.*

19) *Details of grazing land if any involved in the mining lease to be provided. In case activity is to be proposed on grazing land than PP shall provide the relevant rule position applicable in this regard and compliance of the same.*

20) *PP shall submit the action plan to adhere the Plastic Waste Management Rules 2016 and to adhere Ministry's OM dated 18/07/2022.*

21) *PP shall submit the proposal of EC only after completion of about 75% conditions stipulated in earlier EC dated 16th February, 2012.*

22) *PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs.*

23) *The PP should ensure that only NABET accredited consultant shall be engaged for the preparation of EIA/EMP Reports. PP shall ensure that accreditation of consultant shall be valid during the collection of baseline date, preparation of EIA/EMP report and during the appraisal process. The PP and consultant should submit an undertaking the information and data provided in the EIA Report and submitted to the Ministry are factually correct and PP and consultant are fully accountable for the same.*

24) *PP shall prepare a wildlife conservation plan in consultation with the local forest department.*

25) *PP shall submit certified compliance report of EC conditions from Ministry's IRO. IRO shall certify that PP has complied 90% of conditions.*

26) *The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.*

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Agenda No. 6.5

Expansion of Prakasham Khani Opencast Coal mine (Amalgamation of Manuguru OC II Expansion & Manuguru OC IV Extension) for increase in production capacity from 9.75 MTPA to 10.45 MTPA in the ML area of 2402.40 ha (2214.84 ha Forest Land and 187.56 ha non-forest land) of Singareni Colleries Company Limited (SCCL) located in Village & Mandal Manuguru, District Bhadradri Kothagudem (Telangana) - For Environmental Clearance under Ministry's OM dated 11.04.2022 (Stage I - 20% expansion) – reg.

[Online Proposal No. IA/TG/CMIN/447190/2023; File No. J-11015/78/2013-IA-II(M)]

6.5.1 The proposal is for Environmental Clearance for Expansion of Prakasham Khani Opencast Coal mine (Amalgamation of Manuguru OC II Expansion & Manuguru OC IV Extension) for increase in production capacity from 9.75 MTPA to 10.45 MTPA in the ML area of 2402.40 ha (2214.84 ha is Forest Land and 187.56 ha is non-forestland) of Singareni Colleries Company Limited located in Village & Mandal Manuguru, District Bhadradri Kothagudem (Telangana) under provisions of 7(ii) of EIA Notification, 2006 and under OM dated 11.04.2022 [Stage-1 20%].

The project falls under Schedule 1(a) of mining and is a Category - "A" project as per EIA notification 14th September 2006 as the mining lease area is more than 500 Ha. PP applied for expansion in pursuant to O.M dated 11.04.2022 [Stage-1 20%].

6.5.2 Details of the proposal, as ascertained from the proposal documents and as revealed from the discussions held during the meeting, are given as under:

6.5.2.1: Location:

(i) The project area is covered under Survey of India Topo Sheet No. 65C/9 & 65 C/13 and is bounded by North Latitudes 17°55'36.81" N to 17°58'54.87" N and East Longitudes 80°44'16.41" E to 80°48'48.34" E.

(ii) The project does not fall in the **Critically Polluted Area (CPA)**, where the MoEF&CC's vide its OM dated 13th January, 2010 has imposed moratorium on grant of environment clearance.

6.5.2.2: Mining Lease: The PKOC Mine is amalgamation of two existing opencast mines namely, Manuguru OC II Expansion and Manuguru OC IV Extension opencast mine, with production capacity of 9.75 MTPA in the mine lease area of 2402.40 ha.

Sl No	Details	Area (Ha)
1	Manuguru ML granted vide G.O Ms. No 217 dated 12.08.2008	921.0
2	Manuguru Ext. granted vide G.O Ms. No 259 dated 23.09.2008	125.90
3	Manuguru OC-II granted vide G.O Ms. No 63 dated 6.03.1999	198.22

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4	Manuguru OC-III granted vide G.O Ms. No 91 dated 24.03.2005	75.00
5	Manuguru OC-II granted vide G.O Ms. No 238 dated 27.08.2008	175.69
6	Manuguru OCP IV granted vide G.O Ms. No 13 dated 18.05.2016	384.31
7	Manuguru OC-II granted vide G.O Ms. No 5 dated 12.04.2019	288.74
	Total-1	2168.86
8	LoI for non-coal bearing area	233.54
Grand Total		2402.40

6.5.2.3: Forest Area: PP submitted that 2214.84 ha of forest land has been reported to be involved in the project. Approval under the Forest (Conservation) Act, 1980 for diversion of 2214.84 ha of forest land for non-forestry purposes has been obtained vide MoEF&CC.

Letter No	Area (in Ha)
F.No. 8-8/96-FC dated 10.10.1997 for an area 286.25 ha covered under PK OC mine .	286.25
F.No. 8-37/2001-FC dated 31.12.2003 for an area 75.00 ha covered under PK OC mine.	75
F.No. 8-73/2005-FC dated 10.07.2008 (Corrigendum Dated 06.11.2009) for an area of 1161 ha out of which 828.16 ha covered under PK OC mine.	828.16
F.No. 8-56/2004-FC dated 14.07.2008 for an area of 125.90 ha covered under PK OC Mine.	125.9
F.No. 8-7/2008-FC dated 30.12.2008 for an area of 175.69 ha covered under PK OC mine.	175.69
F.No. 8-71/2009-FC dated 06.01.2016 for an area of 10.50 ha of which 4.68 ha is covered under PK OC Mine.	4.68
F.No. 8-79/2013-FC dated 24.04.2017 for an area of 430.42 ha is covered under PK OC Mine.	430.42
F.No. 8-70/2014-FC dated 02.11.2018 for an area of 367.03 ha of which 288.74 ha is covered under PK OC Mine.	288.74
Total	2214.84

6.5.2.4: Protected Area: The kinnerasani Wild life sanctuary and Eco-Sensitive zone are at a distance of 5.82 km and 1.92 km. Wildlife conservation plan for Schedule-I species (Indian peafowl, hour horned antelope, monitored lizard & Gaur) of Manuguru area has been approved by PCCF&CWW, Telangana with a budgetary provision of Rs.2.41 Crores vide lr No.906/2010/M4. Dated:14.06.2018.

6.5.2.5: Method of Mining & Mining Plan:

(i) PP submitted thatMining Plan (Including Mine Closure Plan) (3rd Revision) for Prakasham Khani OC Mine (Amalgamation of Manuguru OC II Expansion & Manuguru OC IV Extension)" was approved by MoC vide Lr.No.38011/6/2019-PCA dated 7th October, 2019 for an extent of 2402.40 ha (Coal Bearing area 2168.86 ha + Non Coal Bearing area 233.54). PP submitted the mining plan approved by company's board under clause 1.3(b) of guidelines dated 29.05.2020 for a capacity of 15 MTPA over an area of 2402.40 Ha.

(ii) Total geological reserve reported in the mine lease area is 402.01 MT with 309.35 MT mineable reserves. Out of total mineable reserves 290.55 Mt are extractable, out of which 228.78 MT were already extracted by Fy 31-03-2023 and 61.77 MT (2023-24) are available for extraction. Percent of extraction is 72.27 %.

(iii) 15 seams with thickness ranging from 1.2 to 9.78 m are workable. Grade of coal is G-8. Stripping ratio 7.75, while gradient is varying from 1 in 5.5 to 6.5.

(iv) Method of mining operations is by Opencast method of working with Surface Miner & Shovel and Dumper combination

(v) Life of mine is 7 years from 2023-24.

(vi) The project has 3 external OB dump in an area of 504.34 ha with 120 m height and 441.06 Mm^3 of Total OB. 1 Internal OB dump in an area of 783.199 ha with 1066.44 Mm^3 of Total OB is envisaged in the project.

(vii) Total quarry area is 1495.476 ha out of which backfilling will be done in 783.119 ha which shall be reclaimed with plantation while final mine void will be created in an area of 712.357 ha with a depth of 270 m. Final mine void will be converted into water body.

(viii) **Land Use Details of Mine:** The land usage pattern of the project is as follows:

Pre-mining land use details

Land ownership	Land use	Extent (ha)
Private land	Agricultural	25.498
Govt. land	Agricultural	126.745
	Township	35.317
Forest land	Reserve	2214.84
TOTAL		**2402.400**

Post Mining:

Sl. No.	Type	Total	Plantation	Water Body	Public/ Company Use
1	Excavation / Quarry Area				

2	Backfilled Area	783.119	783.119		
3	Excavated Void	712.357		712.357	
4	External Dump	504.341	504.341		
5	Safety Zone /Rationalisation area	179.743	82.293	34.219	63.231
6	Diversion Nallah	22.085		22.085	
7	Road & Infrastructure area (Service Buildings and CHP)	137.976	84.996		52.98
8	Embankment	33.334	33.334		
9	Green Belt	28.116	28.116		
10	Water Reservoir near pit/Water body	1.329		1.329	
Grand Total		**2402.400**	**1516.199**	**769.990**	**116.211**

(ix) **Transportation of Coal:** Transportation of coal has been proposed by working face to in-pit crusher by dumpers, in-pit crusher to KCHP siding by conveyor and KCHP siding to customers by rail mode. This is existing transportation.

(x) Reclamation Plan in an area 1516.199 ha, comprising of 504.341 ha of external dump, 756.136 ha of internal dump and 28.116 ha of green belt and 227.607 ha in others proposed for green belt development.

(xi) Coal linkage as per fuel Supply Agreement of the Company.

6.5.2.5: Baseline Data: Environmental Baseline data was generated in the Summer season from March - 2023 to May - 2023 (Summer Season) at 10 locations.

Air Quality (Core Zone)	Ambient air quality data monitored in the core zone shows that PM10 concentrations varied from 149.0 to 196.0µg/m3. The PM2.5 concentrations were in the range of 37.3µg/m 3 to 52.4µg/m 3. The SO 2 and NO 2 concentration varies from 10.9µg/m 3 to 13.9µg/m 3 and 15.3µg/m 3 to 20.5µg/m 3 respectively. All the parameters were found to be within the Coal Mine Standards, GSR 742 (E), dt. 25.09.2000. Carbon monoxide concentration was found to be BDL.
Air Quality (Buffer Zone)	In buffer zone, the concentration of PM10 varied from 49.0µg/m 3 (BA-4, Shanthi Nagar village) to 80.0µg/m 3 (BA-2, Bandagirigudam village). The PM2.5 concentration varied from 21.9µg/m 3 (BA-1, Pagederu village) to 34.5µg/m 3 (BA-8, Samithi Singaram village). The SO 2 concentration varies from 9.2µg/m 3 (BA-8, Samithi Singaram village) to 12.4µg/m 3 (BA-2, Bandagirigudam village) andNO x concentration14.1µg/m 3 (BA-5, Kunavaram village) to 18.2µg/m 3 (BA-3,Bommarajupalli) respectively.

Noise Quality	In core zone, max, value of Day Leq is 65.2 dB (A) and max. value of Night Leq is 50.5 at MNG OC-IV Ext. Site Office.In buffer zone, min., Day Leq is 47.7 dB (A) at Bommarajupalli (BN-3) & Shanthi nagar (BN-4) and max., Day Leq is 49.2dB (A) at Bandagirigudam (BN-2) village andmin., Night Leq is 35.8 dB (A) at Kunavaram Village (BN5) and max., value of Night Leq is 39.8 dB (A) at Samithi singaram (BN-8).
Surface Water Quality	The surface water quality is compared with CPCB water quality criteria. The analysis results of surface water samples from all the sampling locations shows that the water quality conforms to Class–B (Outdoor bathing (Organized) Criteria.
Ground Water Quality	pH values were in the range between 7.3 to 7.7 in GW-1 to GW-5 groundwater samples collected within the study area. TDS concentrations are in the range of 254 - 1105 mg/L, are above the acceptable limit of 500mg/L but within the permissible limit of 2000mg/L at all locations except GW-1, 2 (254, 430mg/L) are within the acceptable limits. Calcium concentrations are observed to be above the acceptable limit of 75mg/L but within the permissible limit of 200mg/L at Shivalingapuram GW-3 (90mg/L), Samithi Singaram GW-4 (99mg/L) and within the acceptable limits in other locations. Magnesium concentrations were observed to be above the acceptable limit of 30mg/L but within the permissible limit of 100mg/L in GW-3, 4, 5 (66, 69, 33mg/L) and within the acceptable limits at other GW-1, 2 locations. Chlorides concentration is observed to be above the acceptable limit of 250mg/L but within the permissible limit of 1000mg/L at location Samithi Singaram GW-4 (259mg/L) and within the acceptable limits at other locations. Sulphates, Fluorides Nitrates & Iron concentrations were observed to be within the acceptable limit at all the locations. The total alkalinity concentrations were in the range 180 – 575mg/L, were above the acceptable limit of 200mg/L but within the permissible limit of 600mg/L at all locations except Padageru GW-1 (180mg/L) is within the acceptable limit. Total hardness concentrations were in the range 87 – 524mg/L, were above the acceptable limit of 200mg/L but within the permissible limit of 600mg/L at all locations except Padageru GW-1 (87mg/L) is within the acceptable limit. The concentrations of heavy metals Cadmium (Cd), Copper (Cu), Lead (Pb), Zinc (as Zn), Arsenic (As), Chromium (Cr), were either below the detection limits or below the permissible limits.

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	The water samples, for which few parameters exceed acceptable limits but within the permissible limits can be used for drinking purpose in the absence of alternate water resources.
Water Requirement	The ground water level has been reported to be varied between 2.05 m to 7.48 m during pre-monsoon and between 1.20 m to 4.18 m during post-monsoon. The total water requirement for the project is 9816 KLD. Ground Water Clearance was obtained vide Lr. No. Lr.No. 258/T/SCCL/2018-2, Dated 18.05.2021 valid up to 17.05.2026 for existing project.

6.5.2.6: Public Hearing: Public hearing was conducted for MNG OC II & MNG OC IV on 28.08.2007 & 25.07.2012 respectively. However, Public hearing is exempted for the present proposal i.e. Prakasham Khani OC Mine of 9.75 MTPA capacity. PP submitted the issues raised during PH of MNG OC II were employment, falling down of ground water level, R&R issues, requirement of basic amenities like roads, education, health and drinking water facilities. The issues raised during PH of MNG OC IV were control of water pollution, employment, establishment of Thermal Power Plant by SCCL and avenue plantation in village area.

6.5.2.7: EMP Budget: PP submitted that the Environment Management Plan (EMP) for the said project and reported that the cost of EMP will be Rs. 52.90 Crore (Capital) and Rs. 25.54 cost per tonne as recurring cost.

6.5.2.8: Other Details:

(i) No River/Nallah diversion is proposed in this project.

(ii) No R&R was involved in this project.

(iii) Regular monitoring of ambient air quality is being carried out on fortnightly basis. The documented report is being submitted to State Pollution Control Board and also to MoEF&CC along with half yearly EC compliance report. In general, the results of ambient air quality monitoring data were found within prescribed limits except few aberrations which can be attributed to the specific local conditions during the day of sampling.

(iv) No court cases, violation cases are pending against the project of the PP. The project does not involve violation of the EIA Notification, 2006 and amendment issued thereunder. The amalgamated EC was granted on 12.02.2021. PP submitted that following past production detail:

Year	EC sanctioned capacity (MTPA)	Actual production (MTPA)	(v) Excess production

2021-22	9.75	9.75	0
2022-23	9.75	9.75	0

6.5.3 Committee after deliberations noted the followings:

i. PP has submitted the para-wise reply of O.M. dated 11.04.2022 as follows:

Sl. No.	Para No.	Conditions as per OM	Compliance
1.	4(i)	The project should have gone through the public hearing process, at least once, for its existing EC capacity on which expansion is being sought, except those category of projects which have been exempted as per para 7 III (i) of EIA Notification 2006 and its amendments.	Present PK OC is amalgamation of 2 adjacent opencast mines viz., Manuguru OC II Expansion & Manuguru OC IV Extension for which public hearing were conducted individually. The details are given below: 1. MNG OC-II Exp.: • PH conducted on 28.08.2007 for a peak production capacity of 5.00 MTPA for which MoEF&CC granted EC on 31.07.2008. • Subsequently, EC was obtained for enhanced capacity of 6.25 MTPA on 21.02.2014 under 25% enhancement of existing EC capacity as per O.M. dated 19.12.2012. 2. MNG OC-IV Ext.: PH conducted on 25.07.2012 for a peak production capacity of 3.50 MTPA for which MoEF&CC granted EC on 10.12.2014. 3. PK OC: SCCL obtained EC for PK OC with a production of 9.75 MTPA (6.25+3.50) under 7(ii) on 12.02.2021.

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2.	4(ii)	There should not be change in Category of the project from 'B2' to 'B1' or 'A' due to proposed modernization or expansion.	There is no change in the project area i.e., 2402.40 ha and hence there is no change in category i.e., 'A'.
3.	4(iii)	There is no additional land acquisition or forest land diversion involved for the proposed expansion or there is no increase in lease area with regard to mining vis-a-vis the area mentioned in the EC, based on which public hearing has been held earlier.	The expansion in terms of production is proposed in the same project area for which EC has been granted earlier. There is no additional land requirement in the proposed expansion project.
4.	4(iv)	The proposed expansion shall not be more than 50% of production capacity as mentioned in the prior EC, issued on the basis of public hearing held and the same shall be allowed in minimum three phases.	The present proposal is for 50% increase in the previous EC sanctioned capacity i.e., from 9.75 MTPA to 12.75 MTPA within the same project area of 2402.40 ha.
5.	4(v)	Predicted environmental quality parameters arising out of proposed expansion/modernization shall be within the prescribed norms and the same shall be maintained as per prescribed norms.	Air quality impact prediction modelling has been done for the expansion capacity of 12.75 MTPA. All the predicted GLCs are within the prescribed norms. The details of predicted environmental quality parameters are furnished in Chapter-4 of EIA/EMP.
6.	4(vi)	The proposed expansion should not result in reduction in the greenbelt area as stipulated in the earlier EC, or if the existing ratio of greenbelt is more than 33%, after expansion it should not reduce below 33%.	There is no reduction in the greenbelt area due to the proposed expansion. The green belt area as per the existing EC as well as proposed expansion is 1516.199 ha at post closure stage, which is 63.1% of the total project area.
7.	4(vii)	The project proponent should have satisfactorily complied the conditions stipulated in the existing EC(s) and satisfactorily fulfilled all the commitments made during the earlier public hearing /	The conditions stipulated in the existing EC are being complied and all the commitments made

		consultation proceedings and also the commitments given while granting previous expansion, as may be applicable. This shall be duly recorded in the certified compliance report issued by the IRO/CPCB/SPCB, which should not be more than one-year-old at the time of submission of application.	during the earlier public hearing have been fulfilled. Director, MoEF&CC, Integrated Regional Office, Hyderabad inspected the project on 20th September, 2023 and issued latest Certified Compliance Report (CCR) on EC conditions.
8.	4(viii)	Public Consultation shall be undertaken if applicable by obtaining response in writing, as per para 7 III (ii) (b) of EIA Notification 2006, except those category of projects which have been exempted as per para 7 III (i) of EIA Notification 2006 and its amendments.	Revised EIA/EMP has been prepared for production enhancement up to 50% of existing EC as per O.M dated 30.05.2022. Public consultation will be undertaken by obtaining response in writing, as per para 7 III (ii) (b) of EIA Notification 2006 and the details will be furnished in the proposal while seeking EC for enhancing coal production from 40 to 50 percent.
9.	4(ix)	Effluent monitoring including air quality monitoring systems as specified in the existing EC, if stipulated, should have been installed.	Effluent monitoring and air quality monitoring is being carried out as specified in the EC. An online ambient air quality monitoring station was established at the core zone.
10.	5	Requirement of revised EIA/EMP report.	Prepared a revised EIA/EMP report for 50% enhancement in sanctioned EC capacity.
11.		Requirement of Certified Compliance Report.	Director, MoEF&CC, Sub-Office, Hyderabad inspected the project on 20th September, 2023 and issued latest Certified Compliance Report (CCR) of EC conditions.
12.		Requirement of fresh public consultation.	Not Applicable (The present proposal is seeking EC for 20% enhancement of coal production during Phase-1)

ii. PP has submitted an application to increase production capacity from 9.75 MTPA to 10.45 MTPA (Stage-I expansion upto 20% under O.M. dated 11.04.2022 for expansion up to 50%).

iii. PP has obtained EC for PK OC project on 12.02.2021 for production capacity of 9.75 MTPA in ML area of 2402.40 ha.

iv. Prakasham Khani Opencast (PK OC) Project formed by amalgamating Manuguru OC-II Expansion & Manuguru OC-IV Extension projects located near Manuguru Village & Mandal, Bhadradri Kothagudem District of Telangana State.

v. PP submitted the mining plan approved by company's board under clause 1.3(b) of guidelines dated 29.05.2020 for a capacity of 15 MTPA over an area of 2402.40 Ha.

vi. PP has obtained the permission for diversion of 2214.84 ha of forest land within the project boundary of PKOC Mine i.e. 2402.400 ha.

vii. PP has obtained the Ground Water Clearance vide its Letter No. 258/T/SCCL/2018-2 dated 18.05.2021 valid up to 17.05.2026.

viii. Baseline data has been collected during the period of March to May, 2023 in the Summer season for Air, Water, Soil, Noise and others.

ix. PP has submitted the revised EIA-EMP for expansion of Prakasham Khani Opencast Coal Mine with production capacity 12.75 MTPA in ML area of 2402.40 ha.

x. PP has taken pollution control measures such as installation of mist sprayers and fixed water sprinkling system for dust suppression.

xi. The project boundary is at a distance of 1.92 km from the ESZ of Kinnerasani Wildlife Sanctuary.

xii. Schedule I species - Indian peafowl, four horned antelopes, Indian monitor lizard & Gaur are found in the study area.

xiii. Wildlife conservation plan is under implementation for conservation of bio-diversity in the PKOC project with the funds of Rs. 241.885 Lakhs deposited in the year 2018 by SCCL.

xiv. PP has submitted the route of coal transportation from face to in-pit crusher by dumpers, in-pit crusher to KCHP by Conveyor and KCHP to customers by rail.

xv. PP also submitted an affidavit vide which inter-alia it has mentioned that there is no difference document submitted to the Ministry and presentation being made to EAC and there is no litigation on the project.

6.5.4 The EAC, after detailed deliberations observed that the instant proposal has been submitted under Ministry's OM dated 11th April, 2022 for expansion in capacity upto 20% with exemption in public hearing and without change in mine lease area under clause 7 (ii) of EIA, Notification, 2006. Earlier Ministry had issued EC on 12.02.2021 for capacity of 9.75 MTPA in the ML area of 2402.4 ha without PH as the EC was granted for amalgamation of two earlier granted ECs.

Committee observed that as Ministry's OM dated 11.04.2022 *"The proposed expansion shall not be more than 50% of production capacity as mentioned in the prior EC, issued on the basis of public hearing held and the same shall be allowed in minimum three phases."* It is clear from the aforesaid OM that expansion is dependent of capacity for which PH was done. In the instant case the capacity which can be extended based on PH in pursuant to OM is as follows:

Mines & EC details	PH Done	Max capacity with Stage –I (20%)	Max Capacity with Stage-II(40%)	Max Capacity with Stage III(50%)
Manuguru II OC-EC dated 31/07/2008	5 MTPA	6 MTPA	7 MTPA	7.5 MTPA
Manuguru IV OC-EC dated 10/12/2014	3.5 MTPA	4.2 MTPA	4.9 MTPA	6.3 MTPA
Total	8.5 MTPA	10.2 MTPA	11.9 MTPA	13.8 MTPA

PP is already operating the mines at 9.75 MTPA capacity and requested for increase in production capacity up to 10.45 MTPA but it is evident form the above that the maximum expansion at stage-1 (20%) that can be granted with exemption of PH in pursuant to OM dated 11/04/2022 comes out to be 10.2 MTPA. But for further expansion up to 40% there is no change in documentation as compared to 20% expansion except for submission of CCR with respect to previous expansion obtained. In the instant case PP has already obtained expansion of 25% for Manuguru II OC on 21.02.2014 in pursuant to OM dated 19/12/2012 and also submitted the CCR for the amalgamated EC. Further, as per OM dated 11/04/2022 max capacity that can be granted is 11.9 MTPA and the capacity sought by the PP is within the same. Therefore, the Committee agreed for expansion up to 10.45 MTPA as sought by PP but is of the view that further expansion if any PP sought then it should not be more than 11.9 MTPA.

The Committee reviewed the compliances of previous EC conditions as per the perquisite requirements/applicable conditions of OM. It was observed that partial conditions have been mentioned in IRO report for which PP has committed to comply fully within fixed timeline such as to provide training to persons of near villagers, grassing on the active OB dump, 1,50,000 nos. of trees to be planted and monitoring of effluent discharge.

Committee asked the PP to speed-up the process of the lease related work and submit the documents to IRO, MoEF&CC. Additional 1 nos. of CAAQMS to be installed within the ML area in consultation with concerned SPCB.

The EAC, after detailed deliberation on the submission/commitment of Project Proponent observed that PP has to strictly work as per timeline for compliance of EC conditions. Considering the commitment of PP and their seriousness to implement it, *EAC* ***recommended*** *the proposal for grant of Environment Clearance upto 20% (Stage I) to Expansion of Prakasham Khani Opencast Coal mine (Amalgamation of Manuguru OC II Expansion & Manuguru OC IV Extension) for increase in production capacity from 9.75 MTPA to 10.45 MTPA in the ML area of 2402.40 ha (2214.84 ha Forest Land and 187.56 ha non Forest Land) of M/s Singareni Collieries Company Limited located in Village & Mandal Manuguru, District Bhadradri Kothagudem (Telangana), under OM dated 11.04.2022, under the provisions of Environment Impact Assessment Notification, 2006 and subsequent amendments/circulars thereto subject to the compliance of the following specific conditions in addition to specific conditions already prescribed in EC dated 12.02.2021, and standard EC conditions for environmental safeguards:*

Specific condition: -

1) *PP to obtain the CTO for Opencast coalmine capacity of 10.45 MTPA after grant of EC.*

2) *PP shall get the mining lease amalgamated and submit then documents in this regard to IRO, MoEF&CC.*

3) *PP should install additional 1 nos. of CAAQMS within the ML area in consultation with concerned SPCB.*

4) *PP to address the issues of local public with sufficient budgetary provisions as a part of public hearing. The maintenance of all public hearing activities shall be covered through recurring cost, which will be part of CSR budget. Details shall be intimated to IRO*

5) *PP to install continuous ambient air quality monitoring stations at suitable locations preferably village side with consultation of SPCB. The real time data so generated shall be uploaded on company website and linked it with website of CPCB &SPCB. In addition, data should also be displayed digitally at entry and exit gate of mine lease area for public display.*

6) *PP to implement the activities proposed in EMP in a time bound manner. The budget earmarked for the same shall be kept in a separate account and audited annually. PP shall submit the implementation status with documentary proof and amount spent for the same to RO, MoEF&CC.*

7) *PP shall conduct feasibility studies for assessment of voids for backfilling of ash and mixing of ash with overburden, taking up backfilling ash and OB mixing activities during operations as well as post closure of mines in line with the Fly Ash Utilization Notification, 2021.*

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8) *PP shall conduct third party audit of compliance of EC condition at an interval six months and its report shall be submitted to IRO, MoEF&CC.*

9) *The green belt and plantation plan submitted in the EIA/EMP shall be implemented in a time bound manner. A survival rate of at least 80% shall be maintained by carrying out gap plantation in case of mortality. The budget earmarked for the plantation shall be kept in a separate account. PP should annually submit the audited statement of expenditure along with proof of activities viz. photographs (before & after with geolocation date & time), details of expert agency engaged, details of species planted, number of species planted, survival rate, density of plantation etc. to the Regional Office of MoEF&CC and on PARIVESH Portal as the case may be for the activities carried out during previous year. Third party monitoring of the plantation done shall be carried out through an institution of MoEFCC (e.g ICFRE)*

10) *PP shall ensure that all type of plastic waste generated from the mines shall be stored separately in isolated area and disposed of strictly adhering to the Plastic Waste Management Rules 2016. In pursuant to Ministry's OM dated 18/07/2022. PP shall also create awareness among the people working in the project area as well as in its surrounding area on the ban on Single Use Plastic(SUP) in order to ensure compliance of Ministry's Notification published by the Ministry on 12/08/2021. A report along with photograph on the measures taken shall also be included in the six monthly compliance report being submitted by PP.*

11) *Hon'ble Supreme Court in an Writ Petition(s) Civil No. 114/2014, Common Cause vs Union of India &Ors vide its judgement dated 8th January, 2020 has directed the Union of India to impose a condition in the mining lease and a similar condition in the environmental clearance and the mining plan to the effect that the mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. Compliance of this condition after the mining activity is over at the cost of the mining lease holders/Project Proponent". The implementation report of the above said condition shall be sent to the Regional Office of the MoEF&CC.*

12) *PP should collaborate with the recognized institute for facilitating the skill development program for the local villagers. PP shall keep the digital record of skill development programme wherein the details of the persons undergone skill development program needs to be provided. Further, details of benefit obtained viz. whether they are employed or not also needs to be monitored. Based on this data PP needs to modify its skill development programme so that maximum number of trainees get the employment. After skilling local persons, if possible PP shall engage them as per their qualifications.*

13) *PP shall complete the proposed belt conveyor installation as proposed during the meeting.*

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14) PP shall strengthen the existing Environment Management division of the unit under intimation to the IRO

Agenda No. 6.6

Barsingsar Opencast Lignite mine of capacity 2.1 MTPA in mine lease area of 971 ha by Neyveli Lignite Corporation Limited located at village Barsingsar, District Bikaner (Rajasthan) - For Environmental Clearance as per SoP dated 07.07.2021 (read with OM dated 28th January, 2022) for violation category – reg.

[Online Proposal No. IA/RJ/CMIN/456905/2023; File No. IA-J-11015/28/2020-IA-II(M)]

6.6.1 The proposal is for Environmental Clearance for Barsingsar Opencast Lignite mine of capacity 2.1 MTPA in mine lease area of 971 ha by M/s Neyveli Lignite Corporation Limited located at village Barsingsar, District Bikaner (Rajasthan).

6.6.2 Details of the proposal, as ascertained from the proposal documents and as revealed from the discussions held during the meeting are given as under:

6.6.2.1: Location of Project:

(i) The project area is covered under Survey of India Topo Sheet No 45 E/1,45 E/2, 45 E/5,45 E/6 and is bounded by the geographical coordinates ranging from **Latitude:** $27^0$48'23" N - $27^0$50'40" N and **Longitude**: $73^0$11'34" E - $73^0$13'54" E.

(ii) Coal linkage of Barsingsar Mine project is for 2 X 125 MW Thermal power plant of NLCIL at Barsingsar, District Bikaner, Rajasthan.

(iii) Barsingsar Opencast Mine project does not fall in the Critically Polluted Area (CPA).

6.6.2.2: Category of Project:

The project falls under Schedule 1(a) of mining and is a Category - "A" project as per EIA notification 14th September 2006 as the mining lease area is more than 500 Ha i.e 971 Ha. PP applied for EC in pursuant to MoEF&CC SOP to deal with violation cases vide OM. F.No.22-21/2020-IA.III dated 07.07.2021 as the PP did not applied for revalidated of EC granted under EIA 1994, in pursuant to Ministry's Notification dated 6.04.2018.

6.6.2.3: Previous Approvals:

The Environment Clearance (EC) for the Barsingsar project was issued to M/s Hindustan Vidyut Corporation Limited (HVCL) on 03.06.1998 and later it was transferred to M/s NLC India Limited (NLCIL) vide Lr.No. J-15012/23/97- IA. II(M) dated 20.12.2002.

TOR under Violation has been issued by MoEF&CC vide letter reference No. IA-J-11015/23/97-IA-II(M) dated 9th June 2022. Again, the amendment to the above TOR was issued vide letter No. IA-J-

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11015/28/2020-IA-II(M) dated 15th November2022 for exemption of public hearing and to invite suggestions/objections as part of public consultation for the project.

6.6.2.4: Change in Consultant:

NLC India Limited (NLCIL) had taken the services of NABET accredited EIA Consultant M/s Vimta Labs Limited (VLL), Hyderabad to prepare EIA/EMP report. However, due to some unavoidable circumstances, NLCIL has changed the consultant and entrusted the assignment to M/s GRC-India (P) Ltd to complete the EIA-EMP report vide letter dated 27.04.2023.

6.6.2.4: Mining Lease:

The mining lease for an area of 971 ha was granted by Govt. of Rajasthan vide order No.Pa.17(55)/Khan/Group-1/2004 dated 2nd March 2006. Mining activity in Barsingsar Lignite Mine Project (BLMP) commenced on 7th August, 2006 and commercial production of lignite commenced on 23rd November 2009.

6.6.2.5: Forest land & Protected Area: PP submitted that no forest land involved in the project and no Wildlife sanctuaries & National Park within 10km radius of the project. However, wildlife conservation plan for Schedule-I species for Chinkara is submitted to DCF, Bikaner on 21.09.2023 for approval.

6.6.2.5: Mining Plan:

Mining plan and progressive mine closure plan of Barsingsar lignite mine had already been approved by MoC vide letter dated 08.09.2004 and 31.03.2011, respectively. The latest Mining plan and Mine Closure Plan has been approved by MoC vide letter dated 21.04.2023.

6.6.2.6: Method of Mining:

(i) Gross geological reserves within the mining lease area are 77.94 MT. Net geological reserves are 72.10 MT out of which 17.63 MT reserves are blocked in NE and West pits. The existing mine is planned for the Barsingsar main pit only. West and NE blocks are not considered at present. However, option is kept open to mine these blocks in future. The mine is operated through an open-cast method using conventional mining equipment (CME) technology. Total extractable lignite reserves are 53 million tonnes and total overburden is 255.18 million cum. The rated capacity of the mine is 2.1 MTPA. As on 31.03.2023, 17.26 MT reserves are exhausted and balance reserves are 35.74 MT. Balance mine life is 26 years.

Presently, the project has 1 no's of external OB dump over an area of about 215 ha and the average height of the dump is about 45 m. So far, around 81.97 Mm^3 of OB stored in the external dump.

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Total quarry area 411 Ha out of which backfilling will be done in 288 while final mine void will be created in an area of 123 ha with a depth of 50 m. Backfilled quarry area of 288 ha shall be reclaimed with plantation.

Reclamation Plan in an area of 971 ha, comprising of 411 ha of excavation area and 56 ha of green belt. In addition to this, an area of 133 ha included in the safety zone area has also been proposed for green belt development.

(ii) **Land Use Details:**

Pre-mining land use details: (Area in Ha)

S. No.	Land Use	Within ML Area	Outside ML Area	Total
1.	Agricultural Land (Non-irrigated land)	896.24	--	896.24
2.	Forest Land	--	--	--
3.	Wasteland	--	--	--
4.	Grazing Land	--	--	--
5.	Surface Water Bodies	--	--	--
6.	Settlements	--	--	--
7.	Others (Specify) Government land	74.76	--	74.76
8.	Old Excavation Area (EastQuarry)	--	--	--
9.	Old Excavation Area (WestQuarry)	--	--	--
10.	Old OB Dumps	--	--	--
11.	Roads & Mine Infrastructure	--	--	--
12.	R & R Colony	--	--	--
13.	Staff Colony	--	--	--
14.	Green Belt	--	--	--
15.	Balance Area	--	--	--
	Total Project Area	971.00		971.00

Post Mining

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S.No.	Land use	Land use (ha)				
		Plantation	Water Body	Public Use	Undisturbed	Total
1	External OB Dump	215	-	-	-	215
2	Topsoil Dump	10	-	-	-	10
3	Excavation	288	123			411
4	Roads	5	-	-	-	5
5	Built-up Area	-	-	-	-	
6	Green Belt	56	-	-	-	56
7	Undisturbed Area	138	-	-	-	138
8	Safety Zone/ Rationalization Area	133	-	-	-	133
9	Diversion/ Below River/ Nala/Canal	-	-	-	-	
10	Water Body	-	-	-	-	
11	Staff Colony	-	-	-	-	
1	Garland drain/ Embankment	3	-	-	-	3
	Total Area	**848**	**123**			**971**

(iii) **Transportation of Mineral:**

Currently, transportation of lignite is carried out through covered belt conveyor system to the pit head thermal power plant.

6.6.2.7: Baseline Data: Baseline data generated from 1st March 2021 to 31st May 2021 and one-month additional data from 27th April to 27th May 2023.

Period	1st March 2021 to 31st May 2021
AAQ parameters at 9 locations (min. & Max.)	• PM_{10} = 31.5-94.5 µg/m^3 • $PM_{2.5}$ = 17.1-46.2 µg/m^3 • SO_2 = 10.1-21.3 µg/m^3 • NOx = 12.4-30.7 µg/m^3. • CO =246-547 µg/m^3.

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	• O_3 = 2.3-7.2 µg/m^3. • NH_3 < 20 µg/m^3.
Incremental GLCLevel	This is not an expansion proposal the baseline is for existingcapacity.
Ground Waterquality	No ground water source is present within 10km study area. illages are using supply water for domestic purpose.
Surface water	No sources of surface water observed within the study area during the study period.
Noise levels Leq(Day & Night) at 8Locations	The Leq values for day time was observed to be 41.9 to 68.8 dB (A). The Leq values for day time and night time was 39.4 to 57.3 dB (A).
Soil Quality	The soil sampling was carried out at 9 locations. Data computations for 9 sampling locations were carried out and summarized as under: Based on particle sizes distribution and texture, the soils are mostly sandy loam and sandy clay loam category. The pH value of the soil suspension varied from 7.48 to 7.92. In terms of soil pH, the characteristic of the soil is moderately alkaline pH in nature. The Electrical conductivity varied from 268 to 312 µS/cm. The sodium absorption ratio of soil varied from 0.55 to 0.64. The Cation exchange capacity varied from 12 to 13 meq/100 gm. The loss on ignition in terms of organic matter varied from 0.45 to 0.64%, The major nutrient such as Nitrogen, Phosphorus and Potassium level were varied from 152 kg/ha to 169 kg/ha., 18.6 to 20.5 kg/ha and 219 to 323 kg/ha respectively. The micronutrients such as copper, zinc, boron and iron are minimum and sufficient for plantation. Based on soil analysis data it is concluded that soils are moderately alkaline in nature at all sampling locations. The organic carbon status is medium (between 0.48 to 0.64%. The soils are also sufficient in Nitrogen (between 38 mg/kg to 43 mg/kg., and medium in phosphorus (between 6.3 to 6.9 mg/kg). However, for successful plantation and green belt development, sufficient quantity of organic

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	manure and the recommended doses of fertilizers should be added in appropriate quantity.
Water Requirement	Domestic Water Requirement: 7 KLD; Green Belt: 500 KLD Dust Suppression: 1200 KLD Total Water Requirement (Peak): 1707 KLD Source: Met from IGNP canal & Thermal Effluent

Baseline data was also validated with one-month additional data. PP submitted that ambient air quality parameters have been found within the standard prescribed limits as per NAAQS standard, 2009. Though the maximum values of PM10 and PM2.5 are approaching NAAQS, it has not crossed it. The high maximum value is due to the operations taking place within the lease area. Sources of pollution are the existing power plant as well as other industries and activities taking place in the study area and nearby. The emission sources during the initial phase of the project would be the emissions from various sources. Values of SO2, NO2 and CO are well within the NAAQS indicating that these are not emitted in high concentration. Other pollutants like Benzene, B(a)P, NH3, O3 and other Heavy Metals in dust are not very relevant to the project activities and are well within the NAAQS.

6.6.2.8: Public Hearing:

Amendment to the above TOR was issued vide letter No. IA-J-11015/28/2020-IA-II(M) dated 15th November2022 for exemption of public hearing and to invite suggestions/objections as part of public consultation for the project. The Draft EIA Report was submitted to Regional Office, RSPCB, Bikaner (Rajasthan) vide letter dated 16.06.2023 with request to initiate proceedings for public consultation. Accordingly, public notice for public written comments as per ToR amendment dated 15.11.2022 was published in two newspapers namely "The Times of India" and "Dainik Bhaskar" on 25.06.2023 in Regional language for information to the stakeholders to offer their Views/ Comments/ suggestions/ objections relevant to the project, addressing to the Regional Officer, RSPCB, Bikaner within 30 days of the publication of the notice. During the notice period, total 5 No. of representations were received from the stakeholders in Regional Office, RSPCB, Bikaner which were forwarded to M/s NLC India Ltd. vide letter dated 26.07.2023. Further, NLC India Limited vide its letter dated 14.08.2023 submitted point-wise comments on the received suggestions/objections to Regional Office, Rajasthan State Pollution Control Board, Bikaner.

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PP has submitted the concerns of Public consultation and their action plan during the EAC meeting. The concern raised by public includes i) Air pollution control measures, ii) CSR done by NLC India towards construction of road, drainage, road light, electricity in Barsingsar Village, iii) Employment for Villagers, iv) Upgradation of education for local villagers, v) Greenbelt development and arrangement of water for animal and birds, and vi) Preventive measure for ground water Quality.

6.6.2.9: EMP Cost: NLCIL, Barsingsar has proposed to spend a total of Rs. 537.30 Lakhs as capital towards environmental protection measures during balance mine life. The details of capital and recurring cost of EMP are as follows:

Sr No.	Summary of EMP	Cost of EMP (Rs. In Lakhs)	
		Total CapitalCost	**Recurring CostPer Annum**
A	Air environment	11.00	31.0
B	Water environment	18.30	2.62
C	Noise and ground vibration	0.00	0.88
D	Soil and waste dump management	96.0	0.50
E	Plantation & Green belt	412.00	407.00
	Total	537.30	442.00

6.6.2.10: Damage assessment: PP has prepared & submitted the damage assessment, remediation plan, natural and community resource augmentation plan and a detailed assessment has been carried out along with EMP budget as follows:

S. No.	Damage Description	Monetary Cost

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1.	As per CTO condition 33% of total land use for mining should be covered with plantation, which is 320.43 Ha. Considering the total initial mine life pericd of 30 years (till 2036 as per ML grant order dated 02.03.2006), on pro-rata of 10.68 Ha per annum plantation, till March 2022 there must have developed plantation in 170 ha. Till 31.03.2022 the PP has developed 138 Ha area of plantation, the difference in plantation, which is 32 Ha, will be taken for damage which includes Greenbelt plantation at Rs.150 per plant at 2000 trees per hectare density as per EC. The balance trees as per conceptual plan will be planted in upcoming years.	Total damage cost = 150*32*2000= Rs.0.96 Crores

6.6.3 Committee after deliberations noted the followings:

i. PP has obtained TOR under Violation category vide letter No. IA-J-11015/23/97-IA-II(M) dated 09.06.2022. Amendment of TOR was issued vide letter No. IA-J-11015/28/2020-IA-II(M) dated 15.11.2022 to invite suggestions/ objections as a part of public consultation instead of public hearing.

ii. PP has collected the Baseline data for period from March 2021 to May 2021 by M/s. Vimta Labs Limited (VLL), Hyderabad and additional one-month data was generated during 27.04.2023 to 27.05.2023 by GRC India Training and Analytical Laboratory (A Unit of GRC).

iii. PP has published in two newspapers namely "The Times of India" and "Dainik Bhaskar" on 25.06.2023 in Regional language for information to the stakeholders to offer their Views/ Comments/ suggestions/ objections relevant to the project. Proceeding from RSPCB was provide vide letter No. RPCB/RO/BKN/Tech/BM-731/782 dated 29.08.2023

iv. Final EIA-EMP has been prepared for capacity of 2.1 MTPA in ML area of 971 ha for Barsingsar Opencast Lignite Mine.

v. The proposal falls under violation category and committee considered the application as per SoP dated 07.07.2021 (read with OM dated 28th January, 2022) for violation category.

vi. The Hon'ble Supreme Court vide judgment dated the 7th February, 2018 in Special Leave to

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Appeal (Civil) No. 32138 of 2015 in the matter of Goa Foundation versus M/s Sesa Sterlite Ltd., & Ors. has reiterated that the validity of the Environmental Clearance for mining projects granted under the EIA Notification, 1994 shall be five years.

vii. Ministry's issued a Notification dated 6th April, 2018 applicable for mining project which were granted environmental clearance under the EIA Notification, 1994, but not obtained environmental clearance for expansion / modernisation / amendment are required to obtain environmental clearance under the EIA Notification, 2006. Ministry vide its notification gave a 6 months' window for revalidating such proposals however PP did not apply in that period thereby continuing mining operation without valid EC.

viii. Meanwhile SOP for handling violation cases was issued by Ministry on 7th July, 2021 and subsequently stayed by Madras High Court. Further, Ministry issued OM regarding 28th January, 2022 regarding Observation of Hon'ble Supreme Court with reference to the SOP. Further, as per the Ministry's OM dated 08.01.2024 *"The Hon'ble Supreme Court in W.P. (C) No. 1394/2023 titled Vanashakti vs. Union of India, has **stayed** the operation of both the Office Memoranda dated 7th July 2021 and dated 28th January 2022 issued by this Ministry".*

6.6.4 The Committee after deliberations, is of the view that the proposal is in pursuant to SoP dated 07.07.2021 for violation category and the same has already been stayed by Hon'ble Supreme Court in W.P. (C) No. 1394/2023 titled Vanashakti vs. Union of India, has **stayed** the operation of both the Office Memoranda dated 7th July 2021 and dated 28th January 2022 issued by this Ministry. *Therefore, Committee decided to **defer** the proposal and is of the view that proposal may only be considereded once the Ministry issues any further direction to deal with the violation proposals. Further, the Committee is of the view that in case, proposal is to be considered in future then PP should also provide the following information:*

1) PP should submit a year-wise production and development plan (tabular format) till the end of life of mine. Year wise backfilling plan in a tabular format needs to be submitted.

2) PP should submit the detailed plan in tabular format (year-wise for life of mine) for afforestation and green belt development in and around the mining lease. PP should submit the number of saplings to be planted, area to be covered under afforestation & green belt, location of plantation, target for survival rate and budget earmarked for the afforestation & green belt development. In addition to this PP should show on a surface plan (5-year interval for life of mine) of suitable scale the area to be covered under afforestation & green belt clearly mentioning the latitude and longitude of the area to be covered during each 5 years. The capital and recurring expenditure to be incurred needs to be submitted. As the area is difficult for plantation the PP may take the assistance of any expert agency for plantation programme.

3) PP should clearly bring out the details of the manpower to be engaged for this project with their roles /responsibilities/designations. In addition to this PP should mention the number and

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designation of person to be engaged for implementation of environmental management plan (EMP). The capital and recurring expenditure to be incurred needs to be submitted.

4) *PP shall provide the budget already spent for addressing the issues raised during PH and also submit the budget earmarked for the issues raised by public through written comments in a tabular format along with timeline for implementation.*

5) *PP shall also explore the possibility of using EV/CNG based vehicle in place of diesel operated vehicle to reduce the specific diesel consumption.*

Agenda No. 6.7

Expansion of Jalagam Vengala Rao Opencast Mine (amalgamation of Jalagam I & II) with increase in production capacity from 10 MTPA to 12 MTPA with coal washery of 4 MTPA capacity in ML Area 1953.46 ha by M/s Singareni Collieries Company Limited at village Kommepalli near Sathupalli town, Sathupalli mandal, Khammam District, (Telangana) – Reconsideration for Environmental Clearance under Ministry's OM dated 11.04.2022 (Stage I - 20% expansion) – reg.

[Online Proposal No. IA/TG/CMIN/447089/2023; File No. J-11015/268/2007-IA-II(M)]

6.7.1 The proposal is for Environmental Clearance for Jalagam Vengala Rao Opencast Mine (amalgamation of Jalagam I & II) with increase in production capacity from 10 MTPA to 12 MTPA with coal washery of 4 MTPA capacity in ML Area 1953.46 ha by M/s Singareni Collieries Company Limited at village Kommepalli near Sathupalli town, Sathupalli mandal, Khammam District, (Telangana) under provisions of 7(ii) of EIA Notification, 2006 under OM dated 11.04.2022.

The project falls under Schedule 1(a) of mining and is a Category - "A" project as per EIA notification 14th September 2006 as the mining lease area is more than 500 Ha.

6.7.2 Details of the proposal, as ascertained from the proposal documents and as revealed from the discussions held during the meeting, are given as under:

6.7.2.1: Location:

(i) The project area is covered under Survey of India Topo Sheet No. 65C/16 and is bounded by the geographical coordinates ranging from Latitudes 17°09'54.59"N to 17°13'01.70"N and longitudes 80°45'43.38" E to 80°49'20.86"E.

(ii) Project does not fall in the Critically Polluted Area (CPA), where the MoEF&CC's vide its OM dated 13th January, 2010 has imposed moratorium on grant of environment clearance.

6.7.2.2: Mining Lease:

Sl No	Details	Area (Ha)

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1	JVR OCP-II granted vide G.O Ms. No 29 dated 3.11.2016	1300.69
2	JVR OCP-I granted vide G.O Ms. No 5 dated 21.02.2005	383.05
3	JVR OCP-I granted vide G.O Ms. No 115 dated 13.05.2008	136.50
Total-1		1820.24
4	LoI for non-coal bearing area	89.85
Grand Total		1910.09

6.7.2.3 Forest Area:

(i) PP reported that 1156.72 ha of forest land has been reported to be involved in the project. Approval under the Forest (Conservation) Act, 1980 for diversion of 1156.72 ha of forest land for non-forestry purposes has been obtained as per following details:

Sl No	**Details**	**Area (Ha)**
1	F.No. 8-129/2003-FC, dated 02nd February, 2005, (JVR OCP-I 244.02 ha)	244.02
2	F.No. 8- 56/2008-FC, dated 03rd July, 2012, (JVR OCP-I Expansion 136.50 ha)	136.50
3	F.No. 8-56/2014-FC, dated 30th May, 2017 , (JVR OC-II 776.20 ha)	776.20
Total		1156.72

6.7.2.4 Protected Area:

(i) No National Parks, Wildlife Sanctuaries and Eco-Sensitive Zones have been reported with 10 km boundary of the project.

(i) Wildlife conservation plan for Schedule-I species has been already obtained with an amount of Rs. 2.57 Crores from the Principal Chief Conservator of Forest (HoFF) and Chief Wild life Warden (FAC), TS and the funds were deposited with State Forest Dept. on 09-11-2021.

6.7.2.5: Previous Approvals:

Sl No	**Details**	**Area (Ha)**	**Capacity (MTPA)**

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1	JVR-I (expansion project 2.5 MTPA to 5.0 MTPA) granted under violation category vide letter dated 1.02.2021.	544.81	5
2	JVR-II vide letter dated 28.03.2010	1409.81	5
Total		1954.62	10
3	JVR (I & II) amalgamation and expansion EC dated 11.10.2021 and 4 MTPA coal washery within ML.	1953.46	10

6.7.2.5 Method of Mining & Mining Plan:

(i) Total project area is 1953.46 ha (1910.09 ha ML area and 43.37 ha colony). Mining Plan (Including Mine Closure Plan) has been approved by MoC Vide F.No PCA-38011/12/2017-PCA dated 29th March, 2019. PP submitted the mining plan approved by company's board under clause 1.3(b) of guidelines dated 29.05.2020 for a capacity of 15 MTPA over an area of 1910.09 Ha.

(ii) **Land use details of mine:** Theland usage pattern of the project is as follows:

Pre-mining Land use details (Area in ha)

Sl. No.	Land use	Within ML Area(ha)	Outside ML Area (ha)	Total (ha)
1.	Non-Forest Land			
	Agriculture	691.74	22.57	714.31
	Grazing	3.75	-	3.75
	Water Body	37.29	-	37.29
	Roads	12.24	-	12.24
	Villages	8.35	-	8.35
	Waste Land	-	20.80	20.8
	Sub-Total	753.37	43.37	796.74
2.	Forest Land	1156.72	-	1156.72
Total		1910.09	43.37	1953.46

Post Mining:

Post Closure Land use status is furnished hereunder: (Area in ha)

Sl. No.	Type	Total Area	Plantation	Water Body	Public / Company Use
1	Excavation/ Quarry Area:	1030.9	-	-	-

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	(a) Backfilled Area	531.75	531.75	-	-
	(b) Excavated Void	499.12		95.56	-
2	External Dump	507.05	507.05	-	-
3	Safety Zone /Rationalization area	177.69	162.69	-	15
4	Road& Infra-structure area	152.74	58.89	-	93.85
	(a) CHP & Coal Yard	22.33	22.33	-	-
	(b) Coal Washery	*13.03*	*1.13*	-	*11.9*
	(c) Road Diversion	*18.97*	*13.88*	-	*5.09*
	(d) Magazine	*6.94*	*1.45*	-	*5.49*
	(e) Railway Siding	*43.15*	*1.74*	-	*41.41*
	(f) Mine Service Facilities	*48.32*	*18.36*	-	*29.96*
5	Garland Drains, Settling Ponds	26.78	13.52	13.26	-
6	Embankment	14.96	14.96	-	-
7	Water Reservoir near pit/ Water Body	-	-	403.56	-
Outside ML area					
8	Colony/township	43.37	-	-	43.37
	GRAND TOTAL	**1953.46**	**1288.86**	**512.4**	**152.22**

(iii) Total geological reserves reported in the mine lease area are 309.55 MT with 291.97 MT extractable reserves. Percent of extraction is 94.32%. Balance extractable reserves are 206.79 MT as on 31th March, 2023.

(iv) 6 seams with thickness ranging from 0.05 m – 15.20 m are workable. grade of the coal is G-9 to G-12, stripping ratio 4.12 Cum of OB per 1 tonne of coal, while gradient is 1 in 1.25 to 1 in 11.

(v) Method of mining operations envisages by opencast method.

(vi) Life of mine is 23 years from 2023-24.

(vii) The project has one external OB dumps in an area of 507.05 ha with 120 m height above ground level and 374.61 Mm3 of OB. Internal OB dump in an area of 531.75 ha with 827.72 Mm3 of OB is envisaged in the project.

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(viii) Total quarry area is 1030.87 ha out of which backfilling will be done in 531.75 ha while final mine void will be created in 499.12 ha (121.24 ha in East Side and 377.88 ha in South Side) with a max. depth of 363.45 m (146 m in East Side & 363.45 m in South Side) will be converted in to water body. Backfilled quarry area of 531.75 ha shall be reclaimed with plantation. Final mine voids will be converted into water body.

(ix) Reclamation Plan in an area of 1288.86 ha, comprising of 507.05 ha of external dump, 531.75 ha of internal dump and 162.29 ha of green belt. In addition to this, an area of 87.77 ha, included in the Infrastructure area etc has also been proposed for green belt development.

(x) **Transportation of Coal:** Transportation of coal has been proposed from quarry to pit head by Trucks/Dumpers, from surface to siding (Railway siding, Sathupalli) by belt conveyor) and from siding (Railway siding, Sathupalli) to customers by rail.

6.7.2.6 Baseline Data:

Environmental Baseline data was generated in the summer season from March to May, 2023 (Summer Season).

Air Quality	Ambient air quality data monitored in the core zone shows that PM10 concentrations varied from 94µg/m3 to 151µg/m3, the minimum concentration was observed at JVR OC Mine (I&II Expansion) PO Office (CA-1) and maximum concentration was observed at JVR OC Mine (I&II Expansion) BWS (CA-2). The PM2.5 concentrations were in the range of 31.8µg/m3 to 52.1µg/m3. The minimum concentration was observed at JVR OC Mine (I&II Expansion), PO Office (CA-1) and maximum concentration was observed at JVR OC (I&II Expansion), BWS (CA-2). The SO 2 and NO 2 concentration varies from 14.1µg/m3 to 17.7µg/m3 and 21.3µg/m3 to 27.4µg/m3 respectively. All the parameters were found to be within the coal mines standards. In buffer zone, the concentration of PM_{10} values varied from 45µg/m3 (Jaganthapuram village) to 69µg/m3 (Rejarla). The $PM_{2.5}$ concentration varied from 19.0µg/m3 (Jaganthapuram) to 28.7µg/m3 (Rejarla Village). The SO2 and NOx concentration had varied from 12µg/m3 (Pallewada) to 14.9µg/m3 (Vengalarao Nagar Village) and 17.4µg/m3 (Cherukupalli Village) to 22.5µg/m3 (Vengalarao Nagar) respectively. All the values were found to be within the prescribed limits as per National Ambient Air Quality Standards prescribed by MoEF&CC.

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	The incremental increase in the values was projected to be in the range of 1.25µg/m^3 to 5.58 µg/m^3 for PM_{10} and 0.47 µg/m^3 to 2.35µg/m^3 for $PM_{2.5}$ respectively. Whereas, for SO_2 it is in the range of 0.09µg/m^3 to 0.58µg/m^{3}and that of forNOx is 0.14µg/m^3 to 0.93µg/m^3. The value of Total GLC is for PM_{10} in the range of61.03 µg/m^3 to 129.58µg/m^3 and that of for $PM_{2.5}$ is 53.06 µg/m^3 to 23.92µg/m^3, whereas for SO_2 it is in the range of 13.76µg/m^3 to 17.87µg/m^3 and 20.29µg/m^3 to 27.68µg/m^3 for NOx respectively. PP submitted that predicted total GLCs at all locations in respect of PM_{10}& $PM_{2.5}$, SOx & NOx are within the prescribed limits after expansion of mining operations in the project.
Surface Water	Surface water Monitoring was done at 5 locations. The result indicates that the pH value in the range of 7.2 to 7.9 and its turbidity value is 0.07 to 10.9 NTU, dissolved oxygen in the range of 5.6 to 6.5 mg/l, dissolved solids ranged 242 to 956 mg/l, Surface water samples have Coliforms ranges between 94 to 240 MPN/100ml and contaminated due to surface runoff entering these sources. The analysis results of surface water samples from all the sampling locations shows that the water quality conforms to Class–B (Outdoor bathing (Organized) Criteria.
Ground Water	pH values are in the range between 6.7 to 7.3 in the groundwater samples collected within the study area. TDS concentrations are in the range of 510 - 1262 mg/L, are above the acceptable limit of 500mg/L but within the permissible limit of 2000mg/L at all locations. Calcium concentration is observed to be within the acceptable limit of 75mg/L at all the locations except at Pallewada GW-4 where the value (158mg/L) is above the acceptable limit but within the permissible limit of 200mg/L. Magnesium concentrations are observed to be above the acceptable limit of 30mg/L but within the permissible limit of 100mg/L at all locations (40, 37, 78, 95, 57mg/L). Chloride concentration is observed to be within the acceptable limit at all the locations except at Pallewada GW-4 where the value (366mg/L) is above the acceptable limit of 250mg/L but within the permissible limit of 1000mg/L. Fluorides concentrations are observed 0.34 to 0.81 mg/L which is well within the acceptable limit (1.0 mg/L) at all the locations. Sulphates,

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	Nitrates & Iron concentrations were observed to be within the acceptable limit at all locations. The total alkalinity concentration(175mg/L) at Vengal Rao Nagar GW-1 is within the acceptable limit of 200mg/L and that of remaining samples are above the acceptable limit but within the permissible limit of 600mg/L. Total hardness concentration is observed to be above the acceptable limit but well within the permissible limit of 600mg/L. The concentrations of heavy metals Cadmium (Cd), Copper (Cu), Lead (Pb), Arsenic (as As), Chromium (Cr), were either below the detection limits or below the permissible limits. The ground water quality in the study area of the project indicates that the water can be used for drinking purposes in the absence of any alternate sources of supply.
Noise Quality	In core zone maximum value of Leq Day is 60.7 dB(A) at JVR OC Mine (I&II Expansion), BWS (CN-2), and minimum is 55.4 dB(A) at JVR OC Mine (I&II Expansion). PO Office (CN-1) and maximum value of Leq Night is 42.4 dB(A) at JVR OC Mine (I&II Expansion), BWS (CN-2), and minimum is 38.3 dB(A) at JVR OC Mine (I&II Expansion), PO Office (CN-1). In buffer zone maximum value of Leq Day is 51.9 dB(A) at Kistaram Village (BN-3), and minimum is 49.2 dB(A) at Pallewada village (BN-8) and maximum value of Leq Night is 40.1 dB(A) at Sathupalli Town (BN-2), and minimum is 36.7 dB(A) at Vengalarao nagar (BN-1). It is observed that the noise levels in terms of Day Leq and Night Leq are well within the stipulated standards at all the locations in core and buffer zone. The traffic and commercial activities are causing the increased noise levels.
Water Requirement	Total water requirement for the project is 2410 KLD. • Dust suppression: 2200 KLD • Domestic use: 90 KLD • Plantation & Others: 40 KLD • HEMM Washing: 80 KLD

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	PP submitted that Ground Water Clearance was obtained vide Lr. No. 2182/HgI/2008, dated 05th May, 2021and is valid for five years.

6.7.2.7 Public Hearing:

Public hearing for the existing project of 10 MTPA capacity in an area of 1953.46 ha was conducted on 14th February, 2020 at JVR Government college, Sathupalli, Major issues raised in the public hearing include development of surrounding areas, infrastructure facilities employment of local, compensations for land, education and health, effects of air, noise, water, and road repairs etc. PP also submitted the summary of issues raised during Public Hearing existing JVR OC Mine (I&II Expansion) project of 10 MTPA and action taken for the same.

6.7.2.8 Past production details:

PP reported that the project does not involve violation of the EIA Notification, 2006 and amendment issued there under. The last EC was granted on 11.10.2021 and PP submitted the coal production from the mine from 2021-22 onwards, is as under:

Year	EC Sanction capacity (MTPA)	Actual Production (MTPA)	Excess Production beyond the EC
2021-22	10.00	07.35	0
2022-23	10.00	10.00	0

6.7.2.9 EMP Cost:

Environment Management Cost is Rs. 13.36 crore and recurring cost is 8.86 /tone

6.7.2.10 Others:

(i) The project does not involve project affected families. No R&R involved.

(ii) Joint venture cartel has been formed - Not Applicable.

(iii) Consent to Operate for the existing capacity was obtained from the State PCB on 13th April, 2022 and is valid till 31st October, 2026.

(iv) No River/nalla is flowing within the boundary of lease.

(v) Total cost of the project is Rs. 47322 lakhs. Cost of production is Rs. 1225.97/- per ton, CSR cost is 2% of average net profits of the company made during last three years at company level, R&R cost is Nil.

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6.7.3 Committee after deliberation noted the followings:

(i) Earlier the proposal was considered in the 3rd EAC meeting held during 16-17 November, 2023 wherein the committee deferred the proposal for want of requisite information. PP submitted the reply on Parivesh portal vide letter dated 30.12.2023 and the proposal is now placed in EAC meeting held during 17-18 January, 2024. The information provided by PP is as follows:

Sl.No.	Observation of EAC	Reply by PP
1.	PP should submit the certified compliance report after completing 90% of the EC conditions along with compliance of Remediation plan, Natural Resource Augmentation plan and Community Resource Augmentation plan. Also, status of construction of school and hospital and its operational shall be submitted.	• Director, Sub-Office, MoEF&CC, Hyderabad inspected the mine on 20.09.2023 and issued Certified Compliance Report on 20.10.2023. • 90% of Remediation plan, Natural Resource Augmentation Plan and Community Resource Augmentation Plan activities have been completed. • Director, Sub-Office, MoEF&CC, Hyderabad issued CCR certifying that all RP&NCRAP works are in progress as per schedule.
2.	PP shall submit the status of pending court cases as well as disposed of cases from any court (Civil court, High court and Supreme Court)/NGT.	• Two cases were admitted by NGT, Southern Bench, Chennai. 1. Case No. O.A. 174 of 2020 (SZ), dt: 08.09.2020 - Sri Banothu Nandu Nayak, R/o Sathupalli filed a case in NGT alleging environmental violations and damage caused to houses by SCCL in operation of JVR Opencast mines. 2. Case No. O.A.No.20 of 2021(SZ), dt: 27.01.2021 - Sri Oggu Srinivasa Reddy, R/o Sathupalli and another filed a case in NGT in regard to violation of environmental conditions by SCCL in operation of JVR OCP-II. Common judgment: • Hon'ble NGT through a common judgment dated 06.05.2022 directed SCCL to pay a compensation of Rs.41.21Crores [i.e. Rs.58.86 Crores (10% of the profit) - Rs.17.65 Crores (3% of the profit) which was directed to be adjusted towards the remediation plan] within a period of 3 months with the Telangana State

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		Pollution Control Board along with other directions to comply by SCCL. • SCCL approached Hon'ble Supreme Court regarding the common judgment and the apex court while granting stay order directed SCCL to deposit 50% of amount as imposed by Hon'ble NGT. SCCL deposited 50% of the amount with the Tribunal. The case is presently pending with the Hon'ble Supreme Court.
3.	PP shall submit the technical justification for not implementing the conditions of surface miner and plantation of sal trees with its nursery. Further, difference of emission and impact due to shovel dumper and surface miners should be provided.	(a) Justification for not implementing surface miner: • The geological structure of JVR OC Block is in the form of a syncline which facilitatesquarry opening from all the 3 sides along the syncline where the seams in crop. The gradient of coal seams varies from 1 in 1.25 to 1 in 11. At the in crop area of the block it is very steep and gradually flattens as the depth of workings increase. • Till date, the quarry is being operated in the steep gradient areas (1 in 3 to 1 in 4) which are not amenable for deploying Surface Miner. • As the land acquisition including diversion of state highway along south-east direction was completed recently, the coal bearing area which is flatter (up to 1 in 5) is now exposed and hence, is favourable for deploying surface miner. As such, it is now proposed to deploy the Surface Miners in this area.
4.	PP shall submit the status of mine closure activity w.r.t. area of already reclaimed (biologically) and proposed area to be completed in 2-3 years.	• All the Mine closure activities are being carried out as per the approved Mining Plan and Mine Closure Plan. Till date area reclaimed is about 223.70 ha against the 164.54 ha as per approved EMP. • In addition to 223.70 ha of plantation within the project area about 132.00 ha plantation was done in outside project area beyond mandate. • It is proposed to reclaim about 377.30 ha (90.00 ha over back filled area, 200.60 ha over

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		external dump, 69.00 ha in safety zone and 11.00 ha avenue plantation) in the next 3 years.
5.	PP to submit the details related to the existing mechanized transportation route and preparedness for transporting 12 MTPA of coal.	• A Railway line from Bhadrachalam Road to Sathupalli town up to JVR OCP railway siding for a length of 54.10 km is completed by 28.05.2022 in collaboration with South Central Railway with a cost of Rs.927.94 Crores (SCCL share: Rs.618.55 Cr and Railway share:Rs.309.39 Cr) for transportation of coal by rail mode from the project. • A modern CHP with two nos. of Rapid Loading System (5500-6000 tph) and high-capacity conveyors (up to 3000 tph) from pit head up to Silos (2 Silos of each 1000t capacity) along with over ground bunkerage of 24,000 tonnes storage capacity is also established and commissioned on 28.05.2022 which can handle up to 15 MTPA. • The existing JVROC CHP with two nos. of Rapid Loading System (Silos) and high-capacity conveyors can handle up to 15 MTPA of coal comfortably.
6.	PP shall submit the Approved Mine Plan document for its proposed capacity after its approval from its Board, considering the justification of OM issued by Ministry of Coal.	The Mining plan for the proposed peak capacity of 15.00 MTPA has been approved by the Board of Directors in the meeting held on 04.11.2023 vide minute No. 568:5:14.
7.	PP should install CAAQMS on urgent basis in consultation with state pollution control Board and share their online data with the CPCB/SPCB.	• One Continuous Ambient Air Quality Monitoring Station (CAAQMS) is installed in the core zone of the project in consultation with State Pollution Control Board and connected to TSPCB portal online. • 10 No.s of ambient air quality stations were established in core zone (2 No.s) and buffer zone (8 No.s) of the project as part of post project environment monitoring. • As per EAC advise, order for procurement and installation of another CAAQMS in the buffer zone is placed and will be installed shortly in

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		consultation with State Pollution Control Board.
8.	PP should submit existing status of plantation along with the plantation proposed in the upcoming year considering native species only.	• Till date plantation was carried out in about 223.70 ha against the 164.54 ha as per approved EMP. In addition to 223.70 ha of plantation within the project area about 132.00 ha plantation was done in outside project area beyond mandate. • The stage wise plantation details are furnished below: Plantation is being carried out with the following native species: *Hardwikia binata, Dendrocalamus strictus, Ficus religiosa, Pterocarpus santalinus, Azadirachta indica, Limonia acidissima, Ficus bengalensis, Aegle marmelos, Mitragyna parvifolia, Dalbergia latifolia, Pterocarpus marsupium, Syzygium cumini, Albizzia procera, Terminalia bellarica, Pongamia pinnata, Madhuka indica, Tamarindus indica, Pithecelobium dulci, Sterculia urens, Dalbergia sissoo, Bombax ceiba, Albizzia lebbek.*
9.	PP should submit plan to strengthen the Environmental cell with qualification having environment engineer's/science degree and by developing dedicated environment laboratory at with certain timeline.	• SCCL has a full-fledged Environment Cell, led by General Manager (Environment) who directly reports to the Director of the company. • Corporate Environment Department functioning under the GM (Environment) is having officers with environmental degrees. • Further there are 11 administrative Areas under the control of Area General Managers who will be guided by GM (Environment) related to environmental protection and other compliance conditions. In each Area, environment cell is functioning with an environment officer having environmental degrees. • In addition, qualified environmental officers in each Project are also working for fulfilling the necessary statutory compliance. In each operational area, an Environment Management Committee (EMC) has been constituted with multi-disciplinary team. This committee is chaired by Senior officer of the area

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		(SO to GM) to protect and guide in implementation of the environmental safeguards.
10.	PP should submit the status upon the implementation of M-sand plant with the ML area.	• In compliance to the EC condition of JVR Coal Mine (I&II Exp.) project, an M-sand plant has been established on a pilot scale in Medapalli open cast project (MOCP) of SCCL. • Plant Details: Capacity: 3,000 cu.m per day. • After commercial success of the existing M-sand plant, SCCL will revise the existing Mining Plan of JVR Coal Mine (I&II Exp.) and establish M-sand plant within the project area.
11.	PP should survey to assess the number of house damaged due to blasting within & in the radius of 1km from periphery of ML boundary and its remediation plan.	• The criteria for vibration standards, peak particle velocity (PPV) has been globally used in practice for assessment of blast induced damage to structures. DGMS technical circular 7 of 1997 is considered as vibration standard for the safety of surface structures in mining areas. • Blast induced ground vibration are monitored regularly and found less than 5 PPV well within the stipulated standards of 10 PPV. Blasting operations within 500 m up to 125 m from habitation were carried out as per the blasting permissions obtained from DGMS. • Controlled blasting techniques are also being followed to reduce the blast induced ground vibrations while blasting near to habitation. • There was no damage observed to the houses within 1 km from the periphery of the mine boundary. However, on humanity grounds, SCCL renovated the old houses (249) in the periphery of the project in NTR colony, Vengalrao Nagar, Rejarla village (BC colony), Kistaram (SC & BC colony) with an expenditure of Rs.2.04 Crores.
12.	PP should submit the CCO certified past production detail before	Certification has been obtained from the CCO for the past production details before and after

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	amalgamating mine and after amalgamation.	amalgamation of the mine. A copy of the same is furnished.
13.	PP shall submit the compliance of issues raised during earlier Public Hearings for violation EC and amalgamated EC and expenditures incurred.	PP has enclosed the information with the issues raised along with their corrective measures.
14.	PP shall submit the plan of filling the mine void up to the level of ground (if technically feasible) and accordingly Mine plan shall be submitted.	• As per the approved Mining Plan and Mine Closure Plan by MoC, GoI, o Total quarry area of the project is 1030.87 ha out of which backfilling will be done in 531.75 ha. o Final mine void with water body will be created in 499.12 ha with a max. depth of 363.45 m. o Backfilled quarry area of 531.75 ha shall be reclaimed with plantation. • Filling the mine void up to the ground level requires the following: o Back filling of 499.12 ha of final void up to ground level requires about 885.23 Mm3 of over burden which needs to be re-handled from already reclaimed OB dumps. o About 995.75 ha of plantation over the dump area (488.70 ha - Internal dump above GL & 507.05 ha - External Dump) is to be disturbed for back filling 885.23 Mm3 in the final void. o Apart from disturbing the fully reclaimed area, the emissions liberated due to re-handling of OB for back filling will further pollute.

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		○ Filling of 885.23 Mm3 of void requires about Rs. 13,604.21 Cr (@ Rs.153.68 per m^3) which is economically not feasible. ○ Due to the above mentioned reasons, it is not environmentally and economically feasible for filling of void up to ground level. ○ However, as per the standard condition being stipulated in the ECs, engineering interventions will be implemented for sustenance of aquatic life in the final mine void.
15.	PP shall submit plan for third party monitoring of planting preferably through an institution of MoEF&CC (ICFRE etc).	• CSIR-NEERI, Nagpur has conducted the third party audit of EC compliance including plantation during June-July' 2023. However, as advised, third party monitoring of planting will be again carried out by ICFRE within 2 years.

(ii) PP had obtained the EC vide Ministry's letter No. J-11015/268/2007-IA. II (M) dated 11.10.2021 for 10.00 MTPA in ML area of 1953.46 ha (1910.09 ha of lease area and 43.37 ha of colony).

(iii) PP submitted the mining plan approved by company's board under clause 1.3(b) of guidelines dated 29.05.2020 for a capacity of 15 MTPA over an area of 1910.09 Ha.

(iv) Life of mine is 23 years from 2023-24.

(v) Diversion of 1156.72 ha of forest land has been obtained vide MoEF&CC letter Nos. F. No. 8-129/2003-FC, dated 02.02.2005 (JVR OCP-I 244.02 ha), F. No. 8- 56/2008-FC, dated 03.07.2012 (JVR OCP-I Expansion 136.50 ha) & F. No. 8-56/2014-FC, dated 30.05.2017 (JVR OC-II 776.20 ha).

(vi) No National Parks, Wildlife Sanctuaries and Eco-Sensitive Zones have been reported within 10 km boundary of the project.

(vii) Wildlife conservation plan for schedule I species has been obtained from the Principal Chief Conservator of Forest (HoFF) and Chief Wild life Warden (FAC), TS and the funds deposited with State Forest Dept. on 09-11-2021.

(viii) PP has obtained the Ground Water Clearance vide letter no. 2182/HgI/2008, dated 05.05.2021 and is valid for five years.

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(ix) Public hearing was conducted on 14.02.2020 for capacity of 10 MTPA for the project area of 1953.46 ha including ML area of 1910.09 Ha.

(x) Consent to Operate for the existing capacity was obtained from the State PCB on 13.04.2022 and is valid till 331.10.2026.

(xi) One court case pending before the Hon'ble Supreme Court in which while granting stay directed to pay 50% of amount imposed by the National Green Tribunal, Southern Bench, Chennai in following court case:

1. Case No. O.A. 174 of 2020 (SZ), dated 08.09.2020 - Basing on a complaint received from Sri Banothu Nandu Nayak, R/o Sathupalli in regard to environmental violations and damage caused to houses by SCCL in operation of JVR Opencast mines.
2. Case No. O.A.No.20 of 2021(SZ), dated 27.01.2021 - Basing on a complaint received from Sri Oggu Srinivasa Reddy, R/o Sathupalli and another in regard to violation of environmental conditions by SCCL in operation of JVR OCP-II.

(xii) PP has submitted the compliance as per OM dated 11.04.2022 w.r.t expansion under 7 (ii) (a) Stage I (20%) for Jalagam Vengala Rao Opencast Mine Project within the same mine lease area of M/s Singareni Collieries Company Limited:

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Sl.No.	Criteria as Per OM dated 11.04.2022	Reply
1.	The project have gone through the public hearing process, at least once, for its existing EC capacity on which expansion is being sought, except those categories of projects which have been exempted as per para 7 II (i) of EIA Notification 2006 and its amendments.	Public Hearing was held on 14th February, 2020. MoEF&CC granted EC for a capacity of 10.00 MTPA in ML area of 1953.46 ha on 11th October, 2021.
2.	There should not change in Category of the project from "B2" to "B1" or 'A' due to proposed modernization or expansion.	No change in category. Category 'A'.
3.	There is no additional land acquisition or forestland diversion involved for the proposed expansion or there is no increase in lease area with regard to mining vis-a.-vis the area mentioned in the EC, based on which public hearing has been held earlier.	There is no additional land requirement for the proposed expansion as there is no increase in project area.

4.	The proposed expansion shall not be more than 50% of production capacity as mentioned in the prior EC, issued on the basis of public hearing held and the same shall be allowed in minimum three phases.	Proposal is for 20% production enhancement (1st Phase) over the production capacity mentioned in the prior EC, issued on the basis of public hearing held.
5.	Predicted Environmental quality parameters arising out of proposed expansion / modernization shall be within the prescribed norms and the same shall be maintained as per Prescribed norms.	Air quality impact prediction modelling is done for 50% expansion i.e., from 10.00 MTPA to 15.00 MTPA. All the predicted values are within the prescribed norms.
6.	The proposed expansion should not result in reduction in the greenbelt area as stipulated in the earlier EC, or if the existing ratio of greenbelt is more than 33%, after expansion it should not reduce below 33%.	There is no reduction in the greenbelt area due to the proposed expansion. The green belt area as per the existing EC as well as proposed expansion is 1288.86 ha at post closure stage, which is about 67.5% of the total project area.
7.	The project proponent should have satisfactorily complied the conditions stipulated in the existing EC(s) and satisfactorily fulfilled all the commitments made during the earlier public hearing/ consultation proceedings and also the commitments given while granting previous expansion, as may be applicable. This shall be duly recorded in the certified compliance report issued by the IRO/CPCB/SPCB, which should not be more than one year old at the time of submission of application	Director, MoEF&CC, I.R.O., Hyderabad inspected the project on 20th September, 2023 and issued latest certified EC compliance report. The conditions of existing EC are being complied and the commitments of earlier public hearing are being fulfilled.
8.	Public Consultation shall be undertaken [if applicable as per table below] by obtaining response in writing, as per para 7 III (ii) (b) of EIA Notification 2006, except those categories of projects which have been exempted as per para 7 III (i) of EIA Notification 2006 and its amendments.	The proposal is for 20% increase of production capacity only. Public consultation will be undertaken at the time of expansion proposal from 40% to 50%
9.	Effluent & ambient monitoring including air quality monitoring systems as specified in the existing EC, if stipulated, should have been installed.	Effluent monitoring and air quality monitoring is being carried out as specified in the EC. An online ambient

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		air quality monitoring station was established at the core zone.

6.7.4 The EAC after detailed deliberations observed that the instant proposal has been applied under Ministry's OM dated 11th April, 2022 for expansion in capacity upto 20% with exemption in public hearing under clause 7 (ii)(a) of EIA, Notification, 2006. Earlier Ministry had issued EC on 11.10.2021and public hearing for the same was conducted on 14.02.2020.

The Committee observed that PP has proposed the project area as 1953.46 (1910.09 Ha within ML area and 43.37 Ha outside lease area for Colony/township). The Committee is of the view that EC may be considered for an area for which lease including LOI and mining plan is there i.e. 1910.09 Ha.

The Committee discussed certified compliance report submitted by sub-office Hyderabad of RO, Chennai vide letter dated 20.10.2023 and observed the conditions which are non-complied are mainly due to non-commissioning of the Coal Washery. PP submitted that once the Washery will be commissioned the conditions will be complied. The Committee observed that sub-office Hyderabad mentioned that i) PP should not plant Conocarpus spp, in green belt which is an exotic species, ii) PP may seek amendment in special condition (vi) as growing of SAL tree is not having favourable conditions at the project area, iii) A wildlife expert may be hired to monitor wildlife movement in the areas and also support SCCL in effective implementation of Wildlife Action Plan, iv) PP shall continuing to submit the six-month compliance through PARIVESH Portal only. In addition to this some partial compliance include i) PP has yet to complete construction of STP at Rudrampur Colony of Kothagudem, ii) PP has not created another water tank near Chilla vagu before removing Jeenugupalli tank in the project area, iii) PP has not provided the information related to on ground implementation of works and financial utilization, which may be sought from the Forest Department in the implementation of Wildlife Conservation plan, iv) PP has yet to construct 200 KLD STP at Sathupalli town. Therefore, the Committee emphasised on the compliance of these conditions.

The final mine void area recommended by PP seems to be large. Committee asked the PP to prepare the scientific reclamation plan in order to reduce the void area post mining. Another, CAAQMS to be installed in the buffer zone before July, 2024. Company environment management committee should conduct the monthly review meeting. Committee also asked the PP to expedite the process of getting mining lease amalgamated. PP shall explore the possibility of utilising the mine waste by setting up of M-sand plantand necessary permission required for the same.

Based on the above discussions held in the 6th EAC meeting held during 17-18 January,20224 , the EAC ***recommended*** *the Environmental Clearance under Ministry's OM dated 11.04.2022 for expansion of Jalagam Vengala Rao Opencast Mine (amalgamation of Jalagam I & II) with increase in production capacity from 10 MTPA to 12 MTPA with coal washery of 4 MTPA capacity in an area of 1910.09 Ha by M/s Singareni Collieries Company Limited at village Kommepalli near Sathupalli town, Sathupalli mandal, Khammam District, (Telangana) with the following specific conditions in addition to specific conditions already prescribed in EC dated 11.10.2021 and Standard EC conditions under the provisions of EIA Notification, 2006 and its amendments:*

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***Specific condition*: -**

1) *PP to obtain the CTO for Opencast coalmine capacity of 12 MTPA after grant of EC and for existing Coal washery of 4 MTPA capacity.*

2) *PP shall complete construction of STP at Rudrampur Colony of Kothagudem, and 200 KLD STP at Sathupalli town within a period of one year from the date of grant of expansion EC.*

3) *PP should create another water tank near Chilla vagu within in a period of one year from the date of grant of expansion EC.*

4) *PP to provide free of cost treatment in the Hospital to the locals living there within the periphery of 5km radius of the ML area. A log-book shall be maintained with the detail of doctors and patient's.*

5) *PP shall get the mining lease amalgamated and submit then documents in this regard to IRO, MoEF&CC.*

6) *PP should provide the school facility to below poverty students and same shall be kept in the company record.*

7) *PP should strengthen the Plantation within/outside the premise of Mine lease area and avoid to use species like Conocarpus spp, in green belt. Further, special condition (vi) of growing of SAL tree is amended to the extent that PP shall plant native species like Siris, Neem, Palasa, Amaltas, Shisham, Amla, Jamun, Mango, Arjun, Karanja, Bija, etc. will be planted along with other species in consultation with the forest department. As ensured by PP a survival rate of at least 80% shall be maintained by carrying out gap plantation in case of mortality. The budget earmarked for the plantation shall be kept in a separate account. Further, PP shall maintain atleast10 mtrs width tree plantation of broad leaves and wind break/greenshield of about 10 mts height along the boundary of coal storage yard. PP should annually submit the audited statement of expenditure along with proof of activities viz. photographs (before & after with geolocation date & time), details of expert agency engaged, details of species planted, number of species planted, survival rate, density of plantation etc. to the Regional Office of MoEF&CC and on PARIVESH Portal as the case may be for the activities carried out during previous year. Third party monitoring of the plantation done shall be carried out through an institution of MoEFCC (e.g ICFRE)*

8) *PP shall prepare the scientific reclamation plan in order to reduce the void area post mining.*

9) *PP should conduct the monthly review meeting with the environment management committee of the company.*

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10) PP shall ensure that all type of plastic waste generated from the mines shall be stored separately in isolated area and disposed of strictly adhering to the Plastic Waste Management Rules 2016. In pursuant to Ministry's OM dated 18/07/2022 PP shall also create awareness among the people working in the project area as well as in its surrounding area on the ban on Single Use Plastic(SUP) in order to ensure compliance of Ministry's Notification published by the Ministry on 12/08/2021. A report along with photograph on the measures taken shall also be included in the six monthly compliance report being submitted by PP.

11) All the mitigation measures committed / envisaged in the EIA/EMP report and subsequent submission shall be implemented. PP shall install one CAQMS in the buffer zone before July, 2024. PP should annually submit the audited statement along with proof of activities carried to the Regional Office of MoEF&CC and PARIVESH Portal as the case may be for the activities carried out during previous year.

12) PP shall implement Effluent Treatment Plant for wastewater generated from workshop and Sewage Treatment Plan for its colony. No untreated water shall be discharged from mine boundaries to ponds/nallah/river.

13) PP shall conduct feasibility studies for assessment of voids for backfilling of ash and mixing of ash with overburden, taking up backfilling ash and OB mixing activities during operations as well as post closure of mines in line with the Fly Ash Utilization Notification, 2021.

14) Hon'ble Supreme Court in an Writ Petition(s) Civil No. 114/2014, Common Cause vs Union of India &Ors vide its judgement dated 8th January, 2020 has directed the Union of India to impose a condition in the mining lease and a similar condition in the environmental clearance and the mining plan to the effect that the mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. Compliance of this condition after the mining activity is over at the cost of the mining lease holders/Project Proponent". The implementation report of the above said condition shall be sent to the Regional Office of the MoEF&CC.

Agenda no. 6.8

Himgir Coal Washery project for (5 MTPA) in an area of 13.52 ha. of M/s ACB (India) Limited located in Tehsil Hemgir, District Sundargarh, (Odisha) – Reconsideration for Amendment in Environmental Clearance dated 22.06.2009 – reg.

[Online proposal No. IA/OR/CMIN/298151/2023; File No. J-11015/925/2007-IA. II (M)]

6.8.1 The proposal is for amendment in EC dated 22.06.2009 for Himgir Coal Washery project for (5 MTPA) in an area of 13.52 ha. Of M/s ACB (India) Limited located in Tehsil Hemgir, District Sundargarh, (Odisha).

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PP vide proposal No IA/OR/CMIN/298151/2023 dated 2.03.2023 applied for amendment in specific condition of EC granted on 22.06.2009 and additional specific conditions prescribed vide letter dated 22.02.2022. The details of the same are as follows:

Sl. No.	Reference of Approved EC	Description as per Approved EC	Amendment Sought
1	Additional Specific Condition No. i	SPCB shall grant Consent to Operate of 2.5 MTPA for the aforesaid project	SPCB shall grant Consent to Operate of 5.0 MTPA for the aforesaid project
2	Additional Specific Condition No. iii	As committed, project proponent to install belt conveyor system to transport coal within 2 years from date of issue of this letter.	Project Proponent can transport washed coal from Washery to Kanika Railway Siding by road with covered trucks instead of belt conveyor system

The above proposal was considered in EAC meeting 42nd EAC meeting held on 5th April 2023 wherein Committee deferred the proposal for want of requisite information. PP submitted the information and the proposal was again considered in 46th EAC meeting held on 26-27 June,2023 wherein the Committee recommended the following amendments:

Sl. No.	Reference of Approved EC	Description as per Approved EC	Amendment Sought
1	Additional Specific Condition No. i	SPCB shall grant Consent to Operate of 2.5 MTPA for the aforesaid project	SPCB shall grant Consent to Operate of 4.0 MTPA for the aforesaid project for 3 years accordingly the SPCB shall issue CTO
2	Additional Specific Condition No. iii	As committed, project proponent to install belt conveyor system to transport coal within 2 years from date of issue of this letter.	Project Proponent can transport washed coal from Washery to Kanika Railway Siding by road with covered trucks for 3 years along with mechanisation of

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			transportation system shall be completed.

The above recommendation of EAC was examined in the Ministry and Ministry vide letter dated 8.11.2023 asked the PP to apply once the production reaches 2.5 MTPA. The PP on 12/12/2023 uploaded letter dated 11/12/2023 on Parivesh Portal and requested for enhancement in EC capacity from 2.5 MTPA to 5.0 MTPA. The grounds for amendment submitted by the PP is as follows:

(a) ACB (India) Limited, Hemgir washery has presently two work orders i.e. (i) 2.14 MTPA a/c Maharashtra State Mining Corporation Ltd (MSMC) and (ii) 1.50 MTPA a/c Kalkilspat Pvt. Ltd. ACBIL. Hemgir washery is already washing coal for MSMC against order of 2.14 MTPA and we are unable to commence work against Kalkilspat Pvt Limited since out of total permitted capacity of 2.50 MTPA, capacity of 2.14 MTPA is already booked a/c MSMC and balance capacity is not sufficient to take up the 1.50 MTPA order of Kalkilspat. (PP also submitted copies of said work orders.)

(b) In addition to above mentioned orders, some other customers such as Adani, Vedanta, Hindalco are also routing their coal through Hemgir siding/washery to the tune of —1.50 MTPA. They have shown their intent to wash entire coal, but due to unavailability of EC we are unable to take their order for washing of coal. It is worthwhile to bring your kind notice that 1.347 MT of coal has been dispatched from Hemgir washery/siding during current fiscal (up to Nov'23) averaging 1.68 lack per month. (PP also provided the details of monthly coal quantity handled by this Washery.)

(c) The quality of raw coal available in IB valley coal fields of MCL is generally of inferior quality, i.e. G-13/G-14 grade and is therefore unfit for consumption in Sponge Iron / cement / other units without washing. After enhancement of capacity as requested above, many plants may source their requirement of washed coal which will also reduce dependence on imported coal and result in savings in precious foreign exchange.

6.8.2 The above request of PP is now placed in 6th EAC Meeting held on 17-18 January, 2024 wherein the additionally requested the following:

AmendmentNo.01:SpecificConditionNo.(ii)

Specific Condition as per EC	Amendment Sought
SpecificConditionNo. (ii) "The Proponent shall establish a Closed Conveyor System within3 (three) years for transportation of Washed Coal between the Washery and the Railway Siding at Himgir and prior Forestry Clearance Shall be	"The companyshall transportWashedCoal betweenthe Washeryand RailwaySiding by Tarpaulin Covered Trucks through a shortest non interfering straight route of 1.860 Kms long Compacted Black Top Road straight from Washery Site to its own Rly Siding at Kanika, in

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Obtained under the Provisions of the FC Act, 1980".	Himgir Tehsil without any Turning and with provision of fixed water sprinklers at both the sides at 100 mtrs apart in a Zig Zag Pattern".

ReasonforAmendment:

1. On dated 27.01.2018 Tehsildar, Himgir, Sundergarh handed over the physical possession ofthe said forest land of 2.699 Ha to ACB (India) Limited after grant of Stage - 2 FC from the office of Conservator of Forest (Central), GOI, MOEFCC, Eastern Regional Office, Bhubaneswar.

2. Thereafter ACBIL has immediately started and completed compaction of Service Road of total length of 1.86 Kms straight from Washery to its own Rly Siding in Kanika having width of 16 Mtrs.

3. While working for preparing the said service road we have studied the field situations at present regarding transport of washed coal from Washery to Railway Siding in the contextof maximum protection of the surrounding environment from the dust pollution / fugitive emission by Closed Conveyor System *vis-a-vis* Road Transport and concluded that;

   i. At the time of grant of Environmental Clearance in the year 2009 the route proposed for washedcoal transport from Washery to Rly siding was through the existing Belpahar – Sundergarh PWD road which is passing adjacent to the Washery presently the dedicated Coal Corridor of M/s MCL.

   ii. As the said road was the main commuting road for public, the Esteemed EAC Committee had given decision for establishment of Closed Conveyor system for the purpose of Washed Coal transport from Washery to Rly siding. The best option in view of protection of Environment as well as the safety of the villagers.

   iii. After receiving the Environmental Clearance ACBIL had identified the best possible route to establish Closed Conveyor system for the washed coal transportation directly from its Washery to its own Rly siding, this is a straight route of 1.860 Kms length intersecting a patch of forest land covering 2.699 Ha of Forest Land instead along the main commuting road as demarcated in the Map.

   iv. After receiving the said 2.699 Ha of diverted forest land ACBIL has completed compaction of Service Road of total length of 1.86 Kms straight from Washery to its own Rly Siding in Kanika having width of 16 Mtrs.

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v. As the said route is straight from washery to Rly siding under control of ACBIL, and it is not a public road, there will not be any need for speed breaker. Thus there will not be any possibilities of spillage of coal en-route.

vi. In addition, all the vehicles will be completely covered with tarpaulin.

vii. Where as in Closed Conveyor System there will be some spillage over the service road from the coal carrying belt. The situation will be worse during any breakdown of the belt. That in turns will create again ground fugitive dust emission.

viii. Where as in Closed Conveyor System it is not completely covered. There is some possibilities of fine coal dust get emitted out in the atmosphereat a height of 5 to 10 mtrs thus will affect thetrees around.

ix. Our aim is to operate Washery while taking all precautionary measures to protect the environment from all possible pollution generation specifically fine coal dust.

x. If we transfer washed coal from our Washery to Himgir Railway Siding by Compacted Black Topped Road straight from Washery to Siding without any Turning and with provision of fixed water sprinklers both the sides at 100 mtrs apart in a Zig Zag pattern instead of Closed Conveyor System at a height of 5 to 10 mtrs above the ground level then webelieve and ensure that therewill beNO coal dust fugitive emissions orspillage that can have any adverse impact on the immediate or surrounding vicinity due to coal dustpollution.

AmendmentNo.02: Specific ConditionNo.(iii)

Specific Condition as per EC	Amendment Sought
Specific ConditionNo.(iii) "TheentirecoalrejectsshallbeusedinanFBCbasedTPP. ThelinkedFBCbasedThermalPower Plant shall be commissioned within two years of Operation of the Washery".	"Theentirecoalrejectsshallbeusedinany FBC basedTPP insteadofonlythelinkedFBC based Thermal Power Plant"

Reason forAmendment:

i. The linked FBC based Thermal Power Plant 45 MW (WHRB 21 MW + FBB 24 MW)was of Aryan Ispat and Power Private Limited (AIPPL) located at Bomaloi,

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Sambalpur,
Odisha.ThePowerPlantofAIPPLhasbeencommissionedwith18MW(WHRB12 MW + FBB 6 MW) in the year 2009 with valid **Consent to Operate Order** from State PollutionControlBoardvideCTOletterno.**6219/IND-I-5334**dtd.**18.04.2009.**and **letter** no. **20177 /IND-I-5334** dtd. **10.12.2009.**

ii. Due tovariousreasonsthesaidlinkedpower plantwasestablishedwithmuchlessthan50 %ofECgrantedlimitof45MW.Thusrequirementofrejectsbythelinked FBBbased Thermal Power plant has been drastically reduced.

iii. Therefore, ACBIL have to dispose the rejects generated to other FBB based Thermal Power Plants.

iv. Further with reference to the amendment in Environmental Protection Rule, 1986 vide Notification No. G.S.R. 443 (E) dtd. 25th June, 2021 of MoEF&CC, Govt. Of India middling and rejects to be utilised in any Thermal Power Plants, subject to the said Thermal Power Plant complying with the stipulated emission and fly ash norms as specified time to time by MoEFCC, GOI.

v. Thus our appeal is for amendment of the said specific condition No.iii accordingly as mentioned above.

6.8.3 Committee during the deliberations noted the followings:

i. PP had obtained the EC vide Ministry's letter No. J-11015/925/2007-IA. II (M) dated 22.06.2009 for 5.0 MTPA in ML area of 13.57 ha to M/s Aryan Coal Beneficiation Pvt. Ltd.
ii. EC transferred to M/s ACB India Limited vide letter no. J-11015/925/2007-IA. II (M) dated 23/04/2019.
iii. Forest clearance for 2.699 ha has been obtained for non-forestry activity vide MoEF&CC letter No. 5-ORB171/2013-BHU dated 28.06.2016.
iv. Ministry granted amendment in EC vide letter dated 22.02.2022
v. PP vide proposal No IA/OR/CMIN/298151/2023 again applied for amendment in EC dated 22.02.2022 and the earlier, Committee in the 46th EAC meeting held on 5th April, 2023 recommended the proposal for production of 4 MTPA and recommended for providing 3 years' time for transportation of mineral by road. But Ministry did not accept the recommendation of EAC and asked the PP to apply once the production reaches to 2.5 MTPA.
vi. PP vide letter dated 11.12.2023 again requested for amendment in EC from 2.5 MTPA to 5.0 MTPA.

6.8.4 The EAC noted that the proposal submitted in the PARIVESH Portal is for amendment in only two additional specific conditions but PP now requesting for amendment in three conditions the details of the same are as follows:

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Sl. No.	Reference of Approved EC	Description as per Approved EC	Amendment Sought	Observation of EAC
1	Additional Specific Condition No. i	SPCB shall grant Consent to Operate of 2.5 MTPA for the aforesaid project	SPCB shall grant Consent to Operate of 5.0 MTPA for the aforesaid project	As per PARIVESH Portal
2	Additional Specific Condition No. iii	As committed, project proponent to install belt conveyor system to transport coal within 2 years from date of issue of this letter.	Project Proponent can transport washed coal from Washery to Kanika Railway Siding by road with covered trucks instead of belt conveyor system	As per PARIVESH Portal

Specific Condition as per EC	**Amendment Sought**	**Observation of EAC**
<u>SpecificConditionNo. (ii)</u> "The Proponent shall establish a Closed Conveyor System within3 (three) years for transportation of Washed Coal between the Washery and the Railway Siding at Himgir and prior Forestry Clearance Shall be	"The companyshall transportWashedCoal betweenthe Washeryand RailwaySiding by Tarpaulin Covered Trucks through a shortest non interfering straight route of 1.860 Kms long Compacted Black Top Road straight from Washery Site to its own Rly Siding at Kanika, in Himgir Tehsil without any Turning and with provision of fixed water sprinklers at both the sides at 100 mtrs apart in a Zig Zag Pattern".	Additional amendment sought during the meeting.

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Obtained under the Provisions of the FC Act, 1980".		
SpecificConditionNo.(iii) "The entire coal rejects shall be used in an FBC based TPP. The linked FBC based Thermal Power Plant shall be commissioned within two years of Operation of the Washery".	"TheentirecoalrejectsshallbeusedinanyFBC basedTPP insteadofonlythelinkedFBC based Thermal Power Plant"	Additional amendment sought during the meeting

The Committee observed that PP is required to apply when the production capacity reach 2.5 MTPA, the unit is already achieved 1.6 MTPA of Coal Processing and dispatch of 1.3 MTPA till November 2023. The Committee asked the PP whether they are able to reach 2.5 MTPA by March 2024. In this regard, PP submitted that they are already executing an order of 2.14 MTPA and to achieve 2.5 MTPA the balance quantity comes out be 0.36 MTPA but it is difficult to get the small order of exact 0.36 MTPA. PP submitted that they are getting orders of higher capacity but it is difficult to accept the same as the EC capacity is restricted to 2.5 MTPA. Committee agreed with the submission of PP and is of the view that PP has submitted sufficient supporting documents to establish the fact that they are getting the orders for more than 2.5 MTPA but not able to execute the same as the EC is restricted at 2.5 MTPA.

Committee also deliberated on the mode of transportation and also viewed the drone video shown by the PP. PP submitted that they have dedicated road under their control for the coal transportation from washery to railway siding. PP also shown the self-certified EC compliance report and informed that they have already requested RO, Bhubaneshwar for submission of CCR but the same is awaited.

Based on the document submitted and discussion held the Committee is of the view that w.r.t requested of expansion capacity from 2.5 MTPA to 5 MTPA and for additional amendment sought by PP i.e. SpecificConditionNo. (iii) as mentioned above, the same may be considered after submission of the following:

a) Proposal for amendment in EC conditions shall be submitted a fresh in PARIVESH 2.0 Portal.

b) Submission of fresh traffic study and one-month baseline data.

c) Cost analysis of deployment of electric tippers vis a vis. installation of belt conveyor system for transportation of mineral from washery to railway siding.

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d) Certified Compliance Report from concerned RO for compliance of 90% of the conditions.

*The Committee also **recommended** that additional specific condition iii shall be read as "As committed, by PP, project proponent shall install belt conveyor system to transport the coal by 22/02/2025."*

Agenda no. 6.9

Tawa-II UG Coal mine for increase in production capacity from 0.60 MTPA to 0.86 MTPA with increase in ML area from 520.0 ha to 523.75 ha of Western Coalfields Limited located at Village Hirapalla, Panchayat Bhogaikhapa, Tehsil Ghoradongri, District Betul (Madhya Pradesh) – For Environmental Clearance under expansion – reg.

[Online Proposal No. IA/MP/CMIN/417657/2023; File No. J-11015/53/2006-IA. II(M)]

6.9.1 The proposal is for expansion in Environmental Clearance for Tawa-II UG Coal mine for increase in production capacity from 0.60 MTPA to 0.86 MTPA with increase in ML area from 520.0 ha to 523.75 ha of M/s Western Coalfields Limited located at Village Hirapalla, Panchayat Bhogaikhapa, Tehsil Ghoradongri, District Betul (Madhya Pradesh).

6.9.2 Details of the proposal, as ascertained from the proposal documents and as revealed from the discussions held during the meeting, are given as under:

6.9.2.1: Location:

i. Tawa-II UG is located in the Hirapalla village, Ghoradhongri Tehsil, Betul District, Madhya Pradesh. The mine is adjacent to Tawa UG of WCL. It is bounded by North Latitude 22^0 08' 44'' N and 22^0 10' 18'' N and east Longitude 78^0 9' 33'' E to 78^0 11' 48'' E and is covered in the Survey of India Toposheet No. 54 J/4.

ii. Project does not fall in the Critically Polluted Area (CPA), where the MoEF&CC's vide its OM dated 11.04.2022 & 07.05.2022 has imposed moratorium on grant of environment clearance.

6.9.2.3: Forest Area: 400.029 Ha of forest land is involved in the project. Forestry clearance for entire 400.029 ha has been obtained. The details are tabulated below:

S. No.	Forest Area (ha)	Remarks
1	195.200	FC Obtained No F-5/29/97/10/3 dated 9/8/1999
2	201.079	FC of Stage-II Obtained No. 8-52/2017-FC dated 02.11.2023
3	3.75	FC (surface only) of 3.75 ha for power line obtained vide 6-MPB-109/2006-BHO-3741 dated 16-8-2007.

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Total	**400.029 ha**	

6.9.2.4: Protected Area:

i. Tiger corridor is 6 km in NE direction and 6.5 Km SE direction from Mine boundary. Pachmari Bio-sphere Reserve is approximately 7 km from the north side of Tawa-II Mine boundary. Satpura Nation Park is at 17 kms distance from the mine.

6.9.2.5: Method of Mining & Mining Plan:

i. Total Mining lease area as per block allotment is 520.0 Ha (additional 3.75 ha land is for power line). The mining plan including mine closure plan was approved by WCL Board vide Ref: WCL/BD/SECTT/BM-282/2016/738 Dated 05.11.2016.

ii. **Land use details of Mine:** The land usage pattern of the project is as follows:

Pre-mining:

S. No.	Type of Land	Land in ha
1	Forest	400.029 Ha
2	Agriculture	69.265 Ha
3	Other (waste land etc)	54.456 Ha
	Total	**523.750**

During Mining:

S. No.	Particular	Land in ha
1	Surface Rights for infrastructure including road	14.858
2	Mining Rights (land below which only mining activities are conducted)	508.892
	Total	523.750

Post-Mining:

SL. No.	Particular	Land in ha
1	Land are to be restored with plantation i.e. under Surface Rights for infrastructure including road	14.858
2	Undisturbed Land area i.e. under Mining Rights (land below which only mining activities are conducted)	508.892
	Total	523.750

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iii. Total geological reserve reported in the mine lease area is 26.507MT, with mineable reserves are 19.727 MT. Balance extractable reserve as on 01.04.2023 is 4.806 Mt.

iv. Total 5 coal seams, only 2 seams are workable with thickness ranging from 0.92 to 3.34. Grade of coal is G-8.

v. Method of mining operations envisages by Underground Bord & pillar with Continuous Miner and LHDs Combination.

vi. Life of mine is 8 years as on 01-04-2023.

vii. Since it is an underground mine, there is no external OB dump and quarry / excavation area.

viii. **Transportation of Coal:** Coal is transportation through conveyor from face to surface and then by tippers from surface to Sarni Thermal Power Plant. Black topped road is provided for coal transportation road from surface to power plant.

6.9.2.6: Baseline Data:

i. Environmental Baseline data was generated in the summer season from 16th March, 2023 to 15th June, 2023 (summer Season) at 6 locations. The result indicates that the maximum and minimum values are 51 to 85 µg/m3 for PM10, 20 to 40 µg/m3 for PM2.5 in buffer zone. In core zone the maximum and minimum values are 131 to 180 µg/m3 for PM10, 44 to 59 µg/m3 for PM2.5. The SO2 concentrations are in the range of <10 to 15 µg/m3 and NOx in the range of 7 to 24 µg/m3. The incremental increase is projected to be 5.42 µg/m3 for PM101.31 µg/m3 for PM2.5, 0.06 µg/m3 for SO2, and 0.22 µg/m3 for NOx within buffer zone. The value of total GLC is estimated to be 87.19 µg/m3 for PM10, 40.31 µg/m3 for PM2.5,12.06 µg/m3 for SO2, and 21.22 µg/m3 for NOx. The observed pollutant levels are compared with CPCB National Ambient Air Quality Standards.

ii. Surface water Monitoring was done at 3 locations. The result indicates that the pH value in the range of 7.72 and 8.22, dissolved oxygen in the range of 4.44 to 5.8 mg/l, dissolved solids ranged 158 to 788 mg/l.

6.9.2.7: Public Hearing:

i. Public hearing for the project of 0.86 MTPA capacity in an area of 523.75 ha was conducted on 25.08.2022 at project location under the Chairmanship of ADM, Betul. Major issues raised in the public hearing include CSR activities, health, education, roads, dust generation, employment opportunities, Toilets, Water Environment, Medical facilities, air environment, Noise Pollution, safety etc. Appropriate action to address the issues raised in the Public has been proposed.

ii. Commitment made by the Project Proponent to address the Public Hearing concerns in lieu of Corporate Environment Responsibility (CER) to be mentioned in the following table:

Sl. No.	Particulars	Year-1 (In Lakhs) (2023-24)	Year-2 (In Lakhs) (2024-25)	Year-3 (In Lakhs) (2025-26)	Year-4 & onwards (In Lakhs) (2026-27)	Total (In Lakhs)

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1	Infrastructurecreationfor Drinking Water supply	6.00	3.00	3.00	3.00	**15**
2	SkillDevelopment & Education	40.00	10.00	10.00	10.00	**70**
3	Roads	46.34	10.00	10.00	10.00	**76.34**
4	Rainwater Harvesting	-	10.00	10.00	10.00	**30**
5	Medical Camp	2.00	2.00	2.00	2.00	**8**
6	Art,Culture& Sports	0.50	0.50	0.50	1.00	**2.5**
7	Others	-	5.00	5.00	5.00	**15**
	Total	**94.84**	**40.5**	**40.5**	**41**	**216.84**

iii. Hearing have already been taken under the Chairmanship of ADM, Betul on 25.08.2022.

6.9.2.7: EMP Budget:

i. Total capital cost of the project is Rs. 68.74 crores. Cost of production is Rs. 2443.70/t(at 85%), CSR cost is Rs. 2 per tonne. Environment Management Cost; Capital 57.22 lakhs. & Recurring cost is Rs. 6/tonne of coal production.

6.9.2.8: Others:

i. Employment generation: Permanent Manpower in the project is 732 Nos. Approximately 100 contractual workers will get employment through outsourcing agencies. In addition, approximately 50 Nos. of indirect employment will be generated.

ii. Coal linkage of the project is proposed for thermal use for MPGENCO & Various consumers.

iii. There is no Joint venture.

iv. The project is reported to be beneficial in terms of Environmental: Conservation of Coal. As it is an underground mine, there will not be any significant impact on the environment. Social: Project will continue to lead to development of roads, infrastructure, improvement in social and living standards and provide employment directly & indirectly. Financial: the project will contribute government through various taxes.

v. The project has been granted Environmental Clearance for production capacity of 0.6 MTPA with ML area of 520 ha vide Ministry's letter no. J-11015/ 53/2006/-IA. II(M) Dated 02.08.2006 and revalidation of existing EC granted vide No J-11015/ 53/2006/-IA. II(M) Dated 15.01.2021.

vi. Project has been granted ToR for expansion of production capacity from 0.6 MPTA to 0.86 MTPA and increase in project area from 520 ha to 523.75 ha. vide letter no. J-11015/53/2006-IA. II(M) dated 8th January, 2021.

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vii. The ground water level has been reported to be varying between 3.8 m to 14.00 m during pre-monsoon and between 1.3 m to 6.9 m during post-monsoon in the study aera of 10km radius.

viii. Total water requirement for the project is 490.32 KLD.

ix. NOC has been secured from CGWA for abstraction/ dewatering of mine discharge in respect of subject mine vide NOC no. CGWA/NOC/MIN/ORIG/2021/14068 valid upto 16/12/2023. Renewal application is in process vide application no. 21-4/563/MP/MIN/2017.

x. Consent to Operate for the existing capacity was obtained from the State PCB on 19.08.2022 and is valid till 31.08.2025.

xi. Tawa River is flowing along the boundary of lease. The river will not be diverted.

xii. Regular monitoring of ambient air quality is being carried out on fortnightly basis. The documented report is submitted to MPPCB and also to MoEF&CC along with half yearly EC compliance report. In general, the results of ambient air quality monitoring data were found within prescribed limits.

xiii. No court cases, violation cases are pending against the project of the PP.

xiv. The project does not involve violation of the EIA Notification, 2006 and amendment issued thereunder. The coal production, realized from the project, from 1993-94 onwards, is as under:

Year	EC capacity (MTPA)	Actual Production (MT)	Excess Production Beyond the EC Sanctioned Capacity
2006-07	0.60	Nil	Nil
2007-08	0.60	0.188	Nil
2008-09	0.60	0.234	Nil
2009-10	0.60	0.330	Nil
2010-11	0.60	0.361	Nil
2011-12	0.60	0.412	Nil
2012-13	0.60	0.435	Nil
2013-14	0.60	0.532	Nil
2014-15	0.60	0.522	Nil

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2015-16	0.60	0.500	Nil
2016-17	0.60	0.480	Nil
2017-18	0.60	0.401	Nil
2018-19	0.60	0.374	Nil
2019-20	0.60	0.319	Nil
2020-21	0.60	0.308	Nil
2021-22	0.60	0.352	Nil
2022-23	0.60	0.464	Nil

xv. No R&R is proposed in this project.

xvi. Consent to operate for production capacity of 0.6 MTPA has been obtained vide letter no. 116226 dated 19.08.22 and valid up to 31.08.25.

6.9.3 Committee after deliberations noted the followings:

i. Environmental Clearance for production capacity of 0.6 MTPA with ML area of 520 vide Ministry's letter no. J-11015/53/2006/-IA.II(M) Dated 02.08.2006 and revalidation of existing EC granted vide No J-11015/ 53/2006/-IA. II(M) Dated 15.01.2021.

ii. ToR for expansion of production capacity from 0.6 MPTA to 0.86 MTPA and increase in project area from 520 ha to 523.75 ha. vide letter no. J-11015/53/2006-IA. II(M) dated 8th January, 2021.

iii. Total Mining lease area as per block allotment is 520.0 Ha (additional 3.75 ha land is for power line). The mining plan including mine closure plan was approved by WCL Board vide Ref: WCL/BD/SECTT/BM-282/2016/738 Dated 05.11.2016.

iv. Life of mine is 8 years as on 01-04-2023.

v. 400.029 Ha of forest land is involved in the project. Forestry clearance for entire 400.029 ha has been obtained.

vi. Tiger corridor is 6 km in NE direction and 6.5 Km SE direction from Mine boundary. Pachmari Bio-sphere Reserve is approximately 7 km from the north side of Tawa-II Mine boundary. Satpura Nation Park is at 17 kms distance from the mine.

vii. NOC has been secured from CGWA for abstraction/ dewatering of mine discharge in respect of subject mine vide NOC no. CGWA/NOC/MIN/ORIG/2021/14068 valid upto 16/12/2023. Renewal application is in process vide application no. 21-4/563/MP/MIN/2017.

viii. Public hearing for the project of 0.86 MTPA capacity in an area of 523.75 ha was conducted on 25.08.2022.

ix. Consent to Operate for the existing capacity was obtained from the State PCB on 19.08.2022 and is valid till 31.08.2025.

x. Tawa River is flowing along the boundary of lease. The river will not be diverted.

6.9.4 *The Committee after deliberations noted that the instant proposal is for expansion of Environmental Clearance after obtaining ToR vide dated 08.01.2021 and Public Hearing conducted on 25.08.2022.*

Committee during the deliberations noted that the additional area of 3.75 ha lies outside the ML area of 520.0 ha. As per the provision of EIA notification, 2006 and MMDR Act, 1957 PP is not allowed to perform any mining activity outside the ML area. Therefore, committee asked the PP to review the proposed application for expansion of ML area upto 523.75 ha.

Further, Committee expressed the concerns upon the intersection of ground water for static & dynamic range of ground water. Therefore, PP should conduct a scientific study for knowing the exact status upon the same. In continuation, PP should propose the efficient water recharge system within/outside the ML area.

Committee also reviewed the CCR vide dated 01.11.2023 and asked the PP to complete the non-complied EC conditions and action plan needs to be submitted to the Committee.

Committee observed that as per KML file there is a Satpura reservoir and Satpura dam just adjacent to mining lease area. The Committee is of the view that PP shall submit a study from the reputed institute that presence of the same will not affect the mine working and mine is safe for inundation point of view. Further, mine working will not cause any damage to the reservoir.

Coal is transported through conveyor from face to surface and ***then by tippers from surface to Sarni Thermal Power Plant****. Black topped road is provided for coal transportation road from surface to power plant.*

In view of the above, the committee desirs the following information from the project proponent:

i. *PP should review the instant application submitted for the addition of 3.75 ha of additional area lying outside the ML area of 520.0 ha.*
ii. *PP shall submit the action plan for the non-complied EC conditions of issued EC dated 02.08.2006 and 15.01.2021.*
iii. *PP shall submit the details of settling pond and sedimentation pond lying within the ML area with their storage capacity.*
iv. *PP shall submit the health check-up plan for mine plan workers and project affected people living within the 5km radius of ML area.*
v. *PP shall revise the budget associated with the EMP and Public Hearing.*
vi. *PP shall also evaluate the impact of the mining upon the existing corridor of Tiger and their mitigation plan with the appropriate budget.*
vii. *PP should conduct a scientific study for knowing the exact status of ground water including static & dynamic range of ground water.*

viii. *Committee observed that as per KML file there is a Satpura reservoir and dam just adjacent to mining lease area. The Committee is of the view that PP shall submit a study from the reputed institute that presence of the same will not affect the mine working and mine is safe for inundation point of view.*

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ix. *PP should submit efficient water recharge system to be planned within/outside the ML area.*

x. *Traffic density study and road plan for coal transportation to be submitted with proposed mitigation measures.*

xi. *PP shall conduct a drone video survey for 10 minutes for clear view of the project.*

xii. *Issues raised during public hearing shall be addressed with reply based on fund allocated for issue & timeline for completing the issue.*

xiii. *PP shall bring out the transportation route to be followed and why belt conveyor cannot be installed. Further, possibility of using EV vehicle may also be explored. The PP shall also submit a cost analysis of setting up of belt conveyor vis-a vis EV/CNG based tippers.*

*In view of the above, the project was **deferred** to submit the above observation.*

Agenda No. 6.10

Expansion of Gevra Opencast Coal Mine from 52.5 to 70 MTPA with increase in ML area from 4184.486 to 4781.798 ha of M/s South Eastern Coalfields Limited located in Tehsil- Katghora, District- Korba (Chhattisgarh) - For Environmental Clearance-reg.

[Online Proposal No. IA/CG/CMIN/443111/2023; F. No. J-11015/85/2010-IA. II (M);

6.10.1 The proposal is for Environmental Clearance for Expansion of Gevra Opencast Coal Mine from 52.5 to 70 MTPA with increase in ML area from 4184.486 to 4781.798 ha of M/s South Eastern Coalfields Limited located in Tehsil Katghora, District Korba (Chhattisgarh).

The project/ activity is covered under category "A" of item 1(a) 'Mining of Minerals' the schedule of the EIA Notification 2006 as the mining lease area is more than 500 Ha.

6.10.2 Details of the proposal, as ascertained from the proposal documents and as revealed from the discussions held during the meeting, are given as under:

6.10.2.1: Location:

(i) The project area is covered under Survey of India Topo Sheet No. 64 J /11, Scale- 1:50000 and is bounded by the geographical coordinates ranging from $22^0$18'00" to $22^0$21'42" N and $82^0$32'00" to $82^0$39' 30" E.

(ii) Project does not fall in the Critically Polluted Area (CPA) as per MoEFCC OM no. J-11013/5/2010/IA. II(I) dated 17.09.2013 regarding lifting of Moratorium in respect of industrial

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clusters/areas including Korba Chhattisgarh.

6.10.2.2: Terms of Reference (ToR) & Environmental Clearances (EC):

(i) The project proponent applied for ToR for 49 to 70 MTPA for mining of coal in leasehold area of 4781.798 Ha. (increase in leasehold area from 4184.486 Ha to 4781.798 Ha) in Gevra of Tehsil Katghora, District Korba in the state of Chhattisgarh. on dt: 16.08.2021 vide proposal no. IA/CG/CMIN/221371/2021. Terms of reference granted on: 07.03.2022 and amended ToR for 52.5 to 70 MTPA granted on dated 09.01.2023.

(ii) Earlier, the Environmental Clearance of Gevra opencast was accorded as follows:

Sl No.	EC details	EC Capacity
1.	F. No. J- 11015/88/2003 -IA.II (M), Dated 04-10-2004	25.00 MTPA
2.	F. No. J- 11015/484/2007 - IA.II (M), Dated 03-06-2009	35.00 MTPA
3.	F. No. J- 11015/85/2010 - IA.II (M), Dated 31-01-2014	40.00 MTPA
4.	F. No. J- 11015/85/2010 - IA.II (M), Dated 06-02-2015	41.00 MTPA
5.	F.No.- J-11015 /85/2010 – IA.II (M)Pt Dated 21-02-2018 (Validity extension for one year)	45.00 MTPA
6.	F.No.- J-11015 /85/2010 – IA.II (M) Dated 28-03-2019 (Validity extension for one year)	45.00 MTPA
7.	F.No.- J-11015 /85/2010 – IA. II (M) Dated 04.06.2020 (Validity for 30 years or life of Mine whichever is earlier.)	45.00 MTPA
8.	F. No.- J-11015 /85/2010 – IA.II (M) Dated 10.05.2021	49.00 MTPA
9.	F.No.- J-11015 /85/2010 – IA.II (M) Dated 05.09.2022 and regularized on Dated 23.08.2023	52.5 MTPA

6.10.2.3: Forest Area:

Final FC issued vide letter no. and date	Area (in ha)
F No.8-33/2005-FC dated 05.05.2008	100.898
F No.8-81/ 2006-FC dated 20-04-2015	46.198
F No.8–77/2006 – FC dated 20-04-2015	192.046
F No.8–79/2006 – FC dated 20-04-2015	564.885
F.No. 8-41/2017-FC dated 21.06.2022.	112.385
Total Stage-II FC	1016.412
Applied for Stage-1 FC, the proposal was considered in	94.293

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FAC meeting held on 17.01.2024.	
Total Forest	1110.705

6.10.2.4: Protected Area:

(i) No National Parks, Wildlife Sanctuaries and Eco-Sensitive Zones have been reported with 10 km boundary of the project. Schedule I species do not exist in the study area. However, Wildlife conservation plan has been made through State Forest Research & Training Institute Raipur. The Wildlife conservation plan will be implemented through State Forest Department. An amount of Rs. 10.09 Cr has been deposited in CAMPA on dated 31.05.2022 for its implementation.

6.10.2.5: Method of Mining & Mining Plan:

(i) Total Mine lease areas per block allotment is 4781.798 Ha. Project Report along with Mine closure plan for 35 to 70.00 MTPA got approved by CIL Board on 05th March 2016 in its 325th meeting. Revised Mine Plan 52.5 to 70 MTPA along with Mine Closure Plan has been approved in the 197th meeting of the Committee of Functional Directors of South Eastern Coalfields Limited held on 25.10.2023. PP also submitted M/o Coal O.M dated 31/05/2012 wherein it has mentioned the Mine Plan and Mine Closure Plan of Coal India Subsidiaries are not required to be approved by Standing Committee of M/o Coal.

(ii) **The land use details of the Mine:**

Pre-mining Land Usage:

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Sr. No.	Land Use	Total (Ha.)
1	Agricultural land	2967.651
2	Forest land	1110.705
3	Waste Land	0
4	Grazing Land	32.879
5	Surface Water Bodies	16.58
6	Settlements	0
7	Others (Specify) Govt. Land	653.983
	TOTAL	4781.798

Post Mining:

Sr. No.	Land Use	Land Use (Ha.)				
		Plantation	Water Body	Public Use	Undisturbed	Total
1	External OB Dump	480				480
2	Excavation	1282.85	1347.5			2630.35
3	Top soil Storage (05ha included in excavation)	5				5
4	Roads			6		6
5	Built-up area (Colony/office/R&R siteInfrastructure,)			1243.062		1243.062
6	Green Belt	417.386				417.386
7	Undisturbed area					
Total	Total Area	2185.236	347.5	1249.062	0	4781.798

Post-Mining Land Use:

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Sr. No.	Pattern of utilization	Area (ha)
1	Reclaimed External and Internal dumps	1762.18
2	Green belt	5.67
3	Final void /Water body	1347.5
4	Built up area (Infrastructure, colony, roads, R & R site)	1249.062
5	Safety zone: Undisturbed area	417.386
	Total	4781.798

(iii) Presently Gevra opencast Expansion (25-35 MTPA) is being worked with shovel Dumper combination for OB Removal and Surface Miner alongwith Front End loader and Dumper/Tippers for coal. Shovel-dumper combination is proposed to be continued for removal of OB and deployment of surface Miner with front end loader & dumper for mining out coal. The configuration of equipment proposed in OB would be, Electric Rope Shovels of 42 cum / 10 cum and 15 cum hydraulic shovels & 240t / 100t /150t dumpers respectively as per load of different horizon, and for mining out coal Surface Miner having 5.0 to 8.0 MTPA capacity would be used in conjunction with 60t coal body dumpers for transport and 10m3 F.E.L for loading.

(iv) Excavation and transport of OB will be done departmentally by deploying existing equipment with additional 42 cum capacity rope shovels + 240 T rear dumpers, 10cum rope shovels+ 100T rear dumpers and 15 cum capacity Hyd. Backhoe +150 T rear dumpers. Coal loading and transport operations upto unloading station will be done contractually. Coal cutting will be done with outsourced surface miner.

(v) PP submitted Mining is mostly carried out by surface miners. Around 89% (46.85 MT out of 52.499 MT) coal is produced by surface miners and only 11% coal is produced by convention drilling and blasting where operation of Surface miners in coal benches are impossible.

(vi) Transportation of Coal:

a) Transportation from face to In-pit conveyor belt: By Trucks (inside mine only)
b) In pit conveyor belt to Silo: By belt conveyor.
c) Silos to consumers: By Rail
d) Action plan with timeline for coal evacuation through first mile connectivity (silo loading through railway siding) is provided below:

SL.No	Description	Capacity	Commissioning Schedule

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1	Load Out system with RLS at Eastern side of the mine along with Siding	20 MTY	Commissioned on 24.06.23
2	02 nos. Silo (5&6) of 4000 Te with RLS along with In-pit belt conveyor system along with Siding	30 MTY	Mar-24
Total		50MTY	

(vii) Additional land required for expansion- 597.312 ha (Agricultural land- 447.08 ha, Govt. land-55.939 ha and Forest land-94.293 ha). 75% of additional land required is agricultural land. Post mining land use will envisage to bring the land back to its original land use to the maximum extent possible.

(viii) Reserves:

S.No	**Particulars**	**Quantity in Million Tons**
i.	Total Geological reserve as per approved PR 70MTPA (As on 01.04.2014)	1940.98 MT
ii.	Total Minable/Extractable reserve as per approved PR 70MTPA (as on 01.04.2014)	1337.68 MT
iii.	Total mineable reserve within 4781.798 Ha (as on 01.04.2023)	951.481 MT

(ix) Details of Seams:

i. No of seams : 18
ii. Thickness of seams to be worked on : 0.70 m to 70.34 m
iii. Grade of coal : G10 grade
iv. Stripping ratio (mineral in tonnes to overburden in cum) : 0.617 tonne per cum (1:1.62)
v. Average gradient : 1 in 6 to 1 in 12
vi. Maximum thickness of seams : 70.34 m
vii. Ultimate working depth : 340 m

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(x) Life of mine will be 16 years starting from FY 2022-23.

6.10.2.6: Baseline Data:

Period	March to May 2022
Air Quality	The result indicates that the maximum and minimum values of PM10 are in the range of 42.0 µg/m3 to 123.1 µg/m3, whereas the PM2.5 are in the range of 21.8 to 69.8µg/m3. The SO2 concentrations within the study area are in the range of 10.0 to 31.1 µg/m3 and the NOx are in the range of 18.4 to 44.4 µg/m3. Ozone varies from 16.6 to 29.1 µg/m3. Ammonia varies from 14.6 to 24.8 µg/Nm3. Carbon monoxide varies between 0.3 to 0.44 mg/m3. Rest of the parameters like benzene, benzo(alpha) pyrene, arsenic, cadmium, chromium, lead, mercury and nickel were found to below detection limits.
Incremental GLC Level	The incremental GLC ascertained is PM_{10} = Max. GLC -18.54 $\mu g/m^{3;}$ $^{PM}{}_{2.5}$ = Max GLC- 5.32 $\mu g/m^3$;SO_2 = Max GLC- 0.01 $\mu g/m^3$ and NOx = Max GLC- 10.06 $\mu g/m^3$. The values are for highest incremental value obtained through modelling in buffer zone in downwind direction.
Ground Water quality	The result indicates that the maximum and minimum values of pH ranges between 7.18 to 7.97. TSS <5 mg/L; TDS between 216 mg/l to 352 mg/l; Total hardness between 136 mg/l to 198 mg/l.; Chlorides between 31.99 to 62.98 mg/l; Fluoride between 0.08 to 0.97 mg/l and iron (<0.05 mg/l) to 0.052 mg/l. All the results within the prescribed environmental standard - IS 10500:2012
Surface water quality	The result indicates that the minimum and maximum values of pH ranges between 7.1 to 8.3, DO between 5.8 to 8.5 mg/L; BOD between (<2 mg/l) to 2.6 mg/l and COD between (<5 mg/l) to 10 mg/l. All the results within the prescribed environmental standard – IS 2296:1992 (Tolerance Limit for Inland Surface Waters, Class – C)
Noise levels (Day & Night)	Leq (Day) range between 45.5 to 71.5 dB(A)and Leq (Night) between 33.6 to 57.3 dB(A). All values at all stations are within the prescribed standards
Soil Quality	Soil sample has been collected at different depths (0-30, 30-60 and 60-90 cm. The results indicate that pH range from 5.83 to 6.9; Available nitrogen between 111.59 to 388.78 kg/ha; Available phosphorus between 2.87 to 12.52 kg/ha; Available potash between 122.68 to 268.35 kg/ha and electrical conductivity between 256.70 to 531.70 uS/cm. The soil fertility as per values of NPK ranges in medium fertile category. The texture of soil has been found to be

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	loam (0-30 cm) and sandy loam at (30- 60 cm) & (60-90 cm) depth for forest land while for others it is sandy loam at all depth.
Flora & Fauna	Flora and Fauna baseline study has been carried by CMPDI. Sitesurvey was conducted between 4th to 8th May 2022. The list of flora and fauna of core and buffer zone has been provided in Chapter-3.No endangered and endemic taxa reported from the core and bufferzone. No schedule I Fauna species is observed from the core andbuffer zone.
Water Requirement	Source of Water:

Sl No.	Source	Quantity (m3/day)	Approval
1	Mine Seepage Water	13087	CGWA
2	Surface/River Water (Hasdeo River)	3601	Irrigation Dept.
Total		16688	

Water Requirement:

	Purpose	Peak demand (m3/day)
A	Industrial water demand	13087
1	Surface miner	288
2	Land reclamation	-
3	Dust suppression	8388
4	Green belt	26
5	Beneficiation (CHP)	1575
6	Washeries	-
7	Fire service	315
8	Others (specify) Washing in workshop	1305
9	Add for losses (10%)	1190

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	B	Domestic/Potable Water Demand	3601
	1	Housing	2738
	2	Non-residential population	238
	3	Other (specify) For service buildings	298
	4.	Process and other losses (10%)	327
		Total	16688

Rain Water Harvesting:

Artificial Rainwater Harvesting Structures or Recharge Ponds have been constructed at 5 locations close to Gevra OC Project. Total recharge capacity-58,852 m3/year. Roof top rain water harvesting system are augmenting the groundwater recharge to the tune of 33,050 m3/year at 12 locations in in the study area of Gevra OCP.

CGWA Permission:

Date of Ground water clearance Obtained NOC from CGWB for withdrawal of 11487 m3/day vide NOC no. GWA/NOC/MIN/ORIG/2018/4474 Dt: 22.01.2019.

Application for renewal of NOC has been made online Application no. 21-4/630/CT/MIN/2017 Dt: 02.12.2020). Proposal has been approved by Chairman CGWB New Delhi on dt: 19.07.2022. Renewal of NOC yet to be issued.

Cumulative Impact Assessment	For carrying out cumulative impact assessment, one season baseline air quality data for Summer Season (March 2022 to May 2022) has been collected for the parameters PM10, PM2.5, Sulphur dioxide (SO2) and Nitrogen dioxide (NO2). This has been done by collecting air quality data from Baseline reports of Gevra OC and Kusmunda OC carried out for March 2022-May 2022 period. Total 18 number of air quality monitoring location data has been recorded covering 15 km of area from Gevra OC. The Cumulative Impact Assessment has been carried out by considering impact of all four coal mine for proposed expansion as per their respective mining plan considering the OB/Coal extraction and hauling, inpit belt conveyor system, surface miner coal cutting (Except Manikpur OC – Proposed convention drilling and blasting

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	in Coal), CHP/SILO Railway siding for coal despatch to distant consumer. Cumulative impact assessment study reveals that the predicted ground level concentrations (GLC) of air quality parameters such as PM10, PM2.5, SO2 and NO2 in study area (15km from Gevra boundary) are within the stipulated norms. The proposed additional control measures are Fog cannon dust suppression systems at haul road, coal pit, Coal Stock and OB dumps (about 90% control efficiency) and road sweeping machines for coal transportation road, wind breaker and vertical greenery system.

6.5.2.7: Public Hearing:

Public hearing for the project of 70 MTPA capacity in an area of 4781.798 ha was conducted on 06/06/2023 in the premises of SECL Gevra OCP, Urja Nagar. The PH was presided by Addition District Magistrate, Korba & Regional Officer, Chhattisgarh Environment Conservation Board, Korba. The advertisement for PH was published on 4/05/2023 in *'The Times of India'* & *'Dainik Bhaskar'*. Major issues raised in the public hearing include compensation, Rehabilitation & resettlement, Facilities at R&R sites, pollution control etc. Appropriate action to address the issues raised in the Public Hearing has already been taken/are being taken & a budgetary provision of Rs 15.15 Crore has been made. Commitment made by the Project Proponent to address the Public Hearing concerns in lieu of Corporate Environment Responsibility (CER) is as below:

S. N.	Particular	Location (Name of School/Village/Area)	Year -1(In Lakhs	Year -2 (In Lakhs	Total (in Lakhs)
1	Infrastructure for creation for Drinking Water Supply	Dhurena, Batari, Madwadhora, Chhindpur.	15.00	15.00	30.00
2	Sanitation	Vijay Nagar, Ganga Nagar, Nehru Nagar, Birda.	12.00	15.00	27.00
3	Education	Dhurena, Ranjna, Tiwarta, Chhindpur, Kusmunda.	30.00	30.00	60.00
4	Skill Development	Korba District	25.00	25.00	50.00
5	Roads	Vijay Nagar, Ganga Nagar, Nehru Nagar, Kuchena, Birda.	300.00	300.00	600.00
6	Cross drains	Vijay Nagar, Ganga Nagar, Nehru Nagar, Kuchena.	30.00	40.00	70.00
7	Electrification including solar power	Dhurena, Batari, Dewari, Chhindpur, Tiwarta	10.00	10.00	20.00

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8	Solid waste management facilities	Dhurena, Batari, Dewari, Chhindpur, Tiwarta	15.00	15.00	30.00
9	Scientific support and awareness to local farmers to increase yield of crop and fodder	Gevra Basti, Khodri, Salora, Pandripani, Barbhata	10.00	10.00	20.00
10	Rain water Harvesting	Gevra Basti, Khodri, Salora, Pandripani, Barbhata	50.00	50.00	100.00
11	Soil moisture conservation works	Kasaipali, Dewari , Kolihamuda, Korai, Dewgaon	50.00	50.00	100.00
12	Avenue plantation	Ganga Nagar, Dhurena	100.00	100.00	200.00
13	Plantation in community areas	Kasaipali, Dihupara	108.00		108.00
14	Infrastructure	Dhurena, Batari, Dewari, Korai	20.00	20.00	40.00
15	Health Camps	Ralia, Bhilai Bazar, Naraibodh	10.00	10.00	20.00
16	Art, Culture & Sports	Vijay Nagar,Bhilai Bazar, Dhurena, Naraibodh	10.00	10.00	20.00
17	Livelihood	Vijay Nagar,Bhilai Bazar, Dhurena, Naraibodh	05.00	05.00	10.00
18	Agriculture Programme	Chhindpur, TIwarta, Dewari, Korai	05.00	05.00	10.00
		Total	805	50	1515

PP submitted that the total cost of the project is Rs. 11816.40 Crores. Cost of production is Rs. 566.02 /- per tonne, CSR cost: According to new CSR policy the fund for the CSR should be allocated, based on 2% of the average net profit of the Company for the three immediate preceding financial years or Rs. 2.00 per tonne of coal production of previous year, whichever is higher, R&R cost is Rs. 564.44 crores.

6.5.2.8: EMP Budget:

Environment Management Cost is Rs. 205 crores (Capital) and Rs 55.51 Cr (Revenue Cost). The details are as follows:

(i) Capital Cost:

1	**Air pollution control measures**	**Amount (in cr)**
a	Dust suppression arrangements	4.42
b	Water sprinkling arrangement along approach road	4.00

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c	Green belt in & around the mine	1.00
d	Arboriculture/plantation in industrial area	0.10
e	CAAQMS and Piezometers Cost	5.10
f	Horticulture and land development	0.83
	Sub-Total	15.45
2	**Water Pollution Control Measures**	**Amount (in cr)**
a	Effluent treatment plant (ETP)	10.00
b	Sewerage treatment Plant (STP)	5.00
c	Settling tank for mine water disposal	2.00
d	Garland drains	1.00
e	Other development measures in industrial site viz. drains, tree	7.59
f	Other development measures in colony viz. drains, tree	0.51
g	Water drains in township	0.21
h	Sewage disposal arrangement in colony	1.07
I	Water Treatment Plant	7.40
j	Rain Water Harvesting	0.24
	Sub-Total (2)	35.02
3.	**Other Environmental Control Measures**	**Amount (in cr)**
a	Barbed fencing for the project	1.50
b	HEMM for Reclamation	133.39
c	Housing personnel	3.82
d	Flora and fauna study	0.30
e	Cost of EMP preparation	0.50
	Sub-Total (3)	139.51
	GRAND TOTAL	189.98

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4	Additional Capital Expenditure (proposed in EMP of 52.5 to 70 MTPA)	**Amount (in cr)**
a	Green belt between residential area and mine (2 km)	7.0
b	Tyre washing arrangement (additional 2 no.)	1.0
c	Sprinkler system with mist spray in CHP/Transfer points and enclosure system for coal unloading facility	1.0
d	Additional Rainwater harvesting measures	0.5
e	Noise protection personal equipment like ear muff/plug and other measures like Acoustic Panel Technology Noise barrier, etc	1.0
f	Integrated Continuous effluent monitoring system with real time tracking and server linkage	2.02
g	Miscellaneous Environmental Control measures as per EC conditions/Issues raised during Public hearing	2.5
	Sub-Total(4)	15.02
	Total Capital Cost	**205.00 crores**

(ii) Revenue Cost:

1	**Revenue Expenditure Related To Environment (As Per Approved Pr-70 MTPA)**	**Amount (in Cr)**
a	Environment Audit @ 0.60 lakhs/annum	0.006
b	Environment monitoring @10.00 lakhs/annum	0.10
c	Mine closure cost* (*Revised first year mine closure cost- 22.12 crores)	18.65
d	Monitoring of CSR and RR Plan	0.02
e	Monitoring of land use through satellite surveillance	0.02
	Sub-Total(1)	**18.97**
2	**Additional Revenue Expenditure (Proposed In EMP of 45 To 49 MTPA)**	
a	Mist Blower (Fog Cannon) cum road Fogger	0.60

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b	Mechanized Sweeping machine	0.50
c	Mobile Water Sprinkler	0.45
d	Periodic Health Checkup	0.50
	Sub-Total(2)	**2.05**
3	**Additional Revenue Expenditure** **(proposed in EMP of 52.5 to 70 MTPA)**	**Amount (in Cr)**
a	Fog Cannon (Additional -8 no.) @0.6 cr/unit	**4.8**
b	Mechanized Sweeping Machine (Additional 2 no.) @0.5 cr/unit	**1.0**
c	Green belt around the mine boundary (14 km) @8 lakh/ha	**1.12**
d	Grass bedding over slope with support measures per year (60 ha @10 lakh/ha)	**6.0**
e	Soil and Moisture Conservation of top soil @Rs 3500/ha	**1.0**
f	Grassland creation over reclaimed OB dumps per year (6 ha @8 lakh/ha)	**0.48**
g	Wildlife Conservation Plan implementation	**10.09**
h	Groundwater recharge and monitoring per year (lump sum)	**1.0**
i	Environment Monitoring per year	**3.0**
j	Third party audit of compliance of various clearances at suitable interval	**1.0**
k	Specialized studies like slope stability, fly ash related studies, topsoil management, Just transition, development of eco park, floating solar park, ecological restoration, OB to sand or similar from scientific institution of repute per year	**5.0**
	Sub-Total(3)	**34.49**
	Total Revenue cost	**55.51 crores**

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6.5.2.9: Court Case:

(i) There are court cases pending with the project proponent as per the following details: -Details of Court Case

	Court	Case Details	Status
	case no. is 886/2015 and the case is at Chief Judicial Magistrate Korba.	ce, Chhattisgarh Environment Conservation Board, Korba Vs CGM Dipka Extension Project Gevra Area SECL for coal production in excess of 10 MTPA consented capacity. The Criminal complaint was filed under Sec.15 &17 of EP Act and the year of violation was 2001-02 to 2004-05	ng is on 23.01.2024.
	Court of India	The Civil Appeal has been filed under section 22 of the National Green Tribunal Act, 2010 against the final order dt: 25.08.2020 of the Ld. National Green Tribunal, Principal Bench at New Delhi in appeal no. 79 of 2018 titled Laxmi Chauhan vs UOI & others	iven was 15.05.2023. Next date not yet displayed.

(ii) In line with the judgment of Hon'ble Supreme Court dated the 2nd August 2017 in writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors, the collector had issued notice on 04.01.2019 and subsequently reply was submitted by SECL Gevra OCP on 14.05.2019. Accordingly, Dept of Geology & Mines (Mineral Resource Dept, CG Raipur had called meeting on 25.09.2019 for discussion regarding Collectors notice issued for excess production cases wherein the Joint Director, Dept of Geology and Mines discussed on the point about the agreeable violation years and the amount, & also considering the PP's view on Non applicability of Section 21(5) of MMDR Act 1957. Further meeting was called on 14.10.2019, discussing the points deliberated in the 25.09.2019 meeting, after which no further communication has been received to SECL Gevra OCP from Collector Office or Dept of Geology Mines, Raipur. However, SECL agrees to abide by any future decisions/guidelines issued in this regard.

6.5.2.10: Other Details:

(i) Employment to 4391 persons will be provided from the project.

(ii) The project is reported to be beneficial in terms of: Project will considerably improve the socio-economic status of the adjoining areas. This will result in benefits such as improvements in physical infrastructure; improvements in social infrastructure, increase in employment potential, contribution to the exchequer, meet energy requirement and post-mining enhancement of green cover.

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(iii) Coal linkage of the project is proposed for NTPC and Various thermal power plants.

(iv) No Joint venture cartel has been formed.

(v) Consent to Establish cum Operate for capacity (52.5 MTPA) was obtained from the Chhattisgarh Environment Conservation Board, Raipur on 15.03.2023 and valid for one year.

(vi) Hasdeo river is the main drainage of the area flowing 08 kms from mine boundary. The study area includes a number of seasonal nallah and tributaries of Hasdeo river like Ahiran, Kholar nallah. Lilagar river also flows through the study area of project. No nalla diversion is proposed.

(vii) Regular monitoring of ambient air quality is being carried out with frequency of twice a week. The documented report is submitted to APCCF, MoEFCC, Regional Office, Nagpur, Member Secretary, Paryavas Bhavan, Raipur and RO CECB, Korba along with half yearly EC compliance report. In general, the results of ambient air quality monitoring data were found within prescribed limits except few aberrations which can be attributed to the specific local conditions during the day of sampling.

(viii) The ground water clearance: Renewal of NOC has been obtained vide no. CGWA/NOC/MIN/REN/1/2024/8879 Dt: 09.01.2024 for abstraction of 8334cum/day valid upto 03.12.2024.

6.10.3 Committee after detail deliberations noted the followings:

(i) PP has obtained ToR dated 07.03.2022 and amended on 09.01.2023 for capacity of 52.5 to 70 MTPA.

(ii) PP has collected the Baseline data for the period of March to May 2022.

(iii) Mine closure plan for 35 to 70.00 MTPA approved by CIL Board on 05.03.2016 and Revised Mine Plan for 52.5 to 70 MTPA along with Mine Closure Plan has been approved on 25.10.2023.

(iv) Public hearing for the project of 70 MTPA capacity in an area of 4781.798 ha was conducted on 06.06.2023.

(v) PP submitted the Action Taken Report dated 13.01.2024 with respect to CCR dated 8.01.2024.

(vi) PP has submitted the application for Stage I FC for forest area of 94.293 ha vide FP/CG /MIN/ 41389/2019 dated 05.11.2019 involved in the ML area of 4781.798 ha.

(vii) EMP (capital- Rs 205 crores and recurring- Rs 55.51 crores) including additional proposed.

(viii) Revised mine closure cost- Rs 523.40 cr

(ix) Wildlife Conservation plan- Rs 10.09 cr.

(x) Catchment Area Treatment Plan- Rs 84.47 lakhs

(xi) Total no. of PAF-3466 (Total employment provided as on 31.07.23- 2941; Balance employment to be provided- 763; Total families resettled-844; Total balance families to be resettled-1155).

(xii) CER Budget- 22.852 cr.

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6.10.4 Committee after deliberations noted that the instant project is for expansion of production capacity from 52.5 to 70 MTPA with increase in ML area from 4184.486 to 4781.798 ha. PP conducted Public Hearing after obtaining ToR & its amendment. The Committee deliberated on the compliance of ToR conditions, cumulative impact assessment study, R&R, issues raised during PH, coal transportation, water requirement and other impacts of the project on environment.

Committee observed that PP has submitted that Gevra OCP has implemented all the recommendations by BHU regarding ecosystem carrying capacity and Comprehensive catchment area treatment plan prepared by Chhattisgarh council of Science and Technology, Govt. of Chhattisgarh. The action taken with timeline is provided below:

Tyre Washing System	Operational since March 2023.Amount spent- Rs. 47.12 Lakhs.
3 nos. Fog cannon	9 nos. of fogging machines under operation
1 nos. Sweeping machine	1 sweeping machine was in operation since Sept 2019. The addl. machine delivered in Jan 2022 & operational since Feb 2022
Catchment area treatment Plan	The work will be implemented through State Forest Dept. An amount of Rs 8447900/- has been deposited in CAMPA vide UTR no. UCBAH21312039819 on Dt: 08.11.2021 towards implementation of proposed measures in the study.

PP submitted Mining is mostly carried out by surface miners. Around 89% (46.85 MT out of 52.499 MT) coal is produced by surface miners and only 11% coal is produced by convention drilling and blasting where operation of Surface miners in coal benches are impossible.

PP submitted that 240 nos. of roof top connected solar power plant 2000 KW for Gevra Area. Work order has been issued and work is in progress.

As desired by EAC the PP vide letter dated 19.01.2024 inter-alia submitted the i) action plan with timeline for the balance families to be settled, ii) land acquisition details, iii) impact assessment w.r.t to Gevra OCP, vi) commitment made during PH, v) details of water supply plan & water treatment plant, vi) detailed report on CSR, vii) post mining land use , viii) water utilization plan i.e void/water body utilization after mine closure, ix) education facility, x) details of health care facilities, xi) details of Korba Action Plan of SPCB and action taken by PP, xi) updated status of court cases and undertaking in this regard.

Committee observed that with respect to R&R Plan PP submitted that balance families to be settled is 1149 and as per action plan it is estimated that out of 1149 PAFs it is most likely approx. 690 PFAs will opt for plots (option 1B) and remaining approx. 459 PFAs opt for lump sum cash grant of Rs 3.0

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Lakh in leiu of alternate house site. The timeline is mentioned as March 2025. In addition to cumulative impact PP also submitted the impact due to operation of Gevra OCP and as per study report the Air Quality impact assessment study reveals that the predicted ground level concentrations (GLC) of air quality parameters such as PM_{10}, $PM_{2.5}$, SO_2 and NO_2 in study area (15km from Gevra boundary) are within the stipulated norms. *Committee is of the view than EMP and recommendations made out of cumulative impact assessment study shall be implement.*

The Committee is of the view that PP shall address the issues raised in PH in a time bound manner and budget earmarked for the same should not be diverted for the other use. Additionally, the Committee emphasized that PP shall provide mobile medical units and ambulance facility for locals. Committee also advised to provide the modern science lab to near schools and sports facility too. The Committee is of the view that skill development programme should be linked with the employment potential and a record of the same shall be maintained regarding to ascertain whether the skill development plan is effective enough or not to enable the local persons to get employment after the training, in case if it is required that skill program needs to be changed as per present & future requirement than PP shall do so.

Committee observed that PP submitted the details of water supply plan & water treatment plant and also water utilization plan i.e void/water body utilization after mine closure. PP submitted that for this particular case of Gevra OC Mine, stored water (seepage ground water as well as collected rain water) will be utilised in consultation with Central/State Agencies in the manner viz. i) Water Supply for Irrigation purposes to local villages: Accumulated water will be supplied to local villages as per their needs, ii) Water Supply for domestic needs of local populace: Water quality will be monitored regularly and accordingly, after proper treatment water will be supplied to local villages, iii) Development of Eco-Park and Recreation lakes: It's to worth mentioning that SECT, already in process to develop an ECO Park at Gevra Area and it will ultimately help to diversification of economics of that region and iv) Installation of Floating Solar Panel: Floating solar panel will be installed on the mine lakes. PP further submitted that the mine voids filled with water will act as a ground water recharge structure which will increase the ground water level in the mining affected area and eventually the crop yield of the surrounding area. Based on the submission of the PP the *Committee is of the view that PP shall ensure to increase the water supply including availability of drinking water in the nearby area. Further water ATM can be setup at public places. PP shall prepare a plan in a period of one year that how the existing water requirement for the project can be reduced further and how the excess water collected by various means including rainwater harvesting measure can be treated and supplied for the public use. Further, the work of development of ECO Park at Gevra Area shall be completed within a period of two years.*

Committee observed that PP submitted the proposal of ongoing and completed CSR activities with amount proposed and disbursed. The Committee observed that total 1941 Lakh has been proposed and 587.01 Lakh has already been disbursed i.e 30%. *The Committee observed that many activities has already been completed but still PP shall expedite the implementation part for the ongoing and proposed activities. Establishment of smart classes shall be completed within a period of one year after grant of EC.*

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Committee observed that with respect to educational facilities PP submitted the economic study report which reveals that there are several educational institutions of various standards managed by both public and private sectors/bodies in the area by SECL and NTPC etc. Educational facilities provided are by Central School in Kusmunda by SECL and NTPC, Korba, Delhi Public School (Upto Class XIIth) by NTPC and DAY School in Kusmunda & Gevra Area by SECL. In the study area (core zone + buffer zone), there are a total of 13 pre-primary schools, 102 primary school, 60 middle schools, 14 secondary schools, 8 senior secondary schools. 2 art and science college, 1 ITI and 3 Govt. non formal training centers within villages. Education facility provided to i) Primary & Secondary School at Urja Nagar, ii) Upgradation work with providing of smart education facility such as Computer set, furniture, Green Board, Books , Games material etc of 5 nos. of new Swami Atmanand Govt. Utkrist Hindi Medium school. The budget proposed for the same is Rs. 891.751- Lakh. *Committee is of the view that establishment of smart classes shall be completed within a period of one year after grant of EC.*

Committee observed that with respect to health care facilities PP submitted that there is a well equipped 100 beded Hospital at Gevra Project : Nehru Centenary Hospital (NCH). In addition, there are 4 dispensaries, 4 primary health center, 30 primary heath sub center, 2 maternity and child welfare center, 2 allopathic hospitals, 2 hospital of alternative medicine and 3 veterinary hospital within 5 Km radius from Mine lease boundary of Gevra project. NCH have facilities like Surgery, Medicines, Gyne. and Obst., Eye, ENT, Anaesthesia, Pathology with corresponding specialists heading the units. The hospitals have got well equipped laboratories and operation theatres to take routine surgery and emergencies. There are medical officers, specialists, paramedical staff and ambulances to meet any eventuality. Immunization facilities are available at every colliery hospital and dispensary.

PP submitted that medical camps are organized time to time by different medical teams of SECT on different items for the benefit of local people residing in core & buffer zone. The mining activities expose workers to some injuries and health hazards. Incidence of occupational disease and injuries and health hazards as recorded in the hospital for employees in Gevra area is almost negligible. Every worker is periodically' checked up once in every' five years and proper record of their health profile including X-ray and laboratory tests is kept. The importance of such periodical medical examination be is to detect and prevent occupational diseases like Pneumoconiosis and Tuberculosis. PP submitted that the SECL authorities have adopted following measures to prevent occupational diseases and health hazards viz. i) Pre-employment, pre-placement and periodic medical examination of employees, ii) Regular monitoring of working environment and implementation of safety and control measures, to prevent hazards, iii) Use of protective equipment, clothing, helmets, Gas mask, shoes, etc. iv) Periodical medical examination of every worker is done once in five years to detect preventable and curable diseases at an early stage v) A Special Board constituted by the Chief Medical Officer examines cases suspected to have Pneumoconiosis. Established cases are suitably compensated and their job is changed if required, vi) Apart from the above NCH Gevra provides free of cost medical facilities to not only displaced families but also to each & every person with BPL card under the CSR head, vii) The manpower details of Doctors in NCH Gevra as on 31.12.2023 is a) General duties Medical Officer (GDMO): 09 nos., b) Dentist: 01 no., c) Specialist: 06 nos. (Orthopedician, Pathologist, Opthalmologist, Psychiatrist, General Surgeon & Pediatrician). *The Committee appreciated the efforts taken by the PP but is of the view that PP shall continue to provide proper medical facilities to local peoples residing*

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in the close vicinity of the project area and also to the project affected peoples. PP shall provide provision for financial assistance for the critical illness such as cancer, kidney/liver failure etc. on cases to case basis. PP shall ensure to provide ambulance facilities for the general public particularly in the remote areas and a helpline in this regard may also be created.

The Committee also deliberated on the compliance of previous EC conditions. PP presented the Action Taken Report dated 13.01.2024 submitted to RO, Raipur w.r.t CCR dated 8.01.2023. Committee noted that RO in its CCR mentiond that the EC letter dated 21.08.2018 supersedes the earlier granted EC 31.01.2014 for expansion from 35 to 40 MTPA, followed by amendment in EC dated 6.02.2015 for further expansion up to 41 MTPA. However, in the EC letter dated 6/9/2022 & 23/8/2023 it has been stipulated that all other terms and conditions stipulated in previous ECs granted vide letter dated 3.06.2009, 31.01.2014, 6.02.2015, 21.02.2018, 28.03.2019, 4.06.2020, 10.05.2021, 5.09.2022 shall be adhere to and remain unchanged, so there is an inconsistency in EC conditons. PA neither took any corrective action from Ministry on the observed inconsistency nor submitted six monthly compliances. ***The committee deliberated on this issue and is of the view that EAC may prescribe all the required conditions while considering this expansion so that it would be convenient for RO to monitor the project and also for PP to submit the six monthly compliance by referring to only one document.***

The Committee observed that PP in its ATR dated 13.01.2024 with respect to observation made by RO, for most of the conditions informed that it is being complied and also complied nine conditions. Further, agreed for the compliance of some of the conditions. After deliberation on CCR and ATR *the Committee is of the view that*

a) *PP has obtained CGWA permission for 8334 m3 and is valid till 3.12.2024 but PP in future PP shall take proactive steps for its renewal. Further, the water requirement for the project was mentioned as 16688 m3/day including 13087 m3/day for which CGWA approval is required. Therefore, the PP shall obtain the permission for the same or restrict the water utilization to 8334 m3/day. PP also submitted an agreement dated 17/02/2011 made between Irrigation Department and Gevra Mines for 10500 m3/month of water to be used in housing colony. The Committee is of the view that PP shall not use the water for other purpose before obtaining permission from Irrigation Department.*

b) *Work of establishment of the Sal Nursery of 10 Ha area shall be completed by March 2024.*

c) *Digital display board shall be installed before April 2024.*

d) *For implementation of WLC & CAT, PP has already deposited the amount and implementation is to be done by concerned authorities but still PP shall follow up for the same.*

e) *With respect to compliance of Court Order, PP has already submitted an undertaking to comply with the direction of DMG.*

f) *PP reported that existing coal evacuation capacity is 65 MTPA (45 MTPA mechanized SILO & RLS, 15 MTPA railway siding, 5 MTPA by road to local consumers) and proposed for additional 30 MTPA mechanized system i.e [2 silos (5&6) of 4000 Te with RLS along with belt conveyor*

system of 30 MTPA] shall be commissioned by Oct, 2024.

g) *PP also submitted the compliance made towards the recommendation of sub-committee visited the site on 5/10/2021. Committee observed that PP has reported to complied with most of the recommendation and some are being complied. PP reported that Solar Roof top work will be completed by May, 2024.*

h) *The Committee is of the view that out of the total 70 MTPA sought 65 MTPA should be transported only through mechanized system and remaining 5 MTPA should be through road and PP should reduce it further to fully transport through mechanized system by October 2024. The major concern is of transportation of 5 MTPA road transportation which could lead to fugitive emission and other issues. This was also reported by RO. In this regard, PP has submitted the corrective measures which are already taken. Therefore, the Committee is of the view that PP shall install CCTV camera in all entry and exist points of the mines from where tippers are moved, around coal handling plant, silos, railway siding. The Committee is of the view that PP shall ensure to have transportation route away from the habitation.*

i) *PP reported that public liability insurance conditions are not applicable to them in pursuant to MoEF&CC notification S.O (E) 227 dated 24.03.1992. The Committee is of the view that PP shall ensure that in case of any injury/accident the workers should be provided with proper compensation and should be insured.*

j) *PP submitted that the peripheral fencing is continuous work as quarry is in progression. PP shall continue to do so.*

k) *It has reported in the CCR the PA has commissioned ETP having the capacity of 210KLD and is in operation. The sewage treatment plant having the capacity of 3 MLD has already commissioned and is in operation. Treated water from the STP is being used for greenbelt development. Committee is of the view that in addition to this PP shall implement the mitigation measures proposed in the EMP for this expansion project.*

l) *During the visit only one CAAQMS was installed and in operation. Additional CAAQMS station has not been installed as stipulated by September 2023. PA informed that purchase order has been issued vide letter dated 24/08/2023 for additional 1 no. of CAAQMS. The Committee is of the view that PP shall install 2 CAAQMS out of which one should be in downwind direction as discussed during the meeting. The final location for the same shall be finalized in consultation with CPCB/SPCB.*

Committee observed that PP informed that now the project does not come under Critically Polluted Area (CPA) and as per the action plan prepared by SBCB, the Gevra OC has implemented fugitive dust control measures i.e. 2 no. mechanized sweeping machine and long range fogging machine (4 no.) are already in operation.

Committee observed that PP provided the details of the court cases and also submitted an undertaking to the effect that *" In line with the judgment of Hon'ble Supreme Court dated the 2ndAugust 2017 in writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors, the collector had issued notice on 04.01.2019 and subsequently reply was submitted by SECL Gevra*

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OCP on 14.05.2019. Accordingly, Dept of Geology & Mines (Mineral Resource Dept, CG Raipur had called meeting on 25.09.2019 for discussion regarding Collectors notice issued for excess production cases wherein the Joint Director, Dept of Geology and Mines discussed on the point about the agreeable violation years and the amount, & also considering the PP's view on Non-applicability of Section 21(5) of MMDR Act 1957. Further meeting was called on 14.10.2019, discussing the points deliberated in the 25,09.2019 meeting, after which no further communication has been received to SECL Gevra OCP from Collector Office or Dept of Geology Mines, Raipur. However, SECL agrees to abide by any future decisions/guidelines issued in this regard." The Committee is of the view that PP shall comply with the direction of Hon'ble Courts and decision of Collector Office or Dept of Geology Mines, Raipur in this regard.

Based on the above discussions & documents submitted in the EAC meeting, the EAC recommended the Environmental Clearance for expansion of Gevra Opencast Coal Mine from 52.5 to 70 MTPA with increase in ML area from 4184.486 to 4781.798 ha (subject to FC approval) of M/s South Eastern Coalfields Limited located in Tehsil- Katghora, District- Korba (Chhattisgarh) with the following specific conditions and standard EC conditions under the provisions of EIA Notification, 2006 and its amendments:

Specific Conditions:

1) *PP should submit the Stage I FC for forest area of 94.293 ha involved in the ML area of 4781.798 ha.*

2) *PP to comply the outcome of the court case number 834/2021 pending before Hon'ble Supreme Court and case number 1217/2007 pending before Judicial Magistrate Katghora and any other court cases.*

3) *PP shall submit the proposal for next expansion only after the compliance of all its Existing EC conditions.*

4) *PP shall implement the protective measure proposed in EMP in a time bound manner. The budget earmarked for the same is Rs 205 crores (Capital) and Rs 55.51 crores(recurring) and should be kept in separate account and audited annually. The implantation status along with amount spent with documentary proof shall be submitted to concerned Regional Office for the activities carried out during the previous year.*

5) *Mining shall be carried out only by Surface Miners for the project. Presently 04nos. Silos (1&2, 3&4-Capacity-25MTPA) with rapid load out System (20 MTPA) for transportation of Coal through rail are in operation. As proposed PP shall complete mechanized system for additional 30 MTPA (Silo 5 & 6) capacity of coal handling before Oct 2024 and status report be intimated to RO MoEF&CC.*

6) *PP shall conduct feasibility studies for assessment of voids for backfilling of ash and mixing of ash with overburden, taking up backfilling Ash and OB mixing activities during operations as well as post closure of mines in line with fly utilization notification 2021.The study being*

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conducted by NIT Rourkela for 7 mines of SECL including Gevra shall be completed and report shall be submitted to RO MoEF&CC. The percentage of voids should be reduced to not more than 30% of the total area.

7) *Digital processing of the entire lease shall be through remote sensing techniques should be done regularly once in 3 years for monitoring land use pattern and report submitted to MOEF and its Regional Office at Raipur.*

8) *The project proponent shall obtain the necessary permission from the Central Ground Water Authority for ground water abstraction. No groundwater shall be used for mining operations without valid CGWA NOC. Also the project proponent shall obtain the necessary permission from the state/irrigation department for the use of surface water from river/nallha. Further, the water consumption should be restricted to the level for which permission has been obtained from CGWA/ Irrigation department as the case may be.*

9) *Environmental laboratory should be established with adequate numbers and type of pollution monitoring and analysis equipment in consultation with the state Pollution Control Board. Internal Environment Management division shall be strengthened and details submitted to IRO.*

10) *No mining operations shall be undertaken in Forest land, until forestry clearance has been obtained under the provisions of FC Act, 1980.*

11) *OB shall be stacked at the earmarked external OB dumpsite of 480 ha within ML area for the opencast operations of a maximum height of 90m consisting of 3 benches of 30m each. The ultimate slope of the dump shall not exceed 28°. Monitoring and management of existing reclaimed dumpsites including slope stability shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests and its Regional office located at Raipur on a yearly basis.*

12) *An afforestation plan covering an area not less than 2185.236 ha shall be implemented, which includes backfilled area (1287.85 ha) and ext. OB dump (480 ha), along ML boundary, green belt, along roads, infrastructure (1249.062 ha), safety zone (417.386 ha), undisturbed/vacant land by planting native species in consultation with the local DFO. The density of the trees shall be around 2500 plants per ha. PP should annually submit the audited statement of expenditure along with proof of activities viz. photographs (before & after with geolocation date & time), details of expert agency engaged, details of species planted, number of species planted, survival rate, density of plantation etc. to the Regional Office of MoEF&CC and on PARIVESH Portal as the case may be for the activities carried out during previous year.*

13) *Backfilling shall start by the 1" year of expansion operations. Of the total 2635.35 ha of the quarry area, an area of 1287.85 ha of excavated area shall be reclaimed with*

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plantation/afforestation by planting native plant species in consultation with the local DFO. The density of the trees shall be around 2500 plants per ha. The balance 1347.50 ha of de coaled the void left for further expansion in the dipside shall be converted into a water reservoir, shall be gently sloped and the upper benches of the reservoir shall be stabilised with plantation and the periphery of the reservoir fenced.

14) *ETP shall also be provided for treatment of effluents from workshop (1305 m3/d) and an STP shall be provided for treating wastewater (2881 m3/d) from the township with all dwelling units and the treated effluents shall be used for green belt development. An estimated 13087 m3/d (97.85 %) of the total 13375 m3/d of wastewater (mine pumped out water) generated from the mine would be treated and recycled for mine operations and the balance 3168 m3/d of wastewater (Excess mine water+ waste water from DETP) shall be treated to prescribed standards before discharge into the surface waters/agricultural use.*

15) *Besides carrying out regular periodic health check-up of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any. Further, PP shall engage an agency such as NIOH, Ahmedabad to review the status of implementation of occupational health plan and suggest corrective measures.*

16) *PP shall implement the action plan submitted for addressing the issues raised during Public Hearing. The budget earmarked for the same is Rs. 15.15 Cr. The budget earmarked for the same shall be kept in a separate account and audited annually. In addition to this PP shall provide mobile medical units and ambulance facility for locals, provide the modern science lab to near schools and sports facility too. The Committee is of the view that skill development programme should be linked with the employment potential and a record of the same shall be maintained regarding to ascertain whether the skill development plan is effective enough or not to enable the local persons to get employment after the training, in case if it is required that skill program needs to be changed as per present & future requirement than PP shall do so. PP shall submit the activities carried out and amount spent along with documentary proof to concerned Regional Office for the activities carried out during the previous year.*

17) *Establishment of smart classes shall be completed within a period of one year after grant of EC.*

18) *PP shall prepare and implement a plan in a period of one year that how the existing water requirement for the project can be reduced further and how the excess water collected by various means including rainwater harvesting measure can be treated and supplied for the public use. The work of development of ECO Park at Gevra Area shall be completed within a period of one year. PP shall ensure to increase the water supply including availability of drinking water in the nearby area and water ATM can be setup at public places.*

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19) *PP shall continue to provide proper medical facilities as proposed during the meeting, to the local people residing in the close vicinity of the project area and also to the project affected peoples. PP shall keep the provision for providing financial assistance for the critical illness such as cancer, kidney/liver failure etc. on cases to case basis. PP shall ensure to provide ambulance facilities for the general public particularly in the remote areas and a helpline in this regard may also be created.*

20) *A detailed Plan for CSR with specific budgetary allocation (capital and revenue) for various skill development and alternate livelihood programmes and schemes and implemented through establishment of cooperatives and SHGs shall be implemented. CSR activities shall not overlap for the villages falling in the study area of the coal mine projects located in the study area. The fund for CSR shall be provided as per companies act & CSR policy of the company, "the fund for the CSR should be allocated based on 2% of the average net profit of the Company for the three immediate preceding financial years or Rs. 2.00 per tonne of coal production of previous year whichever is higher". PP shall expedite the implementation part for the ongoing and proposed activities. Establishment of smart classes shall be completed within a period of one year after grant of EC.*

21) *Tribal Development Plan for the tribals shall be prepared as part of CSR. A detailed pre-project survey shall be carried on the socio-economic status of the local communities living in the villages near the project area before start of the mining operation based on a scientific methodology based on UND Human Development Index and monitoring the impact of project on the socio-economic and human development of the local communities, which shall be used as a base-line data for monitoring the progress of the status of human and socio-economic development in the area during and after the project life which is reflected in their Annual Report of the company and is also furnished as part of the Monitoring Report submitted to MOEF.*

22) *R&R shall be not less than the norms prescribed in National R&R Policy 2007/State R&R Policy/CIL Policy whichever is higher. R&R for a cost of not less than Rs. 564.44 crores for the PAFs shall be completed within an agreed time schedule.*

23) *The maximum production from the mine at any given time shall not exceed the limit as prescribed in the EC.*

24) *PP shall submit action plan for using and developing Renewable Energy for its consumption in its utilities/machinery/equipment's instead of using electricity from Grid/generated from Thermal Power Plants.*

25) *PP shall conduct physical and strength analysis within a period of two years and accordingly*

propose to install Sand Segregation Plant.

26) *PP shall obtain 5-star rating in terms of Environment Compliance from Ministry of Coal as per rating system implemented by Ministry of Coal.*

27) *In addition to the existing CAAQMS, PP shall install the two additional CAAQMS out of which one should be in downwind direction. Further, the location of all the CAAQMS existing as well as proposed shall be in consultation with CPCB/SPCB.*

28) *PP shall display data of CAAQMS by online information/Display system at gate of Gevra OCP and link with company website and with Chhattisgarh Environment Conservation Board.*

29) *Haul road from mine operation site till conveyor system shall be provided with fog canons and water sprinklers to reduce fugitive dust.*

30) *PP shall submit carrying capacity of the area from reputed institutes for its proposed production of 70 MTPA from Gevra on a regular interval of 3 years & submit status report to IRO MoEF&CC.*

31) *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.*

32) *There shall be no overflow of OB into the river Hasdeo and Ahiran river and Kholar nalla and other first order stream-lets and into the agricultural fields and massive plantation of native species shall be taken up in the area between the river and the project.*

33) *An estimated 2606.92 Mm3 of OB will be generated during the entire life of the mine. Out of which 219.56 Mm3 of OB will be dumped in seven external OB Dump in an earmarked area covering 480 ha of land 2387.36 Mm3 of OB will be dumped eight internal OB dump in embankment covering an area of 1287.85 ha. The maximum height of external OB dump for hard OB will not exceed 90 m with 3 tier and that for soft OB shall not exceed 60 m. The maximum slope of the dump shall not exceed 28 degrees. Monitoring and management of reclaimed dump sites shall continue till the vegetation becomes self- sustaining and compliance status shall be submitted to MOEF and its Regional Office on yearly basis. Further, PP shall carry out slop stability analysis of the dumps from a recognized institute (IITs/NITs etc.) and implement its recommendations.*

34) *Thick green belt of 50 m width at the final boundary in the down wind direction of the project site shall be developed to mitigate/check the dust pollution.*

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35) *The predominant Sal species in the forest area shall be protected, and in case of coal mining operations inevitable therein, compensatory forestation of these species shall be carried out in consultation with State Forest Department.*

36) *The project proponent shall obtain Consent to Establish/Operate from the State Pollution Control Boards for the proposed capacity of 70 MTPA prior to commencement.*

37) *PP shall ensure to submit the compliance report to Regional Office in a timely manner and in case of any non-compliance identified so far/in future in the CCR then the same shall be complied on priority and action taken report in this regard shall be submitted to concerned RO.*

38) *PP shall complete all the mitigation measures for reduction of air pollution proposed during EAC meeting within one year.*

39) *Third party monitoring by reputed instituted for air quality shall be carried out at identified locations, both ambient and the process area, to arrive at impact of the proposed expansion at regular interval of 3 years.*

40) *Project proponent shall plant 200000 nos. of native trees with broad leaves along the transportation route in three years to prevent the effect of air pollution. After completion of tree plantation, number of trees shall be duly endorsed from District Forest Officer.*

41) *PP shall carry out monthly water monitoring quality of Hasdeo and Ahiran River and conduct Bio-assay test half yearly and further monitoring Ground water level.*

42) *PP should conduct epidemiology study to (analysis of the distribution, patterns and determinants of health and disease conditions in defined populations).*

43) *PP shall plant additional 200 ha of Sal trees (only) and create a nursery of 10 ha to distribute the species freely in the region for redevelopment of Sal forest in the region.*

44) *Permanent Health care facilities of Hospital should be established within 5 km of project boundary for the local people.*

45) *PP shall pay to farmers of agricultural land if there is any loss due to pollution found by concerned District Commissioner as per extent rules or norms.*

46) *Domestic water shall be provided to the residents/villages which are coming under the zone*

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of influence of the project due to ground water extraction.

47) *10 nos of Water Harvesting Pond with adequate area and depth shall be development within 5 km of project area.*

48) *Adequate facility of drinking water, plantation and other social amenities should be provided to established R&R villages.*

49) *Recommendation made in the carrying capacity study shall be implemented for the protection of environment.*

50) *Recommendation made for social impact assessment study shall be implemented.*

51) *PP shall comply with the direction of Hon'ble Courts and decision of Collector Office or Dept of Geology Mines, Raipur with respect to pending court cases and other issues.*

52) *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 rivarine/riparian ecosystem conservation and management plan should be prepared and implemented in consultation with the irrigation/ water resource department in the State Government.*

53) *PP shall implement the recommendation made during the site visit of sub-committee on 5/10/2021.*

54) *Work of establishment of the Sal Nursery of 10 Ha area shall be completed by March 2024.*

55) *Digital display board shall be installed before April 2024.*

56) *The recommendation made by sub-committee during the site visit on 5/10/2021 shall be implemented. Further, Solar Roof top work shall be completed by May, 2024.*

57) *PP shall install CCTV camera in all entry and exist points of the mines from where tippers are moved, around coal handling plant, silos, railway siding. The Committee is of the view that PP shall ensure to have transportation route away from the habitation.*

58) *PP shall ensure that in case of any injury/accident the workers should be provided proper compensation and treatment and they should be insured as per existing laws as applicable to the project.*

59) *The peripheral fencing work shall be continued as per mine progression.*

60) *PP shall ensure that plastic waste generated from the mines shall be stored separately in isolated area and disposed of strictly adhering to the Plastic Waste Management Rules 2016. In pursuant to Ministry's OM dated 18/07/2022 PP shall also create awareness among the people working in the project area as well as in its surrounding area on the ban on Single Use Plastic(SUP) in order to ensure compliance of Ministry's Notification published by the Ministry on 12/08/2021.*

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A report along with photograph on the measures taken shall also be included in the six monthly compliance report being submitted by PP.

61) *Hon'ble Supreme Court in an Writ Petition(s) Civil No. 114/2014, Common Cause vs Union of India &Ors vide its judgement dated 8th January, 2020 has directed the Union of India to impose a condition in the mining lease and a similar condition in the environmental clearance and the mining plan to the effect that the mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. Compliance of this condition after the mining activity is over at the cost of the mining lease holders/Project Proponent". The implementation report of the above said condition shall be sent to the Regional Office of the MoEF&CC.*

62) *Third party audit of plantations carried out should be got done through a reputed forestry institution of MoEFCC (eg. ICFRE) and report submitted to IRO.*

Additional Agenda No. 6.11

6.11 Expansion of Vakilpalli Mine (VKP) Underground Coal Mining Project (0.35 MTPA) in ML area 205.34 Ha of Singareni Collieries Company Ltd., located Village Vakilpalli, Mandal Kamanpur, District Peddapalli (Telangana) -For Environmental Clearance (Under violation Notification dated 14th March, 2017) – Reg

[Online proposal IA/TG/CMIN/258008/2018, File No. 23-253/2018-IA.III(V)]

6.11.1 The proposal is for grant of Environment Clearance to expansion of Vakilpalli Mine (VKP) Underground Coal Mining Project (0.35 MTPA) in ML area 205.34 Ha of M/s Singareni Collieries Company Ltd., located Village Vakilpalli, Mandal Kamanpur, District Peddapalli (Telangana).

6.11.2 Committee during the EAC meeting noted the followings:

i. The instant proposal for EC was recommended in the 27th EAC meeting (Coal Mining Sector) held during 3rd to 4th March, 2022 wherein the Committee recommended the project for grant of EC.
ii. Additional Details Sought (ADS) on 13/04/2022 and 16/01/2024 for submission of Stage-1 FC and Bank Guarantee valid for 2 years.
iii. PP has submitted the Bank Guarantee valid for 2 years (i.e. tll 27/04/2026) vide letter dated 17.01.2024.

6.11.3 Committee during the deliberations noted that the instant proposal was earlier considered in 27th EAC meeting held during 3-4 March 2022 under violation category in pursuant to Notification S.O 804 (E) dated 14.03.2017 and the proposal was recommended by the EAC subject to specific conditions which inter-alia include submission of bank guarantee of Rs 127 Lakh and submission of Stage-I FC. Ministry also requested to submit the same vide letter dated 13/04/2022. The PP submitted the same vide letter dated 25/11/2023 i.e. after lapse of 19 months.

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Further, as per OM dated 19.06.2014 for consideration of proposals involving forest land, wherein it has mentioned that " *In the eventually that the Stage I FC is not submitted by the project proponent within the prescribed time limit (18 months), as and when the stage I FC is submitted thereafter, such project would be referred to EAC for having a re-look, in case the primary data used in preparation of EIA report is more than three years old. In such a situation, the EAC may get the fresh data collected and on that basis and after due diligence, either reiterate its earlier recommendations, or decide for reappraising the project proposal on account of valid reasons, as the case may be. In case it is decided to reappraise the project, the committee may also decide on the requirement of documents/information for reappraisal as also the need for a fresh public hearing"*

During the meeting PP presented the environment monitoring data for period Oct-Dec 2023. Considering the above facts, the Committee is of the view that there is no requirement of fresh baseline data or additional information from the PP. The Committee ***recommended*** *the proposal for grant of EC as per the earlier recommendation made during* 27th EAC meeting held during 3-4 March 2022, for grant of Environment Clearance to expansion of Vakilpalli Mine (VKP) Underground Coal Mining Project (0.35 MTPA) in ML area 205.34 Ha of M/s Singareni Collieries Company Ltd., located Village Vakilpalli, Mandal Kamanpur, District Peddapalli (Telangana) with specific conditions already prescribed by the EAC and standard EC conditions as per provision of EIA Notification 2006 (as amended).

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Annexure-I

Standard EC Conditions for Coal Mining Project (Opencast mining):

All the projects recommended for grant of environmental clearance by the EAC shallalso comply with the following Standard EC conditions as per Ministry's circular issued from time to time:

(a) Statutory compliance

(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.

(ii) The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.

(iii) The project proponent shall prepare a Site-Specific Conservation Plan / Wildlife Management Plan and approved by the Chief Wildlife Warden. Therecommendations 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).

(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.

(v) The project proponent shall obtain the necessary permission from the CentralGround Water Authority.

(vi) Solid/hazardous waste generated in the mines needs to addressed in accordance to the Solid Waste Management Rules, 2016/Hazardous & OtherWaste Management Rules, 2016.

(b) Air quality monitoring and preservation

(i) Continuous ambient air quality monitoring stations as prescribed in the statuebe established in the core zone as well as in the buffer zone for monitoring ofpollutants, namely PM10, PM2.5, SO_2 and NO_x. Location of the stations shall be decided based on themeteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Online ambient air quality monitoring stationsmay also be installed in addition to the regular monitoring stations as per the requirement and/or in consultation with the SPCB. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc to be carried out at least once in six months.

(ii) 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 25th September, 2000 and as amended from time to time by the Central PollutionControl 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.

(iii) Transportation of coal, to the extent permitted by road, shall be carried out by covered trucks/conveyors. Effective control measures such as regular water/mist sprinkling/rain gun

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etc shall be carried out in critical areas prone to air pollution (with higher values of PM10/PM2.5) such as haul road, loading/unloading and transfer points. Fugitive dust emissions from allsources shall be controlled regularly. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central/StatePollution Control Board.

(iv) The transportation of coal shall be carried out as per the provisions and routeenvisaged in the approved Mining Plan or environment monitoring plan. Transportation of the coal through the existing road passing through any village shall be avoided. In case, it is proposed to construct a 'bypass' road, itshould be so constructed so that the impact of sound, dust and accidents couldbe appropriately mitigated.

(v) Vehicular emissions shall be kept under control and regularly monitored. Allthe vehicles engaged in mining and allied activities shall operate only after obtaining 'PUC' certificate from the authorized pollution testing centres.

(vi) Coal stock pile/crusher/feeder and breaker material transfer points shall invariably be provided with dust suppression system. Belt-conveyors shall befully covered to avoid airborne dust. Side cladding all along the conveyor gantry should be made to avoid air borne dust. Drills shall be wet operated orfitted with dust extractors.

(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.

(c) Water quality monitoring and preservation

(i) The effluent discharge (mine waste water, workshop effluent) shall be monitored in terms of the parameters notified under the Water Act, 1974 CoalIndustry Standards vide GSR 742 (E) dated 25th September, 2000 and as amended from time to time by the Central Pollution Control Board.

(ii) The monitoring data shall be uploaded on the company's website and displayed at the project site at a suitable location. The circular No. J- 20012/1/2006-IA.11 (M) dated 27th May, 2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regardfor 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 monitoringof 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 a year, and the data thus collected shall be sent regularly to MOEFCC/RO.

(iv) Monitoring of water quality upstream and downstream of water bodies shallbe carried out once in six months and record of monitoring data shall be maintained and submitted to the Ministry of Environment, Forest and ClimateChange/Regional Office.

(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.

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(vi) Catch and/or garland drains and siltation ponds in adequate numbers and appropriate size shall be constructed around the mine working, coal heaps &OB dumps to prevent run off of water and flow of sediments directly into theriver 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 de-silted particularly before onset of monsoonand maintained properly. 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 and other industrial use. Dimension of the retaining wall constructed, if any, at thetoe 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 betweentoe of the dump and adjacent field/habitation/water bodies.

(vii) 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).

(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 asamended from time to time. Adequate ETP /STP needs to be provided.

(ix) The water pumped out from the mine, after siltation, shall be utilized for industrial purposive. watering the mine area, roads, green belt developmentetc. The drains shall be regularly desilted particularly after monsoon and maintained properly.

(x) The surface drainage plan including surface water conservation plan for the area of influence affected by the said mining operations, considering the presence of river/rivulet/pond/lake etc, shall be prepared and implemented bythe 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. The construction of embankment to prevent any danger against inrush of surfacewater into the mine should be as per the approved Mining Plan and as per thepermission of DGMS or any other authority as prescribed by the law.

(xi) The project proponent shall take all precautionary measures to ensure riverine/riparian ecosystem in and around the coal mine up to a distance of 5km. A riverine/riparian ecosystem conservation and management plan shouldbe prepared and implemented in consultation with the irrigation / water resource department in the state government.

(d) Noise and Vibration monitoring and prevention

(i) Adequate measures shall be taken for control of noise levels as per Noise Pollution Rules,2016 in the work environment. Workers engaged in blastingand drilling operations, operation of HEMM, etc shall be provided with personal protective equipments (PPE) like ear plugs/muffs in conformity withthe prescribed norms and guidelines in this regard. Adequate awareness programme for users to be conducted. Progress in usage of such

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accessoriesto be monitored.

(ii) Controlled blasting techniques shall be practiced in order to mitigate groundvibrations, fly rocks, noise and air blast etc., as per the guidelines prescribedby the DGMS.

(i) The noise level survey shall be carried out as per the prescribed guidelines toassess noise exposure of the workmen at vulnerable points in the minepremises, and report in this regard shall be submitted to the Ministry/RO onsix-monthly basis.

(e) Mining Plan

(i) Mining shall be carried out under strict adherence to provisions of the MinesAct 1952 and subordinate legislations made there-under 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 relevantcirculars issued by Directorate General Mines Safety (DGMS).

(iii) No mining shall be carried out in forest land without obtaining Forestry Clearance as per Forest (Conservation) Act, 1980.

(ii) Efforts should be made to reduce energy and fuel consumption by conservation,efficiency improvements and use of renewable energy.

(f) Land reclamation

(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 monitoringland use pattern and report in 1:50,000 scale or as notified by Ministry of Environment, Forest and Climate Change(MOEFCC) from time to time shallbe 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 40 m, adequate engineering interventionsshall be provided for sustenance of aquatic life therein. The remaining area shall be backfilled and covered with thick and alive top soil. Post-mining landbe rendered usable for agricultural/forestry purposes and shall be diverted. Further action will be treated as specified in the guidelines for Preparation ofMine Closure Plan issued by the Ministry of Coal dated 27th August, 2009 and subsequent amendments.

(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 the MOEFCC/RO.

(iv) Fly ash shall be used for external dump of overburden, backfilling or stowingof mine as per provisions contained in clause (i) and (ii) of subparagraph (8)of fly ash notification issued vide SO 2804 (E) dated 3rd November, 2009 asamended from time to time. Efforts shall be made to utilize gypsum generatedfrom Flue Gas Desulfurization (FGD), if any, along with fly ash for externaldump of overburden, backfilling of mines. Compliance report shall be submitted to Regional Office of MoEF&CC, CPCB and SPCB.

(v) Further, it may be ensured that as per the time schedule specified in mine closure plan it

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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 andafforested in line with the 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 Ministryof Environment, Forest and Climate Change/ Regional Office.

(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 areas 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.

(g) Green Belt

(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. The Action plan in this regard, if any,shall be prepared and implemented in consultation with the State Forest and Wildlife Department.

(ii) Greenbelt consisting of 3-tier plantation of width not less than 7.5 m shall bedeveloped allalong the mine lease area as soon as possible. The green belt comprising a mix of native species (endemic species should be given priority)shall be developed all along the major approach/ coal transportation roads.

(h) Public hearing and Human health issues

(i) Adequate illumination shall be ensured in all mine locations (as per DGMS standards) and monitored weekly. The report on the same shall be submittedto this ministry & it's RO on six-monthly basis.

(ii) 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% ofthe personnel identified from workforce engaged in active mining operationsshall be subjected to health check-up for occupational diseases and hearing impairment, if any, as amended time to time.

(iii) 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.

(iv) Implementation of the 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. Land oustees shall be compensated as per the norms laid down in the R&R policy of the company/State Government/Central Government, as applicable.

(v) The project proponent shall follow the mitigation measures provided in this Ministry's OMNo.Z-11013/5712014-IA.II (M) dated 29th October, 2014, titled 'Impact of mining

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activities on habitations-issues related to the miningprojects wherein habitations and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease area'.

(i) Corporate Environment Responsibility

(i) The project proponent shall comply with the provisions contained in this Ministry's OM vide F.No.22-65/2017-IA.III dated 1st May 2018, as applicable, regarding Corporate Environment Responsibility.

(ii) The company shall have a well laid down environmental policy duly approveby the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental/forest/wildlife norms/conditions. The company shall havedefined system of reporting infringements/deviation/violation of the environmental/forest/wildlife norms/conditions and/or shareholder's/stake holders.

(iii) A separate Environmental Cell both at the project and company head quarterlevel, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.

(iv) Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation ofaction plan shall be reported to the Ministry/Regional Office along with the Six Monthly Compliance Report.

(v) Self-environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.

(j) Miscellaneous

(i) The project proponent shall make public the environmental clearance grantedfor their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of theDistrict or State, of which one shall be in the vernacular language within sevendays and in addition this shall also be displayed in the project 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 inaddition to the relevant offices of the Government who in turn has to displaythe same for 30 days from the date of receipt.

(iii) The project proponent shall upload the status of compliance of the stipulatedenvironment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.

(iv) The project proponent shall monitor the criteria pollutants level namely; PM10, SO2, NOx (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.

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(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 environment clearance portal.

(vi) The project proponent shall follow the mitigation measures provided in this Ministry's OM No. Z-11013/5712014-IA. II (M) dated 29th October, 2014, titled 'Impact of mining activities on habitations-issues related to the mining
projects wherein habitations and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease area'.

(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.

(viii) The project authorities shall inform to the Regional Office of the MOEFCC regarding commencement of mining operations.

(ix) The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.

(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 AppraisalCommittee.

(xi) No further expansion or modifications in the plant shall be carried out withoutprior approval of the Ministry of Environment, Forests and Climate Change.

(xii) 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.

(xiii) The Ministry may revoke or suspend the clearance, if implementation of anyof the above conditions is not satisfactory.

(xiv) The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

(xv) The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.

(xvi) 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 the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble SupremeCourt of India / High Courts and any other Court of Law relating to the subjectmatter.

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Annexure-II

Standard EC Conditions for Coal Mining Project (Underground mining):

All the projects recommended for grant of environmental clearance by the EAC shallalso complywith the following Standard EC conditions as per Ministry's circular issued from time to time:

I. Statutory compliance:

(i) The Environmental clearance shall be subject to orders of Hon'ble SupremeCourt of India, Hon'ble High Courts, NGT and any other Court of Law, fromtime to time, and as applicable to the project

(ii) 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.

(iii) The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.

(iv) The project proponent shall prepare a Site-Specific Conservation Plan / Wildlife Management Plan and approved by the Chief Wildlife Warden. Therecommendations of the approved Site-Specific Conservation Plan / WildlifeManagement 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)

(v) 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.

(vi) The project proponent shall obtain the necessary permission from the CentralGround Water Authority.

(vii) Solid waste/hazardous waste generated in the mines needs to addressed in accordance to the Solid Waste Management Rules, 2016 / Hazardous & Other Waste Management Rules,2016

II. Air quality monitoring and preservation

i. Adequate ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for monitoring of pollutants, namely particulates, SO_2 and NO_x.Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive receptors in consultation with the State Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc.tobe carried out at least once in six months. Online ambient air quality monitoring station/stations may also be installed in addition to the regular airmonitoring stations as per the requirement and/or in consultation with the SPCB

ii. The Ambient Air Quality monitoring in the core zone shall be carried out toensure the Coal Industry Standards notified vide GSR 742 (E) dated 25.9.2000 and as amended from time to time by the Central Pollution ControlBoard. Data on ambient air quality and heavy metals

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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.

iii. Transportation of coal, to the extent permitted by road, shall be carried out by covered trucks/conveyors. Effective control measures such as regular water sprinkling/rain gun/ mist sprinkling etc., shall be carried out in criticalareas prone to air pollution with higher level of particulate matter all throughthe coal transport roads, loading/unloading and transfer points. Fugitive dustemissions from all sources shall be controlled regularly. It shall be ensured that the ambient air quality parameters conform to the norms prescribed bythe Central/State Pollution Control Board.

iv. Major approach roads shall be black topped and properly maintained.

v. The transportation of coal shall be carried out as per the provisions and routeproposed in the approved mining plan. Transportation of the coal through theexisting road passing through any village shall be avoided. In case, it is proposed to construct a 'bypass' road, it should be so constructed that the impact of sound, dust and accidents could be appropriately mitigated.

vi. Vehicular emissions shall be kept under control and regularly monitored. Allthe vehicles engaged in mining and allied activities shall operate only after obtaining 'PUC' certificate from the authorized pollution testing centres.

vii. 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 airborne dust. Side cladding all along the conveyor gantry should be made to avoid air borne dust. Drills shall be wet operated orfitted with dust extractors.

viii. 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.

III. Water quality monitoring and preservation

i. The effluent discharge (mine waste water, workshop effluent) shall bemonitored in terms of the parameters notified under the Water Act, 1974 CoalIndustry Standards vide GSR 742 (E) dated 25.9.2000 and as amended fromtime to time by the Central Pollution Control Board.

ii. The monitoring data shall be uploaded on the company's website and displayed at the project site at a suitable location. The circular No. J-20012/1/2006-IA.11 (M) dated 27.05.2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regardfor its compliance.

iii. Regular monitoring of ground water level and quality shall be carried out in andaround the mine lease area by establishing a network of existing wells and constructing new piezometers during the mining operations. The monitoringof 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 a year, and the data thus collected shall be sent regularly to MOEFCC/RO.

iv. Monitoring of water quality upstream and downstream of water bodies shallbe carried out once in six months and record of monitoring data shall be maintained and submitted to the Ministry of Environment, Forest and ClimateChange/Regional Office.

v. Ground water, excluding mine water, shall not be used for mining operations. Rainwater

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harvesting shall be implemented for conservation and augmentation of ground water resources.

vi. The project proponent shall not alter major water channels around the site. Appropriate embankment shall be provided along the side of the river/nallah flowing near or adjacent to the mine. The embankment constructed along theriver/nallah boundary shall be of suitable dimensions and critical patches shallbe strengthened by stone pitching on the river front side, stabilized with plantation so as to withstand the peak water pressure preventing any chance of mine inundation.

vii. Garland drains (of suitable size, gradient and length) around the critical areas i.e. mine shaft and low lying areas, shall be designed keeping at least 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine sites. The sump capacity shall also provide adequate retention period to allow proper settling of silt material of the surface runoff

viii. The water pumped out from the mine, after siltation, shall be utilized for industrial purposive. watering the mine area, roads, green belt developmentetc. The drains shall be regularly desilted particularly after monsoon and maintained properly.

ix. Industrial waste water from coal handling plant and mine water shall be properly collected and treated so as to conform to the standards prescribed under the Environment (Protection) Act, 1986 and the Rules made thereunder, and as amended from time to time. Oil and grease trap shall be installed before discharge of workshop effluent. Sewage treatment plant of adequate capacity shall be installed for treatment of domestic waste water.

x. Adequate groundwater recharge measures shall be taken up for augmentation of ground water. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.

xi. The surface drainage plan including surface water conservation plan for the area of influence affected by the said mining operations shall be prepared, considering the presence of any river/rivulet/pond/lake etc., with impact of mining activities on it, and implemented by the project proponent. The surface drainage plan and/or any diversion of natural water courses shall be asper the provisions of the approved Mining Plan/ EIA-EMP submitted to this Ministry and the same should be done with due approval of the concerned State/GoI Authority. 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.

xii. The project proponent shall take all precautionary measures to ensure reverian/ riparian ecosystem in and around the coal mine upto a distance of 5 km. A revarian /riparian ecosystem conservation and management plan should be prepared and implemented in consultation with the irrigation / water resource department in the state government.

IV. Noise and Vibration monitoring and prevention

i. Adequate measures shall be taken for control of noise levels below 85 dB(A)in the work environment. Workers engaged in underground mining 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. Progress in usage of such

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accessories to be monitored. Adequate awareness programme for users to beconducted.

ii. The noise level survey shall be carried out as per the prescribed guidelines toassess noise exposure of the workmen at vulnerable points in the minepremises, and report in this regard shall be submitted to the Ministry/RO onsix-monthly basis.

V. Mining Plan

i. Mining shall be carried out under strict adherence to provisions of the MinesAct 1952 and subordinate legislations made there-under as applicable.

ii. No change in mining method i.e. UG to OC, calendar programme and scopeof work shall be made without obtaining prior approval of the Ministry of Environment, Forests and Climate Change (MoEFCC).

iii. Mining shall be carried out as per the approved mining plan (including mineclosure plan) abiding by mining laws related to coal mining and the relevant circulars issued by Directorate General Mines Safety (DGMS).

iv. Underground work place environmental conditions shall be rendered ergonomic and air breathable with adequate illumination in conformance withDGMS standards.

v. No mining activity shall be carried out in forest land without obtaining Forestry Clearance as per Forest (Conservation) Act, 1980 and also adheringto The Scheduled Tribes and Other Traditional Forest Dwellers (Recognitionof Forest Rights) Act, 2006 read with provisions of Indian Forest Act, 1927.

vi. Efforts should be made to reduce energy and fuel consumption by conservation, efficiency improvements and use of renewable energy.

VI. Land reclamation

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 monitoringland use pattern and report in1:50,000 scale or as notified by Ministry of Environment, Forest and Climate Change(MOEFCC) from time to time shallbe submitted to MOEFCC/Regional Office (RO).

ii. Post-mining land be rendered usable for agricultural/forestry purposes and shall be handed over to the respective State Government, as specified in the Guidelines for Preparation of Mine Closure Plan, issued by the Ministry of Coaldated 27th August, 2009 and subsequent amendments.

iii. Regular monitoring of subsidence movement on the surface over and aroundthe working areas and its 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 beyond the limit prescribed, appropriate effective mitigation measures shall be taken to avoid loss of life and materials. Cracks should beeffectively plugged in with ballast and clay soil/suitable material.

iv. Fly ash shall be used for external dump of overburden, backfilling or stowingof mine as per provisions contained in clause (i) and (ii) of subparagraph (8)of fly ash notification issued vide SO 2804 (E) dated 3rd November, 2009 asamended from time to time. Efforts shall be made to utilize gypsum generatedfrom Flue Gas Desulfurization (FGD), if any, along with fly ash for externaldump of overburden, backfilling or stowing of mines. Compliance report shall be submitted to Regional Office of MoEF&CC, CPCB and SPCB.

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v. A separate team for subsidence monitoring and surface mitigation measures shall be constituted and continuous monitoring & implementation of mitigation measures be carried out.

vi. Thorough inspection of the mine lease area for any cracks developed at the surface due to mining activities below ground shall be carried out to prevent inrush of water in the mine.

vii. Native tree species shall be selected and planted over areas affected by subsidence.

viii. 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 areas 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.

VII. Green Belt

i. The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered flora/fauna, if any, spotted/reported in the study area. Action plan, in this regard, if any, shall beprepared and implemented in consultation with the State Forest and Wildlife Department.

ii. Greenbelt, consisting of three-tier plantation, of width not less than 7.5 m, shall be developed all along the mine lease area in a phased manner. The greenbelt comprising of a mix of native species shall be developed all along the major approach roads/ coal transportation roads.

VIII. Public hearing and Human health issues

i. Adequate illumination shall be ensured in all mine locations (as per DGMS standards) and monitored.

ii. The Project Proponent shall undertake Occupational Health survey for initialand Periodical medical examination of the workers engaged in the Project andmaintain records accordingly as per the provisions of the Mines Rules, 1955 and DGMS Circulars. Besides carrying out regular periodic health check-up of their workers, 20% of the workers engaged in active mining operations shallbe subjected to health check-up for occupational diseases and hearing impairment, if any.

iii. Personnel (including outsourcing employees) working in dusty areas shall wear protective respiratory devices and shall also be provided with adequatetraining and information on safety and health aspects.

iv. Skill training as per safety norms specified by DGMS shall be provided to allworkmen including the outsourcing employees to ensure high safety standards in mines.

v. Effective arrangement shall be made to provide and maintain at suitable points conveniently situated, a sufficient supply of drinking water for all the persons employed.

vi. Implementation of Action Plan on the issues raised during the Public Hearingshall be ensured. The Project Proponent shall undertake all the tasks as per the Action Plan submitted with budgetary provisions during the PublicHearing. Land oustees shall be compensated as per the norms laid out R&R Policy of the Company/ or the National R&RPolicy/ R&R Policy of the StateGovernment, as applicable

vii. The project proponent shall follow the mitigation measures provided in this Ministry's OMNo.Z-11013/5712014-IA. II (M) dated 29th October, 2014, titled 'Impact of mining activities on habitations-issues related to the miningprojects wherein habitations and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease

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area'.

IX. Corporate Environment Responsibility

i. The project proponent shall comply with the provisions contained in this Ministry's OM vide F.No. 22-65/2017-IA.III dated 1st May 2018, as applicable, regarding Corporate Environment Responsibility.

ii. The company shall have a well laid down environmental policy duly approveby the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest / wildlife norms / conditions. The company shall have defined system of reporting infringements / deviation/ violation of the environmental / forest / wildlife norms / conditions and / or shareholder's / stake holders. The copy ofthe board resolution in this regard shall be submitted to the MoEF&CC as a part of six-monthly report.

iii. A separate Environmental Cell both at the project and company head quarterlevel, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.

iv. Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation ofaction plan shall be reported to the Ministry/Regional Office along with the Six Monthly Compliance Report.

v. Self-environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.

X. Miscellaneous

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 sevendays and in addition this shall also be displayed in the project 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 thesame for 30 days from the date of receipt.

iii. The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on theirwebsite and update the same on half-yearly basis.

iv. 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 environment clearanceportal.

v. 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

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Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.

vi. The project authorities shall inform to the Regional Office of the MOEFCC regarding commencement of mining operations.

vii. The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.

viii. 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 AppraisalCommittee.

ix. No further expansion or modifications in the plant shall be carried out withoutprior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC).

x. Concealing factual data or submission of false/fabricated data may result inrevocation of this environmental clearance and attract action under the provisions of Environment (Protection)Act, 1986.

xi. The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

xii. The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

xiii. The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.

xiv. 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 Transboundary Movement) Rules, 2016 and 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 subjectmatter.

xv. Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

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Annexure-III

Standard EC Conditions for Coal Washery Project

I. Statutory compliance:

(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.

(ii) The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.

(iii) The project proponent shall prepare a Site-Specific Conservation Plan / Wildlife Management Plan and approved by the Chief Wildlife Warden. Therecommendations of the approved Site-Specific Conservation Plan / WildlifeManagement 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 thestudy area)

(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.

(v) The project proponent shall obtain the necessary permission from the CentralGround Water Authority.

(vi) Solid waste/hazardous waste generated in the washery needs to addressed inaccordance to the Solid Waste Management Rules, 2016 / Hazardous & Other Waste Management Rules,2016.

(vii) Coal beneficiation practices shall be carried out under strict adherence to provisions of the Factories Act, 1957 and subordinate legislations made there under.

II. Air quality monitoring and preservation

i. Adequate ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for monitoring of pollutants, namely particulates, SO2 and NOx. Location of the stations shall be decided based onthe meteorological data, topographical features and environmentally and ecologically sensitive receptors 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.

ii. Continuous ambient air quality monitoring stations as prescribed in the statuebe established in the core zone as well as in the buffer zone for monitoring ofpollutants, namely PM10, PM2.5, SO2 and NOx. Location of the stations shall be decided based on themeteorological 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. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc to be carried out at least once in six months.

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iii. Transportation of coal by road shall be carried out by covered trucks/conveyors. The transportation of clean coal and rejects shall be by railwith wagon loading through silo. Effective measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulates such as roads, belt conveyors, loading/unloading and transfer points. Fugitive dust emissions from allsources shall be controlled at source. It shall be ensured that the ambient air quality parameters conform to the norms prescribed by the Central/State Pollution Control Board

iv. All approach roads shall be black topped and internal roads shall be concreted. The roads shall be regularly cleaned. Coal transportation shall be carried out by covered trucks.

v. Covered trucks shall be engaged for mineral transportation outside thewashery up to the railway siding, shall be optimally loaded to avoid spillage en-route. Trucks shall be adequately maintained and emissions shall be belownotified limits.

vi. Facilities for parking of trucks carrying raw material from linked mine shallbe created within the unit.

vii. Vehicular emissions shall be kept under control and regularly monitored. Thevehicles having 'PUC' certificate from authorized pollution testing centres shall be deployed for washery operations.

viii. Hoppers of the coal crushing unit and other washery units shall be fitted withhigh efficiency bag filters/mist spray water sprinkling system shall be installed and operated effectively at all times of operation to check fugitive emissions from crushing operations, transfer points of closed belt conveyor systems and from transportation roads.

ix. The raw coal, washed coal and coal wastes (rejects) shall be stacked properlyat earmarked site (s) within stockyards fitted with wind breakers/shields. Adequate measures shall be taken to ensure that the stored mineral does not catch fire.

x. The temporary reject sites should appropriate planned and designed to avoidair and water pollution from such sites.

III. Water quality monitoring and preservation

i. The effluent discharge (mine waste water, workshop effluent) shall bemonitored in terms of the parameters notified under the Water Act, 1974 CoalIndustry Standards vide GSR 742 (E) dated 25.9.2000 and as amended from time to time by the Central Pollution Control Board.

ii. The monitoring data shall be uploaded on the company's website and displayed at the project site at a suitable location. The circular No. J-20012/1/2006-IA.11 (M) dated 27.05.2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regardfor compliance.

iii. Industrial waste water shall be properly collected and treated so as to conformto the standards prescribed under the Environment (Protection) Act, 1986 andthe Rules made there under, and as amended from time to time.

iv. The project proponent shall not alter major water channels around the site. Appropriate embankment shall be provided along the side of the river/nallahflowing near or adjacent to the washery. The embankment constructed alongthe river/nallah boundary shall be of

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suitable dimensions and critical patches shall be strengthened by stone pitching on the riverfront side stabilised with plantation so as to withstand the peak water pressure preventing any chance of inundation.

v. Heavy metal content in raw coal and washed coal shall be analysed once ina year and records maintained thereof.

vi. The rejects should preferably be utilized in FBC power plant or disposed offthrough sale for its gainful utilization. If the coal washery rejects are to be disposed off, it should be done in a safe and sustainable manner with adequate compaction and post closure arrangement to avoid water pollutiondue to leachate from rejects and surface run of from reject dumping sites.

vii. An Integrated Surface Water Management Plan for the washery area up to itsbuffer zone considering the presence of any river/rivulet/pond/lake etc. with impact of coal washing activities on it, shall be prepared, submitted to MoEFCC and implemented.

viii. Waste Water shall be effectively treated and recycled completely either for washery operations or maintenance of green belt around the plant.

ix. Rainwater harvesting in the washery premises shall be implemented for conservation and augmentation of ground water resources in consultation with Central Ground Water Board.

x. No ground water shall be used for coal washing unless otherwise permitted in writing by competent authority (CGWA) or MoEFCC. The make-up waterrequirement of washery should not exceed 1.5 m3/tonne of raw coal.

xi. Regular monitoring of ground water level and quality shall be carried out in andaround the mine lease area by establishing a network of existing wells and constructing new piezometers during the mining operations. The monitoringof 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 a year, and the data thus collected shall be sent regularly to MOEFCC/RO. 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 ClimateChange/Regional Office.

xii. 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

IV. Noise and Vibration monitoring and prevention

i. The noise level survey shall be carried out as per the prescribed guidelines toassess noise exposure of the workmen at vulnerable points in the minepremises, and report in this regard shall be submitted to the Ministry/RO onsix-monthly basis

ii. Adequate measures shall be taken for control of noise levels as per noise pollution Rules,2016 in the work environment. Workers engaged in blastingand drilling operations, operation of HEMM, etc shall be provided with personal protective equipments (PPE) like ear plugs/muffs in conformity withthe prescribed norms and guidelines in this regard. Adequate awareness programme for users to be conducted. Progress in usage of such accessoriesto be monitored.

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V. Coal beneficiation

i. Coal stacking plan shall be prepared separately for raw coal, clean coal, middling and rejects.

ii. Efforts should be made to reduce energy consumption by conservation, efficiency improvements and use of renewable energy.

VI. Green Belt

i. Three tier greenbelt comprising of a mix of native species, of minimum 30 mwidth shall be developed all along the washery area to check fugitive dust emissions and to render aesthetic to neighbouring stakeholders. A 3-tier green belt comprising of a mix of native species or tree species with thick leaves shall be developed along vacant areas, storage yards, loading/transferpoints and also along internal roads/main approach roads.

ii. 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 areas 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.

VII. Public hearing and Human health issues

i. Adequate illumination shall be ensured in all mine locations (as per DGMS standards) and monitored weekly. The report on the same shall be submittedto this ministry & its RO on six-monthly basis. 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% ofthe personnel identified from workforce engaged in active mining operationsshall be subjected to health check-up for occupational diseases and hearing impairment, if any. as amended time to time.

ii. Personnel (including outsourced employees) working in core zone shall wearprotective respiratory devices and shall also be provided with adequate training and information on safety and health aspects.

iii. Implementation of the 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. Land oustees shall be compensated as per the norms laid down in the R&R policy of the company/State Government/Central Government, as applicable.

iv. The project proponent shall follow the mitigation measures provided in this Ministry's OM No. Z-11013/5712014-IA.I1 (M) dated 29th October, 2014, titled 'Impact of mining activities on habitations-issues related to the mining projects wherein habitations and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease area'.

VIII. Miscellaneous

i. The project proponent shall make public the environmental clearance grantedfor their project along with the environmental conditions and safeguards at their cost by prominently

advertising it at least in two local n

ii. 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 theproject proponent's website permanently.

iii. The copies of the environmental clearance shall be submitted by the project proponents tithe Heads of local bodies, Panchayats and Municipal Bodies inaddition to the relevant offices of the Government who in turn has to displaythe same for 30 days from the date of receipt.

iv. The project proponent shall upload the status of compliance of the stipulatedenvironment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.

v. The project proponent shall monitor the criteria pollutants level namely; PM10, SO2, NOx (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.

vi. 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 environment clearance portal.

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.

viii. The project authorities shall inform to the Regional Office of the MOEFCC regarding commencement of mining operations.

ix. The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.

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 AppraisalCommittee.

xi. No change in coal beneficiation process and scope of work shall be made withoutobtaining prior approval of the Ministry of Environment, Forests and Climate Change (MoEFCC) with such conditions mentioned therein. No change in the maximum quantum of raw material feed per annum against the approved washery capacity shall be made

xii. 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.

xiii. The Ministry may revoke or suspend the clearance, if implementation of anyof the above conditions is not satisfactory.

xiv. The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

xv. The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.

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xvi. 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 Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble SupremeCourt of India / High Courts and any other Court of Law relating to the subjectmatter.

xvii. Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

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ANNEXURE-IV

Generic ToR for coal washery

i. Siting of washery is critical considering to its environmental impacts. Preferenceshould be given to the site located at pit head; in case such a site is not available, the site should be as close to the pit head as possible and coal shouldbe transported from mine to the washer preferably through closed conveyerbelt to avoid air pollution.

ii. The washery shall not be located in eco-sensitive zones areas.

iii. The washery should have a closed system and zero discharge. The storm drainage should be treated in settling ponds before discharging into rivers/streams/water bodies.

iv. A thick Green belt of about 50 m width should be developed surrounding the washery.

v. A brief description of the plant along with a layout, the specific technologyused and the source of coal should be provided.

vi. The EIA-EMP Repot should cover the impacts and management plan for theproject of the capacity for which EC is sought and the impacts of specific activities, including the technology used and coal used, on the environment of the area (within 10km radius), and the environmental quality of air, water,land, biotic community, etc. through collection of data and information, generation of data on impacts for the rated capacity. Cumulative impacts forair and water should be a part of ElA in case coal mine, TPP and other washeries are located within 10km radius. The ElA should also include mitigative measures needed to minimize adverse environmental impacts.

vii. A Study Area Map of the core zone as well as the 10km area of buffer zoneshowing major industries/mines and other polluting sources should be submitted. These maps shall also indicate the migratory corridors of fauna, if any and areas of endangered fauna; plants of medicinal and economic importance; any ecologically sensitive areas within the 10 km buffer zone; the shortest distance from the National Park/WL Sanctuary Tiger Reserve, etc. along with the comments of the Chief Wildlife Warden of the State Govt.

viii. Data of one-season (non-monsoon) primary- base-line data on environmental quality of air (PM10, PM2.5, SOx and NOx, noise, water (surface and groundwater), soil be submitted.

ix. The wet washery should generally utilize mine water only. In case mine water is not available, the option of storage of rain water and its use should be examined. Use of surface water and ground water should be avoided.

x. Detailed water balance should be provided. The break-up of water requirement as per different activities in the mining operations vis-a-vis washery should be given. If the source of water is from surface water and/orground water, the same may be justified besides obtaining approval of the Competent Authority for its drawl.

xi. The entire sequence of mineral production, transportation, handling, transfer and storage of mineral and waste, if any, and their impacts on air quality should be shown in a flow chart with specific points where fugitive emissions can arise and specific pollution control/mitigative measures proposed to be put in place. The washed coal

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and rejects should be transport by train as far as possible. Road transport of washed coal and rejects should generally be avoided. In case, the TPP is within 10km radius, it should be through conveyer belt. If transport by rail is not feasible because of the topography ofthe area, the option for transport by road be examined in detail and its impactsalong with the mitigation measures should be clearly brought out in ElA/EMP report.

xii. Details of various facilities proposed to be provided in terms of parking, restareas, canteen etc. to the personnel involved in mineral transportation, workshop and effluents/pollution load from these activities should be provided.

xiii. Impacts of CHP, if any, on air and water quality should also be spelt out along with Action Plan.

xiv. O.M. No. J-l10I3/25/2014-IA.I dated 11th August, 2014 to be followed with regard to CSR activities.

xv. Details of Public Hearing, Notice(s) issued in newspapers,proceedings/minutes of Public Hearing, points raised by the general public and response/commitments made by the proponent along with the Action Plan and budgetary provisions be submitted in tabular form. If the Public Hearing is in the regional language, an authenticated English translation of thesame should be provided. Status of any litigations/ court cases filed/pending,if any, against the project should be mentioned in EIA.

xvi. Analysis of samples indicating the following be submitted: Characteristics of coal prior to washing (this includes grade of coal, other characteristics of ash, S and heavy levels of metals such as Hg, As, Pb,Cr etc). Characteristics and quantum of coal after washing. Characteristics and quantum of coal rejects.

xvii. Details of management/disposal/use of coal rejects should be provided. Therejects should be used in TPP located close to the washery as far as possible.If TPP is within a reasonable distance (10 km), transportation should be by conveyor belt. If it is far away, the transportation should be by rail as far as possible.

xviii. Copies of MOU/Agreement with linkages (for stand-alone washery) for thecapacity for which EC is being sought should be submitted.

xix. Corporate Environment Responsibility:

a) The Company must have a well laid down Environment Policy approvedby the Board of Directors.

b) The Environment Policy must 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 must be furnished.

d) To have proper checks and balances, the company should 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.

xx. A detailed action Plan for Corporate Social Responsibility for the project affected people and people living in and around the project area should be provided.

xxi. Permission of drawl of water shall be pre-requisite for consideration of EC.

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xxii. Wastewater /effluent should confirm to the effluent standards as prescribed under Environment (Protection) Act, 1986

xxiii. Details of washed coal, middling and rejects along with the MoU with the end-users should be submitted.

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ANNEXURE-V

GENERIC TOR FOR AN OPENCAST COALMINE PROJECT for EC

(i) An EIA-EMP Report shall be prepared for MTPA rated capacity in an ML/project area of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.

(ii) An EIA-EMP Report would be prepared for..... MTPA rated capacity to cover the impacts and environment management plan for the project specificactivities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for MTPA of coal production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.

(iii) A toposheet specifying locations of the State, District and Project site should be provided.

(iv) A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries/mines and other polluting sources. In case of ecologically sensitive areas such as BiosphereReserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found inthe 15 km study area should be given.

(v) Land use map (1: 50,000 scale) based on a recent satellite imagery of the study area mayalso be provided with explanatory note on the land use.

(vi) Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas(as per records), along with other physical features such as water bodies, etc should be furnished.

(vii) A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.

(viii) A detailed Site plan of the mine showing the proposed break-up of the landfor mining

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operations such as the quarry area, OB dumps, green belt, safetyzone, buildings, infrastructure, CHP, ETP, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channeling of the water courses,etc., approach roads, major haul roads, etc should be indicated.

(ix) In case of any proposed diversion of nallah/canal/river, the proposed route of diversion

/modification of drainage and their realignment, construction of embankmentetc. should also be shown on the map as per the approval of Irrigation and flood control Department of the concerned state.

(x) Similarly, if the project involves diversion of any road/railway line passing through the

ML/project area, the proposed route of diversion and its realignment shouldbe shown in the map along with the status of the approval of the competent authority.

(xi) Break up of lease/project area as per different land uses and their stage ofacquisition should be provided.

LANDUSE DETAILS FOR OPENCAST PROJECT should be given as per the following table:

Sl. No.	Land use	Within ML area (ha)	Outside ML area (ha)	Total
1.	Agricultural land			
2.	Forest land			
3.	Wasteland			
4.	Grazing land			
5.	Surface water bodies			
6.	Settlements			
7.	Others (specify)			
	TOTAL			

(xii) Break-up of lease/project area as per mining plan should be provided.

(xiii) Impact of changes in the land use due to the project if the land is predominantly agricultural land/forestland/grazing land, should be provided.

(xiv) One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SO_x, NO_x and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-seasonmet data coinciding with the same season for AAQ collection period should be provided.

(xv) Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location

of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non- polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.

(xvi) Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and faunaduly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as ahabitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.

(xvii) Details of mineral reserves, geological status of the study area and the seamsto be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approvedMining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure planapproval of Competent Authority should be furnished for green field and expansion projects.

(xviii) Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis- à-vis the potential impacts should be provided.

(xix) Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing though the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.

(xx) Detailed water balance should be provided. The break-up of water requirement for the various mine operations should be given separately.

(xxi) Source of water for use in mine, sanction of the Competent Authority in the State Govt..and impacts vis-à-vis the competing users in the upstream and downstream of the project site. should be given.

(xxii) Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/orif the area falls within dark/grey zone.

(xxiii) Impact of blasting, noise and vibrations should be given.
(xxiv) Impacts of mining on the AAQ and predictions based on modeling using the ISCST-3 (Revised) or latest model should be provided.
(xxv) Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.
(xxvi) Effort be made to reduce/eliminate road transport of coal inside and outsidemine and for mechanized loading of coal through CHP/ Silo into wagons andtrucks/tippers.
(xxvii) Details of waste OB and topsoil generated as per the approved calendar programme, and their management shown in figures as well explanatory notes tables giving progressive development and mine closure plan, green belt development, backfilling programme and conceptual post mining land use should be given. OB dump heights and terracing based on slope stabilitystudies with a max of 28° angle as the ultimate slope should be given. Sections of final dumps (both longitudinal and cross section) with relation tothe adjacent area should be shown.
(xxviii) Efforts be made for maximizing progressive internal dumping of O.B., sequential mining, external dump on coal bearing area and later rehandling into the mine void. --to reduce land degradation.
(xxix) Impact of change in land use due to mining operations and plan for restoration of the mined area to its original land use should be provided.
(xxx) Progressive Green belt and ecological restoration /afforestation plan (both in text, figures and in the tabular form as per the format of MOEFCC given below) and selection of species (native) based on original survey/land-use should be given.

Table 1: Stage-wise Land use and Reclamation Area (ha)

S.N.	Land use Category	Present (1st Year)	5th Year	10th Year	20th Year	24th Year (end o fmine life)*
1.	Backfilled Area Reclaimed with plantation)					
2.	Excavated Area (not reclaimed)/void					
3.	External OB dump Reclaimed with					

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	plantation)					
4.	Reclaimed Top soil dump					
5.	Green Built Area					
6.	Undisturbed area (brought under plantation)					
7.	Roads (avenue plantation)					
8.	Area around buildingsand Infrastructure					
	TOTAL					

* As a representative example

Table 2 : Stage Wise Cumulative Plantation

S. No.	YEAR*	Green Belt		External Dump		Backfilled Area		Others(Undisturbed Area/etc)		TOTAL	
1.	1st year										
2.	3rd year										
3.	5th year										
4.	10th year										
5.	15th year										
6.	20th year										
7.	25th year										
8.	30th year										
9.	34th year (end of mine life)										
10.	34-37thYear (Post-mining)										

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* As a representative example

(xxxi) Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre- mining status should be provided. A Plan for the ecological restoration of the mined out area and post mining landuse should be prepared with detailed cost provisions. Impact and

management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.

Table 3: Post-Mining Landuse Pattern of ML/Project Area (ha)

S.N.	Land use during Mining	Land Use (ha)				
		Plantation	Water Body	Public Use	Undisturbed	TOTAL
1.	External OB Dump					
2.	Top soil Dump					
3.	Excavation					
4.	Roads					
5.	Built up area					
6.	Green Belt					
7.	Undisturbed Area					
	TOTAL					

(xxxii) Flow chart of water balance should be provided. Treatment of effluents from workshop, township, domestic wastewater, mine water discharge, etc. should be provided. Details of STP in colony and ETP in mine should be given. Recycling of water to the max. possible extent should be done.

(xxxiii) Occupational health issues. Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower inthe mine should be given.

(xxxiv) Risk Assessment and Disaster Preparedness and Management Plan should be provided.

(xxxv) Integration of the Env. Management Plan with measures for minimizing useof natural resources - water, land, energy, etc. should be carried out.

(xxxvi) Cost of EMP (capital and recurring) should be included in the project costand for progressive and final mine closure plan.

(xxxvii) Details of R&R. Detailed project specific R&R Plan with data on the existing socio- economic status of the population (including tribals, SC/ST, BPL families) found in thestudy area and broad plan for resettlement of thedisplaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people,civic and housing amenitiesbeing offered, etc and costs along with the schedule of the implementationof the R&R Plan should be given.

(xxxviii) CSR Plan along with details of villages and specific budgetary provisions (capital

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and recurring) for specific activities over the life of the project should be given.

(xxxix) Corporate Environment Responsibility:

a) The Company must have a well laid down Environment Policy approved by the Board of Directors.

b) The Environment Policy must 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 theenvironmental clearance conditions must be furnished.

d) To have proper checks and balances, the company should have a welllaid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/orshareholders or stakeholders at large.

(xl) Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general publicand commitments made by the proponent and theaction proposed with budgets in suitabletime frame. These details should bepresented in a tabular form. If the Public Hearing is inthe regional language,an authenticated English Translation of the same should be provided.

(xli) In built mechanism of self-monitoring of compliance of environmental regulations shouldbe indicated.

(xlii) Status of any litigations/ court cases filed/pending on the project should be provided.

(xliii) Submission of sample test analysis of Characteristics of coal: This should include details on grade of coal and other characteristics such as ash content,S and heavy metals including levels of Hg, As, Pb, Cr etc.

(xliv) Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept.(if req.), etc. wherever applicable.

FOREST CLEARANCE: Details on the Forest Clearance should be given as per the format given:

TOTAL ML/PROJECTAREA (ha)	TOTAL FORESTLAND (ha)	Date of FC	Extent of forestland	Balance area for which FC isyet to be obtained	Status of appl for. diversion of forest land
		If more than, provide details of each FC			

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ANNEXURE -VI

GENERIC TORs FOR AN UNDERGROUND COALMINE PROJECT

(i) An EIA-EMP Report shall be prepared for MTPA rated capacity in an ML/project area of ha based on the generic structure specified in Appendix III of the EIA Notification,2006.

(ii) An EIA-EMP Report would be prepared for MTPA rated capacity to cover the impacts
and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for MTPA
of coal production based on approved project/Mining Plan for MTPA.
Baseline data collection can be for any season (three months) except monsoon.

(iii) A Study area map of the core zone (project area) and 10 km area of the bufferzone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries/mines and other polluting sources. In case of ecologically sensitive areas such as BiosphereReserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found inthe 15 km study area should be given.

(iv) Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas(as per records), along with other physical features such as water bodies, etc should be furnished.

(v) A contour map showing the area drainage of the core zone and 25 km of thestudy area (where the water courses of the core zone ultimately join the majorrivers/streams outside the lease/project area) should also be clearly indicatedin the separate map.

(vi) A detailed Site plan of the mine showing the proposed break-up of the land for mining

operations such as the quarry area, OB dumps, green belt, safetyzone, buildings, infrastructure, CHP, ETP, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of

embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.

(vii) Original land use (agricultural land/forestland/grazing land/wasteland/waterbodies) of the area should be provided as per the tables given below. Impactsof project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified.

S. N	ML/Project Land use	Area under Surface Rights(ha)	Area Under Mining Rights (ha)	Area under Both (ha)
1.	Agricultural land			
2.	Forest Land			
3.	Grazing Land			
4.	Settlements			
5.	Others (specify)			

Area under Surface Rights

S.N.	Details	Area (ha)
1.	Buildings	
2.	Infrastructure	
3.	Roads	
4.	Others (specify)	
	TOTAL	

(viii) Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and faunaduly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as ahabitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained

and furnished.

(ix) Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approvedMining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure planapproval of Competent Authority should be furnished for green field and expansion projects.

(x) Details of mining methods, technology, equipment to be used, etc., rationalefor selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.

(xi) Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing though the ML and adjoining the lease/project and the impact on the existing users and impacts ofmining operations thereon.

(xii) One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SO_x, NO_x and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-seasonmet data coinciding with the same season for AAQ collection period should be provided.

(xiii) Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should beselected on the basis of size of lease/project area, the proposed impacts in thedownwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non- polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surfacewater as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.

(xiv) Impact of mining and water abstraction from the mine on the hydrogeologyand groundwater regime within the core zone and 10 km buffer zoneincluding long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/orif the area falls within dark/grey zone.

(xv) Study on subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.

(xvi) Detailed water balance should be provided. The breakup of water requirement as per different activities in the mining operations, including useof water for sand stowing should be given separately. Source of water for usein mine, sanction of the Competent Authority in the State Govt. and impactsvis-à-vis the competing users should be provided.

(xvii) Impact of choice of mining method, technology, selected use of machinery and

impact on air quality, mineral transportation, coal handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.

(xviii) Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.

(xix) Effort be made to reduce/eliminate road transport of coal inside and outsidemine and for mechanized loading of coal through CHP/ Silo into wagons and trucks/tippers.

(xx) Details of various facilities to be provided to the workers in terms of parking,rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.

(xxi) The number and efficiency of mobile/static water sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.

(xxii) Impacts of CHP, if any on air and water quality should be given. A flow chartshowing water balance along with the details of zero discharge should be provided.

(xxiii) Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre- mining status should be provided. A Plan for the ecological restoration of the mined out area and post mining landuse should be prepared with detailed cost provisions. Impact and managementof wastes and issues of re-handling (wherever applicable) and backfilling andprogressive mine closure and reclamation should be furnished.

(xxiv) Greenbelt development should be undertaken particularly around the transport route and CHP. Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.

(xxv) Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.

(xxvi) Details of R&R. Detailed project specific R&R Plan with data on the existingsocio-economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenitiesbeing offered, etc and costs along with the schedule of the implementation of the R&R Plan should be given.

(xxvii) CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project shouldbe given.

(xxviii) Corporate Environment Responsibility:

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a) The Company must have a well laid down Environment Policy approved bythe Board of Directors.

b) The Environment Policy must prescribe for standard operatingprocess/procedures to bring into focus any infringements/deviation/violationof 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 must be furnished.

d) To have proper checks and balances, the company should 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.

(xxix) Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and theaction proposed with budgets in suitable time frame. These details should bepresented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.

(xxx) In built mechanism of self-monitoring of compliance of environmentalregulations should be indicated.

(xxxi) Status of any litigations/ court cases filed/pending on the project should be provided.

(xxxii) Submission of sample test analysis of Characteristics of coal: This should include details on grade of coal and other characteristics such as ash content,S and heavy metals including levels of Hg, As, Pb, Cr etc.

(xxxiii) Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept.(if req.), etc. wherever applicable.

Details on the Forest Clearance should be given as per the format given:

Total ML /Project Area (ha)	Total Forest Land (ha)	Date of FC	Extent of Forest Land	Balance are a for which FC is yet to be obtained	Status of appl. For diversion of forest land
		If more than one provide details of each FC			

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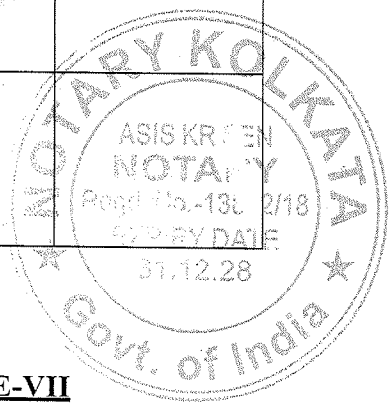

ANNEXURE-VII

GENERIC TORs FOR A N O P E N C A S T -CUM UNDERGROUND COAL MINE PROJECT

(i) An EIA-EMP Report would be prepared for a combined peak capacity of.....MTPA for OC-cum-UG project which consists of.... MTPA in an ML/project area of ha for OC and .... MTPA for UG in an ML/project area of ha based on the generic structure specified in Appendix III of the EIA Notification 2006.

(ii) An EIA-EMP Report would be prepared for MTPA rated capacity to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for MTPA of coal production based on approved project/Mining Plan for MTPA. Baseline data collection can be for any season (three months) except monsoon.

(iii) The ToRs prescribed for both opencast and underground mining are applicable for opencast – cum underground mining.

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~~ANNEXURE~~-VIII

LIST OF PARTICIPANTS OF EAC (COAL) IN 6th MEETING HELD ON 17-18 JANUARY, 2024 THROUGH HYBRID MODE

Sl. No.	Name	Position	17.01.2024	18.01.2024
1.	Dr. Sharad Singh Negi (I.F.S Retd.)	Chairman	*Present*	*Present*
2.	Sh. Inder Pal Singh Matharu, (I.F.S. Retd.)	Member	*Absent*	*Absent*
3.	Sh. Lalit Kapur (Retd. Adviser, MoEFCC)	Member	*Present*	*Present*
4.	Dr. Umesh Jagannathrao Kahalekar	Member	*Present*	*Present*
5.	Shri K.B. Biswas	Member	*Present (through VC)*	*Present (through VC*
6.	Sh. Savalge Chandrasekhar	Member	*Present (through VC)*	*Present (through VC)*
7.	Prof. Shyam Shanker Singh	Member	*Absent*	*Absent*
8.	Dr. Vinod Agrawal	Member	*Present*	*Present*
9.	Dr. Santosh Kumar Hampannavar	Member	*Present (through VC)*	*Present (through VC)*
10.	Prof. R M Bhattacharjee, Representative of IIT/ISM Dhanbad	Member	*Present (through VC)*	*Present (through VC)*
11.	Shri M.P Singh, Representative of CEA	Member	*Present (through VC)*	*Present (through VC)*
12.	Mr. Harmeet Sahanay Representative of IMD	Member	*Absent*	*Absent*
13.	Dr. Nazimuddin, Representative of Central Pollution Control Board	Member	*Present (through VC)*	*Present (through VC)*
14.	Shri Amit Vashishtha, Scientist 'E, MoEFCC	Member-Secretary	*Present*	*Present*
MOEF&CC				
15.	Sh. Mohit Saxsena	Sc 'D'	*Present*	*Present*

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APPROVAL OF CHAIRMAN EAC

Email **Amit Vashishtha**

Re: Draft MoM of 6th EAC (Coal Sector) held on 17-18 January, 2024

From : sharadnegi1957@gmail.com Mon, Feb 05, 2024 06:43 PM
Subject : Re: Draft MoM of 6th EAC (Coal Sector) held on 17-18 January, 2024
To : Amit Vashishtha <amit.vashishtha@nic.in>

The final MoM of 6 th EAC Coal at per your attachment is approved

On Monday, February 5, 2024, Amit Vashishtha <amit.vashishtha@nic.in> wrote:

Sir,

The necessary corrections have been made. Please find attached herewith the Final MoM of 6th EAC (Coal Sector) held on 17-18 January, 2024 for approval please.

With Regards

Amit Vashishtha
Sc 'E'
MoEF&CC

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3~~2~~6 ANNEXURE-'M'

Query raised by Shri Sanjay Kumar Mishra through MoEF&CC: Looking into the Test Reports issued on 09.01.2023 available at Welcome to PARIVESH it is found that for the entire period of monitoring carried out between 03.10.2022 to 31.12.2022, the parameter Benzene is reported to be below detection limit, which is 0.5 microgram per cubic meter in all the stations. The villages in which the laboratory has carried out monitoring are named as: Pidhakhamana, Tangarsahi, Kosala, Korada, Kalikatta, Golabandha, Kumunda, Malibrahmani, Brahmanbil, Kalamchhuin, Chhotagolagadia.

Benzene in all the villages for the month of December 2022 needs a review. There are some other findings which show that in December 2022, the Benzene concentration in all these villages found to be varying between 2.2 to 6.4 microgram per cubic meter. The maximum was found in Golabandha.

Submission/Justification: Vardan EnviroLab a NABL Accredited Lab based in Gurgaon, Haryana was engaged for carrying out Baseline Monitoring Environmental Study during the period from October to December 2022. The environmental study conducted was in accordance with the guidelines of EIA issued by the Ministry of Environment Forests and Climate Change, Govt. of India and Central Pollution Control Board, New Delhi.

The locations of the Air Monitoring were as follows:

Stations	Name	Distance in Km	Latitude	Longitude
A1	Project Site	-	20° 57' 36.707" N	84° 59' 28.969" E
A2	Village Tangarasahi	1.27	20° 57' 33.378" N	84° 57' 59.721" E
A3	Village Kosala	1.02	20° 58' 49.664" N	84° 58' 15.542" E
A4	Village Korada	8.4	20° 57' 29.610" N	84° 53' 53.934" E
A5	Village Kaliakata	3.34	20° 54' 11.191" N	84° 59' 6.014" E
A6	Golabandha	8.45	20° 51' 27.956" N	85° 0' 1.713" E
A7	Village Kumunda	1.40	20° 58' 53.749" N	85° 1' 31.201" E
A8	Malibrabmani	1.02	20° 55' 31.211" N	84° 59' 40.727" E

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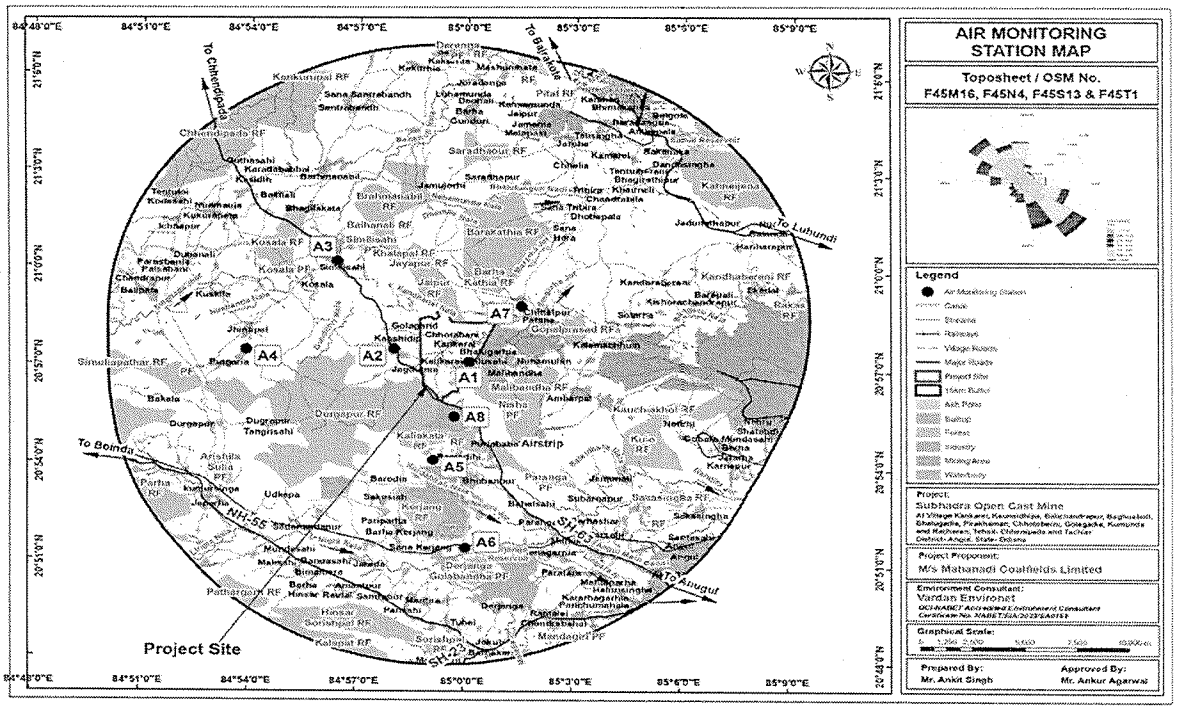

Laboratory analysis of the test samples collected during the period as stated above in all the location for Benzene were found to be within the prescribed NAAQS Limit. (Lab Report is attached as **Annexure-1**)

The different techniques Adopted/Protocols for Ambient Air Quality Monitoring are as follows.

S. No	Parameters	Techniques	Technical Protocol
1	Sulphur Dioxide (SO_2)	West & Gaeke	IS:5182 (P2)
2	Nitrogen Dioxide (NO_2)	Jacob & Hochheiser	IS:5182 (P6)
3	Particulate Matter PM_{10}	Gravimetric	IS:5182 (P23)
4	Particulate Matter $PM_{2.5}$	Gravimetric	IS:5182 (P24)
5	Carbon-monoxide as CO	NDIR	IS: 5182 (P-10)
6	Ammonia	Spectrophotometric Method	IS 5182 (P-25): 2018
7	Arsenic	ICPMS/AAS Method	VEL/ENV/STP/110, Issue No. 01 dated on 01/11/2021
8	Benzene	GC-FID Method	IS: 5182 (P-11): 2006 RA: 2017
9	Benzo(a)pyrene	GC-FID Method	IS: 5182 (P-12): 2004, RA: 2019
10	Lead	ICPMS/AAS Method	IS: 5182 (P-22):2004 RA: 2019
11	Nickel	ICPMS/AAS Method	IS: 5182 (P-26), 2020
12	Ozone	Spectrophotometric Method	IS 5182 (P-9):1974 RA: 2019
13	Mercury as Hg	ICPMS/AAS Method	VEL/ENV/STP/129, Issue No. 01 dated on 01/11/2021

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As mentioned above, the testing of Benzene was done as per IS: 5182 (P-11): 2006 RA: 2017 Standards using the GC-FID Method. (Indian Standard Methods for Measurement of Air Pollution is attached for reference as **Annexure- 2**)

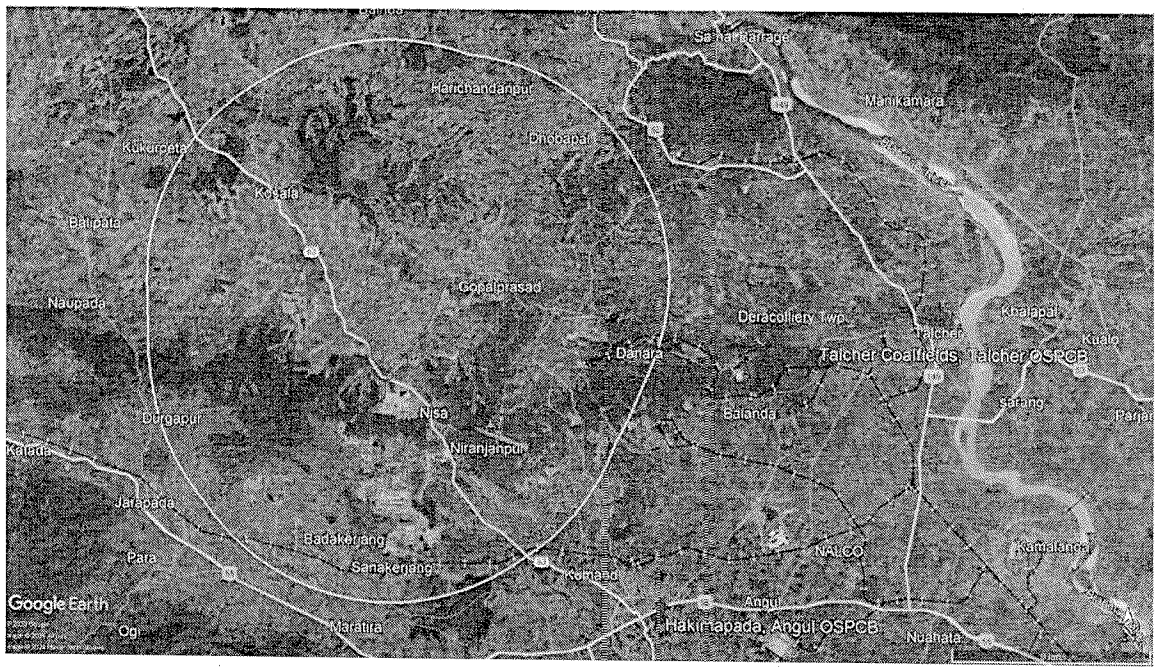
The test results show that the level of Benzene in all the locations was BLQ (Below Limit of Quantification, Limit of Quantification (LOQ) is 0.5 $\mu g/m^3$) and was as per NAAQS prescribed limits for Benzene i.e. 5.0 $\mu g/m^3$ (https://cpcb.nic.in/upload/NAAQS_2019.pdf) both within the core and buffer zone of Subhadra OCP of MCL.

Besides, the study results at 02 below mentioned locations (which are nearer to Subhadra OCP of MCL) of Central Control Room for Air Quality Management - All India, Govt of India (https://airquality.cpcb.gov.in) during the period from October to December 2022, for Benzene vide CAAQMS (CPCB) were found within the NAAQS Standards. (Reports Attached for Reference as **Annexure-3 & 4**).

Locations of CAAQMS (CPCB) monitoring stations:

1) Hakimapada Angul (Distance of 15 Km from Project Site and 5 Km from Buffer Zone)
2) Talcher Coalfields,Talcher (Distance of 17 Km from Project Site and 7Km from Buffer Zone)

Location Positions



This is to confirm that the baseline data generation and its testing was done as per the approved Protocols for Ambient Air Quality Monitoring.

Hence, *the Benzene concentration in all these villages found to be as per the study and as per CPCB reports (reference CPCB station-Hakim pada Station nearer to Golabandha Village which is approx. 11 km) found to be within prescribed limits during the period October-December 2022.*

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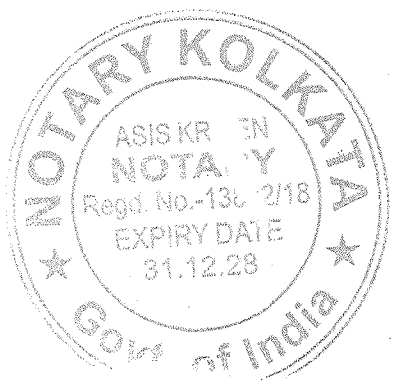
ANNEXURE - 1

Attachment –1

Lab Report for Ambient Air Monitoring



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Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No:	VEL/SOCM/AA/01-026	Report No:	VEL/AA/001-026
Name & Address of the Project:	M/s Subhadra Open Cast Mine. At Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil TachlerSadar and Chhenipada, District- Angul, State- Odisha	Reporting Date:	09/01/2023
		Ref. No:	NIL
		Monitoring Period:	October 2022 to December 2022
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182& CPCB Guidelines
Sample Collected By:	Vardan Envirolab Representative	Parameter Required:	As per TOR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Project Site (Pidhakhamana) (A1)		

RESULTS

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	Ozone ($\mu g/m^3$)	NH_3 ($\mu g/m^3$)	Benzene ($\mu g/m^3$)	B(α) P (ng/m^3)	Arsenic (ng/m^3)	Nickel (ng/m^3)	Lead ($\mu g/m^3$)	Mercury (ng/m^3)
07.10.2022	67.5	42.6	36.8	41.3	0.89	24.3	33.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
09.10.2022	66.9	45.1	37.2	40.9	0.92	23.1	32.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
11.10.2022	64.2	44.7	35.9	39.8	0.86	21.5	35.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
14.10.2022	65.8	43.9	34.1	38.6	0.99	24.6	36.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
18.10.2022	68.0	46.2	36.6	42.5	1.03	25.2	31.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
21.10.2022	69.3	45.1	33.2	40.7	0.87	26.7	34.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
25.10.2022	71.4	44.7	32.7	43.7	0.93	22.1	32.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
28.10.2022	70.8	43.9	31.9	44.3	1.04	23.9	33.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
01.11.2022	66.8	42.1	38.4	42.6	0.95	24.6	34.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
04.11.2022	67.2	44.7	36.5	41.9	0.89	22.9	35.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
08.11.2022	72.3	45.0	37.8	40.8	1.03	21.2	36.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
11.11.2022	70.9	42.9	33.9	43.6	0.86	24.6	33.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
15.11.2022	65.8	43.7	32.8	39.4	1.03	23.7	31.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
18.11.2022	66.0	44.6	31.6	38.6	1.10	25.4	34.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
22.11.2022	67.2	45.5	34.5	40.8	0.94	24.6	35.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
25.11.2022	68.9	46.2	35.7	42.3	0.87	26.1	36.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
29.11.2022	71.2	43.7	36.4	41.3	1.02	25.0	32.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
02.12.2022	70.5	42.1	38.6	44.5	1.09	24.7	31.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
06.12.2022	72.6	45.9	37.0	40.9	0.90	23.8	32.0	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
09.12.2022	69.3	44.6	33.9	39.5	0.86	21.9	33.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
13.12.2022	68.4	46.7	32.8	38.6	1.05	24.6	34.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
16.12.2022	67.2	43.8	31.6	41.2	0.93	22.7	35.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
20.12.2022	66.6	44.0	34.6	44.6	0.87	26.1	36.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
23.12.2022	65.1	42.9	35.8	43.7	1.06	25.0	34.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
27.12.2022	64.6	45.1	36.7	42.5	0.86	24.3	35.3	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
30.12.2022	68.7	46.8	38.0	41.0	0.94	22.5	32.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
Limit as per NAAQS	100	60	80	80	4	180	400	5	1	6	20	1	--

Note- Arsenic (LOQ- 0.1ng/m³), Benzene (LOQ- 0.5µg/m³), Benzo pyrene (LOQ- 0.5ng/m³), Lead (LOQ- 0.1µg/m³), Nickel (LOQ- 5.0ng/m³), Mercury (LOQ- 1ng/m³)*BLQ- BelowLimit of Quantification, *LOQ- Limit of Quantification

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(Approved By)

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)

ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No:	VEL/SOCM/AA/027-052	Report No:	VEL/AA/027-052
Name & Address of the Project:	M/s Subhadra Open Cast Mine. At Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil TachlerSadar and Chhenipada, District- Angul, State- Odisha	Reporting Date:	09/01/2023
		Ref. No:	NIL
		Monitoring Period:	October 2022 to December 2022
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182& CPCB Guidelines
Sample Collected By:	Vardan Envirolab Representative	Parameter Required:	As per TOR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Tangarasahi (A2)		

RESULTS

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	Ozone ($\mu g/m^3$)	NH_3 ($\mu g/m^3$)	Benzène ($\mu g/m^3$)	B(α) P (ng/m^3)	Arsenic (ng/m^3)	Nickel (ng/m^3)	Lead ($\mu g/m^3$)	Mercury (ng/m^3)
07.10.2022	62.3	38.4	31.6	35.9	0.83	19.6	31.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
09.10.2022	61.8	41.2	30.8	36.2	0.91	21.5	30.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
11.10.2022	67.4	40.6	29.5	34.7	0.79	18.3	32.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
14.10.2022	65.9	42.7	32.9	33.8	0.83	22.4	33.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
18.10.2022	66.3	39.5	27.6	38.9	0.96	20.8	28.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
21.10.2022	64.7	38.4	29.4	37.5	0.87	19.5	30.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
25.10.2022	59.8	36.7	31.5	35.6	0.88	21.3	31.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
28.10.2022	65.3	37.5	28.9	36.4	0.79	20.5	29.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
01.11.2022	67.1	39.5	32.4	33.8	0.93	18.0	32.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
04.11.2022	64.9	41.8	27.5	32.9	0.95	22.6	33.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
08.11.2022	65.2	40.3	30.6	38.4	0.85	19.4	30.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
11.11.2022	61.8	39.5	31.8	39.5	0.92	18.8	29.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
15.11.2022	62.7	38.4	29.5	35.2	0.97	21.2	32.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
18.11.2022	63.8	36.2	32.6	34.7	0.91	22.6	31.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
22.11.2022	64.5	38.4	30.8	33.6	0.80	20.7	28.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
25.11.2022	65.7	40.5	31.6	35.8	0.79	18.4	33.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
29.11.2022	62.9	41.2	27.8	36.7	0.94	22.6	32.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
02.12.2022	59.4	42.7	29.4	39.2	0.86	21.5	31.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
06.12.2022	61.9	38.9	28.5	37.4	0.93	20.5	30.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
09.12.2022	60.8	36.7	32.7	36.5	0.97	19.3	29.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
13.12.2022	62.7	38.7	31.2	33.8	0.92	22.7	32.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
16.12.2022	66.3	39.0	29.7	35.6	0.88	21.5	33.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
20.12.2022	65.8	41.6	31.6	34.7	0.95	18.9	31.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
23.12.2022	64.2	40.7	30.8	32.8	0.85	21.2	28.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
27.12.2022	62.9	42.2	32.9	37.6	0.96	19.5	30.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
30.12.2022	61.5	39.1	27.3	39.4	0.79	20.1	29.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
Limit as per NAAQS	100	60	80	80	4	180	400	5	1	6	20	1	--

Note- Arsenic (LOQ- 0.1ng/m³), Benzène (LOQ- 0.5µg/m³), Benzo pyrene (LOQ- 0.5ng/m³), Lead (LOQ- 0.1µg/m³), Nickel (LOQ- 5.0ng/m³), Mercury (LOQ- 1ng/m³)*BLQ- Below Limit of Quantification, *LOQ- Limit of Quantification

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Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No:	VEL/SOCM/AA/053-078	Report No:	VEL/AA/053-078
Name & Address of the Project:	M/s Subhadra Open Cast Mine. At Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angal, Tehsil TachlerSadar and Chhenipada, District- Angul, State- Odisha	Reporting Date:	09/01/2023
		Ref. No:	NIL
		Monitoring Period:	October 2022 to December 2022
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182& CPCB Guidelines
Sample Collected By:	Vardan Envirolab Representative	Parameter Required:	As per TOR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Kosala (A3)		

RESULTS

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	Ozone ($\mu g/m^3$)	NH_3 ($\mu g/m^3$)	Benzene ($\mu g/m^3$)	B(α) P (ng/m^3)	Arsenic (ng/m^3)	Nickel (ng/m^3)	Lead ($\mu g/m^3$)	Mercury (ng/m^3)
03.10.2022	63.8	41.6	31.9	37.6	0.79	23.6	31.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
06.10.2022	64.9	40.8	33.5	35.9	0.85	21.2	30.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
10.10.2022	67.3	43.7	30.9	39.4	0.92	19.5	32.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
13.10.2022	66.2	42.6	29.6	33.9	0.76	20.8	29.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
17.10.2022	68.4	39.5	31.6	35.7	0.88	20.6	28.3	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
20.10.2022	69.3	38.7	32.7	36.1	0.92	22.7	33.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
24.10.2022	65.3	43.6	34.5	39.4	0.76	21.6	32.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
27.10.2022	64.7	40.8	33.9	36.7	0.91	23.4	30.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
31.10.2022	63.8	41.7	31.6	35.2	0.87	19.5	34.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
03.11.2022	69.3	38.4	30.5	40.5	0.93	21.6	32.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
07.11.2022	68.1	37.6	29.0	41.6	0.77	20.5	31.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
10.11.2022	66.7	39.2	32.4	38.9	0.84	22.9	30.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
14.11.2022	65.3	41.7	31.6	39.4	0.91	23.4	28.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
17.11.2022	62.9	42.5	33.5	36.4	0.79	21.5	32.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
21.11.2022	61.5	40.5	34.2	37.5	0.88	20.6	29.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
24.11.2022	64.3	38.0	31.6	41.3	0.94	19.8	31.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
28.11.2022	65.7	41.9	32.8	40.8	0.86	21.5	30.0	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
01.12.2022	66.8	42.2	29.5	38.4	0.93	20.6	33.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
05.12.2022	68.3	43.7	32.7	35.6	0.78	22.8	34.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
08.12.2022	69.4	38.4	33.4	36.7	0.80	23.9	31.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
12.12.2022	63.8	39.6	29.6	34.8	0.92	21.2	32.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
15.12.2022	64.5	40.7	32.5	39.5	0.78	20.5	29.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
19.12.2022	63.8	41.8	31.2	41.6	0.93	19.8	28.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
22.12.2022	65.2	42.3	30.0	40.5	0.88	22.6	32.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
26.12.2022	66.3	37.6	29.6	38.0	0.94	21.2	31.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
29.12.2022	61.0	42.3	33.7	39.4	0.78	20.8	30.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
Limit as per NAAQS	100	60	80	80	4	180	400	5	1	6	20	1	--

Note- Arsenic (LOQ- 0.1ng/m³), Benzene (LOQ- 0.5µg/m³), Benzo pyrene (LOQ- 0.5ng/m³), Lead (LOQ- 0.1µg/m³), Nickel (LOQ- 5.0ng/m³), Mercury (LOQ- 1ng/m³)*BLQ- Below Limit of Quantification, *LOQ- Limit of Quantification

VARDAN ENVIROLAB GURUGRAM (Checked By)

(Approved By)

VARDAN ENVIROLAB KOLKATA ASSISTANT SECRETARY

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Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No:	VEL/SOCM/AA/079-104	Report No:	VEL/AA/079-104
Name & Address of the Project:	M/s Subhadra Open Cast Mine. At Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil TachlerSadar and Chhenipada, District- Angul, State- Odisha	Reporting Date:	09/01/2023
		Ref. No:	NIL
		Monitoring Period:	October 2022 to December 2022
		Equipment Used:	RDS & FPS with all accessories
Sample Collected By:	Vardan Envirolab Representative	Protocol Used:	IS-5182& CPCB Guidelines
Sample Description:	Ambient Air Quality Monitoring	Parameter Required:	As per TOR Letter
Location:	Korada (A4)		

RESULTS

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	Ozone ($\mu g/m^3$)	NH_3 ($\mu g/m^3$)	Benzene ($\mu g/m^3$)	B(α) P (ng/m^3)	Arsenic (ng/m^3)	Nickel (ng/m^3)	Lead ($\mu g/m^3$)	Mercury (ng/m^3)
03.10.2022	53.6	28.1	23.9	26.4	0.63	16.2	28.3	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
06.10.2022	51.2	29.6	21.2	23.8	0.59	15.1	29.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
10.10.2022	55.7	30.5	20.8	21.2	0.61	18.4	27.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
13.10.2022	54.9	32.4	24.6	30.6	0.57	17.6	25.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
17.10.2022	56.1	31.6	23.5	28.4	0.60	16.1	26.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
20.10.2022	52.7	29.4	25.1	27.6	0.58	17.5	29.3	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
24.10.2022	53.4	32.8	22.9	26.9	0.62	18.9	25.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
27.10.2022	56.8	31.5	24.2	22.6	0.50	15.7	27.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
31.10.2022	55.2	30.9	23.6	21.8	0.61	16.8	26.3	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
03.11.2022	54.2	29.1	21.5	24.5	0.54	18.4	25.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
07.11.2022	51.9	28.4	20.8	23.9	0.63	16.6	29.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
10.11.2022	52.7	32.6	25.9	25.7	0.59	15.9	28.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
14.11.2022	53.8	31.7	24.6	26.8	0.62	17.2	26.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
17.11.2022	54.6	30.8	23.7	27.2	0.57	18.0	25.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
21.11.2022	55.6	28.9	22.5	28.4	0.62	17.3	28.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
24.11.2022	53.8	29.4	21.2	29.3	0.59	16.5	29.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
28.11.2022	52.9	32.5	23.6	21.6	0.63	15.9	26.3	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
01.12.2022	56.1	30.6	24.7	30.5	0.52	17.1	28.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
05.12.2022	54.3	31.1	25.1	25.6	0.60	18.6	29.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
08.12.2022	52.8	29.4	20.6	27.2	0.55	15.9	26.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
12.12.2022	51.6	32.5	22.8	29.4	0.63	17.7	25.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
15.12.2022	53.0	31.0	24.6	30.0	0.50	16.2	28.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
19.12.2022	52.9	30.9	23.0	22.6	0.63	18.0	27.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
22.12.2022	55.4	29.4	22.9	23.7	0.55	16.6	29.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
26.12.2022	51.6	28.6	20.5	24.9	0.61	15.9	26.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
29.12.2022	56.4	32.5	21.8	25.1	0.59	18.4	25.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
Limit as per NAAQS	100	60	80	80	4	180	400	5	1	6	20	1	--

Note- Arsenic (LOQ- 0.1ng/m³), Benzene (LOQ- 0.5µg/m³), Benzo pyrene (LOQ- 0.5ng/m³), Lead (LOQ- 0.1µg/m³), Nickel (LOQ- 5.0ng/m³), Mercury (LOQ- 1ng/m³), *BLQ- Below Limit of Quantification, *LOQ- Limit of Quantification

(Checked By:)

(Approved By)

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Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No:	VEL/SOCM/AA/105-130	Report No:	VEL/AA/105-130
Name & Address of the Project:	M/s Subhadra Open Cast Mine. At Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil TachlerSadar and Chhenipada, District- Angul, State- Odisha	Reporting Date:	09/01/2023
		Ref. No:	NIL
		Monitoring Period:	October 2022 to December 2022
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182& CPCB Guidelines
Sample Collected By:	Vardan Envirolab Representative	Parameter Required:	As per TOR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Kalikatta (A5)		

RESULTS

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	Ozone ($\mu g/m^3$)	NH_3 ($\mu g/m^3$)	Benzene ($\mu g/m^3$)	B(α) P (ng/m^3)	Arsenic (ng/m^3)	Nickel (ng/m^3)	Lead ($\mu g/m^3$)	Mercury (ng/m^3)
03.10.2022	63.4	38.4	28.6	35.9	0.86	20.3	28.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
06.10.2022	61.2	39.6	29.4	33.6	0.76	21.2	31.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
10.10.2022	60.9	35.4	30.9	37.8	0.82	19.4	30.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
13.10.2022	59.4	34.2	26.3	36.2	0.75	18.5	26.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
17.10.2022	61.0	37.6	25.8	34.8	0.81	17.6	28.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
20.10.2022	64.3	36.8	28.4	33.9	0.73	21.2	32.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
24.10.2022	65.8	40.5	30.5	32.5	0.89	18.3	31.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
27.10.2022	62.9	38.9	27.9	37.6	0.77	19.4	30.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
31.10.2022	63.6	39.1	25.4	36.7	0.84	20.4	27.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
03.11.2022	64.1	36.7	29.1	35.2	0.75	21.0	26.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
07.11.2022	62.8	35.2	31.2	34.9	0.88	18.6	31.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
10.11.2022	60.9	34.6	26.7	32.8	0.76	17.5	32.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
14.11.2022	59.8	38.1	29.4	35.7	0.82	19.3	30.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
17.11.2022	58.3	37.6	28.3	36.2	0.76	21.5	29.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
21.11.2022	62.7	38.1	26.0	37.9	0.80	20.0	31.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
24.11.2022	63.4	39.2	30.7	32.8	0.76	18.6	32.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
28.11.2022	64.7	40.5	29.1	34.9	0.84	19.4	30.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
01.12.2022	65.0	38.8	27.3	35.6	0.79	21.2	28.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
05.12.2022	61.9	36.7	25.1	34.8	0.83	17.3	29.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
08.12.2022	58.6	37.2	29.3	32.5	0.77	21.2	31.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
12.12.2022	62.9	40.2	31.6	33.7	0.82	20.6	30.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
15.12.2022	63.7	39.6	28.3	37.6	0.76	18.5	32.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
19.12.2022	64.2	35.4	29.7	35.4	0.81	19.7	26.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
22.12.2022	61.9	34.6	28.4	34.9	0.75	21.2	28.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
26.12.2022	60.0	38.7	25.6	32.5	0.89	20.6	27.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
29.12.2022	59.3	39.1	31.8	33.6	0.74	18.6	29.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
Limit as per NAAQS	100	60	80	80	4	180	400	5	1	6	20	1	--

Note- Arsenic (LOQ- 0.1ng/m³), Benzene (LOQ- 0.5µg/m³), Benzo pyrene (LOQ- 0.5ng/m³), Lead (LOQ- 0.1µg/m³), Nickel (LOQ- 5.0ng/m³), Mercury (LOQ- 1ng/m³), *BLQ- Below Limit of Quantification, *LOQ- Limit of Quantification

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Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No:	VEL/SOCM/AA/131-156	Report No:	VEL/AA/131-156
Name & Address of the Project:	M/s Subhadra Open Cast Mine. At Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil TachlerSadar and Chhenipada, District- Angul, State- Odisha	Reporting Date:	09/01/2023
		Ref. No:	NIL
		Monitoring Period:	October 2022 to December 2022
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182& CPCB Guidelines
Sample Collected By:	Vardan Envirolab Representative	Parameter Required:	As per TOR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Golabandha (A6)		

RESULTS

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	Ozone ($\mu g/m^3$)	NH_3 ($\mu g/m^3$)	Benzène ($\mu g/m^3$)	B(α) P (ng/m^3)	Arsenic (ng/m^3)	Nickel (ng/m^3)	Lead ($\mu g/m^3$)	Mercury (ng/m^3)
07.10.2022	68.4	49.3	35.7	42.6	1.00	26.4	33.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
09.10.2022	69.5	48.4	36.1	46.2	0.91	24.9	34.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
11.10.2022	71.3	46.5	39.4	44.1	1.04	27.8	35.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
14.10.2022	70.9	45.7	38.7	43.6	1.12	28.1	37.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
18.10.2022	72.4	50.2	41.2	42.9	0.96	29.6	36.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
21.10.2022	73.4	51.9	40.6	44.7	1.09	27.1	35.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
25.10.2022	68.0	49.3	38.4	45.1	1.07	24.5	39.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
28.10.2022	71.2	48.7	39.1	46.7	1.13	25.3	37.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
01.11.2022	70.9	46.6	36.2	45.6	0.91	26.8	36.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
04.11.2022	66.7	47.9	35.7	43.5	1.12	27.8	35.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
08.11.2022	69.4	48.2	41.2	42.8	1.08	29.1	38.0	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
11.11.2022	72.5	51.6	40.8	45.9	1.00	26.0	34.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
15.11.2022	73.4	50.4	39.9	46.2	0.90	25.8	33.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
18.11.2022	70.9	48.5	38.5	42.5	1.08	24.6	37.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
22.11.2022	71.2	46.5	36.4	44.6	1.14	27.3	36.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
25.11.2022	68.4	49.7	35.1	45.7	0.99	27.4	35.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
29.11.2022	69.5	51.3	34.5	46.7	1.02	28.6	34.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
02.12.2022	72.5	50.5	38.4	46.9	1.10	29.4	37.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
06.12.2022	68.7	46.3	39.6	45.0	1.03	28.8	36.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
09.12.2022	69.3	45.0	41.2	43.7	1.14	25.6	38.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
13.12.2022	67.4	49.8	40.0	42.5	0.90	24.7	39.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
16.12.2022	71.0	47.5	38.4	46.0	1.06	28.5	37.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
20.12.2022	70.5	51.2	37.6	44.9	1.11	29.4	35.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
23.12.2022	68.4	50.8	36.2	43.3	0.90	26.8	34.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
27.12.2022	69.5	49.6	35.4	44.1	1.12	27.2	33.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
30.12.2022	72.3	48.4	39.4	45.9	0.98	26.6	37.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
Limit as per NAAQS	100	60	80	80	4	180	400	5	1	6	20	1	--

Note- Arsenic (LOQ- 0.1ng/m³), Benzène (LOQ- 0.5µg/m³), Benzo pyrene (LGQ- 0.5ng/m³), Lead (LOQ- 0.1µg/m³), Nickel (LOQ- 5.0ng/m³), Mercury (LOQ- Ang/m³)*BLQ- Below Limit of Quantification, *LOQ- Limit of Quantification

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Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No:	VEL/SOCM/AA/157-182	Report No:	VEL/AA/157-182
Name & Address of the Project:	M/s Subhadra Open Cast Mine. At Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil TachlerSadar and Chhenipada, District- Angul, State- Odisha	Reporting Date:	09/01/2023
		Ref. No:	NIL
		Monitoring Period:	October 2022 to December 2022
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182& CPCB Guidelines
Sample Collected By:	Vardan Envirolab Representative	Parameter Required:	As per TOR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Kumunda (A7)		

RESULTS

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	Ozone ($\mu g/m^3$)	NH_3 ($\mu g/m^3$)	Benzene ($\mu g/m^3$)	B(α) P (ng/m^3)	Arsenic (ng/m^3)	Nickel (ng/m^3)	Lead ($\mu g/m^3$)	Mercury (ng/m^3)
05.10.2022	58.4	33.9	27.5	31.6	0.73	18.3	28.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
08.10.2022	59.1	32.7	26.3	30.8	0.69	20.4	29.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
12.10.2022	61.2	37.5	28.1	35.9	0.82	16.7	31.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
15.10.2022	60.7	36.4	29.3	33.4	0.76	17.5	30.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
19.10.2022	62.8	35.1	24.5	34.8	0.69	20.2	26.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
22.10.2022	63.4	35.9	26.8	30.8	0.70	18.8	25.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
26.10.2022	58.4	33.0	27.3	28.6	0.85	19.1	28.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
29.10.2022	57.6	37.4	26.9	34.6	0.79	16.2	29.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
02.11.2022	56.2	36.8	25.4	32.5	0.80	17.6	31.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
05.11.2022	59.1	38.4	30.5	30.0	0.69	20.5	30.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
09.11.2022	61.8	34.9	29.6	29.1	0.81	18.7	28.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
12.11.2022	62.4	33.7	24.2	28.6	0.77	19.6	27.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
16.11.2022	60.8	32.6	28.1	35.0	0.82	20.2	25.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
19.11.2022	63.0	35.7	26.9	33.7	0.69	18.0	26.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
23.11.2022	63.8	36.4	24.7	34.5	0.85	19.7	28.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
26.11.2022	57.2	37.2	25.3	30.9	0.79	16.5	29.0	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
30.11.2022	59.4	38.1	26.1	33.9	0.80	17.5	31.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
03.12.2022	61.5	32.9	27.2	28.7	0.79	18.4	30.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
07.12.2022	62.8	33.7	28.9	33.0	0.82	19.3	28.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
10.12.2022	60.8	34.6	30.7	31.9	0.75	20.0	29.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
14.12.2022	63.4	35.2	29.8	30.5	0.84	16.4	30.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
17.12.2022	56.8	37.4	24.7	34.6	0.69	17.5	28.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
21.12.2022	59.4	38.6	25.2	29.1	0.80	19.1	26.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
24.12.2022	61.5	34.9	26.8	32.6	0.77	20.0	27.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
28.12.2022	60.8	33.5	27.2	30.8	0.85	18.4	30.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
31.12.2022	62.5	32.1	28.1	35.7	0.76	16.7	28.0	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
Limit as per NAAQS	100	60	80	80	4	180	400	5	1	6	20	1	--

Note- Arsenic (LOQ- 0.4ng/m³), Benzene (LOQ- 0.5µg/m³), Benzo pyrene (LOQ- 0.5ng/m³), Lead (LOQ- 0.1µg/m³), Nickel (LOQ- 5.0ng/m³), Mercury (LOQ- 1ng/m³) *BLQ- Below Limit of Quantification, *LOQ- Limit of Quantification

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Vardan EnviroLab
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No:	VEL/SOCM/AA/183-208	Report No:	VEL/AA/183-208
Name & Address of the Project:	M/s Subhadra Open Cast Mine. At Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil TachlerSadar and Chhenipada, District- Angul, State- Odisha	Reporting Date:	09/01/2023
		Ref. No:	NIL
		Monitoring Period:	October 2022 to December 2022
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	IS-5182& CPCB Guidelines
Sample Collected By:	Vardan Envirolab Representative	Parameter Required:	As per TOR Letter
Sample Description:	Ambient Air Quality Monitoring		
Location:	Malibrahmani (A8)		

RESULTS

Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)	Ozone ($\mu g/m^3$)	NH_3 ($\mu g/m^3$)	Benzène ($\mu g/m^3$)	B(α) P (ng/m^3)	Arsenic (ng/m^3)	Nickel (ng/m^3)	Lead ($\mu g/m^3$)	Mercury (ng/m^3)
03.10.2022	68.4	45.9	35.9	42.3	0.89	26.7	34.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
06.10.2022	69.1	46.7	36.2	41.2	0.93	25.2	33.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
10.10.2022	67.2	47.2	34.7	46.8	1.03	27.3	32.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
13.10.2022	71.6	48.2	39.1	45.4	1.16	23.4	37.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
17.10.2022	70.8	44.6	40.5	44.9	0.97	24.6	38.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
20.10.2022	73.4	45.1	38.8	43.7	1.06	25.7	34.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
24.10.2022	74.1	46.9	37.6	42.6	0.98	27.4	35.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
27.10.2022	72.9	47.8	35.4	40.8	1.06	26.1	36.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
31.10.2022	73.4	48.2	32.6	41.7	0.89	24.0	34.0	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
03.11.2022	71.0	47.5	34.3	42.6	1.15	23.6	37.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
07.11.2022	68.4	46.2	33.8	43.8	0.93	25.7	38.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
10.11.2022	70.9	45.9	38.1	44.7	0.89	26.1	32.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
14.11.2022	69.3	44.2	39.6	45.1	0.92	27.2	34.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
17.11.2022	67.8	47.6	40.5	43.9	1.19	24.5	35.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
21.11.2022	72.5	48.0	38.4	45.5	1.02	23.3	36.2	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
24.11.2022	71.6	46.9	37.6	46.2	0.98	26.9	37.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
28.11.2022	70.8	47.5	32.1	44.0	1.05	27.4	38.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
01.12.2022	74.6	45.1	33.7	41.9	0.89	24.2	32.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
05.12.2022	73.6	44.3	34.5	40.6	0.96	23.1	33.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
08.12.2022	72.5	46.8	35.8	42.8	1.13	25.0	35.6	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
12.12.2022	71.6	47.2	36.4	43.7	1.07	26.7	37.5	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
15.12.2022	70.8	48.9	37.8	45.3	0.89	27.5	38.1	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
19.12.2022	68.4	45.0	39.4	45.0	0.94	23.9	34.9	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
22.12.2022	69.3	44.7	40.2	43.6	1.02	25.4	36.4	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
26.12.2022	67.2	46.8	38.7	42.9	1.17	24.6	32.8	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
29.12.2022	71.5	47.2	37.6	41.5	0.89	26.8	33.7	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ	*BLQ
Limit as per NAAQS	100	60	80	80	4	180	400	5	1	6	20	1	--

Note- Arsenic (LOQ- 1.1ng/m³), Benzène (LOQ- 0.5µg/m³), Benzo pyrene (LOQ- 0.5ng/m³), Lead (LOQ- 0.1µg/m³), Nickel (LOQ- 5.0ng/m³), Mercury (LOQ- 1ng/m³) *BLQ- Below Limit of Quantification, *LOQ- Limit of Quantification.

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ANNEXURE - 2

IS 5182 (Part 11) : 2006

भारतीय मानक

वायु प्रदूषण मापन की पद्धतियाँ

भाग 11 बैंजीन, टॉल्यून एवं जाइलीन (बीटीएक्स)

(दूसरा पुनरीक्षण)

Indian Standard

METHODS FOR MEASUREMENT OF AIR POLLUTION

PART 11 BENZENE, TOLUENE AND XYLENE (BTX)

(Second Revision)

ICS 13.040.30; 71.080.15

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Regn No-13U 2/18
EXPIRY DATE
31.12.28
Govt. of India

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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

September 2006

Price Group 8

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Environment Protection and Waste Management Sectional Committee, CHD 32

FOREWORD

This Indian Standard (Part 11) (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Environment Protection and Waste Management Sectional Committee had been approved by the Chemical Division Council.

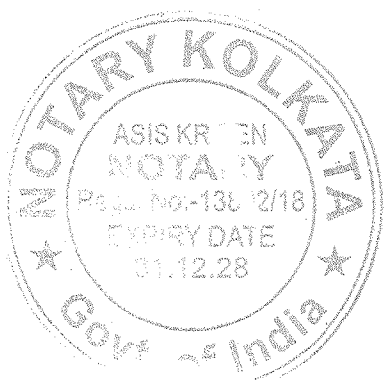
The aromatic hydrocarbons, namely, benzene, toluene and xylene have many industrial uses, most notably as a solvent for numerous materials and as a fuel additive. They are also used in the manufacture of various chemicals, rubber, insecticides, pharmaceuticals, explosives, etc. Though they are very useful chemicals, they are also extremely hazardous. They are highly flammable. While benzene is well known to be carcinogenic, there is recent evidence of carcinogenicity of toluene and xylene at high concentrations in experimental animals. It should also be noted that any future epidemiological observations of cancer risks associated with toluene or xylene would have to take account of the suspected effects of benzene impurities. Regular and systematic procedures for inspection are, therefore, necessary to ensure safety against the hazards involved.

This standard was first published in 1982 and revised it in 1993 based on the development of the analytical procedures to introduce a newer method having a different type of collection, desorption media and use of N, N-Bis-cyanoethylformamide (BCEF) for determination of benzene only. The Committee responsible for the formulation of this standard further decided to revise it based on the experience gained during the last decade as well as technological development in the field. During the revision method for determination of toluene and xylene are incorporated. The revised methods include both active and passive sampling using low flow pump. Apart from the conventional CS_2 desorption, the modern techniques of automated thermal desorption without use of organic solvents is also incorporated in this revision.

There is no ISO Standard on the subject. The standard is prepared based on the measuring techniques available and use in India.

The Committee composition responsible for the formulation of this standard is given at Annex A.

In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'.



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IS 5182 (Part 11) : 2006

Indian Standard

METHODS FOR MEASUREMENT OF AIR POLLUTION

PART 11 BENZENE, TOLUENE AND XYLENE (BTX)

(Second Revision)

1 SCOPE

This standard (Part 11) prescribes active and passive sampling techniques with three gas chromatography based analytical methods for measurement of benzene, toluene and xylene in air.

2 REFERENCES

The following standard contains provisions, which through reference in this text constitute provisions of this standard. At the time of publication, the edition indicated was valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below:

IS No.	*Title*
4167 : 1980	Glossary of terms relating to air pollution (*first revision*)

3 TERMINOLOGY

For the purpose of this standard, definitions given in IS 4167 shall apply.

4 METHOD 1 (ACTIVE SAMPLING USING ACTIVATED CHARCOAL TUBES, DESORBED BY CARBON DISULPHIDE)

4.1 Principle

The charcoal tubes are available in different sizes and contain varying amount of activated charcoal. The ambient air is sucked through the tube using a low flow sampler used for collection of BTX sample in a way that results in an enrichment of the relevant substances in the activated charcoal. Desorption of the adsorbed benzene is done using carbon disulphide (CS_2). The substances desorbed in the CS_2 are analyzed by capillary gas chromatography. A flame ionization detector (FID) is used for analysis while quantification is performed using the internal/external standard.

4.2 Apparatus

4.2.1 *Low Volume Pump* — Portable, battery powered pump with a low flow controller with operating range between 5 to 500 ml/min (±0.2 ml/min) to suck the air sample.

NOTE — Wherever necessary intrinsically safe pumps may be used.

4.2.2 *Sampling Sorbent (Sample) Tubes* — Glass lined (or fused silica lined) stainless steel tube or stainless steel sorbent tubes of 6 mm O.D., 8.9 cm long tubes with a 6 cm of sorbent bed of 200 mg of activated charcoal (coconut shell) or other suitable adsorbent. A typical sorbent/sample tube is shown in Fig. 1 and Fig. 2.

Modular glass or stainless tube (OD 6-8 mm length 10-15 cm) packed with chromatography grade coconut shell activated charcoal, chromatography grade. Tube must have provision for fitting of backup section with provision to measure pressure drop across the tube during sampling. The minimum quantity of charcoal required in front section is 200 mg and in backup section 50 mg. Glass beads or any other porous inert material must be packed in inlet part of front section for uniform distribution of sucked air through tube at the time of sampling.

4.2.3 *Gas Chromatograph* — Any suitable gas chromatograph with flame ionization detector (FID) with fused silica capillary columns having a length of 25 m or more, an internal diameter of 320 µm or below and with a stationary phase film thickness less than 1.5 µm as follows or equivalent may be recommended:

Capillary 624 Column : Coating: cyanopropyl phenyl polysiloxane, Length × ID : 30 m × 0.25 mm, Film thickness (d_f) : 1.4 µm

Capillary Column : Coating : 5 percent phenyl, 95 percent dimethyl polysiloxane Length × ID : 25 m × 0.20 mm, Film thickness (d_f) = 0.33 µm

Wall Coated Column : Coating: Fused Silica PONA CB, Length × ID : 50 m × 0.21 mm, Film thickness (d_f) : 0.5 µm

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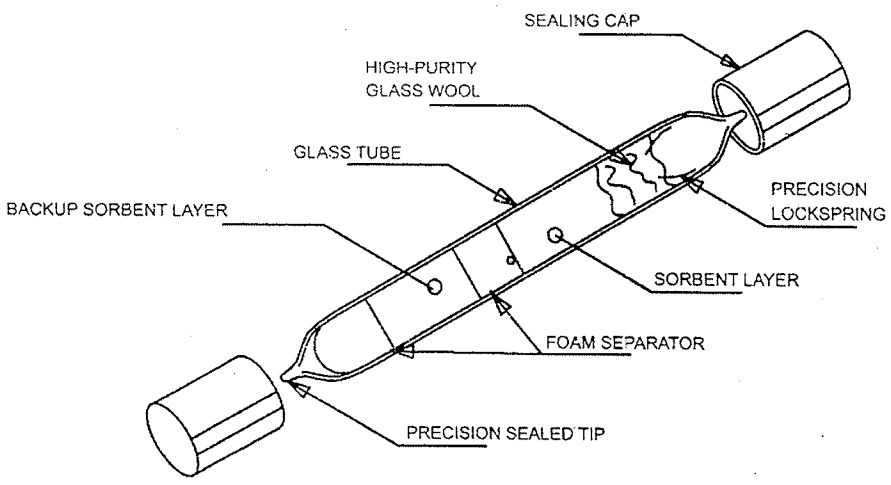

FIG. 1 SORBENT/SAMPLE TUBE FOR ACTIVE SAMPLING FILLED WITH ACTIVATED COCONUT SHELL CHARCOAL (CSC)

Capillary Column : Coating : Fused silica 100 percent dimethyl polysiloxane, Length × ID : 30 m × 0.32 ID, Film thickness (d_f) : 1.0 µm

4.3 Reagents

4.3.1 *Suitable Adsorbent* — Chromatographic grade activated charcoal (coconut shell) or other suitable adsorbent, that is, Chromosorb 106 or other suitable adsorbent having particle size in the range 60 to 80 mesh.

4.3.2 *Carbon Disulphide* (CS_2) — Chromatographic grade, Purity > 99.9 percent (GLC), Residue < 0.000 5 percent, Benzene 0.001 percent, H_2O < 0.02 percent.

4.3.3 *Benzene* — Chromatographic grade, Purity > 99.9 percent (GLC), Residue < 0.000 3 percent, H_2O < 0.02 percent.

4.3.4 *Toluene* — Chromatographic grade, Purity > 99.9 percent (GLC), Residue < 0.000 3 percent, H_2O < 0.02 percent.

4.3.5 *Xylene* — Chromatographic grade, Purity > 99.9 percent (GLC), Residue < 0.000 3 percent, H_2O < 0.02 percent.

4.3.6 *Carrier Gas* — Helium or Nitrogen of purity > 99.9 percent, H_2O < 0.02 percent, Residues < 0.000 3 percent.

4.4 Sampling

4.4.1 *Selection of Sorbent Tube* — Samples are collected in glass sampling tube filled with a activated charcoal (coconut shell), Chromosorb 106 or other suitable adsorbent.

4.4.2 *Sample Tubes Labelling*

Sample tubes are labelled with a unique identification number and the direction of sampling flow. If empty sample tubes are obtained without labels, it is important to label and condition them before and after they are packed with adsorbent prior to use them for sampling.

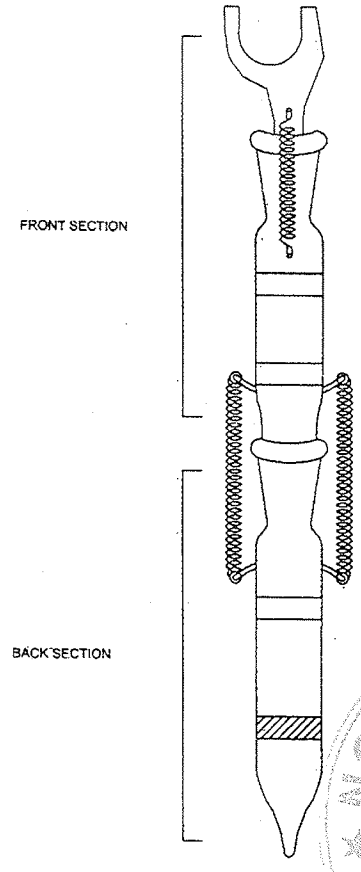

FIG. 2 INLET AND OUTLET OF THE SORBENT/SAMPLE TUBE

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4.4.3 *Sampling Procedure and Sampling Rate*

A sample is collected by opening a tube at two ends, connecting it to a sample pump, and pulling air through the tube with the pump. Airborne chemicals are trapped onto the surface of the sorbent:

a) Two tubes are used in series to take care of breakthrough (if any) compatible to the thermal desorber. The sampling is carried out using low flow sampler. The schematic diagram of sampling train is given in Fig. 3.

b) Keep the tube in a vertical position during sampling to prevent the possibility of channelling that can lead to under sampling.

c) The arrow on the tube indicates air flow direction and should point to the tube holder and pump. If no arrow is present, the smallest section should be near the tube holder.

d) Sampling flow rate in the range of 20-100 ml/min is required (±2 percent) for ambient air.

e) A sample component may breakthrough from the back end of tube, if excessive flow rates are used. Sample is to be discarded, if the breakthrough is observed more than 10 percent. If analyzed concentration in backup section is more than 10 percent of front section, sample needs to be discarded.

The tube is then sealed with push-on caps, and sent to a laboratory for analysis.

4.4.4 *Storage of Blank and Sampled Tubes*

Seal clean, blank sorbent tubes and sampled tubes using inert fittings and PTFE ferrules. Wrap capped tubes individually in uncoated aluminum foil. Use clean, sealable metal cans containing a small packet of activated charcoal or activated charcoal/silica gel for storage and transportation of multiple tubes. Store the multi-tube storage container in a clean environment at 4 ± 1°C.

4.5 Procedure

4.5.1 *Calibration*

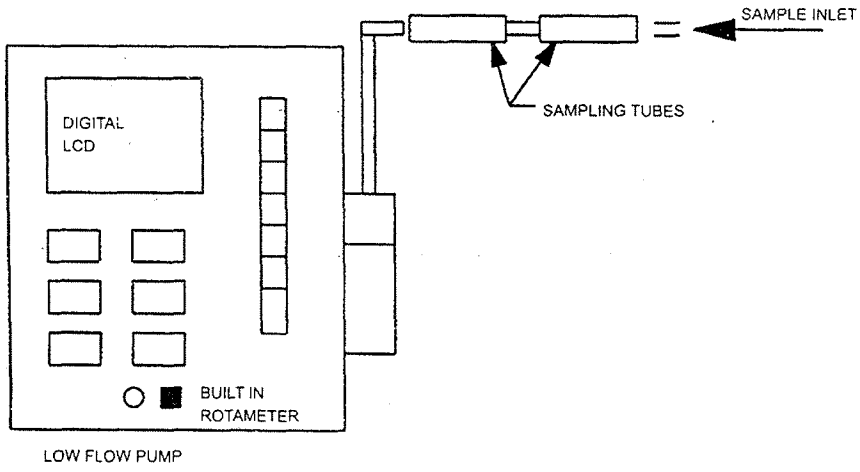

FIG. 3 LOW FLOW SAMPLING PUMP WITH SAMPLING TRAIN

Prepare a mix stock standard solution of 50 µg/µl of benzene, toluene and xylene each gravimetrically using a micro syringe in the eluting solvent that is CS_2. Prepare further diluted solutions of concentration range of 10, 1.0, 0.10 µg/µl with CS_2 from stock standard in a clean vial. Make up to 1 ml solution. Introduce immediately 1 µl standard solution into the injector of GC directly and plot the curve between the concentration and response (peak area). Prepare fresh standard solutions with each batch of samples. A typical chromatogram of standard mixture is given in Fig. 4.

4.5.2 *Analytical Procedure*

Samples collected through active sampling (sorbent tubes) are extracted or desorbed by conventional solvent (generally 1-5 ml of carbon disulphide) using ultrasonication for 15 min to remove analyte from the sorbent material. Desorbed samples are analyzed using gas chromatograph (GC) fitted with capillary column and flame ionization detector (FID). A single tube may provide enough samples to permit several analyses.

The following set of conditions is generally used:

a) *Gas flow*:

Nitrogen : 30 ml/min (FID make up + Column), (Column flow 1 ml/min approximately)

Hydrogen : 30 ml/min

Air : 300 ml/min

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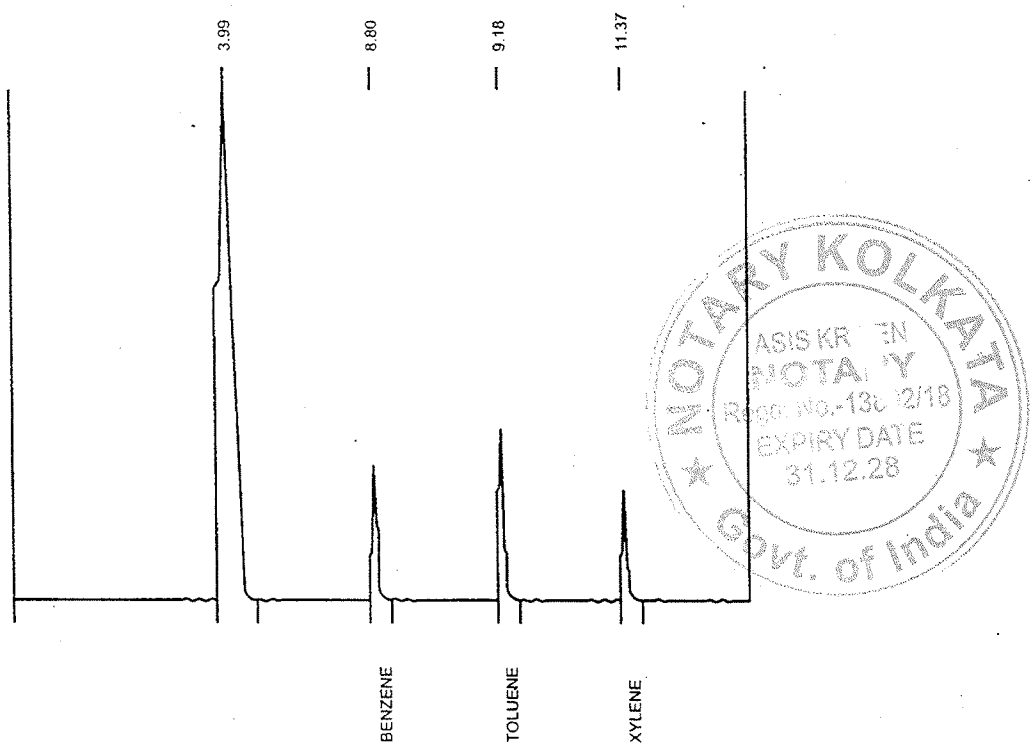

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FIG. 4 TYPICAL CALIBRATION CHROMATOGRAM OF BENZENE, TOLUENE AND XYLENE
(Using column PE 624 at 0.017 4 µg/µl concentration of analytes)

NOTE — Instead of nitrogen, helium may also be used as carrier gas for flow setting and corresponding retention time of analytes may vary.

Capillary column 624, Coating: cyanopropyl phenyl polysiloxane, Length × ID : 30 m × 0.25 mm, Film thickness (d_f) : 1.4 µm

b) *Temperature programming*

Injection port : 250°C

FID : 300°C

Column/Oven : 50°C (hold for 3 min) , ramp1 @ 10°C/ min to 140°C (1 min) ramp 2 @ 20°C/min to 240 (1 min)

Injection volume: 5 µl, Total run time: 19.5 min, Split : 10

- Benzene RT 6.80 min, Search window : 1.00 s, 3.00 percent
- Toluene RT 9.18 min, Search window: 1.00 s, 3.00 percent
- Xylene RT 11.37 min, Search window: 1.00 s, 3.00 percent

NOTE — Temperature programming and retention time (RT) of analyte may vary column to column to get appropriate resolution of analyte peaks. Injection volume and split may also vary according to nature and probable concentration of analyte present in the extract.

4.6 Calculation

Amount of analyte compound found on tube can be converted into mg/m³, by using the formula:

$$\text{Volume of air (m}^3\text{) (sucked through the adsorption tube)} = \frac{S \times t}{10^6}$$

where

S = sampling rate, in ml/min; and

t = sampling time, in min.

$$\text{Concentration (µg/m}^3\text{) (at ambient condition)} = \frac{C \times V_1 \times 10^3}{V_2 \times V_3}$$

where

C = amount of compound found injection sample volume from standard curve, in µg/µl;

V_1 = total volume of the sample extracted in ml;

V_2 = volume of sample extract injected into GC, in µl; and

V_3 = volume of air sucked through the tube, in m³.

Blank value is to be subtracted from the amount of compound found in the sample.

$$\text{Concentration (µg/m}^3\text{) at (STP)} = \frac{C \times 101.3\,(273 + T)}{273 \times P}$$

where

C = concentration at ambient condition, in µg/m³;

T = temperature of the ambient air, in °C; and

P = atmospheric pressure, in kPa.

5 METHOD 2 (ACTIVE SAMPLING USING TENAX/CHROMOSORB 106 SORPTION TUBES, DESORBED THERMALLY)

5.1 Principle

Thermal desorption tubes filled with Tenax TA or other suitable adsorbent as Chromosorb-106, etc, are used for adsorption of benzene, toluene, and xylene in place of charcoal tube. The ambient air is sucked through the tube using a low flow personal sampler in a way that results in an enrichment of the relevant substances on the adsorbent. These tubes are directly connected to the automated thermal desorbers coupled with the gas chromatograph equipped with capillary column and flame ionization detector. The thermal desorption technique offer the advantage of a greatly improved analytical sensitivity, as solvent is not used in this process and the collected sample is not diluted. In most cases analytical recovery is close to 100 percent and desorption efficiency corrections are not required.

5.2 Apparatus

5.2.1 *Sampling Device : Low Volume Pump* — Intrinsically safe, portable, battery powered pump (SKC, PA, USA or equivalent make) (*see* Fig. 3) with a low flow capable of accurate and adjustable flow controller with operating range between 5 to 500 ml/min to suck the air sample with great accuracy in the range of 20-100 ml/min is required (±2 percent). The time programmable, built in flow indicator, rechargeable battery operated low flow pump with adjustable run time up to 8 h should be preferred for sampling of BTX.

5.2.2 *Sampling Sorbent (Sample) Tube* — Automated Thermal Desorption (ATD) tubes of stainless steel filled with absorbing material are required. Stainless steel or glass sorbent tubes (*see* Fig. 5) of 8.9 cm long, 6 mm O.D. with a 6 cm sorbent bed in the central portion packed with greater than 200 mg of solid adsorbent material (that is Tenax TA, Chromosorb106 or any other suitable adsorbent).

NOTE — To be suitable for thermal desorption, sorbent must meet exact specifications that include low contaminant background, high thermal stability and sufficient adsorptive strength to retain components of interest and should also release them quickly when heat is applied.

5.2.3 *Automated Thermal Desorption Apparatus (Two-Stage Thermal Desorption)*

Two-stage automated thermal desorption is recommended to use heat and a flow of inert (carrier) gas to extract volatiles from a solid adsorbent matrix directly into the carrier gas and transfer them to downstream system elements such as the analytical column of a GC.

Two-stage automated thermal desorption is used for the best high resolution capillary chromatography (that is, analytes desorbed from the sorbent tube must be refocused before being rapidly transferred to the GC analytical column).

Typical key components and operational stages of a two-stage desorption system are presented in Fig. 6 and Fig. 7.

5.2.4 *Focusing Tube*

The narrow (typically < 3 mm ID) tube containing a small bed of sorbent, which is maintained near or below ambient temperature and used to refocus analytes thermally desorbed from the sorbent tube. The focusing trap is typically packed with 20 mg of Carbopack™ B (60/80 mesh) and 50 mg of a Carboxen™ 1000-type sorbent (60/80 mesh).

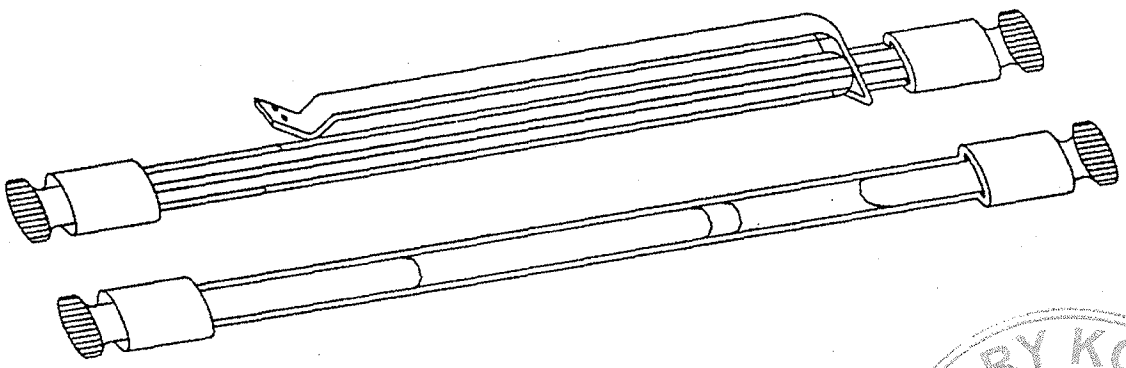

FIG. 5 SORBENT/SAMPLE TUBES OF STAINLESS STEEL OR GLASS FILLED WITH ADSORBING MATERIAL (TENAX OR SO) AND PROTECTING CAPS

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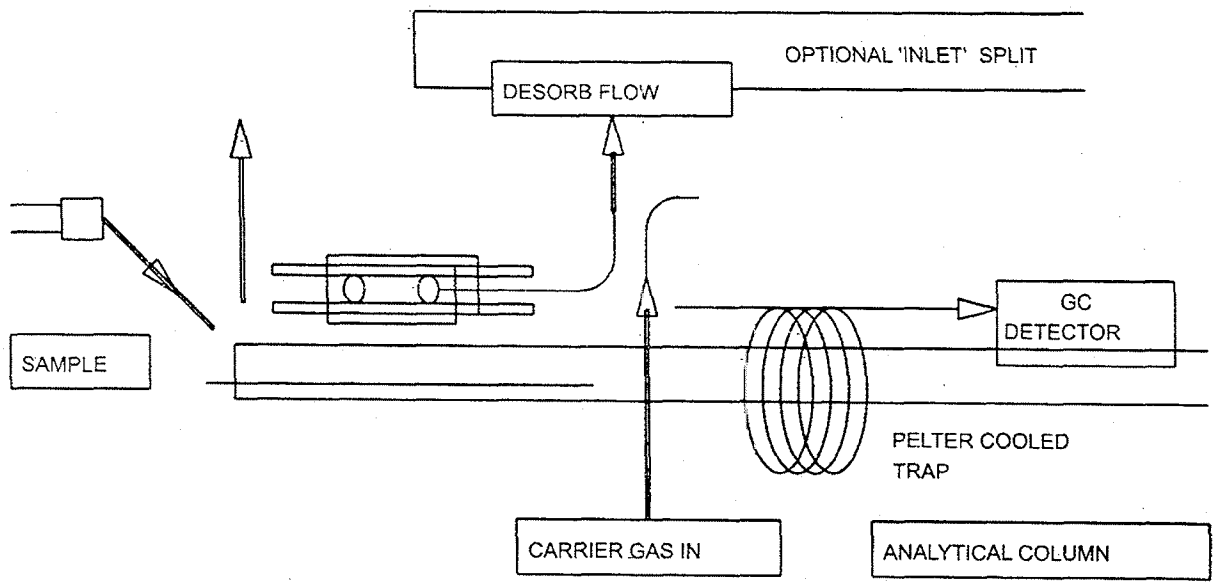

FIG. 6 STAGE 1 : SAMPLE TUBE DESORPTION OR AIR SAMPLE TRANSFER TO TRAP

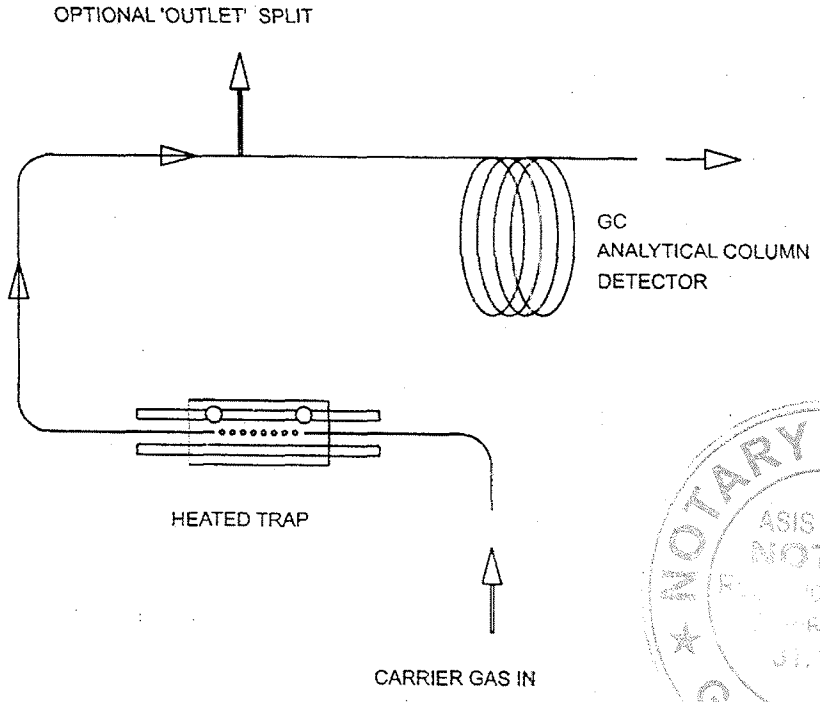

FIG. 7 STAGE 2 : TRAP DESORPTION
(Sample transfer to GC Column)

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Once all the BTX have been transferred from the sorbent tube to the focusing tube, the focusing tube is heated rapidly to transfer the analytes into the capillary column of GC in the form of a band of vapor.

5.2.5 *Electronic Cryogen Systems*

Automated thermal desorber have electronic systems to cool the focusing tube or cold trap. Other non-automated desorber require typically cryogens, that is, liquid nitrogen, liquid argon, or liquid carbon dioxide to cool the focusing tube.

The cryogen-free trap cooling option with a multistage Peltier electrical closed cycle coolers is used. At its low temperature, the trap must provide quantitative analyte retention for target compounds as well as quantitative and rapid desorption of target analytes.

5.2.6 *Thermal Desorber — GC Interface*

The interface line is leak-tight and lined with an inert

material such as deactivated fused silica. Alternatively, thread the capillary column itself through the heated transfer line/interface and connected directly into the thermal desorber.

Place the sealed tubes on the thermal desorber (Perkin Elmer Model ATD 400 Automated System or equivalent). Heat the interface between the thermal desorber and the GC uniformly.

Other thermal desorbers may have different arrangements for automation. Alternatively, use equivalent manual desorption.

NOTE — Use of a metal syringe-type needle or unheated length of fused silica pushed through the septum of a conventional GC injector is not recommended as a means of interfacing the thermal desorber to the chromatograph. Such connections result in cold spots, cause band broadening and are prone to leaks.

5.2.7 *High Resolution Capillary Column Chromatography*

Any suitable gas chromatograph equipped with flame ionization detector (FID) with fused silica capillary columns having a length of 25 metres or more, an internal diameter of 320 µm or below and with a stationary phase film thickness less than 1.5 µm as follows or equivalent may be recommended:

Capillary 624 Column	: Coating: cyanopropyl phenyl polysiloxane, Length × ID : 30 m × 0.25 mm, Film thickness (d_f) : 1.4 µm
Capillary Column	: Coating: 5 percent phenyl 95 percent dimethyl polysiloxane, Length × ID : 25 m × 0.20 mm, Film thickness (d_f) : 0.33 µm
Wall Coated Column	: Coating: Fused Silica PONA CB, Length × ID : 50 m × 0.21 mm, Film thickness (d_f) : 0.5 µm
Capillary Column	: Coating: Fused silica 100 percent dimethyl polysiloxane, Length × ID : 30 m × 0.32 mm, 1.0 µm film thickness

5.3 Reagent

5.3.1 *Carbon Disulphide* — Chromatographic grade, Purity > 99.9 percent (GLC), Residue < 0.000 5 percent, Benzene < 0.000 1 percent, H_2O < 0.02 percent.

5.3.2 *Benzene* — Chromatographic grade, Purity > 99.9 percent (GLC), Residue < 0.000 3 percent, H_2O < 0.02 percent.

5.3.3 *Toluene* — Chromatographic grade, Purity > 99.9 percent (GLC), Residue < 0.000 3 percent, H_2O < 0.02 percent.

5.3.4 *Xylene* — Chromatographic grade, Purity > 99.9 percent (GLC), Residue < 0.000 3 percent, H_2O < 0.02 percent.

5.3.5 *Carrier Gas* — Helium or Nitrogen of purity > 99.9 percent, H_2O < 0.02 percent, Residues < 0.000 3 percent.

5.4 Sampling

5.4.1 *Sampling Location* — Site should be free from any obstacle to free flow of the air in the vicinity.

5.4.2 *Selection of Sorbent Tube and Sorbent Mesh Size* — Samples are collected in SS or glass sampling tube filled with Tenex TA, Chromosorb 106 or other suitable adsorbent (two in series to take care of breakthrough, if any) and compatible to the thermal desorber. The sorbents of particle size in the range 60 to 80 mesh should be used for tube packing.

5.4.3 *Conditioning the Tube*

Condition newly packed tubes for at least 2 h (30 min for preconditioned, purchased tubes) at 320°C while passing at least 30 ml/min of pure Nitrogen or Helium carrier gas through them.

Tube conditioning before reuse of sample tube is also must.

Once conditioned, seal the tube with brass, 1/4 inch fittings and PTFE ferrules. Wrap the sealed tubes in uncoated aluminium foil and place the tubes in a clean, air-tight, opaque container.

A package of clean sorbent material, for example, activated charcoal or activated charcoal/silica gel mixture, may be added to the container to ensure clean storage conditions.

Store in a refrigerator (organic solvent-free) at 4±1°C, if not to be used within a day. On second and subsequent uses, the tubes will generally not require further conditioning as above. However, tubes with an immediate prior use indicating high levels of pollutant trace gases should be reconditioned prior to continued usage.

NOTE — Other sorbents may require different conditioning temperatures.

5.4.4 *Sample Tubes Labelling*

Sample tubes are labelled with a unique identification number and the direction of sampling flow. Stainless steel tubes are most conveniently labelled by engraving. Glass tubes are best labelled using a temperature resistant paint. If empty sample tubes are obtained without labels, it is important to label them before packing and condition them after packing with adsorbent prior to use them for sampling.

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5.4.5 *Sampling Procedure and Sampling Rate*

A sample is collected by opening a tube at two ends, connecting it to a sample pump, and pulling air through the tube with the pump. Airborne chemicals are trapped onto the surface of the sorbent:

a) Two tubes are used in series to take care of breakthrough (if any) compatible to the thermal desorber. The sampling is carried out using low flow sampler. The schematic diagram of sampling train is given in the Fig. 3.

b) Keep the tube in a vertical position during sampling to prevent the possibility of channelling that can lead to under-sampling.

c) The arrow on the tube indicates air flow direction and should point to the tube holder and pump. If no arrow is present, the smallest section should be near the tube holder.

d) Sampling flow rate in the range of 20 - 30ml/min is required (±0.2 ml/min) for ambient air.

e) A sample component may breakthrough from the back end of tube if excessive flow rates are used.

Sample is to be discarded if the breakthrough is observed more than 10 percent.

NOTE — A sample component may breakthrough from the back end of tube if excessive flow rates are used. The sample is to be discarded, if the breakthrough is observed more than 10 percent.

5.4.6 *Sampling Period*

The sorbent tubes are exposed in field for previously determined period (generally between 1 - 4 h or so). Before and after sampling the samples are stored and transported to field/laboratory in sealed containers.

NOTE — Exposure period may be shortened for highly polluted area that is near gasoline dispensing station, garage, refinery or other direct emission source.

5.4.7 *Blank and Sampled Tube Storage*

Seal clean, blank sorbent tubes and sampled tubes using inert, fittings and PTFE ferrules. Wrap capped tubes individually in uncoated aluminium foil. Use clean, sealable metal cans containing a small packet of activated charcoal or activated charcoal/silica gel for storage and transportation of multiple tubes. Store the multi-tube storage container in a clean environment at 4 ± 1°C.

5.5 Procedure

5.5.1 *Calibration*

A standard solution of the compounds of interest in the elution solvent is prepared gravimetrically, using a micro syringe, by adding pure compounds or pre-weighed blends to flasks partially filled with the elution solvent (CS_2). Prepare Benzene standard solution and a blank 0.043 5 µg/ml, 0.087 µg/µl, 0.174 µg/µl, 0.261 µg/µl and 0.348 µg/µl.

1 µl each of standard solution was injected into the sorption/sample tube, which is desorbed thermally, and analyte is transferred to capillary GC directly. Plot the curve between the concentration and response (peak area).

Multi-point external calibration is used on ATD-GC taking 5 levels of BTX standard solution using CS_2 as a diluting solvent or introduction of a fixed volume gas phase standard (optional).

Typical chromatogram for benzene, toluene and xylene is given in Fig. 8 and typical calibration graphs for benzene, toluene and xylene is given in Fig. 9.

5.5.2 *Analytical Procedure*

Remove the sorbent and extract the trapped chemical from sample tubes using heat. Samples collected through this technique (sorbent tubes) may be desorbed by Automated Thermal Desorber generally by 2-stage desorption technique on ATD-GC. The desorbed samples are transferred to gas chromatograph (GC) directly and analysed using capillary column and flame ionization detector (FID). No solvent is required in this process.

a) *Desorption of the sorbent tube onto a focusing trap* — Place the sealed tubes on the thermal desorber (Automated system or equivalent). Heat the interface between the thermal desorber and the GC uniformly.

Desorption of the sorbent tube (typically 200-300°C for 5-15 min with a carrier gas flow of 30-100 ml/min and refocusing of the target analytes on a focusing trap held at near-ambient or sub-ambient temperatures.

Reverse the flow direction of N_2 or He gas, set the flow rate to at least 30 ml/min, and heat the tube to 325°C (in this case) to achieve a transfer of BTX onto a focusing tube at a temperature of 27°C or so.

NOTE — Analytes should be desorbed from the tube in backflush mode, that is, with the gas flow in the reverse direction to that of the air flow during sampling.

b) *Rapid desorption of the focusing trap* — Rapid desorption of the focusing trap (typically 40°C/s to a top temperature of 250-350°C, with a hold time of 10-15 min at the top temperature and an inert/ carrier gas flow of 30-100 ml/min) take place to transfer the analytes into the analytical column.

Analytes are transferred to the column in the form of narrow band of vapor. Desorption in the focusing

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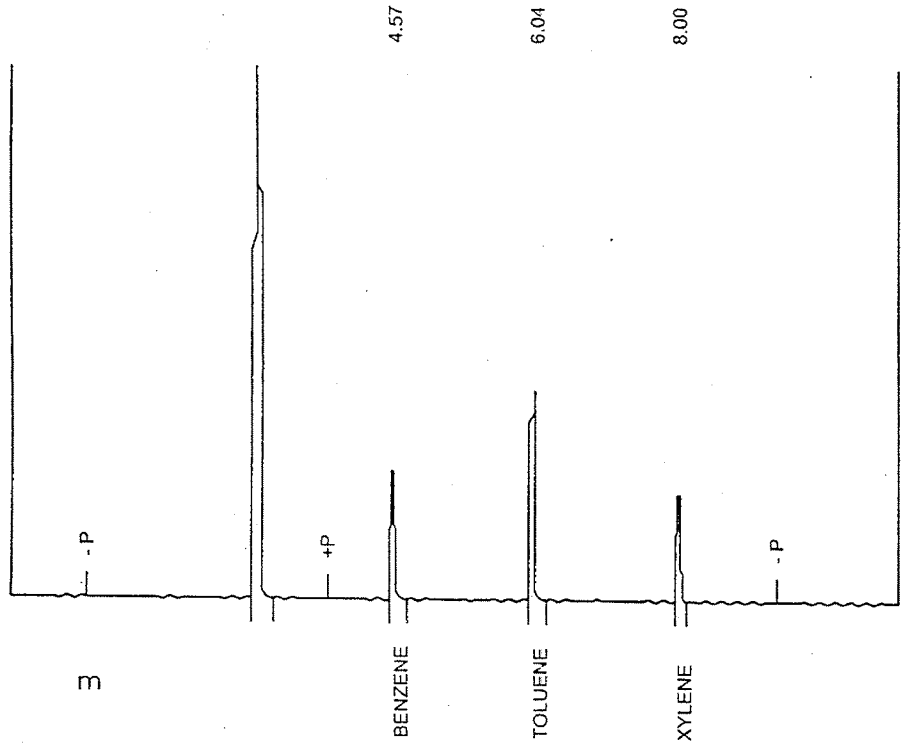
trap initiates the analytes to run through GC column. Different thermal desorbers may have different arrangements for automation. Alternatively, use equivalent manual desorption

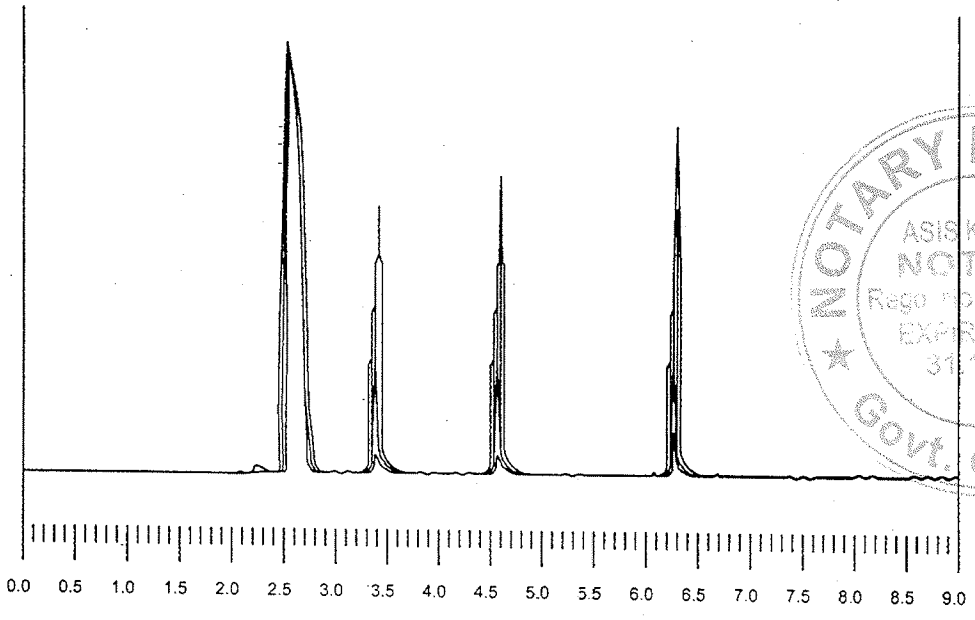
NOTE — Components should normally be desorbed from the focusing trap in backflush mode, that is, with the gas flow through the cold trap in the reverse direction to that used during analyte focusing.

c) *Sample splitting* — If the sample loading is high, it is usually possible to eliminate sufficient water to prevent analytical interference by using sample splitting.

Sample may be split either: (a) between the focusing trap and the capillary column (single splitting) during trap (secondary) desorption, or (b) between both the



8A Typical View



8B Overlay View on ATD-GC-FID System

FIG. 8 CHROMATOGRAMS OF BENZENE, TOLUENE AND XYLENE
(Using Column PE5, 25 m × 0.20 mm, d_f = 0.33 µm 5 percent phenyl 95 percent dimethyl polysiloxane, at concentration of analytes, 0.017 4 µg/µl)

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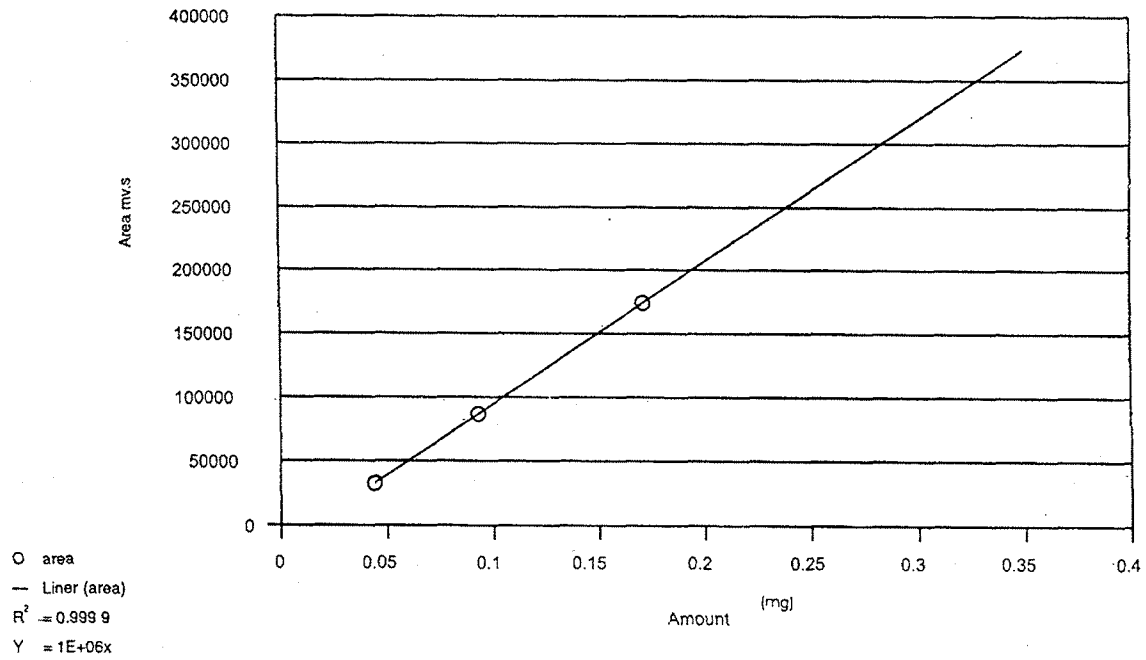
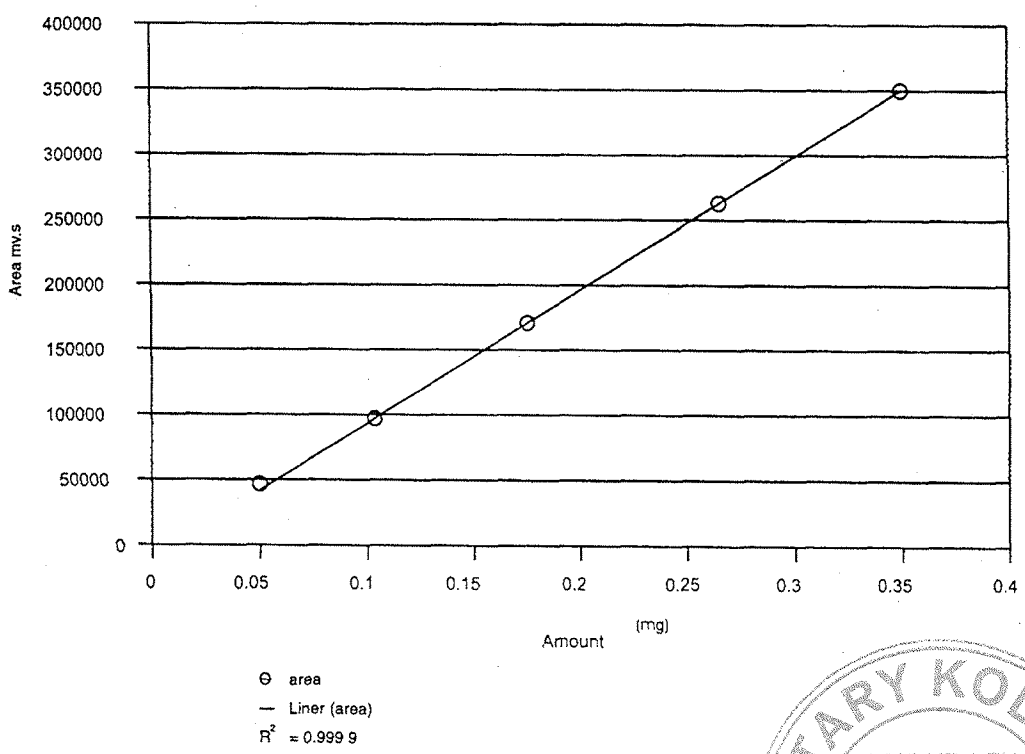
tube and the focusing trap during primary (tube) desorption, that is, double splitting. It may, in fact, be necessary to split the sample in some cases to prevent overloading the analytical column or detector due to excess water accumulation or during the analysis of high concentration/large volume air samples.

NOTE — Sample splitting is one of the key approaches to water management. Moisture management by sample splitting is applicable to relatively high concentrations (10 ppb) or large volume air samples.The mass of water retained by the sorbent tube during sample collection may be sufficiently reduced by the split alone to eliminate the need for further water management steps.



9A Benzene



9B Toluene

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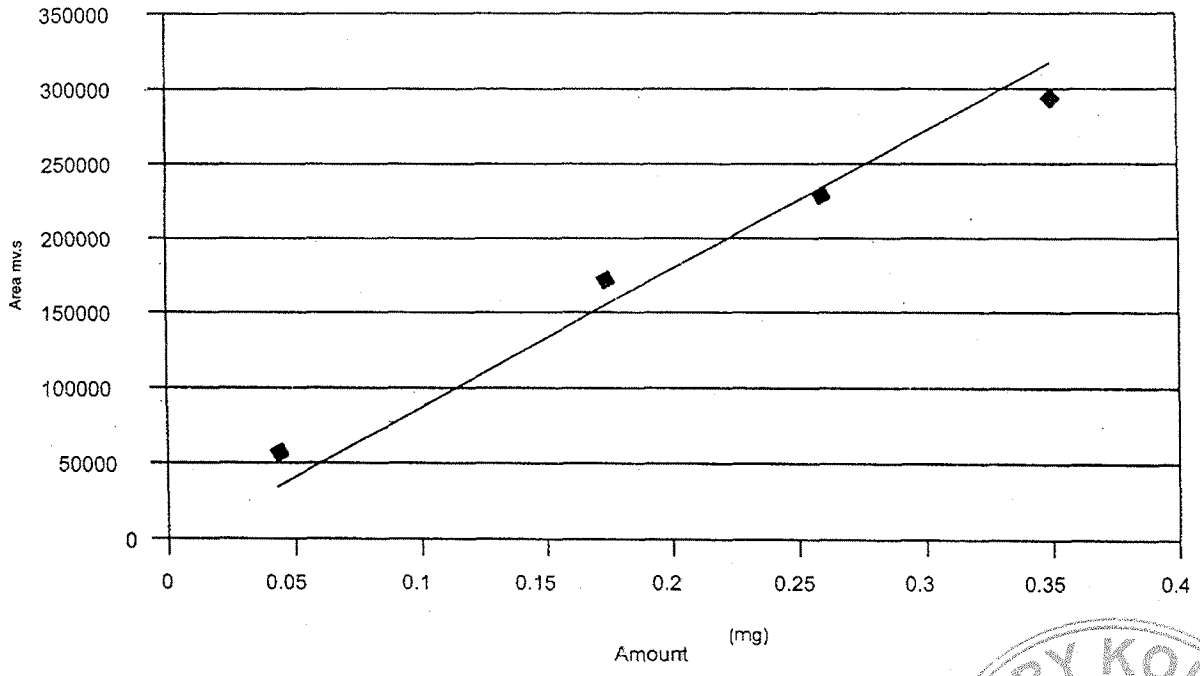

Series 1, — Liner (Series 1), R^2 = 0.963 5, and y = 892 229x

9C Xylene

FIG. 9 CALIBRATION GRAPH

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d) *Trap desorption and GC/MS analysis* — After each tube is desorbed, rapidly heat the focusing trap and apply pure Nitrogen or helium carrier gas. Sample splitting is necessary to accommodate the capillary column. Analytes are transferred to the column in a narrow band of vapor.

The GC run is initiated based on a time delay after the start of thermal desorption. The analytical cycle and ATD and GC conditions are described as follows:

1) *ATD Conditions*

i) Purge time: 1 min (After leak test air is purged to reduce analyte oxidation).

ii) Tube oven temperature : 300°C, Desorb time is 12 min.

iii) Cold trap low temperature : –30°C.

iv) Heat rate of cold trap: 40°C/s up to 225°C for 20 min.

v) Heated valve temperature: 6 Port rotary valve: 200°C.

vi) Transfer line temperature: 225°C.

vii) Inlet and Outlet split: 50 and 20 ml/min before and after cold trap respectively.

(These vary depending on nature and probable concentration of analyte in the sample).

2) *GC Conditions*

i) The ambient laboratory temperature should be between 10°C and 35°C with a relative humidity 20 percent to 75 percent with no condensation. The GC-ATD will operate safely between 15°C and 32°C.

ii) Capillary Column, coating: 5 percent phenyl 95 percent dimethyl polysiloxane, Length × ID : 25 m × 0.20 mm, d_f = 0.33 µm.

iii) Detector: Flame ionization detector (FID) at 260°C.

iv) Air and H_2 Gas: 400 ml/min and 40 ml/min (10 : 1).

v) Carrier Gas: Nitrogen.

vi) Attenuation and Range: – 6 and 1.

vii) Injector: Off.

viii) Oven initial temperature: 50°C hold for 2 min.
Ramp 1 – 8.0°C/min to 140°C hold for 3 min.
Ramp 2 – 10.0°C/min to 250°C hold for 3 min.

ix) Run Time : 30.25 min.

x) Benzene RT 4.57 min, Search window : 1.00 s, 3.00 percent.

xi) Toluene RT 6.04 min, Search window : 1.00 s, 3.00 percent.

xii) Xylene RT 8.00 min, Search window : 1.00 s, 3.00 percent.

NOTE — Temperature programming and retention time (RT) of analyte may vary column to column to get appropriate resolution of analyte peaks. Injection volume and split may also vary according to nature and probable concentration of analyte present in the extract.

e) *Conditioning of sorbent tubes reuse* — All volatiles should be stripped from the sorbent tubes during the thermal desorption process leaving them clean and ready for reuse. The tubes should be resealed to ensure they are kept clean and ready for immediate reuse.

5.6 Calculation

Amount of analyte compound found on tube can be converted into mg/m³ by using the formula:

$$\text{Volume of air, in m}^3 \text{ (sucked through the adsorption tube)} = \frac{s \times t}{10^6}$$

where

s = sampling rate, in ml/min; and

t = sampling time, in min.

$$\text{Concentration, in } \mu\text{g/m}^3 \text{ (at ambient condition)} = \frac{C_2}{V_3}$$

where

C_2 = amount of anlyte compound found on sample tube in µg; and

V_3 = volume of air sucked through the tube, in m³.

Blank value is to be subtracted from the amount of compound found in the sample.

$$\text{Concentration, in mg/m}^3 \text{ at (STP)} = \frac{C \times 101.3\ (273 + T)}{273 \times P}$$

where

C_3 = concentration at ambient condition, in mg/m³;

T = temperature of the ambient air, in °C; and

P = atmospheric pressure, in kPa.

6 METHOD 3 (PASSIVE SAMPLING USING COCONUT SHELL ACTIVATED CHARCOAL PASSIVE DIFFUSION SAMPLER TUBES)

6.1 Principle

Controlled diffusion with an activated charcoal tube is used to enrich the substances targeted for analysis. A diffusion sampling system comprises a sampling layer and a diffusion path in front of this layer. The diffusion path is filled with porous cellulose acetate, to prevent convection currents. The sample is taken by exposing the tube to ambient air (protected from rain). During this exposure time, the analytes stream into the activated charcoal due to the concentration gradient between the air and the desorption layer hand are adsorbed by the charcoal. Once the sample has been collected, the tubes are taken to the laboratory where desorption is done and the substances dissolved in the CS_2 are analyzed using capillary gas chromatography (GC) equipped with flame ionization detector (FID).

6.2 Apparatus

6.2.1 *Sampling Device* — Passive diffusion sampler or Sorption diffusion tube (Fig. 10) of known dimensions (length, internal diameter etc), or standard make [*Orsa-5, Drager, Lubeck. Germany; Radiello diffusive sampler, Fondozione Salvatore Maugeri (FSM), Italy; SKC diffusive sampler series 5, PA, USA* or other equivalent make] filled with known amount (generally 400 mg or so but less than 600 mg) of coconut shell activated charcoal (crystalline form, mesh size between 30 and 80 mesh) and of known diffusion constant, uptake rate and desorption efficiency (for benzene toluene and xylene) provided with protecting hood and passive diffuser tube

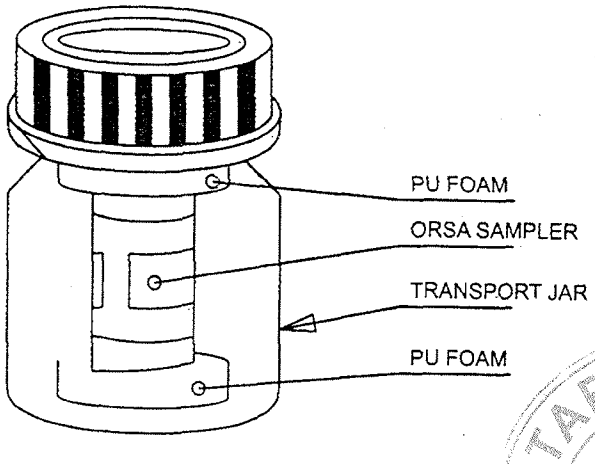

FIG. 10 PASSIVE DIFFUSION SAMPLER TUBE FOR BTX WITH TRANSPORTATION BOTTLE

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holder to protect the tube from rain and direct sunlight. Suitable diffusion barrier like acetate cellulose is provided at ends of diffusive sampler tubes. All the supporting parts that is diffusive tube body, tube holder, clip etc should be made of stainless steel or polycarbonate or polyethylene. The glass bottles (*see* Fig. 10) are used for storing and transporting the sample tubes before and after sampling to/from field and laboratory.

6.2.2 *Gas Chromatograph* — Any suitable gas chromatograph equipped with flame ionization detector (FID) with fused silica capillary columns having a length of 25 m or more, an internal diameter of 320 µm or below and with a stationary phase film thickness less than 1.5 µm as follows or equivalent may be recommended.

Capillary 624 Column : Coating: cyanopropyl phenyl polysiloxane, Length × ID : 30 m × 0.25 mm, Film thickness (d_f) : 1.4 µm

Capillary Column : Coating: 5 percent phenyl, 95 percent dimethyl polysiloxane, Length × ID : 25 m × 0.20 mm, Film thickness (d_f) : 0.33 µm

Wall Coated Column : Coating: Fused Silica PONA CB, Length × ID : 50 m × 0.21 mm, Film thickness (d_f) : 0.5 µm

Capillary Column : Coating: Fused silica 100 percent dimethyl polysiloxane, Length × ID : 30 m × 0.32 ID, Film thickness (d_f) : 1.0 µm

6.3 Reagents

6.3.1 *Carbon Disulphide* (CS_2) — Chromatographic grade, Purity > 99.9 percent (GLC), Residue < 0.000 5 percent, Benzene 0.000 1 percent, H_2O < 0.02 percent.

6.3.2 *Benzene* — Chromatographic grade, Purity > 99.9 percent (GLC), Residue < 0.000 3 percent, H_2O < 0.02 percent.

6.3.3 *Toluene* — Chromatographic grade, Purity > 99.9 percent (GLC), Residue < 0.000 3 percent, H_2O < 0.02 percent.

6.3.4 *Xylene* — Chromatographic grade, Purity > 99.9 percent (GLC), Residue < 0.000 3 percent, H_2O < 0.02 percent.

6.3.5 *Carrier Gas* — Helium or Nitrogen of purity > 99.9 percent, H_2O < 0.02 percent, Residues < 0.000 3 percent.

6.4 Sampling

6.4.1 *Sampling Location*

The sorption diffusion tube with tube hood is placed with the pillar at the height of 1.8-2.1 m at desired location. Site should be free from any obstacle to free flow of the air in the vicinity.

6.4.2 *Sampling Rate*

The sampling is performed through natural diffusion (sampling rate generally range between 5 and 10 ml/min). The analyte is adsorbed on to activated charcoal.

6.4.3 *Sampling Period*

The diffusive samplers are exposed in field for previously determined period [generally for a fortnight (15 days) or so].

NOTE — Exposure period may be shortened to a week or few days only for highly polluted area that is near gasoline emissions or dispensing station, garage or so.

6.4.4 *Sample Diffuser Tubes Labelling* — Sample tubes are labelled with a unique identification number.

6.4.5 *Blank and Sampled Tube Storage*

Before and after sampling the samples are stored and transported to field/laboratory in sealed glass bottle. Store these tubes in storage container having clean environment maintained at 4 - 5°C.

6.5 Procedure

6.5.1 *Calibration*

Prepare a mix stock standard solution of 50 µg/µl of benzene, toluene and xylene each gravimetrically, using a micro syringe in the elution solvent that is CS_2. Prepare further diluted solutions of concentration range of 10, 1.0, 0.10 µg/µl with CS_2 from stock standard in a clean vial. Make up to one millilitre solution. Introduce immediately 1 ml standard solution into the injector of GC directly and plot the curve between the concentration and response (peak area). A typical chromatogram of standard mixture is given in Fig. 11.

6.5.2 *Analytical Procedure*

Samples collected through passive technique (sorbent diffusion tubes) may be desorbed by conventional solvent (generally carbon disulphide). The samples extracted in carbon disulphide are analysed on Capillary GC equipped with flame ionization detector (FID). 1 µl of each standard solution is injected into the column. GC conditions are given as follows:

GC-FID conditions

Capillary column : Wall coated fused silica, PONA, d_f - 0.5 µm

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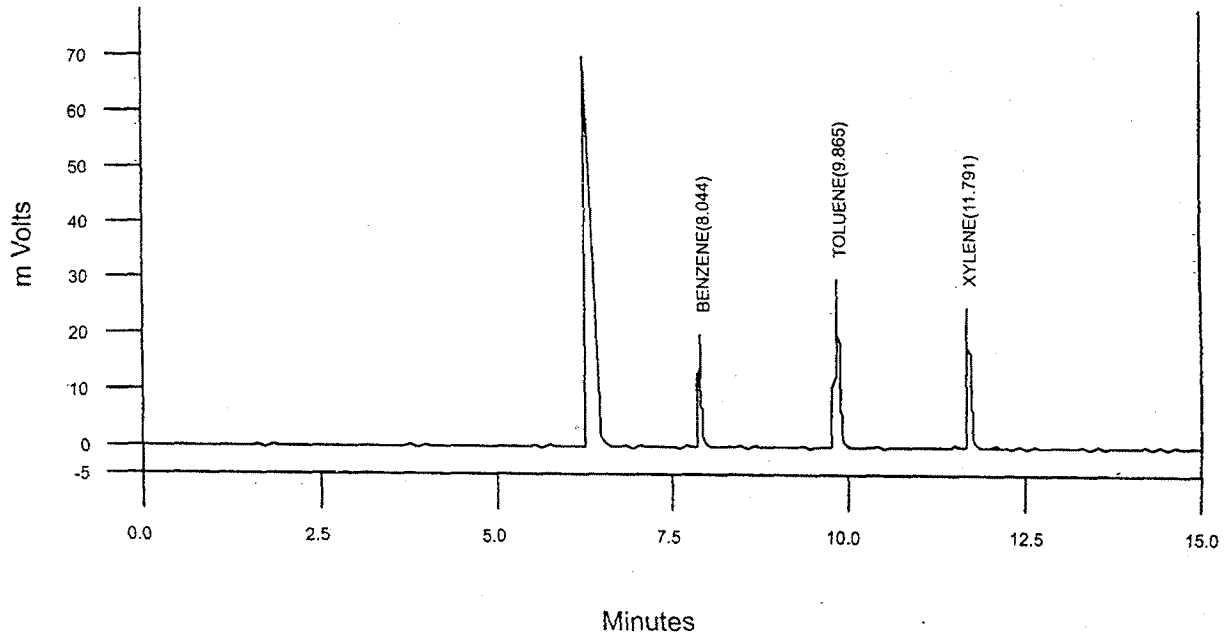

FIG. 11 STANDARD CHROMATOGRAM OF BENZENE, TOLUENE AND XYLENE
(Using CP_Silica PONA capillary column 50 m × 0.2 mm ID, film thickness d_f- 0.5 µm)

Length × ID : 50 m × 0.21 mm

Gas flow:

a) Nitrogen : 30 ml/min (Make up + column), (Column flow: 1 ml/min)

b) Hydrogen : 30 ml/min

c) Air : 300 ml/min

Temperature programming:

Injection port : 250°C FID : 300°C

Oven : 60° - 230°C @ 10°C/min

Typical Injection volume: 2 µl, total run time: 20 min.

- Benzene RT 8.06 min, Search window : 1.00 s, 3.00 percent
- Toluene RT 9.86 min, Search window : 1.00 s, 3.00 percent
- Xylene RT 11.78 min, Search window : 1.00 s, 3.00 percent

NOTE — Temperature programming and retention time (RT) of analyte may vary column to column to get appropriate resolution of analyte peaks. Injection Volume and split may also vary according to nature and probable concentration of analyte present in the extract.

6.6 Calculation

Calculations are given as follows:

$$C = (M - M_{blank}) \times K_{ORSA} \times 1\,000 / DE \times D \times t$$

where

C = concentration of the measured compound/ analyte, in mg/m³;

M = determined mass of the measured compound, in ng;

M_{blank} = weight of analyte organic vapour on blank tube, in ng;

K_{ORSA} = equipment constant of the diffusive sampler (that is 0.8 cm^{-1} for Drager's ORSA 5 diffusive sampler);

1000 = conversion factor to get µg/m³ from, in mg/m³;

DE = desorption efficiency (that is 0.98 for Drager's ORSA 5 diffusive sampler);

D = diffusion coefficient in cm^2/s at 25°C and 1 013 kPa (Benzene 0.085 9 cm^2/s, Toluene 0.076 4 cm^2/s, Xylene 0.072 7 cm^2/s for Drager's ORSA 5 diffusive sampler); and

t = sampling duration, in seconds.

Alternatively following formulae may be applied for calculations:

$$C = (M - M_{blank})/DE \times U \times t$$

where

C = concentration of the measured compound, in µg/m³;

M = determined mass of the measured compound, in ng;

M_{blank} = weight of analyte organic vapour on blank tube, in ng;

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DE = desorption efficiency (0.98);

U = uptake rate in l/h at 25°C (benzene 0.387 l/h, toluene 0.343 l/h, xylene); and

t = sampling duration, in hours.

$$\text{Concentration (mg/m}^3\text{) at (STP)} = \frac{C_3 \times 101.3\ (273 + T)}{298 \times P}$$

where

C_3 = concentration at ambient condition, in µg/m³;

T = temperature of the ambient air; in kelvin; and

P = atmospheric pressure, in kPa.

7 CONVERSION OF CONCENTRATION IN PPB

$$C\ [\text{ppb}] = C\ [\mu\text{g/m}^3] \times 24.1/M$$

where

24.1 = molar volume at 20°C in litres; and

M = molar mass.

8 INTERFERENCES AND LIMITATIONS

8.1 Interference from Sorbent Artifact and Minimizing Artifact Interference

Stringent tube conditioning and careful tube capping and storage procedures are essential for minimizing artifacts. System and sorbent tube conditioning must be carried out using more stringent conditions of temperature, gas flow and time than those required for sample analysis.

NOTE — A reasonable objective is to reduce artifacts to 10 percent or less of individual analyte masses retained during sampling.

8.2 Artifacts from Long-Term Storage of Blank Tubes

Literature reports of the levels of artifacts on (a) Carbotrap/pack™ C, Carbotrap/pack™ B; and Carbosieve™ SIII multi-bed tubes; and (b) Tenax® GR tubes by workers when sealing the tubes using metal Swagelok®-type caps and PTFE ferrules with multi-tube, glass storage jars are reported to be between 0.01 ng after 1-2 months and 0.1 ng after six months respectively. Artifact levels reported for other porous polymers are higher, for example, 5 ng for Chromosorb 106 after one week.

Some varieties of charcoal contain metals which will catalyze the degradation of some organic analytes during thermal desorption at elevated temperatures thus producing artifacts and resulting in low analyte recoveries.

8.3 Artifacts Generated During Sampling and Sample Storage

8.3.1 *Active Sampling*

Benzaldehyde, phenol and acetophenone artifacts are reported to be formed via oxidation of the polymer Tenax when sampling high concentration (100 - 500 ppb) ozone atmospheres.

Tenax should thus be used with an ozone scrubber when sampling low levels (< 10 ppb) of these analytes in areas with appreciable ozone concentrations.

Carbotrap pack type sorbents have not been reported to produce this level of artifact formation. Once retained on a sorbent tube, chemically stable VOCs, loaded in laboratory conditions, have been shown to give good recoveries, even under high ozone concentrations for storage of a year or more.

8.3.2 *Passive Sampling*

The uptake rate of diffusive samplers is not significantly affected by air movement, provided the air velocity exceeds a threshold value which depends on design. Generally, air velocities greater than 0.1 ms^{-1} and below 10 ms^{-1} are sufficient for the passive sampling.

8.3.3 Temperature correction for sampled air volume is to be made, if sampling is performed below 20°C or above 30°C .

9 DETECTION LIMITS AND MAXIMUM QUANTIFIABLE CONCENTRATIONS OF AIR POLLUTANTS

The method of detection limit is defined for each system by making seven replicate measurements of a concentration of the compound of interest near the expected detection limit (within a factor of five), computing the standard deviation for the seven replicate concentrations, and multiplying this value by 3.5 (the Student's t value for 99 percent confidence for seven values).

Detection limits for atmospheric monitoring vary depending on several key factors. They are:

a) Sample storage condition,

b) Injection volume,

c) Minimum artifact levels,

d) GC detector selection, and

e) Volume of air sampled. The volume of air sampled is in turn dependent upon a series of variables including SSVs, pump flow rate limitations and time-weighted-average monitoring time constraints.

Generally detection limits range about sub-ppb for BTX in one litre air samples using the GC-FID. Detection limits are greatly dependent upon the proper management of water for GC capillary analysis of volatile organics in air using sorbent technology.

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9.1 Safe Sampling Volume (SSV)

Usually calculated by halving the retention volume (indirect method) or taking two-thirds of the breakthrough volume (direct method), although these two approaches do not necessarily give identical results. The latter definition is generally used.

9.2 Breakthrough Volume (BV)

The volume sampled when the amount of analyte collected in a backup sorbent tube reaches a certain percentage (typically 5 percent) of the total amount collected by both sorbent tubes.

10 QUALITY ASSURANCE (VALIDATING THE SAMPLE COLLECTION PROCEDURE)

10.1 Blanks

Artifact levels on laboratory and field blanks should be at the low or sub-nanogram level for carbonaceous sorbents and Tenax® and at the double digit ng level for Porapaks®, Chromosorb®. If artifact levels are considerably above this, careful attention must be paid to the tube conditioning and storage procedures.

Artifact peaks, which are 10 percent or more of the area of average component peaks, should be marked as artifacts in the final data reports.

10.2 Performance Criteria for the Monitoring Pump

Records of the pump flow rate delivered against the pump flow rate or pressure selected on a pump should be reviewed at least once per three months. If the performance of any pump has been found to have changed significantly over that time; for example if completely different pump settings are required to deliver the same pump flow rate, the pump should be serviced by the manufacturer or their approved agent.

10.3 Performance Criteria for the Solid Adsorbent Sampling of Ambient Air

There are four performance criteria, which must be met for a system. These criteria are:

a) A method detection limit of 0.5 ppb,

b) Duplicate (analytical) precision within 20 percent on synthetic samples of a given target analyte or vapor in a typical vapor mix in humidified zero air,

c) Agreement within 25 percent for distributed volume pairs of tubes taken in each sampling set, and

d) Audit accuracy within 30 percent for concentrations normally expected in contaminated ambient air (0.5 to 25 ppb).

10.4 Calibration of Response

The multi-level calibration procedures and calibration frequencies should be followed for this. It is also advisable to analyze a single level calibrant (i.e. tubes loaded with analyte masses in the mid-range of those expected to be collected during sampling) approximately every tenth sample during an analytical sequence, as a check on system performance.

10.5 Analytical Precision of Duplicate Pairs

The measure of analytical precision used for this method is the absolute value of the relative difference between two identical samples (same flow rate over the same time period from with a common inlet to the sample volume). The analytical precision is expressed as a percentage as follows:

$$\text{Analytical precision} = [(X_1 - X_2)/X \times 100]$$

where

X_1 = a measurement value taken from one of the two tubes used in sampling,

X_2 = a measurement value taken from the second of two tubes used in sampling, and

X = average of X_1 and X_2.

The analytical precision is a measure of the precision achievable for the entire sampling and analysis procedure including the sampling and thermal desorption process mentioned above and the analytical procedure.

10.6 Accuracy

A measure of accuracy is the degree of agreement with audit standards. Audit accuracy is defined as the relative difference between the measurement result and the nominal concentration of the compound:

$$\text{Audit accuracy, percent} = \frac{(\text{Spiked value} - \text{Observed value}) \times 100}{(\text{Spiked value})}$$

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ANNEX A
(*Foreword*)

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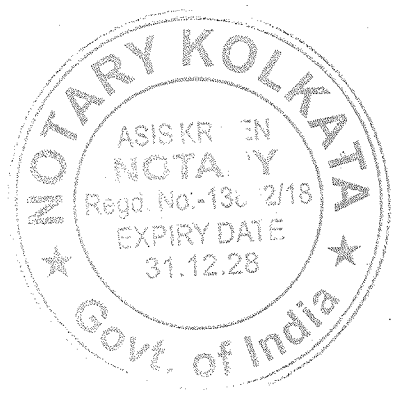

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This Indian Standard has been developed from Doc: No. CHD 32 (1336).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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CENTRAL POLLUTION CONTROL BOARD

CONTINUOUS AMBIENT AIR QUALITY

ANNEXURE - 3

Date: Wednesday, Feb 14 2024

Time: 12:19:20 PM

Station: Hakimapada, Angul - OSPCB
State: Odisha
City: Angul
Parameter: Benzene
Average Period: 24 Hours
From: 01-10-2022T00:00:00Z 00:00
To: 31-12-2022T12:22:59Z 00:00

Prescribed Standards		0-5
Exceeding Standards		NA
Remarks		
From Date	To Date	Benzene (ug/m3)
01-10-2022 00:00	02-10-2022 00:00	None
02-10-2022 00:00	03-10-2022 00:00	None
03-10-2022 00:00	04-10-2022 00:00	None
04-10-2022 00:00	05-10-2022 00:00	None
05-10-2022 00:00	06-10-2022 00:00	None
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07-10-2022 00:00	08-10-2022 00:00	None
08-10-2022 00:00	09-10-2022 00:00	None
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18-10-2022 00:00	19-10-2022 00:00	None
19-10-2022 00:00	20-10-2022 00:00	None

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CONTINUOUS AMBIENT AIR QUALITY

Date: Wednesday, Feb 14 2024

Time: 12:19:20 PM

20-10-2022 00:00	21-10-2022 00:00	None
21-10-2022 00:00	22-10-2022 00:00	None
22-10-2022 00:00	23-10-2022 00:00	None
23-10-2022 00:00	24-10-2022 00:00	None
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17-11-2022 00:00	18-11-2022 00:00	None

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CENTRAL POLLUTION CONTROL BOARD

CONTINUOUS AMBIENT AIR QUALITY

CPCB

Date: Wednesday, Feb 14 2024

Time: 12:19:20 PM

18-11-2022 00:00	19-11-2022 00:00	None
19-11-2022 00:00	20-11-2022 00:00	None
20-11-2022 00:00	21-11-2022 00:00	None
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14-12-2022 00:00	15-12-2022 00:00	None
15-12-2022 00:00	16-12-2022 00:00	None
16-12-2022 00:00	17-12-2022 00:00	None

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CENTRAL POLLUTION CONTROL BOARD

CONTINUOUS AMBIENT AIR QUALITY

Date: Wednesday, Feb 14 2024

Time: 12:19:20 PM

17-12-2022 00:00	18-12-2022 00:00	None
18-12-2022 00:00	19-12-2022 00:00	None
19-12-2022 00:00	20-12-2022 00:00	None
20-12-2022 00:00	21-12-2022 00:00	None
21-12-2022 00:00	22-12-2022 00:00	None
22-12-2022 00:00	23-12-2022 00:00	None
23-12-2022 00:00	24-12-2022 00:00	None
24-12-2022 00:00	25-12-2022 00:00	None
25-12-2022 00:00	26-12-2022 00:00	None
26-12-2022 00:00	27-12-2022 00:00	None
27-12-2022 00:00	28-12-2022 00:00	None
28-12-2022 00:00	29-12-2022 00:00	None
29-12-2022 00:00	30-12-2022 00:00	None
30-12-2022 00:00	31-12-2022 00:00	None
31-12-2022 00:00	31-12-2022 12:22	None

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EXPIRY DATE
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Govt. of India

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CENTRAL POLLUTION CONTROL BOARD

CONTINUOUS AMBIENT AIR QUALITY

CPCB

Annexure - 4

Date: Wednesday, Feb 14 2024

Time: 12:14:35 PM

Station: Talcher Coalfields,Talcher - OSPCB
State: Odisha
City: Talcher
Parameter: Benzene
Average Period: 24 Hours
From: 01-10-2022T00:00:00Z 00:00
To: 31-12-2022T12:17:59Z 00:00

Prescribed Standards		0-5
Exceeding Standards		NA
Remarks		
From Date	To Date	Benzene (ug/m3)
01-10-2022 00:00	02-10-2022 00:00	0.0
02-10-2022 00:00	03-10-2022 00:00	0.0
03-10-2022 00:00	04-10-2022 00:00	0.0
04-10-2022 00:00	05-10-2022 00:00	0.0
05-10-2022 00:00	06-10-2022 00:00	0.0
06-10-2022 00:00	07-10-2022 00:00	0.0
07-10-2022 00:00	08-10-2022 00:00	0.0
08-10-2022 00:00	09-10-2022 00:00	0.0
09-10-2022 00:00	10-10-2022 00:00	0.0
10-10-2022 00:00	11-10-2022 00:00	0.0
11-10-2022 00:00	12-10-2022 00:00	0.0
12-10-2022 00:00	13-10-2022 00:00	0.0
13-10-2022 00:00	14-10-2022 00:00	0.0
14-10-2022 00:00	15-10-2022 00:00	0.0
15-10-2022 00:00	16-10-2022 00:00	0.0
16-10-2022 00:00	17-10-2022 00:00	0.0
17-10-2022 00:00	18-10-2022 00:00	0.0
18-10-2022 00:00	19-10-2022 00:00	0.0
19-10-2022 00:00	20-10-2022 00:00	0.01

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CENTRAL POLLUTION CONTROL BOARD

CONTINUOUS AMBIENT AIR QUALITY

CPCB

Date: Wednesday, Feb 14 2024

Time: 12:14:35 PM

20-10-2022 00:00	21-10-2022 00:00	0.0
21-10-2022 00:00	22-10-2022 00:00	0.0
22-10-2022 00:00	23-10-2022 00:00	0.0
23-10-2022 00:00	24-10-2022 00:00	0.0
24-10-2022 00:00	25-10-2022 00:00	0.0
25-10-2022 00:00	26-10-2022 00:00	0.0
26-10-2022 00:00	27-10-2022 00:00	0.0
27-10-2022 00:00	28-10-2022 00:00	0.0
28-10-2022 00:00	29-10-2022 00:00	0.0
29-10-2022 00:00	30-10-2022 00:00	0.07
30-10-2022 00:00	31-10-2022 00:00	0.0
31-10-2022 00:00	01-11-2022 00:00	0.0
01-11-2022 00:00	02-11-2022 00:00	0.0
02-11-2022 00:00	03-11-2022 00:00	0.0
03-11-2022 00:00	04-11-2022 00:00	0.0
04-11-2022 00:00	05-11-2022 00:00	0.0
05-11-2022 00:00	06-11-2022 00:00	0.0
06-11-2022 00:00	07-11-2022 00:00	0.0
07-11-2022 00:00	08-11-2022 00:00	0.0
08-11-2022 00:00	09-11-2022 00:00	0.0
09-11-2022 00:00	10-11-2022 00:00	0.0
10-11-2022 00:00	11-11-2022 00:00	0.0
11-11-2022 00:00	12-11-2022 00:00	0.0
12-11-2022 00:00	13-11-2022 00:00	0.0
13-11-2022 00:00	14-11-2022 00:00	0.0
14-11-2022 00:00	15-11-2022 00:00	0.09
15-11-2022 00:00	16-11-2022 00:00	0.34
16-11-2022 00:00	17-11-2022 00:00	0.0
17-11-2022 00:00	18-11-2022 00:00	0.04

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CENTRAL POLLUTION CONTROL BOARD

CONTINUOUS AMBIENT AIR QUALITY

Date: Wednesday, Feb 14 2024

Time: 12:14:35 PM

18-11-2022 00:00	19-11-2022 00:00	0.15
19-11-2022 00:00	20-11-2022 00:00	0.7
20-11-2022 00:00	21-11-2022 00:00	0.26
21-11-2022 00:00	22-11-2022 00:00	0.0
22-11-2022 00:00	23-11-2022 00:00	0.0
23-11-2022 00:00	24-11-2022 00:00	0.0
24-11-2022 00:00	25-11-2022 00:00	0.0
25-11-2022 00:00	26-11-2022 00:00	0.03
26-11-2022 00:00	27-11-2022 00:00	0.33
27-11-2022 00:00	28-11-2022 00:00	0.37
28-11-2022 00:00	29-11-2022 00:00	0.0
29-11-2022 00:00	30-11-2022 00:00	0.0
30-11-2022 00:00	01-12-2022 00:00	0.0
01-12-2022 00:00	02-12-2022 00:00	0.0
02-12-2022 00:00	03-12-2022 00:00	0.0
03-12-2022 00:00	04-12-2022 00:00	0.0
04-12-2022 00:00	05-12-2022 00:00	0.0
05-12-2022 00:00	06-12-2022 00:00	0.0
06-12-2022 00:00	07-12-2022 00:00	0.14
07-12-2022 00:00	08-12-2022 00:00	0.3
08-12-2022 00:00	09-12-2022 00:00	0.38
09-12-2022 00:00	10-12-2022 00:00	0.2
10-12-2022 00:00	11-12-2022 00:00	0.44
11-12-2022 00:00	12-12-2022 00:00	0.11
12-12-2022 00:00	13-12-2022 00:00	0.07
13-12-2022 00:00	14-12-2022 00:00	0.04
14-12-2022 00:00	15-12-2022 00:00	0.11
15-12-2022 00:00	16-12-2022 00:00	0.15
16-12-2022 00:00	17-12-2022 00:00	0.4

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CENTRAL POLLUTION CONTROL BOARD

CONTINUOUS AMBIENT AIR QUALITY

CPCB

Date: Wednesday, Feb 14 2024

Time: 12:14:35 PM

17-12-2022 00:00	18-12-2022 00:00	0.34
18-12-2022 00:00	19-12-2022 00:00	0.15
19-12-2022 00:00	20-12-2022 00:00	0.11
20-12-2022 00:00	21-12-2022 00:00	0.18
21-12-2022 00:00	22-12-2022 00:00	0.23
22-12-2022 00:00	23-12-2022 00:00	0.21
23-12-2022 00:00	24-12-2022 00:00	0.39
24-12-2022 00:00	25-12-2022 00:00	0.37
25-12-2022 00:00	26-12-2022 00:00	0.54
26-12-2022 00:00	27-12-2022 00:00	0.3
27-12-2022 00:00	28-12-2022 00:00	0.39
28-12-2022 00:00	29-12-2022 00:00	0.07
29-12-2022 00:00	30-12-2022 00:00	0.12
30-12-2022 00:00	31-12-2022 00:00	0.3
31-12-2022 00:00	31-12-2022 12:17	0.17

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~~372~~ **~~Annexure R1/5~~** ~~284~~

427 ANNEXURE - 'N'

सत्यमेव जयते

Government of India
Ministry of Environment, Forest and Climate Change
IA Division
(Coal Mining)
***

Minutes of AGENDA FOR 7th MEETING OF THE EXPERT APPRAISAL COM MITTEE (COAL MINING SECTOR) meeting Coal Mining held from 12/02/2024 t o 14/02/2024 **Date:** 24/02/2024

MoM ID: EC/MOM/EAC/880056/2/2024

Agenda ID: EC/AGENDA/EAC/880056/2/2024

Meeting Venue: N/A

Meeting Mode: Virtual

Date & Time:

12/02/2024	10:30 AM	05:30 PM
13/02/2024	10:30 AM	05:30 PM
14/02/2024	10:30 AM	01:30 PM

1. Opening remarks

At the outset, the Chairman welcomed the Expert members & other participants and requested to start the proceeding as per the agenda adopted for this meeting. The list of Members participated in the meeting is at ANNEXURE VIII. Note - Due to Editor issue, Final Approved Minutes of the EAC is enclosed herewith in PDF as a [ANNEXURE]. Please refer this document and Treat as approved Minutes of the EAC [Coal Sector].

2. Confirmation of the minutes of previous meeting

Confirmation of the Minutes of 6thMeeting of the EAC (Coal): The minutes of the 6th Meeting of the EAC (Coal) held during 17th& 18th January 2024 has been confirmed by the Chairman with the following corrections. 6th EAC Meeting (Agenda Item No 6.5): Expansion of Prakasham Khani Opencast Coal mine (Amalgamation of Manuguru OC II Expansion & Manuguru OC IV Extension) for increase in production capacity from 9.75 MTPA to 10.45 MTPA in the ML area of 2402.40 ha (2214.84 ha Forest Land and 187.56 ha non-forest land) of Singareni Collieries Company Limited (SCCL) located in Village & Mandal Manuguru, District Bhadradri Kothagudem (Telangana) - For Environmental Clearance under Ministry's OM dated 11.04.2022 (Stage I - 20% expansion) – reg. [Online Proposal No. IA/TG/CMIN/447190/2023; File No. J-11015/78/2013-IA-II(M)] The Committee observed that PP submitted a LOI dated 24.06.2019 for an area of 233.54 Ha falling outside the lease area. The Committee is of the view that PP shall submit an undertaking to the effect that no mining operation shall be carried out in an area of 233.54 Ha before obtaining the mining lease and other permission/clearances from the concerned authority as per law. The Committee therefore, prescribed the following additional condition to be included in EC: "Any mining operation in an area of 233.54 Ha shall only be carried out after obtaining the mining lease and other permission/clearance from the concerned authorities as per law." 6th EAC Meeting (Agenda Item No 6.7): Expansion of Jalagam Vengala Rao Opencast Mine (amalgamation of Jalagam I & II) with increase in production capacity from 10 MTPA to 12 MTPA with coal washery of 4 MTPA capacity in ML Area 1953.46 ha by M/s Singareni Collieries Company Limited at village Kommepalli near

Sathupalli town, Sathupalli mandal, Khammam District, (Telangana) – Reconsideration for Environmental Clearance under Ministry's OM dated 11.04.2022 (Stage I - 20% expansion) – reg. [Online Proposal No. IA/TG/CMIN/447089/2023; File No. J-11015/268/2007-IA-II(M) The Committee observed that PP submitted a LOI dated 17/9/2018 for an area of 89.85 Ha falling outside the lease area. The Committee is of the view that PP shall submit an undertaking to the effect that no mining operation shall be carried out in an area of 89.85 Ha before obtaining the mining lease and other permission from the concerned authorities as per law. The Committee therefore, prescribed the following additional condition to be included in EC: "Any mining operation in an area of 89.85 Ha shall only be carried out after obtaining the mining lease and other permission/clearance from the concerned authorities as per law." 6th EAC Meeting (Agenda Item No 6.8): Himgir Coal Washery project for (5 MTPA) in an area of 13.52 ha. of M/s ACB (India) Limited located in Tehsil Hemgir, District Sundargarh, (Odisha)-Amendment in EC: It has mentioned in the approved MoM that "Based on the document submitted and discussion held, the Committee is of the view that w.r.t requested of expansion capacity from 2.5 MTPA to 5 MTPA and for additional amendment sought by PP i.e. Specific Condition No. (iii) as mentioned above, the same may be considered after submission of the following: a) Proposal for amendment in EC conditions shall be submitted a fresh in PARIVESH 2.0 Portal. b) Submission of fresh traffic study and one-month baseline data. c) Cost analysis of deployment of electric tippers vis a vis. installation of belt conveyor system for transportation of mineral from washery to railway siding. d) Certified Compliance Report from concerned RO for compliance of 90% of the conditions. The Committee is of the view that point c) mentioned above shall be read as "Cost analysis of deployment of electric tippers vis a vis. installation of belt conveyor system for transportation of mineral from washery to railway siding, along with a time bound action plan so that the matter can be discussed in the subsequent meeting" 5th EAC Meeting (Agenda No. 5.3) Expansion of Bhubaneswari OCP for increase in Mine lease area from 638.341 Ha to 658.724 Ha [638.341ha+20.383ha (forest area)] keeping existing production capacity 30 MTPA by M/s Mahanadi Coalfields Ltd. located in the villages Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur,Tehsil Talcher Sadar, District Angul (Odisha) – For Terms of Reference- reg. The EAC in the MoM for the aforementioned project recorded in MoM that :"5.3.4 The Committee after detailed deliberations noted that the instant proposal is for Terms of Reference for project wherein PP will have to maintain coal production on similar capacity i.e 30 MTPA (on granted EC) but with slight increase of area from 638.341ha to 658.724 Ha (i.e 20.383). It has been noted that PP has already conducted public hearing on the same mine area i.e 658.724 ha which is being proposed and had also included the forest land i.e 20.383 ha. Further, EIA- EMP was already prepared for similar capacity for same mine area i.e 658.724 ha. However, PP in the past could not able to utilise the entire mine area due to delay in obtaining FC for 20.383 ha. Now PP is in process of getting the FC for 20.383 ha and accordingly requesting the committee to exempt the public area to avoid repetition the same process of pubic hearing, which has already been done for requirement of EIA-EMP report. The Committee noted the reason cited by PP and opined that in fact it is a case of amendment of EC as PP has already prepared EIA-EMP and already conducted the public hearing on existing mine area and capacity which is proposed to be operated by PP. Earlier due to pressure of coal production PP curtailed the area wherein forest land has been involved as there is delay in process and land acquisition. Due to the stated reasons and in view of the above, the EAC recommended to prepare EIA-EMP report with public consultation by inviting written submission from the affected persons in place of conducting detailed public hearing. Meanwhile PP shall have to collect the additional baseline data at…" Further, the Committee in the specific ToR conditions no (i) mentioned that "PP shall conduct public consultation by issuing public notice in local media, newspapers (English, Hindi and local language) Report through concerned SPCB in the concerned districts as per the provisions/procedure contained in the EIA Notification, 2006 for information of the stakeholders about the present coal mining operations inviting comments and their redressal. All the issues raised and PP reply should be incorporated in EIA." As there is an ambiguity about whether the EAC has recommended the proposal with public consultation i.e. (Public Hearing & written submission) or only Public Consultation i.e. only written submission. The Committee examined the issue and is of the view that as per the provision of EIA Notification 2006: (a) All applications seeking prior environmental clearance for expansion with increase in the production capacity beyond the capacity for which prior environmental clearance has been granted under this notification or with increase in either lease area or production capacity in the case of mining projects or for the modernisation of an existing unit with increase in the total production capacity beyond the threshold limit prescribed in the Schedule to this notification through change in process and or technology or involving a change in the product –mix shall be made in Form I and they shall be considered by the concerned Expert Appraisal Committee or State Level Expert Appraisal Committee within sixty days, who will decide on the due diligence necessary including preparation of Environment Impact Assessment and public consultations and the application shall be appraised accordingly for grant of environmental clearance in respect of projects or activities other than falling in clause (b) and (c). In view of the above facts, the Committee is of the view that specific ToR conditions no (i) shall be read as "PP shall conduct public consultation (i.e. by inviting written submissions) by issuing public notice in local media, newspapers (English, Hindi and local language) Report through concerned SPCB in the concerned districts as per the provisions/procedure contained in the EIA Notification, 2006 for information of the stakeholders about the present coal mining operations inviting written comments/submissions and their redressal. All the issues raised and PP reply should be incorporated in EIA." 5th EAC Meeting (Agenda Item No 5.6): Gondkhari Underground Coal Mine of production capacity 2.0/3.0 MTPA (Normative/Peak) in the mine lease area of 862.00 Ha of M/s Adani Power Maharashtra Limited (APML) located atVillage Gondkhari, Tehsil Kalmeshwar, District Nagpur (Maharashtra) – Reconsideration for Environmental

Clearance reg. The specific condition no (vi) is mentioned as "PP shall implement the activities-wise proposed budget for Public Hearing Budget (as mentioned in EIA-EMP report) and Capital cost of Rs. 58 Lakh (as EMP cost mentioned in the above para no. 5.6.3 (ix)) in time bound manner as per 5.6 3 of minutes. The details of annual expenditure incurred shall be part of report to be submitted to IRO, MoEF&CC. PP needs to include the audited figures against the expenditure and activities to be monitored by through dedicated monitoring mechanism. The maintenance of all activities shall be covered through recurring cost of Public Hearing, and continued as a part of CSR budget.' The Committee noted that in place of capital cost the recurring cost was mentioned in the above condition therefore the above condition shall be read as "PP shall implement the activities-wise proposed budget for Public Hearing Budget (as recommended by the EAC, mentioned in Annexure 2) & EMP Capital cost of Rs. 34.32 Cr in time bound manner. The details of annual expenditure incurred shall be part of report to be submitted to IRO, MoEF&CC. PP needs to include the audited figures against the expenditure and activities to be monitored by through dedicated monitoring mechanism. The maintenance of all activities shall be covered through recurring cost of Public Hearing, and continued as a part of CSR budget." 5th EAC Meeting (Agenda Item No 5.12):Expansion of Amrapali Opencast Coal Mine from 20.16 MTPA to 24.19 MTPA (Peak) in an ML area of 619.87 ha of M/s Central Coalfields Limited located in District Chatra (Jharkhand) - For Environmental Clearance under OM dated 11.04.2022 (Stage-I - 20% expansion) - reg. The Committee observed that Ministry granted expansion EC of 20.16 MTPA in an area of 619.87 Ha on 10.05.2021 with following condition "PP should ensure that coal transportation from Amrapali Railway siding through belt conveyor within two years from grant of EC" The above condition was amended vide letter dated 12.05.2023 as "PP should ensure that coal transportation from Amrapali Railway siding through belt conveyor within 18 months i.e upto Jan 2025 from May 2023" Now, while recommending the further expansion upto 24.19 MTPA (under stage I), in the MoM the specific condition no (ii) in MoM is mentioned as " PP should complete the coal transportation from Amrapali railway siding through belt conveyor before 08.05.2023 and SPCB shall issue CTO accordingly." Considering the above facts, the Committee is of the view that the above condition shall be read as "PP should complete the coal transportation from Amrapali railway siding through belt conveyor before January 2025 and SPCB shall issue CTO accordingly".

3. Details of proposals considered by the committee

Day 1 -12/02/2024

3.1. Agenda Item No 1:

3.1.1. Details of the proposal

Tokisud Block II Coal Mine by **TWENTY FIRST CENTURY MINING PRIVATE LIMITED** located at **RAMGARH,JHARKHAND**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/JH/CMIN/456147/2023	IA-J-11015/53/2023-IA-II(M)	12/01/2024	Mining of minerals (1(a))

3.1.2. Project Salient Features

Agenda No. 7.3
Proposal for grant of ToR to Tokisud Block II Coal Mine (Lease Area 192.26 Ha. having 1.5 MTPA capacity) of Twenty First Century Mining Private Limited located at Anchal Patratu, Ramgarh District, Jharkhand State - For Terms of Reference – Reg.
[Online Proposal No. IA/JH/CMIN/456147/2023; File No. IA-J-11015/53/2023-IA-II(M), Fresh ToR]

[Consultant: P&M Solution, Noida; NABET/EIA/2326/RA 0298 valid till 7.05.2026]

7.3.1: The **Twenty First Century Mining Private Limited** has made an application online vide proposal no. **IA/JH/CMIN/456147/2023 dated 12/01/2024** along with the application in the prescribed format (Form-I), copy of the pre-feasibility report and for undertaking detailed EIA study as per the EIA Notification, 2006 for the project mentioned above. The proposed project activity is listed at S.No. - 1(a) Mining of Minerals Under Category "B1" of the schedule of the EIA Notification, 2006 and does not attract general conditions. The proposal is being appraised at the Central

Additional Agenda:

Agenda:7.14

6th EAC Meeting (Agenda No 6.1) Subhadra Open Cast Mine with production capacity of 25 MTPA in mine lease area of 1111.85 ha of M/s Mahanadi Coalfield Limited located at Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil Tachler Sadar and Chhendipada, District Angul (Odisha) – Reconsideration for Environmental Clearance – reg.

[Proposal No. IA/OR/CMIN/445297/2023; File No. IA-J-11015/72/2021- IA-II(M)]

Member Secretary informed the Committee that after the approval of the MoM for this agenda item a complaint was received against the project on 10/02/2024. The Committee noted that the complaint was addressed previous Member Secretary and now forwarded to the new Member Secretary.

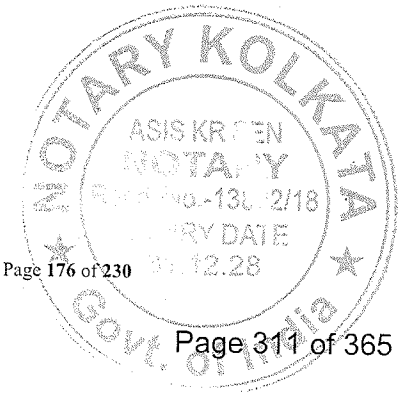
The Committee observed that in the complaint it has mentioned that *"I would like to bring it your kind information that the results reported in respect of Benzene in all the villages for the month of December 2022 needs a review. There are some other findings which show that in December 2022, the Benzene concentration in all these villages found to be varying between 2.2 to 6.4 microgram per cubic meter. The maximum was found in Golabandha."*

The Committee noted that the allegation made by the complainant is without any documentary proof to support his argument. However, the Committee is of the view that PP may be asked to clarify on this issue. Member secretary informed that, an email in this regard has already been sent to PP on 13/02/2024 as per direction of the EAC.

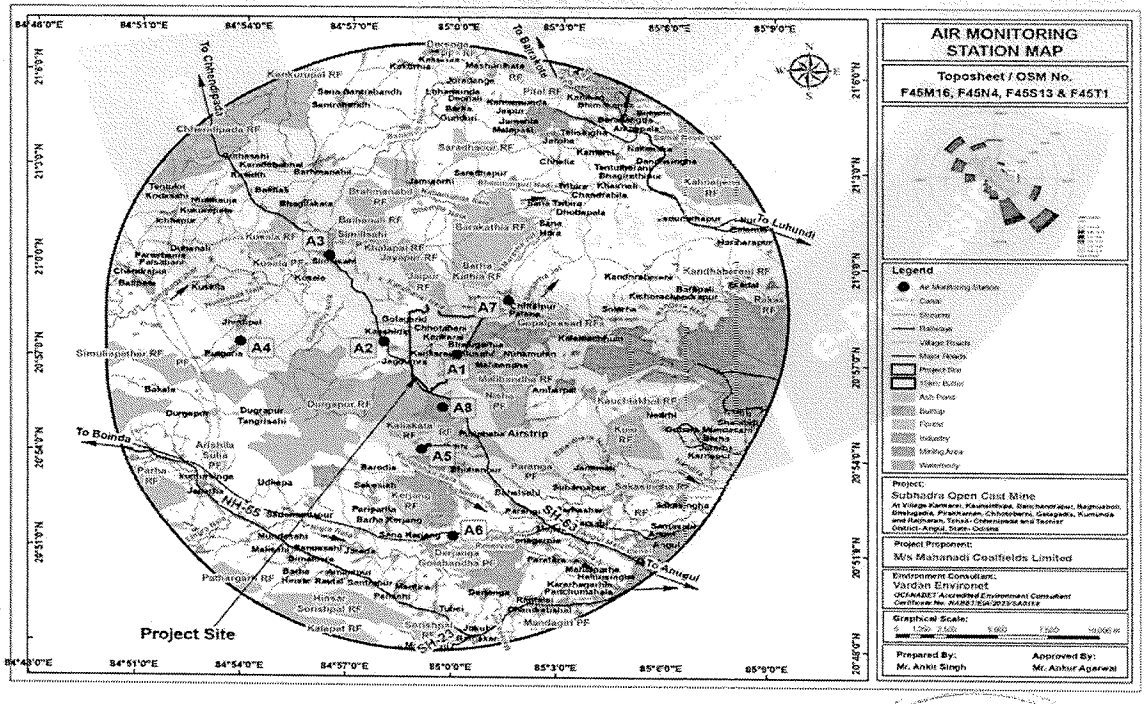
Committee noted that PP vide email date 20/02/2024 submitted its justification wherein it has mentioned that:

Vardan EnviroLab a NABL Accredited Lab based in Gurgaon, Haryana was engaged for carrying out Baseline Monitoring Environmental Study during the period from October to December 2022. The environmental study conducted was in accordance with the guidelines of EIA issued by the Ministry of Environment Forests and Climate Change, Govt. of India and Central Pollution Control Board, New Delhi.

The locations of the Air Monitoring were as follows:



Stations	Name	Distance in Km	Latitude	Longitude
A1	Project Site	-	20° 57' 36.707" N	84° 59' 28.969" E
A2	Village Tangarasahi	1.27	20° 57' 33.378" N	84° 57' 59.721" E
A3	Village Kosala	1.02	20° 58' 49.664" N	84° 58' 15.542" E
A4	Village Korada	8.4	20° 57' 29.610" N	84° 53' 53.934" E
A5	Village Kaliakata	3.34	20° 54' 11.191" N	84° 59' 6.014" E
A6	Golabandha	8.45	20° 51' 27.956" N	85° 0' 1.713" E
A7	Village Kumunda	1.40	20° 58' 53.749" N	85° 1' 31.201" E
A8	Malibrabmani	1.02	20° 55' 31.211" N	84° 59' 40.727" E



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*Laboratory analysis of the test samples collected during the period as stated above in all the location for Benzene were found to be within the prescribed NAAQS Limit. (Lab Report is attached as **Annexure-1**)*

The different techniques Adopted/Protocols for Ambient Air Quality Monitoring are as follows.

S. No	Parameters	Techniques	TechnicalProtocol
1	SulphurDioxide(SO_2)	West&Gaeke	IS:5182(P2)
2	Nitrogen Dioxide(NO_2)	Jacob& Hochheiser	IS:5182(P6)
3	ParticulateMatterPM10	Gravimetric	IS:5182(P23)
4	ParticulateMatterPM2.5	Gravimetric	IS:5182 (P24)
5	Carbon-monoxide as CO	NDIR	IS:5182(P-10)
6	Ammonia	Spectrophotometric Method	IS 5182 (P-25): 2018
7	Arsenic	ICPMS/AAS Method	VEL/ENV/STP/110, Issue No. 01 dated on 01/11/2021
8	Benzene	GC-FID Method	IS: 5182 (P-11): 2006 RA: 2017
9	Benzo(a)pyrene	GC-FID Method	IS: 5182 (P-12): 2004, RA: 2019
10	Lead	ICPMS/AAS Method	IS: 5182 (P-22):2004 RA: 2019
11	Nickel	ICPMS/AAS Method	IS: 5182 (P-26), 2020
12	Ozone	Spectrophotometric Method	IS 5182 (P-9):1974 RA: 2019
13	Mercury as Hg	ICPMS/AAS Method	VEL/ENV/STP/129, Issue No. 01 dated on 01/11/2021

*As mentioned above, the testing of Benzene was done as per IS: 5182 (P-11): 2006 RA: 2017 Standards using the GC-FID Method. (Indian Standard Methods for Measurement of Air Pollution is attached for reference as **Annexure- 2**)*

The test results show that the level of Benzene in all the locations was BLQ (Below Limit of Quantification, Limit of Quantification (LOQ) is 0.5 µg/m³) and was as per NAAQS prescribed limits for Benzene i.e. 5.0µg/m³ (https://cpcb.nic.in/upload/NAAQS_2019.pdf) both within the core and buffer zone of Subhadra OCP of MCL.

Besides, the study results at 02 below mentioned locations (which are nearer to Subhadra OCP of MCL) of Central Control Room for Air Quality Management - All India, Govt of India (https://airquality.cpcb.gov.in) during the period from October to December 2022, for

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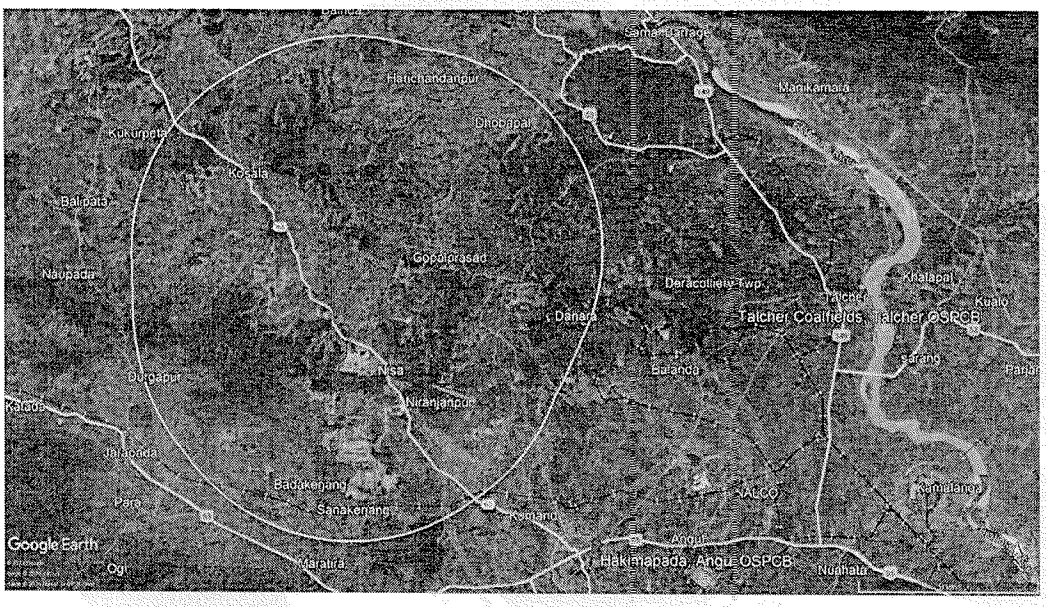
*Benzene vide CAAQMS (CPCB) were found within the NAAQS Standards. (Reports Attached for Reference as **Annexure-3 & 4**).*

Locations of CAAQMS (CPCB) monitoring stations:

1) *Hakimapada Angul (Distance of 15 Km from Project Site and 5 Km from Buffer Zone)*
2) *Talcher Coalfields,Talcher (Distance of 17 Km from Project Site and 7Km from Buffer Zone)*

Location Positions



This is to confirm that the baseline data generation and its testing was done as per the approved Protocols for Ambient Air Quality Monitoring.

Hence, *the Benzene concentration in all these villages found to be as per the study and as per CPCB reports (reference CPCB station-Hakim pada Station nearer to Golabandha Village which is approx. 11 km) found to be within prescribed limits during the period October-December 2022.*

The Committee noted that EIA/EMP report is prepared by the NABET Accredited consultant and PP also submitted an undertaking in the form-1 that "data *and information given in the application and enclosures are true to be best of my knowledge and belief and I am aware that if any part of the data and information is found to be false or misleading at any stage, the project will be rejected and clearance given if any to the project will be revoked at our risk and cost."*Therefore, in the absence of any proof by the complainant the Ministry may take further necessary action as per recommendation already given by the EAC.

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File No.: IA-J-11015/72/2021-IA-II(M)
Government of India
Ministry of Environment, Forest and Climate Change
IA Division
***

Dated **06/03/2024**

To,

Shital Kumar Sahoo
Mahanadi Coalfields Limited
ANAND VIHAR, BURLA , BURLA SAMBALPUR, SAMBALPUR, ODISHA, , 768020
mcl4cil@gmail.com

Subject: **Subhadra Open Cast Mine with production capacity of 25 MTPA in mine lease area of 1111.85 ha of M/s Mahanadi Coalfield Limited located at Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil Talcher Sadar and Chhendipada, District Angul (Odisha) – Environmental Clearance – reg.**

Sir/Madam,

This is in reference to your application submitted to MoEF&CC vide proposal number IA/OR/CMIN/445297/2023 dated 12/10/2023 for grant of prior Environmental Clearance (EC) to the project under the provision of the EIA Notification 2006-and as amended thereof.

2. The particulars of the proposal are as below :

(i) EC Identification No.	EC23A0101OR5745830N
(ii) File No.	IA-J-11015/72/2021-IA-II(M)
(iii) Clearance Type	Fresh EC
(iv) Category	A
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals
(vi) Sector	Coal Mining
(vii) Name of Project	Subhadra Open Cast Project
(ix) Location of Project (District, State)	ANUGUL, ODISHA
(x) Issuing Authority	MoEF&CC
(xii) Applicability of General Conditions	No

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3. The proposal is for Environmental Clearance for Subhadra Open Cast Mine with production capacity of 25 MTPA in mine lease area of 1111.85 ha of M/s Mahanadi Coalfield Limited located at Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil Talcher Sadar and Chhendipada, District Angul (Odisha).

4. Terms of Reference (ToR) was granted vide letter no. J-11015/70/2021-IA. II(M) dated 22.11.2021 and Amendment in

ToR vide letter dated **28.02.2022**. Public Hearing was conducted on 25.08.2023 under the Chairmanship of Shree Pratap Pritimaya, O.A.S. (S) ADM, Angul. Proposal for EC with EIA/EMP report was submitted on PARIVESH portal.

5. Project Proponent alongwith QCI NABET consultant (Vardan Environet) made the detailed presentation in the 3rd & 6th EAC meeting held during 16-17 November, 2023 & 17th Jan 2024, respectively and interalia provided the following information to the EAC:

(i) The Subhadra Open Cast Coal Mine of MCL is located in Kankarei, Pirakhaman, Balichandrapur, Raijharan, Kaunsidhipa, Golagadia, Chhotabereni, Kumunda, Bhalugadia, Baghuabol villages and Jaipur RF Tehsil Talcher and Chhendipada, District Angul (Odisha).

(ii) The project area is covered under Survey of India Topo sheet No. F45S13 & F45T1 (RF 1:50000) and is bounded by the geographical coordinates ranging from 20°55'56.225" N and 20°58'47.344" N and longitudes84°58'42.383" E and 85°0'50.476" E. The DGPS coordinates of the ML area are given in Table 2.1 of EIA Report.

(iii) Project does not fall in the Critically Polluted Area (CPA), where the MoEF&CC's vide its OM dated 13thJanuary, 2010 has imposed moratorium on grant of Environment Clearance.

(iv) There are no National Parks, eco-sensitive Zones, within 10 km radius.

(v) The Utkal A (Subhadra) Coal Mine has been allotted by Ministry of Coal vide order no NA-103/1/2021-NA dated 18.11.2021.

(vi) 125.24ha (Reserve Forest Land: 0.75 ha, Govt. Revenue Forest area: 124.49 ha) of forest land have been reported to be involved in the project. Applications for Forest Clearance was submitted vide Proposal No. FP/OR/MIN/150133/2021 dt. 25.01.2022. Stage I FC has been recommended in the FAC meeting held on 20.10.2023. Stage I FC has been granted vide letter no -8-06/2023-FC dated 05.12.2023.

(vii) There is no national park or wildlife sanctuary within the study area. However, due to presence of Schedule-I Fauna application submitted to DFO, Angul for approval of site specific wild life management plan.

(viii) Mining plan (including Progressive Mine closure plan) has been approved by the MCL Board vide letter no. MCL/SBP/CS/BD-257/Exct/2023/13262 dt- 13.05.2023.

(ix) Method of mining will be Open Cast Mechanized Mining. With due consideration to geo-mining characteristics of the deposit, the mine is proposed to be worked by shovel-dumper combination for OB excavation and Surface Miner for coal winning and loading by Front End Loader.

(x) LAND USE DETAILS OF MINE: Pre Mining land use details

S. No	Type of Land	Within ML Area (Area in Ha.)	Outside ML Area (Area in Ha)	Total (Area in Ha)
1	Agricultural	800.50	Nil	800.50
2	Forest	125.24	Nil	125.24
3	Wasteland	NA	NA	NA
4	Grazing land	58.67	Nil	58.67
5	Water bodies	6.28	Nil	6.28
6	Settlements	NA	NA	NA
7	Others (Specify)			
8	Old Excavation Area (East Quarry)	NA	NA	NA
9	Old Excavation Area (West Quarry)	NA	NA	NA

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10	Old OB Dumps	NA	NA	NA
11	Roads	0.25	Nil	0.25
12	R & R Colony	NA	NA	NA
13	Staff Colony	NA	NA	NA
14	Green Belt	NA	NA	NA
15	Balance Area	NA	NA	NA
16	Barren land**	92.64	Nil	92.64
17	Township**	Nil	Nil	Nil
18	Community/others use area**	28.27	Nil	28.27
19	Total Project Area	1111.85	Nil	1111.85

**** (As per the above table the total land use area is 1111.85 Ha. The other land use types are Barren land of 92.64, Community/others use area of 28.27 Ha.)**

Post Mining

S. No.	Land Use	Land Use (End of Life)	Land Use (ha)				
			Plantation	Water Body	Public use	Undisturbed	Total
1	External OB Dump	24.17	0	0	0	0	24.17
2	Top Soil Dump	8.97	0	0	0	0	8.97
3	Excavation	881.28	0	0	0	0	
4	Roads, buildings Infrastructure	Roads: 15.72	0	0	15.72	0	118.16
		Township: 27.12	1.26	0	25.86	0	
		Infra: 75.32	0	0	0	0	
5	Green Belt	6.89	0	0	0	0	6.89
6	Undisturbed Area	0	0	0	0	0	0
7	Safety Zone	11.79	11.79	0	0	0	11.79
8	Rationalization Area	25.34	25.34	0	0	0	25.34
9	Diversion / Below River / Nala /Canal	8.42	0	0	8.42	0	8.42
10	Water Harvesting	35.36	0	35.36	0	0	35.36
11	Staff Colony		0	0	0	0	
12	Backfilled Area**	715.24	182.52	0	0	0	715.24
13	Excavated Void Without Plantation**	130.68	0	0	0	0	130.68
14	Coal Stock Yard**	9.76	0	0	0	0	9.76
15	Embankment**	11.49	0	0	11.49	0	11.49
16	Explosive Magazine**	5.58	0	0	0	0	5.58
Total Area		**1111.85**	**220.91**	**35.36**	**61.49**	**0**	**1111.85**

** (As per the above table the total land use area is 1111.85 Ha. The other land use types are Backfilled Area of 715.24Ha., Excavated Void without Plantation of 130.68 Ha., Coal Stock Yard of 9.76 Ha., Embankment of 11.49 Ha., and Explosive Magazine of 5.58 Ha.)

(xi) Total Geological Reserve reported in the mine lease area is 1142.67MT with 790.95MT Mineable Reserves by opencast mining. Out of total mineable reserve of 790.95MT,768.83 MT are available for extraction. Percent of extraction is 67%.

(xii) Thickness of seams to be worked on: Opencast mining method is proposed for extraction of coal seam XI to IID. The effective thickness of the seams XI to IID is varying from 0.06m to 75.90m.
Grade of coal: Wt. Avg. G-13 (GCV – 3690 Kcal/Kg)

(xiii) Stripping Ratio: Only In-situ: 0.80 With Re-handling: 0.93

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(xiv) Average gradient: - 3.480(1 in 16.44)

(xv) Maximum thickness of seams: Seam XI to IID varies from 0.06m to 75.90 m

(xvi) The project has 1 external OB dumps (temporary) in an area of 24.17 ha with 88m height and103.72Mm3 of OB.1 internal OB dump in an area of 715.24ha with 613.18 Mm3 (Insitu) 103.72 Mm3 (Re handling) of material is envisaged in the project.

(xvii) Total quarry area is 881.28 ha out of which backfilling will be done in 715.24 ha up to 30m while final mine void will be created in an area of 130.68 ha with a depth of 160 m RL and 35.36 ha water body. Backfilled quarry area 182.52 ha shall be reclaimed with plantation, 495.27 ha agriculture land and 37.45 ha will be returned as forest land.

(xviii) Transportation of coal:
In pit: Initially through Dumper and in Pit Conveyor after few years.
Surface to siding: From surface hopper (20 No.) by belt conveyor (18 Nos.)
Siding to loading: Through two Rapid Loading System (RLS) (02 Nos)
Capacity 5000tonne each
Quantity being transported by Road/Rail/Conveyor: As per approved mining plan
Transportation will be carried out as per Approved Mining Plan.

(xix) Reclamation has been planned in an area of 965.45ha, comprising of 538.17 ha Agricultural use, 220.91 ha Plantation, 35.36 ha Water Body& 125.24 ha Forest Land return Area, Nala diversion, Township &Embankment. &130.68 ha of final void area will be left unplanted.

(xx) Life of mine is 36 Years (including 2 Year of construction)

(xxi) Coal linkage - The mine has been allotted to MCL by the Ministry of Coal vide order no NA-103/1/2021-NA dated 18.11.2021. There shall be no restriction to carry on mining operations for own consumption, sale or for any other purpose.

(xxii) The Primary baseline data for specific micro–meteorology data, ambient air quality, waste quality, noise level, soil and flora & fauna has been collected during Post Monsoon season i.e. October to December, 2022.

(xxiii) Public hearing for the project of 25 MTPA capacity in an area of 1111.85ha was conducted on 25.08.2023 at Ground near Pirakhaman Primary school under Kankarei gram Panchayat of Chhendipada Tehsil of Angul District under the Chairmanship of Shree Pratap Pritimaya, O.A.S. (S) ADM, Angul. Major issues raised in the Public Hearing & appropriate action to address the issues raised in the Public Hearing have already been taken/ proposed to be taken are given in the action plan prepared and mentioned in Chapter -7 in Final EIA/EMP report.

(xixv) No court cases, violation cases are pending against the project of the PP.

(xxv) The project does not involve violation of the EIA Notification, 2006 and amendment issued thereunder since it is a Greenfield project.

(xxvi) Out of the total area of 1111.85 hectares of land to be acquired for the project 696.95 hectares are private land and the remaining areas are Government and Forest lands. While the acquisition of private land has a direct bearing on the personal social and economic status of the land owners. About 1853 families have been identified for displacement due to Subhadra OCP. The R & R benefits will be provided as per norms under R& R policy-2006 of Government of Odisha.

(xxvii) Benefit of the Project: Employment Generation-Proposed coal mine shall provide an opportunity of direct employment to 2108 persons and total indirect employment of approx. 5000 persons. The project is reported to be beneficial in terms of energy security for the development of country. Total cost of the project is Rs. 3955.65 Crore. Cost of production is Rs 678 per tonne., Fund for the CSR will be allocated based on 2% of the average net profit of the Company for the three immediately preceding financial years or Rs. 2.0 per tonne of coal production of previous year

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whichever is higher. Different peripheral development and community development works will be taken up. R&R cost Rs 405.46Crore. Environment Management Cost was: Capital Rs 2295 Lakh; & Recurring Rs. 201Lakh.

6. Proposal was earlier considered by the EAC in its 3rd meeting held during 16.11.2023-17.11.2023. EAC after detailed deliberation deferred the project and sought additional information. Project Proponent submitted the information as sought by the EAC on the PARIVESH portal, accordingly proposal was considered by the EAC in its 6th meeting held during 17-18 January 2024. During the meeting the Committee deliberated on various issues related to project including issues raised during PH, EMP, Grazing land, plantation, transportation of mineral, water requirement, diversion of nallha. Mining lease area etc. EAC after detailed deliberation **recommended** the Environmental Clearance for Subhadra Open Cast Mine with production capacity of 25 MTPA in mine lease area of 1111.85 ha of M/s Mahanadi Coalfield Limited located at Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil Tachler Sadar and Chhendipada, District Angul (Odisha) with the specific conditions and standard EC conditions (Annexure 1) under the provisions of EIA Notification, 2006 and its amendments. Detailed deliberation, observation and recommendation of the EAC are available on the PARIVESH website.

7. Based on the representation received the proposal was again considered in 7th EAC meeting held during 12-14 February, 2024 wherein the Committee recommended that , *the Ministry may take further necessary action as per recommendation already given by the EAC.*

8. The MoEF&CC has examined the proposal in accordance with the provisions contained in the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and based on the recommendations of the EAC hereby **accords** *Environmental Clearance to* **M/s Mahanadi Coalfield Limited** *for* **Subhadra Open Cast Mine with production capacity of 25 MTPA in mine lease area of 1111.85 ha located at Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil Talcher Sadar and Chhendipada, District Angul (Odisha)** with the specific conditions and standard EC conditions (Refer: Annexure-I) under the provisions of EIA Notification, 2006 and its amendments.

9. The proponent shall obtain all necessary clearances/approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection. The Ministry or any other competent authority may stipulate any further condition for environmental protection.

10. The Environmental Clearance to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.

11. The PP is under obligation to implement commitments made in the Environment Management Plan, which forms part of this EC.

12. Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

13. The coal company/project proponent shall be liable to pay the compensation against the illegal mining, if any, and as raised by the respective State Governments at any point of time, in terms of the orders dated 2nd August, 2017 of Hon'ble Supreme Court in WP (Civil) No.114/2014 in the matter of 'Common Cause Vs Union of India & others.

14. The concerned State Government shall ensure no mining operations to commence till the entire compensation for illegal mining, if any, is paid by the project proponent through their respective Department of Mining & Geology, in strict compliance of the judgment of Hon'ble Supreme Court. This environmental clearance shall not be operational till such time the project proponent complies with the above said judgment of Hon'ble Supreme Court, as applicable, and other statutory requirements.

15. General Instructions:

(i) The project proponent shall prominently advertise it at least in two local newspapers of the District or State, of which

one shall be in the vernacular language within seven days indicating that the project has been accorded environment clearance and the details of MoEF&CC website where it is displayed.

(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 must display the same for 30 days from the date of receipt.

(iii) The project proponent shall have a well laid down environmental policy duly approved by the Board of Directors (in case of Company) or competent authority, duly prescribing standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest / wildlife norms / conditions.

(iv) Action plan for implementing EMP and environmental conditions along with responsibility matrix of the project proponent (during construction phase) and authorized entity mandated with compliance of conditions (during operational phase) shall be prepared. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Six monthly progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six-Monthly Compliance Report.

(v) 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.

(vi) The Regional Office of this MoEF&CC shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.

16. This issue with an approval of the Competent Authority.

Copy To

1. The Secretary, Ministry of Coal, Shastri Bhawan, New Delhi.
2. The Additional Principal Chief Conservator of Forests, Regional office (EZ), Ministry of Environment & Forests, A-31, Chandershekharpur, Bhubaneswar- 751023 (Odisha).
3. The Secretary, Department of Environment & Forests, Government of Orissa, Secretariat, Bhubaneswar (Odisha).
4. The Member Secretary, Central Pollution Control Board, CBD-cum-Office Complex, East Arjun Nagar, Delhi - 32
5. The Chairman, Orissa State Pollution Control Board, Parivesh Bhawan, A/118, Nilkanthanagar, Unit VIII, Bhubaneshwar - 751012 (Odisha).
6. District Collector, Angul, Government of Odisha
7. PARIVESH portal

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Annexure 1

Specific EC Conditions for (Mining Of Minerals)

1. Specific Conditions:

S. No	EC Conditions
1.1	*Any activity of the forest land shall only be carried out after obtaining necessary forest clearance.*
1.2	*PP to obtain the CTO for 25 MTPA (peak) capacity after grant of EC.*
1.3	*PP shall deploy electric vehicles to the extent of 50% of transportation fleet for evacuation of coal through road up to Balaram Siding (Approx. 11 KM) till commencement of rail evacuation system with CHP of Subhadra OCP which is likely to commence from the fourth year of mining operations. PP shall monitor the EV usage through installation of adequate number of CCTV cameras. Till such time transportation from a dedicated road and village road shall not be used for the same.*
1.4	*PP shall adopt 6 ponds outside the lease area in different village and carry out the various activities for their protection and maintenance as proposed in the plan submitted for the same to Ministry The budget earmarked for water conservation plan for these ponds is Rs. 1.00 crores shall be kept in a spate account and audited annually. PP while submitting the compliance report to Regional Office and on Parivesh Portal as the case may be also submit evidence of implementation of the plan including geo tagged photographs.*
1.5	*PP shall develop greenbelt on approximately 38% of the lease area, i.e. on 426.15 ha of land as proposed in the plantation plan submitted to the Ministry and maintain a survival rate of at least 70% (after 10 years of the plantation) by carrying out gap plantation in case of mortality. The budget earmarked for the plantation shall be kept in a separate account. PP should annually submit the audited statement of expenditure along with proof of activities viz. photographs (before & after with geolocation date & time), details of expert agency engaged, details of species planted, number of species planted, survival rate, density of plantation etc. to the Regional Office of MoEF&CC and on PARIVESH Portal as the case may be for the activities carried out during previous year. Third party monitoring of the plantation shall be done preferably by an institution of MoEFCC (eg ICFRE).*
1.6	*PP shall maintain atleast10 mtrs width tree plantation of broad leaved species and wind break/greenshield of about 10 mts height along the boundary of coal storage yard.*
1.7	*PP shall implement the activities-wise proposed to address the issues raised during Public Hearing. The budget earmarked for the same is Rs 1235 lakhs and the same shall be kept in a separate account and audited annually. The details of activities undertaken, amount spent along with documentary proof shall be a part of report to be submitted to IRO, MoEF&CC. The maintenance of all activities shall be covered through recurring cost of Public Hearing, and continued as a part of CSR budget.*
1.8	*PP shall ensure that all type of plastic waste generated from the mines shall be stored separately in isolated area and disposed of strictly adhering to the Plastic Waste Management Rules 2016. In pursuant to Ministry's OM dated 18/07/2022 PP shall also create awareness among the people working in the project area as well as in its surrounding area on the ban on Single Use Plastic(SUP) in order to ensure compliance of Ministry's Notification published by the Ministry on 12/08/2021. A report along with photograph on the measures taken shall also be included in the six monthly compliance report being submitted by PP.*
1.9	*All the mitigation measures committed / envisaged in the EIA/EMP report and subsequent submission (ANNEXURE 2) shall be implemented which also includes i). Fog cannon*

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S. No	EC Conditions
	installation: to mitigate dust emissions, ii) Increased greenbelt development budget: aligned with the expanded plan and iii) 02 Continuous Ambient Air Quality Monitoring Stations (CAAQMS): for real-time air quality monitoring. The budget as per revised EMP is Rs 2995 Lakh (Capital) and Rs 201 Lakh (Recurring) shall be kept in a separate account. PP should annually submit the audited statement along with proof of activities carried to the Regional Office of MoEF&CC and PARIVESH Portal as the case may be for the activities carried out during previous year.
1.10	*PP to install 2 continuous ambient air quality monitoring stations at suitable locations preferably on village side with consultation of SPCB. The real time data so generated shall be uploaded on company website and linked with website of CPCB &SPCB. In addition, data should also be displayed digitally at entry and exit gate of mine lease area for public display.*
1.11	*PP shall implement Effluent Treatment Plant for wastewater generated from workshop and Sewage Treatment Plant for its colony. No untreated water shall be discharged from mine boundaries to ponds/nallah/river.*
1.12	*PP to install solar lights along the road used for transportation of minerals also take up installation of solar lights in rural areas with its maintenance within the study area of 10 km radius buffer zone within one year.*
1.13	*Proponent shall appoint an Occupational Health Specialist for Regular and Periodical medical examination of the workers engaged in the Project and maintain records accordingly; also, Occupational health check-ups for workers having some ailments like BP, diabetes, habitual smoking, etc. shall be undertaken once in six months and necessary remedial/preventive measures taken accordingly. The Recommendations of National Institute for ensuring good occupational environment for mine workers shall be implemented. The prevention measure for burns, malaria and provision of anti-snake venom including all other paramedical safeguards may be ensured before initiating the mining activities.*
1.14	*PP shall conduct feasibility studies for assessment of voids for backfilling of ash and mixing of ash with overburden, taking up backfilling ash and OB mixing activities during operations as well as post closure of mines in line with the Fly Ash Utilization Notification, 2021.*
1.15	*Hon'ble Supreme Court in an Writ Petition(s) Civil No. 114/2014, Common Cause vs Union of India &Ors vide its judgement dated 8th January, 2020 has directed the Union of India to impose a condition in the mining lease and a similar condition in the environmental clearance and the mining plan to the effect that the mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. Compliance of this condition after the mining activity is over at the cost of the mining lease holders/Project Proponent". The implementation report of the above said condition along with geo tagged photographs shall be sent to the Regional Office of the MoEF&CC.*
1.16	*PP shall strengthen the existing Environment Management division of the unit under intimation to the IRO*

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Standard EC Conditions for (Mining of minerals)

1. Statutory Compliance

S. No	EC Conditions
1.1	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.
1.2	The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.
1.3	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. TThe 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).
1.4	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 prior to start/commencement of mining operations/production
1.5	The project proponent shall obtain the necessary permission from the Central Ground Water Authority
1.6	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.
1.7	Permission of power supply to be taken from the concerned authority for meeting power demand of the project site.
1.8	The maximum production or peak production at any given time shall not exceed the limit as prescribed in the EC.
1.9	Validity of Environment Clearance is as per life of the mine mentioned in EC letter or 30 years as per EIA Notification, 2006 and its amendments therein
1.10	All the conditions stipulated in previous Environment Clearance conditions should be strictly complied within certain timeline

2. Air Quality Monitoring And Mitigation Measure

S. No	EC Conditions
2.1	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 PM10, PM2.5, SO2 and NOx. 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. The new CAAQMS should be installed with expansion.

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S. No	EC Conditions
2.2	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 25th 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.
2.3	Transportation of coal, to the extent, if permitted by road, shall be carried out by covered trucks/conveyors. Effective control measures such as regular water/mist sprinkling/rain gun/ Fog cannon etc shall be carried out in critical areas prone to air pollution (with higher values of PM10/PM2.5) 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.
2.4	The transportation of coal shall be carried out as per the provisions and route envisaged in the approved Mining Plan or environment monitoring plan. Transportation of the coal 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.
2.5	PP to install solar lights along the road used for transportation of coal to avoid the accidents at night and also seek its maintenance.
2.6	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.
2.7	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 gantry should be made to avoid air borne dust. Drills shall be wet operated or fitted with dust extractors.
2.8	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.
2.9	Adequate measures on EMP should be analyzed on annual basis to assess the trend of air pollution data from continuous monitoring station and quarterly report shall be generated and submitted with 6 monthly compliance reports to RO, MoEF&CC.
2.10	Effective safeguard measures for prevention of dust generation and subsequent suppression like regular water sprinkling shall be carried out in areas prone to air pollution. The Fugitive dust emission from all sources shall be regularly controlled by installation of required equipment's. It should be ensured that air pollution level confirm to the standards prescribed by the MOEFCC/CPCB
2.11	Adequate number of Fog canon (mist sprayer) shall be installed to reduce the impact of air pollution at dust generating sources with time bound action plan.
2.12	PP should Install Wind breaker/shield arrangement along the railway siding for reducing the dust propagation in upwind direction.

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S. No	EC Conditions
2.13	Post environmental closure third party monitoring by reputed instituted in air quality, water, land & soil etc shall be carried out and analysed with EMP measures at regular interval. A suitable recommendation in this regard, shall be furnished to IRO, MoEF&CC for compliance. The data used for analysis shall be obtained from continuos AQMS, site specific water regime. Also third party shall analyses the implementation of river diversion, meeting to the requirement of project report.
2.14	Comparison of average monthly temperature of pre and post mine operation after obtaining EC shall be elaborated for post three years and a record to be maintain at regular interval.

3. Water Quality Monitoring And Mitigation Measures

S. No	EC Conditions
3.1	The effluent discharge (mine waste water, workshop effluent) shall be monitored in terms of the parameters notified under the Water Act, 1974 Coal Industry Standards vide GSR 742 (E) dated 25th September, 2000 and as amended from time to time by the Central Pollution Control Board.
3.2	The monitoring data shall be uploaded on the company's website and displayed at the project site at a suitable location. The circular No.J-20012/1/2006-IA.11 (M) dated 27th May, 2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regard for its compliance.
3.3	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 a year, and the data thus collected shall be sent regularly to MOEFCC/RO.
3.4	Monitoring of water quality upstream and downstream of river including pons, lakes, tanks 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.
3.5	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.
3.6	Catch and/or garland drains and siltation ponds in adequate numbers and appropriate size shall be constructed around the mine working, coal heaps & 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 de-silted particularly before onset of monsoon and maintained properly. 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 and other industrial use. 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.
3.7	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

S. No	EC Conditions
	to the specific requirement (standards).
3.8	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.
3.9	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. The drains shall be regularly desilted particularly after monsoon and maintained properly.
3.10	The surface drainage plan including surface water conservation plan for the area of influence affected by the said mining operations, considering the presence of 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. 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 other authority as prescribed by the law.
3.11	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 rivarine/riparian ecosystem conservation and management plan should be prepared and implemented in consultation with the irrigation / water resource department in the state government.
3.12	Quality of polluted water generated from the operations which include COD and acid mine drainage and metal contamination shall be monitored along with TDS, DO, TSS. The monitored data shall be uploaded on the website of the company as well as displayed at the site in public domain.
3.13	Domestic water shall be providing to the residents/villages which are coming under the zone of influence of the project due to ground water extraction and mining operation by installing adequate number of RO plants with proper supply line and Taps within 2 years
3.14	No obselete technologies for sewage treatment shall be implemented. Construction of Sewage Treatment Plant with latest technology should be completed within 2 years and treated water shall be reused for plantation. CTE and CTO of STP shall be obtained as per the norms.

4. Noise And Vibration Monitoring And Prevention

S. No	EC Conditions
4.1	Adequate measures shall be taken for control of noise levels as per Noise Pollution Rules, 2016 in the work environment. Workers 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 and guidelines in this regard. Adequate awareness programme for users to be conducted. Progress in usage of such accessories to be monitored.
4.2	Controlled blasting techniques shall be practiced in order to mitigate ground vibrations, fly rocks, noise and air blast etc., as per the guidelines prescribed by the DGMS.

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S. No	EC Conditions
4.3	The noise level survey shall be carried out as per the prescribed guidelines to assess noise exposure of the workmen at vulnerable points in the mine premises, and report in this regard shall be submitted to the Ministry/RO on six-monthly basis.

5. Mining Plan

S. No	EC Conditions
5.1	5- Star Rating is mandatory to obtaine certification as per guidelines of Mininstry of Coal
5.2	Mining shall be carried out under strict adherence to provisions of the Mines Act 1952 and subordinate legislations made there-under as applicable.
5.3	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).
5.4	No mining shall be carried out in forest land without obtaining Forestry Clearance as per Forest (Conservation) Act, 1980.
5.5	Efforts should be made to reduce energy and fuel consumption by conservation, efficiency improvements and use of renewable energy.
5.6	PP shall adopt mining method by preferably using surface miners for the project and silo loading through in-pit conveyor should be adopted
5.7	Tranportation of coal till Railway Siding shall be developed to avoid transportation through Road

6. Land Recalmation

S. No	EC Conditions
6.1	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) from time to time shall be submitted to MOEFCC/Regional Office (RO).
6.2	The final mine void depth should preferably be as per the approved Mine Closure Plan, and in case it exceeds 40 m, adequate engineering interventions shall be provided for sustenance of aquatic 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 purposes 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 27th August, 2009 and subsequent amendments.
6.3	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 the MOEFCC/RO.

S. No	EC Conditions
6.4	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 subparagraph (8) of fly ash notification issued vide SO 2804 (E) dated 3rd November, 2009 as amended from time to time. Efforts shall be made to utilize gypsum generated from Flue Gas Desulfurization (FGD), if any, along with fly ash for external dump of overburden, backfilling of mines. Compliance report shall be submitted to Regional Office of MoEF&CC, CPCB and SPCB.
6.5	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 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.
6.6	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 areas 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.
6.7	Top soil should be stored separately at marked area and necessary vegetation shall be maintained to avoid any entrainment of dust
6.8	Progressive backfilling of mine and progressive reclamation of OB dump shall be done
6.9	Active OB Dump should not be kept barren/open and should be covered by temporary grass to avoid air born of particles
6.10	PP shall explore the possibilities of utilization of OB material for different purposes (in construction of roads/ manufacture of artificial sand, aggregates/ use for farmers etc.)
6.11	All approach roads to mine and all other roads which are in regular use should be black topped. The maintenance of road shall be done by PP in collaboration with state government
6.12	Hon'ble Supreme Court in an Writ Petition(s) Civil No. 114/2014, Common Cause vs Union of India & Ors vide its judgement dated 8th January, 2020 has directed the Union of India to impose a condition in the mining lease and a similar condition in the environmental clearance and the mining plan to the effect that the mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. Compliance of this condition after the mining activity is over at the cost of the mining lease holders/Project Proponent". The implementation report of the above said condition shall be sent to the Regional Office of the MoEF&CC

7. Green Belt

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S. No	EC Conditions
7.1	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. The Action plan in this regard, if any, shall be prepared and implemented in consultation with the State Forest and Wildlife Department.
7.2	Greenbelt consisting of 3-tier plantation of width not less than 7.5 m shall be developed all along the mine lease area as soon as possible. The green belt comprising a mix of native species (endemic species should be given priority) shall be developed all along the major approach/ coal transportation roads. And Plantation should also be carried out in nearby area with consent of forest department and gram panchayat within 10 km radius with its proper maintanance

8. Public Hearing And Human Health Issues

S. No	EC Conditions
8.1	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 this ministry & it's RO on six-monthly basis.
8.2	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 personnel 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.
8.3	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.
8.4	Implementation of the time bound 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 time bound action plan submitted with budgetary provisions during the public hearing. Land oustees shall be compensated as per the norms laid down in the R&R policy of the company/State Government/Central Government, as applicable.
8.5	The project proponent shall follow the mitigation measures provided in this Ministry's OM No.Z-11013/5712014-IA.II (M) dated 29th October, 2014, titled 'Impact of mining activities on habitations-issues related to the mining projects wherein habitations and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease area'.
8.6	PP to conduct need based assessment survey of the area to for in order to decide the activities to be carried under the CSR and to provide detail of the activity carried out with adequate budgetary provision and time bound action plan.
8.7	PP should conduct epidemiology study to (analysis of the distribution, patterns and determinants of health and disease conditions in defined populations).
8.8	Permanent Health care facilities of Hospital should be established within 5 km of project boundary

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S. No	EC Conditions
	for the local people.
8.9	PP must ensure an emergency action plan during pandemic in order to provide assistance to the nearby villages located within the 10 km radius buffer zone (If required)
8.10	PP is asked to also identify the rural areas for installation of solar light with its maintenance within the study area of 10 km radius buffer zone within one year
8.11	PP to take measure for installation of Renewable Energy sources in nearby area falling within 10 km radius
8.12	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
8.13	Adequate facility of drinking water, plantation and other social amenities should be provided to established R&R villages.
8.14	Persons of nearby villages shall be given training on livelihood and skill development to make them employable with its proper records.
8.15	Compensation of the land acquired for the project shall be settled as per the R&R Policy within fixed timeline

9. Corporate Environment Responsibility

S. No	EC Conditions
9.1	The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental/forest/wildlife norms/conditions. The company shall have defined system of reporting infringements/deviation/violation of the environmental/forest/wildlife norms/conditions and/or shareholders/stake holders.
9.2	A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.
9.3	Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to 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.
9.4	Self environmental audit shall be conducted annually. Every three years third party environmental

S. No	EC Conditions
	audit shall be carried out.
9.5	PP should establish in house (at project site) environment laboratory for measurement of environment parameter with respect to air quality and water (surface and ground. A dedicated team to oversee environment management shall be setup which should comprise of Environment Engineers, Laboratory chemist and staff for monitoring of air, water quality parameters on routine basis. Any non- compliance or infringement should be reported to the concerned authority

10. Miscellaneous

S. No	EC Conditions
10.1	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 proponent's website permanently.
10.2	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.
10.3	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.
10.4	The project proponent shall monitor the criteria pollutants level namely; PM10, SO2, NOx (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.
10.5	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 environment clearance portal.
10.6	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.
10.7	The project authorities shall inform to the Regional Office of the MOEFCC regarding commencement of mining operations.
10.8	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.
10.9	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.
10.10	No further expansion or modifications in the plant shall be carried out without prior approval of the

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S. No	EC Conditions
	Ministry of Environment, Forests and Climate Change.
10.11	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.
10.12	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.
10.13	The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.
10.14	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.
10.15	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 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.

Additional EC Conditions

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Annexure 2

Budgetary Provision for Public Hearing issues and EMP

Public Hearing Budget

Proposed Activities under Public Hearing Commitment Scheme		Place of Implementation	Phasing of Allocated proposed PH commitment Budget (Rs. Lakh)					
			Year-1	Year- 2	Year- 3	Year- 4	Year- 5	Total
Air & Water Pollution control measures	Different measures to control Air pollution/Water Pollution like utilization of water sprinklers, fixed sprinklers, fog canon etc.	Kosala village (NW), Sandhapal (NW) Natada (E), Ambapal (E)	80	80	80	80	80	**400**
Infrastructure development	Construction of Road, School, Solar Street lights supply, Cremation ground etc.	Villages - Kusumpal, Mallibandh, Ambapal,	50	50	50	50	50	**250**
Plantation	Plantation - Avenue & Community etc.	Kankarei, Pirakhamana, Raijharan, Balichandrapur	5	5	5	10	10	**35**
Healthcare	Health Care and vaccination,	**Health centres** - Angul DHH,	50	50	50	50	50	**250**

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Proposed Activities under Public Hearing Commitment Scheme		Place of Implementation	Phasing of Allocated proposed PH commitment Budget (Rs. Lakh)					
			Year-1	Year- 2	Year- 3	Year- 4	Year- 5	Total
	awareness camp, mobile medical camp, Immunization, medicine etc.	Kosala CHC, Chhendipada CHC, Mandapada PHC **Villages** - Nisha, Kosala, Raijharan, Balichandrapur, Sandhapal						
Water & Sanitation	Drinking Water Supply and Construction of wells, ponds, hand pumps and tube wells	Village - Kumunda, Ambapal, Natada,	30	30	30	30	30	**150**
Education & Livelihood Generation	Skill Development Training, Support to schools and other educational institutions	Kankarei High School, Kosala High School, Raijharan High School	30	30	30	30	30	**150**
Total			**245**	**245**	**245**	**250**	**250**	**1235**

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(B) EMP budgetary provision (Capital and Recurring)

	Activity / Item	Units			
			Unit Cost	Capital Cost	Recurring Cost
1.	**Air Pollution Control**				
a	Truck Mounted Tankers with Mist Spray Sprinkling Arrangement for Haul Roads/Mine/Safety zone etc.	2	35	70	10
b	Mobile Water Mist Spray Sprinkler / truck mounted fog cannon for coal transportation route	1	50	50	6
c	Fixed type Mist spray at Coal stock pile/crusher/Transfer Points etc.	2	15	30	5
d	Wind Barrier Wall & Vertical Greenery System at proposed Railway Siding	LS	LS	30	4
e	Fixed fog cannons at coal stockyard	4	10	40	4
f	CAAQMS	2	15	30	3
Sub Total				**250**	**32**
2.	**Water Pollution Control**				
a	Garland Drain	LS	LS	60	10
b	Effluent Treatment Plant (ETP)	1	LS	90	9
c	Sewage Treatment Plant (STP)	1	LS	40	6
d	Mine Water Sedimentation Pond & Pumps	1	20	20	5
Sub Total				**210**	**30**
3.	**Noise Control**				
a	Noise Pollution Control Measures	LS	LS	100	20
Sub Total				**100**	**20**

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4.	**Conservation of Natural Resources**				
a	Solar lighting arrangement	50	0.7	35	2
b	Pond Conservation of 06 ponds outside the lease area	LS	LS	100	5
c	Soil Preservation (Biological Reclamation)	LS	LS	25	2
Sub Total				**160**	**9**
5.	**Reclamation & Nursery Development**				
a	Green Belt Development & Avenue Plantation etc.	LS	LS	500	55
Sub Total				**500**	**55**
6.	**Fire Fighting Equipment**				
a	Fire tender	1	100	100	10
b	Advance Fire fighting equipment, Fire extinguisher, smoke detectors (for office and workshop), fire Automatic Fire Detection and alarm system etc.	10	30	300	30
Sub Total				**400**	**40**
7.	**Occupational Health**				
a	Personnel Protection Equipment (Ear muffs/plugs, Goggles, Gloves, Helmets, Dust Mask, Safety Boots)	1500	LS	50	10
Sub Total				**50**	**10**
8.	**Miscellaneous**				
a	Awareness Programme (Display Boards (Digital) etc.	-	LS	30	2
b	CCTV camera for monitoring loading and transport, mine blast, fire, dust generation monitoring,	LS	LS	10	1

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c	Equipment for Plantation O & M like water tanker, tractor with trolley, other equipment	LS	LS	50	2
Sub Total				**90**	**5**
9.	Public Hearing Budget			**1235**	**0**
Total Cost (Rs. Lakhs)				**2995**	**201**

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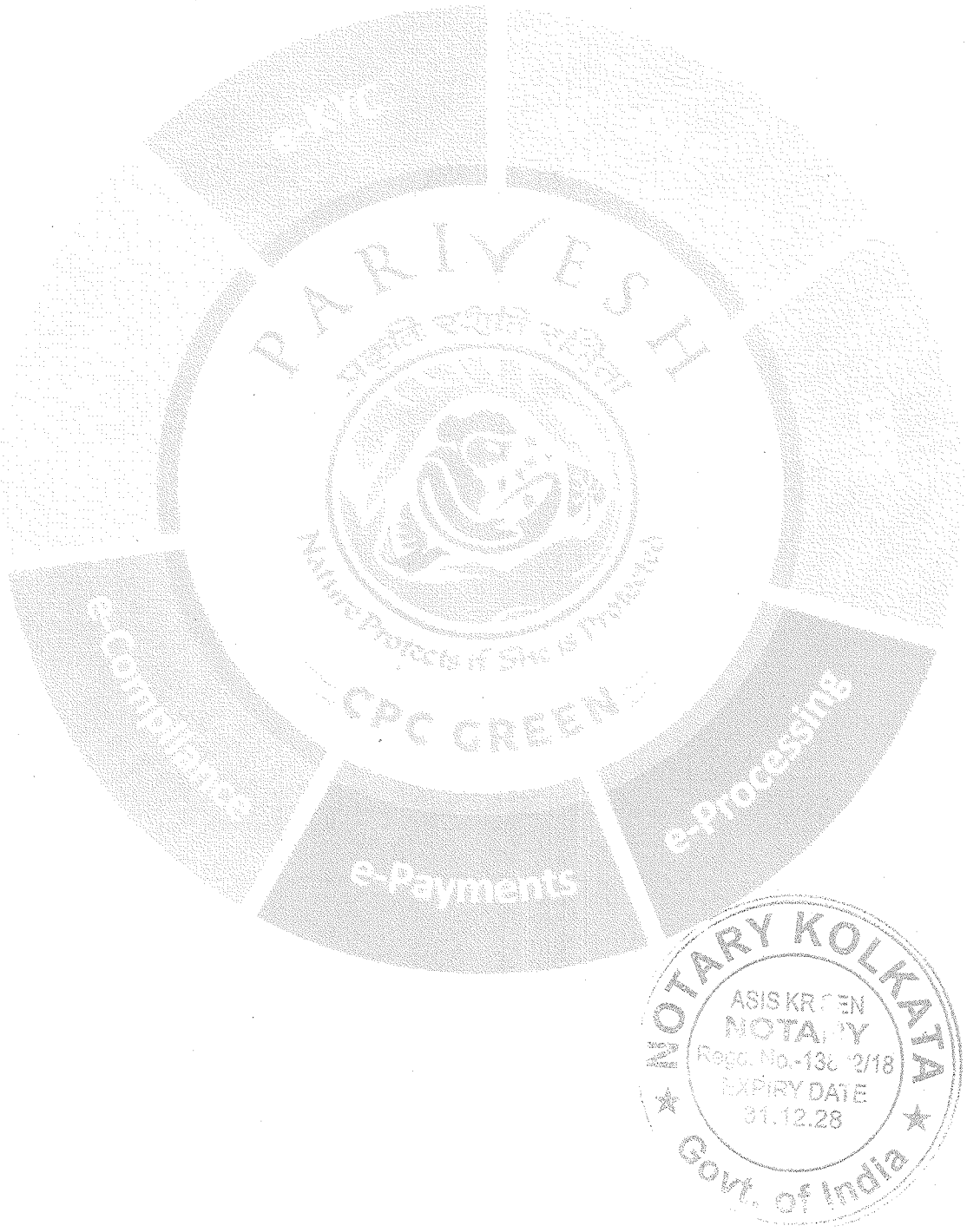
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ANNEXURE - 'O'

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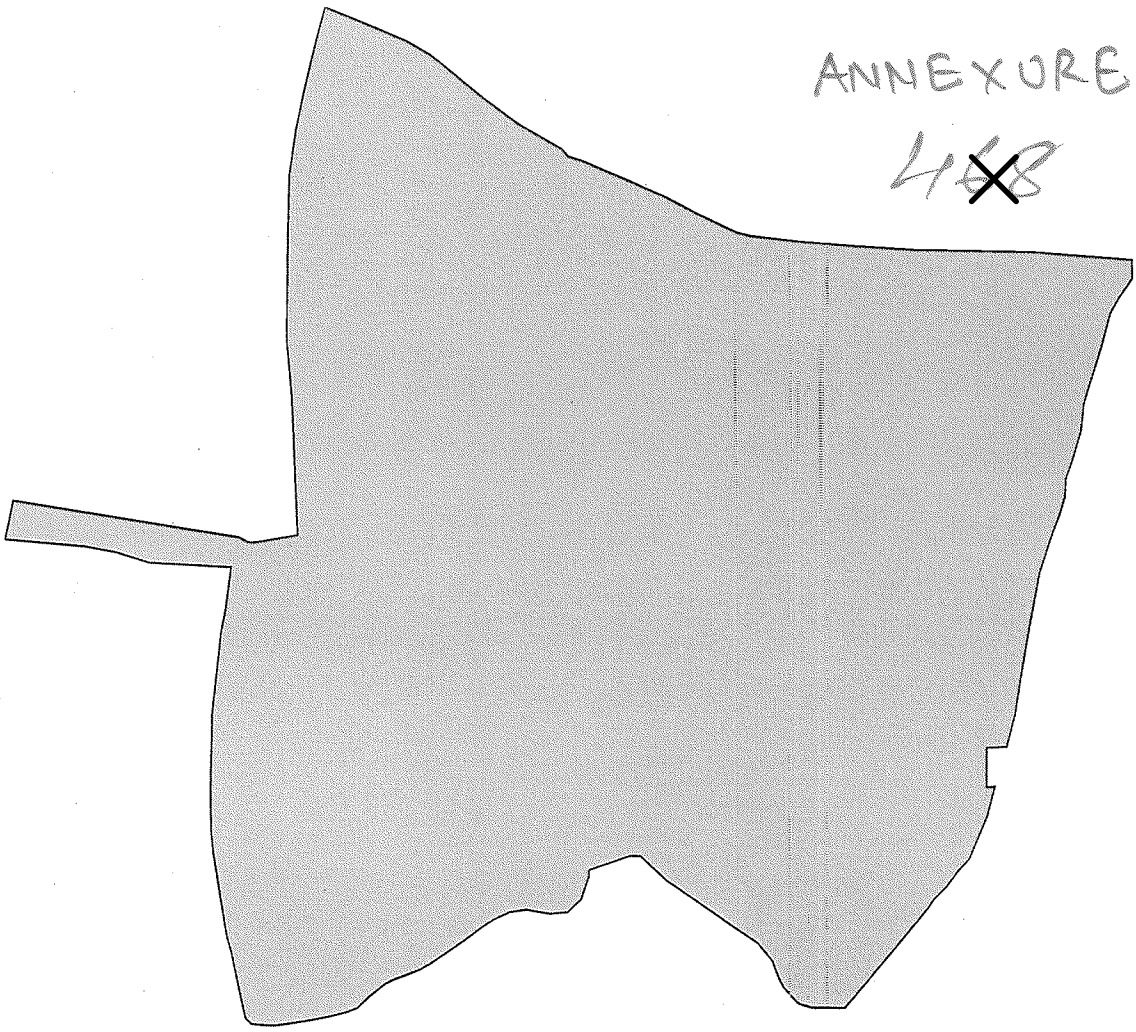

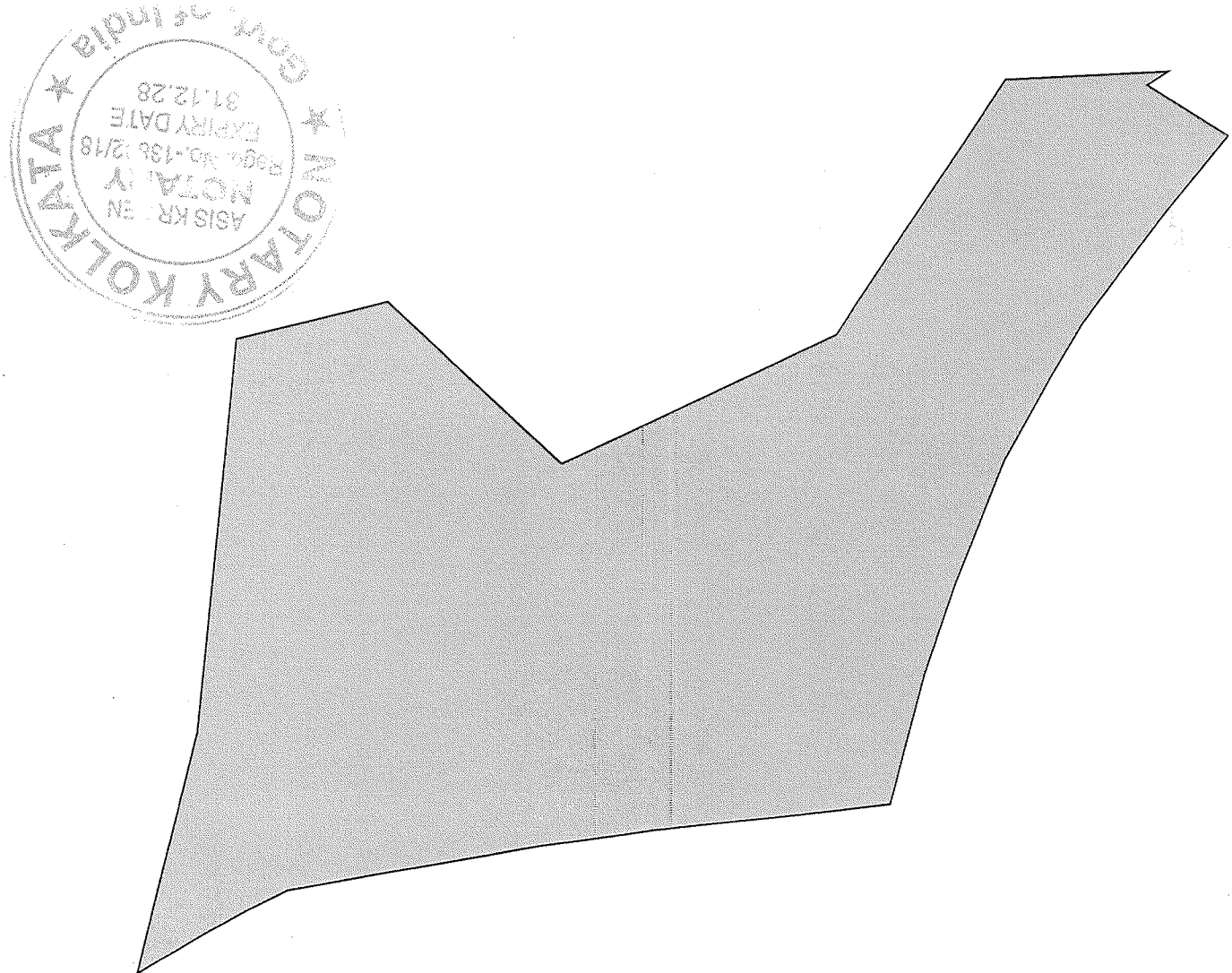

429 ANNEXURE-'P'

ANNEXURE : VI

CENTRE FOR ENVOTECH AND MANAGEMENT CONSULTANCY PVT. LTD.

An ISO 9001-2015 & OHSAS 45001:2018 Certified Company, Empanelled with OCCL, ORSAC and SPCB of Govt. of Odisha
Accredited by NABET, QCI for EIA Studies as 'A' Category Consultant Organization. Empanelled with PCCF(Wildlife) &CWLW,Odisha
Enlisted in Construction Industry Development Council (CIDC) established by the Planning Commission (Govt. of India)
MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986 & NABL Accredited Laboratory

Report no. - CEMC/MMRDL/060323/A1 **Issued Date-06.03.2023**

AIR QUALITY TEST REPORT

Name & Address of the Client : **M/s. JINDAL STEEL & POWER LTD.,ANGUL,ODISHA**
Sampling by : CEMC'S Representative
Sample Description : Air
Sampling duration : 01.12.2022 to 28.02.2023

Sl. No.	Location →	Core Zone (R&R Colony)					Near Sana Mahitala Village					Hariatala Village				
	Date of sampling↓	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	NH_3 µg/m³	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	NH_3 µg/m³	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	NH_3 µg/m³
1	1 - 02-12-2022	69.5	38.4	15.4	19.0	-	56.3	31.3	10.1	13.1	-	56.4	32.5	6.0	12.3	-
2	4 - 05-12-2022	66.8	37.0	16.3	20.5	-	63.5	35.5	10.3	11.1	-	58.0	33.0	7.3	11.1	-
3	9 - 10-12-2022	77.6	43.1	13.6	12.7	-	60.9	32.5	8.8	10.7	-	50.1	27.9	BDL	10.7	-
4	12 - 13-12-2022	71.9	43.4	14.8	18.5	-	65.8	37.1	10.8	11.9	-	59.4	31.7	6.8	10.7	-
5	16 - 17-12-2022	77.2	44.6	14.3	15.8	-	64.7	35.9	7.5	12.6	-	57.7	32.2	6.5	11.9	-
6	19 - 20-12-2022	76.9	43.5	13.3	22.5	-	65.9	38.4	7.3	9.9	-	59.4	35.4	BDL	10.7	-
7	24 - 25-12-2022	78.5	44.6	13.8	18.5	-	68.2	38.4	10.3	10.7	-	53.7	30.4	7.3	10.7	-
8	27 - 28-12-2022	67.7	39.2	13.3	21.8	-	58.7	32.0	7.3	15.0	-	48.3	28.0	BDL	9.5	-
9	1 - 02-01-2023	65.3	35.5	13.7	20.3	-	67.7	38.5	9.5	13.5	-	56.7	32.9	BDL	9.7	-
10	4 - 05-01-2023	69.8	39.6	13.5	22.4	-	65.4	37.4	7.3	14.4	-	56.5	33.3	BDL	12.3	-
11	9 - 10-01-2023	66.0	38.0	12.0	15.2	BDL	57.9	33.0	11.3	14.8	BDL	58.4	32.5	7.1	12.3	BDL
12	12 - 13-01-2023	72.7	40.9	15.9	17.8	BDL	59.2	35.2	7.1	10.2	BDL	54.7	30.8	8.1	11.4	BDL
13	16 - 17-01-2023	77.2	43.4	14.2	18.2	-	55.9	31.7	8.1	11.0	-	51.2	28.3	BDL	9.3	-
14	19 - 20-01-2023	72.6	42.8	14.7	16.5	-	67.6	38.2	7.8	13.1	-	52.4	30.1	BDL	11.9	-
15	24 - 25-01-2023	74.7	40.8	12.7	17.7	-	59.5	35.7	8.1	12.7	-	49.1	26.7	BDL	9.7	-
16	27 - 28-01-2023	78.3	46.4	13.0	16.1	-	56.8	30.5	9.8	11.8	-	48.0	28.0	BDL	11.8	-
17	1 - 02-02-2023	66.0	36.1	14.5	21.5	-	59.7	34.3	7.1	10.6	-	57.9	34.3	6.1	9.7	-
18	4 - 05-02-2023	73.4	40.4	14.0	19.5	-	63.1	38.3	10.6	12.2	-	54.0	32.5	BDL	11.0	-
19	8 - 09-02-2023	78.2	42.9	14.0	22.0	-	63.8	37.9	11.3	13.9	-	54.0	32.3	BDL	11.0	-
20	11 - 12-02-2023	75.7	45.2	16.4	18.6	-	62.5	34.6	10.6	14.8	-	60.8	36.2	BDL	11.9	-
21	15 - 16-02-2023	71.3	41.2	12.2	13.1	-	65.9	36.4	8.7	14.8	-	47.9	26.0	7.7	9.7	-
22	18 - 19-02-2023	69.9	38.7	12.7	17.8	-	67.0	35.9	11.4	13.9	-	57.7	34.2	BDL	11.0	-
23	22 - 23-02-2023	72.4	39.2	12.2	13.5	-	62.4	34.2	7.4	14.0	-	49.2	27.5	BDL	10.1	-
24	25 - 26-02-2023	65.7	37.9	13.5	16.5	-	55.7	34.2	11.4	14.0	-	48.7	28.3	6.3	11.8	-
	Minimum	**65.3**	**35.5**	**12.0**	**12.7**	-	**55.7**	**30.5**	**7.1**	**9.9**	-	**47.9**	**26.0**	**BDL**	**9.3**	-
	Maximum	**78.5**	**46.4**	**16.4**	**22.5**	-	**68.2**	**38.6**	**11.4**	**15.0**	-	**60.8**	**36.2**	**8.1**	**12.3**	-
	Average	**72.3**	**41.0**	**13.9**	**18.2**	-	**62.3**	**35.3**	**9.2**	**12.7**	-	**54.2**	**31.0**	**BDL**	**10.9**	-
	98 percentile	**78.4**	**45.8**	**16.4**	**22.5**	-	**68.0**	**38.5**	**11.4**	**14.9**	-	**60.2**	**35.8**	**7.9**	**12.3**	-

Note: BDL of NH3 <20 µg/m3 and SO2 <4 µg/m3
BDL: Below Detection Limit

Authorized Signatory   Seal of Laboratory

NOTARY KOLKATA ★ Govt. of India ★ Regd. No.-13.../18 EXPIRY DATE 31.12.28

CENTRE FOR ENVOTECH AND MANAGEMENT CONSULTANCY PVT. LTD.

An ISO 9001-2015 & OHSAS 45001:2018 Certified Company, Empanelled with OCCL, ORSAC and SPCB of Govt. of Odisha
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Enlisted in Construction Industry Development Council (CIDC) established by the Planning Commission (Govt. of India)
MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986 & NABL Accredited Laboratory

ANNEXURE : VI Contd..

Report no. - CEMC/MMRDL/060323/A2 Issued Date-06.03.2023

AIR QUALITY TEST REPORT

Name & Address of the Client : M/s. JINDAL STEEL & POWER LTD.,ANGUL,ODISHA
Sampling by : CEMC'S Representative
Sample Description : Air
Sampling duration : 01.12.2022 to 28.02.2023

Sl. No.	Location →	Raijharah Village					Malibandha Village					Near JSPL Town Gate				
	Date of sampling↓	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	NH_3 µg/m³	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	NH_3 µg/m³	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	NH_3 µg/m³
1	2 - 03-12-2022	63.8	35.0	7.3	10.3	-	70.4	40.9	10.5	10.7	-	74.8	41.8	13.3	24.1	-
2	5 - 06-12-2022	59.4	35.1	7.3	16.6	-	75.1	42.5	11.1	17.0	-	71.2	41.0	12.3	24.1	-
3	10 - 11-12-2022	60.9	33.7	10.6	11.8	-	67.0	36.9	10.6	14.2	-	80.1	47.7	14.3	20.5	-
4	13 - 14-12-2022	69.3	40.5	10.8	11.0	-	64.1	35.4	12.1	14.6	-	78.1	47.5	17.4	22.2	-
5	17 - 18-12-2022	66.4	37.9	9.6	13.4	-	70.4	39.9	10.0	17.8	-	75.0	43.3	16.9	22.9	-
6	20 - 21-12-2022	67.2	39.3	9.3	13.1	-	67.8	37.1	9.8	15.8	-	76.3	44.3	15.1	21.3	-
7	25 - 26-12-2022	65.1	36.7	11.3	12.2	-	74.1	43.8	11.1	11.5	-	80.6	47.7	16.1	17.8	-
8	28 - 29-12-2022	60.3	36.4	11.1	12.6	-	75.2	42.1	11.1	13.1	-	73.6	44.2	15.1	14.6	-
9	2 - 03-01-2023	59.7	32.5	9.3	15.2	-	68.3	39.3	10.3	18.6	-	73.2	44.2	15.7	17.3	-
10	5 - 06-01-2023	61.0	35.1	10.8	16.1	-	62.5	35.1	10.3	16.5	-	70.6	43.3	14.9	23.7	-
11	10 - 11-01-2023	68.0	37.9	8.1	14.8	BDL	71.9	39.7	9.8	11.0	BDL	77.8	47.0	18.6	20.7	BDL
12	13 - 14-01-2023	62.6	33.5	8.1	12.3	BDL	65.5	37.0	11.2	13.5	BDL	81.0	48.0	18.1	20.3	BDL
13	17 - 18-01-2023	68.2	39.2	8.3	14.8	-	63.2	34.6	9.8	12.3	-	80.7	46.2	14.5	19.9	-
14	20 - 21-01-2023	60.6	33.3	10.3	13.1	-	72.5	41.9	10.1	16.1	-	70.9	42.8	13.2	21.1	-
15	25 - 26-01-2023	65.0	35.6	10.8	16.5	-	68.1	40.3	11.5	17.3	-	76.8	43.3	14.9	19.0	-
16	28 - 29-01-2023	63.9	35.4	10.5	13.5	-	66.0	35.4	11.0	18.6	-	80.1	45.0	18.4	23.7	-
17	2 - 03-02-2023	62.8	35.6	7.4	11.0	-	71.8	41.3	11.4	15.6	-	76.7	44.3	18.3	22.0	-
18	5 - 06-02-2023	65.1	36.2	9.5	10.1	-	70.9	38.9	9.8	12.7	-	82.2	47.1	16.9	24.5	-
19	9 - 10-02-2023	66.7	40.9	9.8	14.8	-	71.5	39.2	11.6	13.5	-	78.6	44.3	14.8	15.6	-
20	12 - 13-02-2023	68.7	37.8	10.0	17.3	-	69.1	37.2	11.6	14.0	-	81.0	45.8	16.9	23.3	-
21	16 - 17-02-2023	68.7	37.5	10.6	15.6	-	65.3	36.7	11.6	12.3	-	78.1	47.1	18.5	23.7	-
22	19 - 20-02-2023	65.9	37.5	9.8	10.6	-	68.9	40.4	10.3	16.9	-	74.4	43.3	18.2	24.9	-
23	23 - 24-02-2023	58.5	34.1	10.8	12.2	-	68.0	38.0	11.4	16.5	-	79.0	45.5	16.1	22.0	-
24	26 - 27-02-2023	61.2	32.6	9.2	15.6	-	71.3	39.6	10.6	15.7	-	80.1	44.8	18.2	16.9	-
Minimum		58.5	32.5	7.3	10.1	-	62.5	34.6	9.8	10.7	-	70.6	41.0	12.3	14.6	
Maximum		69.3	40.9	11.3	17.3	-	75.2	43.8	12.1	18.6	-	82.2	48.0	18.6	24.9	
Average		64.1	36.2	9.6	13.5	-	69.1	38.9	10.8	14.8	-	77.1	45.0	16.1	21.1	
98 percentile		69.0	40.7	11.2	17.0	-	75.2	43.2	11.9	18.6	-	81.6	47.9	18.5	24.7	

Note: BDL of NH3 <20 µg/m3 and SO2 <4 µg/m3
BDL: Below Detection Limit

Authorized Signatory

Seal of Laboratory

Centre for Environmental Consultancy Pvt. Ltd. Environmental Laboratory

NOTARY KOLKATA Govt. of India ASIS KR SEN NOTARY Regd. No.-136 '2/18 EXPIRY DATE 31.12.28

CENTRE FOR ENVOTECH AND MANAGEMENT CONSULTANCY PVT. LTD.

ANNEXURE : VI Contd..

An ISO 9001-2015 & OHSAS 45001:2018 Certified Company, Empanelled with OCCL, ORSAC and SPCB of Govt. of Odisha
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MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986 & NABL Accredited Laboratory

Report no. - CEMC/MMRDL/060323/A3 **Issued Date-06.03.2023**

AIR QUALITY TEST REPORT

Name & Address of the Client : M/s. JINDAL STEEL & POWER LTD.,ANGUL,ODISHA
Sampling by : CEMC'S Representative
Sample Description : Air
Sampling duration : 01.12.2022 to 28.02.2023

Sl. No.	Location →	Barodia Village					Nisha Village				
	Date of sampling↓	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	NH_3 µg/m^3	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	NH_3 µg/m^3
1	3 - 04-12-2022	63.0	37.2	13.1	13.9	-	69.2	39.6	7.8	15.0	-
2	6 - 07-12-2022	68.8	39.7	11.8	18.2	-	73.7	42.1	9.0	17.8	-
3	11 - 12-12-2022	71.1	39.2	12.3	15.4	-	66.2	38.4	8.3	17.0	-
4	14 - 15-12-2022	63.3	37.2	12.1	13.0	-	64.9	37.1	11.8	15.4	-
5	18 - 19-12-2022	69.4	38.8	11.8	15.8	-	70.4	40.1	8.8	16.2	-
6	21 - 22-12-2022	61.1	34.2	13.3	19.0	-	68.7	41.6	11.6	12.7	-
7	26 - 27-12-2022	66.3	36.3	12.8	19.0	-	77.1	44.3	8.3	16.2	-
8	29 - 30-12-2022	66.0	36.2	11.8	18.2	-	70.3	41.2	7.0	16.2	-
9	3 - 04-01-2023	67.6	37.6	13.0	18.2	-	75.2	45.7	8.8	15.6	-
10	6 - 07-01-2023	70.7	40.6	10.8	19.1	-	67.3	38.0	7.8	15.6	-
11	11 - 12-01-2023	71.9	40.2	13.2	19.0	BDL	66.0	38.9	9.3	13.1	BDL
12	14 - 15-01-2023	64.6	37.0	12.5	12.7	BDL	64.5	34.6	7.8	12.7	BDL
13	18 - 19-01-2023	70.0	39.5	12.7	20.3	-	76.4	44.2	12.0	13.1	-
14	21 - 22-01-2023	72.5	38.7	12.0	13.1	-	70.8	38.9	7.6	13.1	-
15	26 - 27-01-2023	72.5	38.4	13.2	19.9	-	72.0	41.6	7.3	18.6	-
16	29 - 30-01-2023	61.5	36.3	11.7	19.9	-	67.2	35.9	11.8	14.4	-
17	3 - 04-02-2023	69.2	40.2	13.2	19.0	-	63.8	35.9	8.7	16.1	-
18	6 - 07-02-2023	60.6	35.9	11.6	18.6	-	68.7	38.0	7.9	18.2	-
19	10 - 11-02-2023	64.1	37.4	11.1	12.7	-	71.2	40.3	7.1	14.4	-
20	13 - 14-02-2023	63.5	35.8	12.4	18.2	-	63.4	36.4	7.1	13.1	-
21	17 - 18-02-2023	71.4	42.4	11.3	11.4	-	76.5	41.4	6.9	17.3	-
22	20 - 21-02-2023	67.8	40.5	13.2	19.0	-	74.6	43.2	7.4	17.4	-
23	24 - 25-02-2023	67.5	39.1	11.1	15.2	-	73.7	43.1	11.1	19.1	-
24	27 - 28-02-2023	70.5	39.8	13.2	14.8	-	69.7	38.7	9.3	16.5	-
Minimum		**60.6**	**34.2**	**10.8**	**11.4**	-	**63.4**	**34.6**	**6.9**	**12.7**	-
Maximum		**72.5**	**42.4**	**13.3**	**20.3**	-	**77.1**	**45.7**	**12.0**	**19.1**	-
Average		**67.3**	**38.3**	**12.3**	**16.8**	-	**70.1**	**40.0**	**8.8**	**15.6**	-
98 percentile		**72.5**	**41.6**	**13.3**	**20.1**	-	**76.8**	**45.1**	**11.9**	**18.8**	-

Note: BDL of NH3 <20 µg/m3 and SO2 <4 µg/m3
BDL: Below Detection Limit

Authorized Signatory

Seal of Laboratory

CENTRE FOR ENVOTECH AND MANAGEMENT CONSULTANCY PVT. LTD.

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ANNEXURE : VI Contd..

Report no. - CEMC/MMRDL/060323/A4 **Issued Date-06.03.2023**

AIR QUALITY TEST REPORT

Name & Address of the Client : M/s. JINDAL STEEL & POWER LTD.,ANGUL,ODISHA
Sampling by : CEMC'S Representative
Sample Description : Air
Sampling duration : 01.12.2022 to 28.02.2023

Sl. No.	Location →	Core Zone (R&R Colony)	Near Sana Mahitala Village	Hariatala Village
	Date of sampling↓	CO (mg/m^3)	CO (mg/m^3)	CO (mg/m^3)
1	01 - 02-12-2022	0.687	0.354	0.138
2	04 - 05-12-2022	0.501	0.259	0.171
3	09 - 10-12-2022	0.506	0.294	0.283
4	12 - 13-12-2022	0.575	0.398	0.171
5	16 - 17-12-2022	0.517	0.284	0.297
6	19 - 20-12-2022	0.602	0.374	0.138
7	24 - 25-12-2022	0.538	0.289	0.138
8	27 - 28-12-2022	0.522	0.229	0.283
9	01 - 02-01-2023	0.480	0.408	0.129
10	04 - 05-01-2023	0.565	0.384	0.208
11	09 - 10-01-2023	0.666	0.234	0.283
12	12 - 13-01-2023	0.512	0.423	0.255
13	16 - 17-01-2023	0.522	0.398	0.119
14	19 - 20-01-2023	0.586	0.234	0.311
15	24 - 25-01-2023	0.522	0.403	0.115
16	27 - 28-01-2023	0.464	0.393	0.316
17	01 - 02-02-2023	0.634	0.458	0.171
18	04 - 05-02-2023	0.559	0.408	0.250
19	08 - 09-02-2023	0.575	0.274	0.283
20	11 - 12-02-2023	0.528	0.299	0.255
21	15 - 16-02-2023	0.506	0.408	0.339
22	18 - 19-02-2023	0.458	0.403	0.115
23	22 - 23-02-2023	0.639	0.239	0.288
24	25 - 26-02-2023	0.591	0.408	0.344
	Minimum	**0.458**	**0.229**	**0.115**
	Maximum	**0.687**	**0.458**	**0.344**
	Average	**0.552**	**0.344**	**0.225**
	98 percentile	**0.677**	**0.442**	**0.342**

Authorized Signatory

Seal of Laboratory

CENTRE FOR ENVOTECH AND MANAGEMENT CONSULTANCY PVT. LTD.

An ISO 9001-2015 & OHSAS 45001:2018 Certified Company, Empanelled with OCCL, ORSAC and SPCB of Govt. of Odisha
Accredited by NABET, QCI for EIA Studies as 'A' Category Consultant Organization. Empanelled with PCCF(Wildlife) &CWLW,Odisha
Enlisted in Construction Industry Development Council (CIDC) established by the Planning Commission (Govt. of India)
MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986 & NABL Accredited Laboratory

Report no. - CEMC/MMRDL/060323/A5 **Issued Date-06.03.2023**

AIR QUALITY TEST REPORT

Name & Address of the Client : M/s. JINDAL STEEL & POWER LTD.,ANGUL,ODISHA
Sampling by : CEMC'S Representative
Sample Description : Air
Sampling duration : 01.12.2022 to 28.02.2023

Sl. No.	Location →	Raijharah Village	Malibandha Village	Near JSPL Town Gate
	Date of sampling↓	CO (mg/m^3)	CO (mg/m^3)	CO (mg/m^3)
1	02 - 03-12-2022	0.300	0.459	0.541
2	05 - 06-12-2022	0.417	0.441	0.536
3	10 - 11-12-2022	0.458	0.500	0.724
4	13 - 14-12-2022	0.241	0.401	0.591
5	17 - 18-12-2022	0.441	0.468	0.48
6	20 - 21-12-2022	0.388	0.432	0.663
7	25 - 26-12-2022	0.452	0.410	0.558
8	28 - 29-12-2022	0.446	0.468	0.503
9	02 - 03-01-2023	0.329	0.504	0.508
10	05 - 06-01-2023	0.429	0.450	0.519
11	10 - 11-01-2023	0.376	0.437	0.719
12	13 - 14-01-2023	0.452	0.468	0.536
13	17 - 18-01-2023	0.352	0.482	0.802
14	20 - 21-01-2023	0.435	0.405	0.525
15	25 - 26-01-2023	0.364	0.468	0.541
16	28 - 29-01-2023	0.452	0.414	0.785
17	02 - 03-02-2023	0.229	0.437	0.636
18	05 - 06-02-2023	0.358	0.428	0.558
19	09 - 10-02-2023	0.417	0.473	0.503
20	12 - 13-02-2023	0.358	0.468	0.625
21	16 - 17-02-2023	0.347	0.441	0.519
22	19 - 20-02-2023	0.370	0.446	0.458
23	23 - 24-02-2023	0.229	0.468	0.796
24	26 - 27-02-2023	0.247	0.414	0.686
Minimum		**0.229**	**0.401**	**0.458**
Maximum		**0.458**	**0.504**	**0.802**
Average		**0.370**	**0.449**	**0.596**
98 percentile		**0.455**	**0.502**	**0.799**

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Seal of Laboratory

CENTRE FOR ENVOTECH AND MANAGEMENT CONSULTANCY PVT. LTD.

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ANNEXURE : VI Contd..

Report no. - CEMC/MMRDL/060323/A6 **Issued Date-06.03.2023**

AIR QUALITY TEST REPORT

Name & Address of the Client : **M/s. JINDAL STEEL & POWER LTD.,ANGUL,ODISHA**
Sampling by : CEMC'S Representative
Sample Description : Air
Sampling duration : 01.12.2022 to 28.02.2023

Sl. No.	Location →	Barodia Village	Nisha Village
	Date of sampling↓	CO (mg/m^3)	CO (mg/m^3)
1	03 - 04-12-2022	0.493	0.394
2	06 - 07-12-2022	0.463	0.387
3	11 - 12-12-2022	0.533	0.377
4	14 - 15-12-2022	0.511	0.453
5	18 - 19-12-2022	0.529	0.449
6	21 - 22-12-2022	0.560	0.348
7	26 - 27-12-2022	0.493	0.360
8	29 - 30-12-2022	0.493	0.444
9	03 - 04-01-2023	0.516	0.370
10	06 - 07-01-2023	0.538	0.432
11	11 - 12-01-2023	0.524	0.377
12	14 - 15-01-2023	0.480	0.344
13	18 - 19-01-2023	0.511	0.372
14	21 - 22-01-2023	0.573	0.458
15	26 - 27-01-2023	0.498	0.375
16	29 - 30-01-2023	0.568	0.406
17	03 - 04-02-2023	0.511	0.456
18	06 - 07-02-2023	0.546	0.382
19	10 - 11-02-2023	0.573	0.396
20	13 - 14-02-2023	0.458	0.379
21	17 - 18-02-2023	0.542	0.372
22	20 - 21-02-2023	0.555	0.372
23	24 - 25-02-2023	0.520	0.453
24	27 - 28-02-2023	0.573	0.387
Minimum		**0.458**	**0.344**
Maximum		**0.573**	**0.458**
Average		**0.523**	**0.398**
98 percentile		**0.573**	**0.457**

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Seal of Laboratory

Centre for Envotech & Management Consultancy Pvt. Ltd. ★ Environmental Laboratory

NOTARY KOLKATA ★ GOVT. of India ★ ASIS KR SEN NOTARY Regd. No.-13[illegible]2/18 EXPIRY DATE 31.12.28

ANNEXURE : VI Contd..

CENTRE FOR ENVOTECH AND MANAGEMENT CONSULTANCY PVT. LTD.

An ISO 9001-2015 & OHSAS 45001:2018 Certified Company, Empanelled with OCCL, ORSAC and SPCB of Govt. of Odisha
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Enlisted in Construction Industry Development Council (CIDC) established by the Planning Commission (Govt. of India)
MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986 & NABL Accredited Laboratory

Report no. - CEMC/MMRDL/060323/A7 Issued Date-06.03.2023

AIR QUALITY TEST REPORT

Name & Address of the Client : M/s. JINDAL STEEL & POWER LTD.,ANGUL,ODISHA
Sampling by : CEMC'S Representative
Sample Description : Air
Sampling duration : 01.12.2022 to 28.02.2023

Location	Date of Sampling	Pb ($\mu g/m^3$)	As (ng/m^3)	Ni (ng/m^3)	BaP (ng/m^3)	C_6H_6 ($\mu g/m^3$)
Core Zone (R&R Colony	16-17/01/2023	BDL	BDL	BDL	N.D	N.D
	19-20/01/2023	BDL	BDL	BDL	N.D	N.D
Near Sana Mahitala Village	16-17/01/2023	BDL	BDL	BDL	N.D	N.D
	19-20/01/2023	BDL	BDL	BDL	N.D	N.D
Hariatala Village	16-17/01/2023	BDL	BDL	BDL	N.D	N.D
	19-20/01/2023	BDL	BDL	BDL	N.D	N.D
Raijharah Village	17-18/01/2023	BDL	BDL	BDL	N.D	N.D
	20-21/01/2023	BDL	BDL	BDL	N.D	N.D
Malibandha Village	17-18/01/2023	BDL	BDL	BDL	N.D	N.D
	20-21/01/2023	BDL	BDL	BDL	N.D	N.D
Near JSPL Town Gate	17-18/01/2023	BDL	BDL	BDL	N.D	N.D
	20-21/01/2023	BDL	BDL	BDL	N.D	N.D
Barodia Village	06-07/02/2023	BDL	BDL	BDL	N.D	N.D
	10-11/02/2023	BDL	BDL	BDL	N.D	N.D
Nisha Village	06-07/02/2023	BDL	BDL	BDL	N.D	N.D
	10-11/02/2023	BDL	BDL	BDL	N.D	N.D

Note: BDL of Pb<0.01 µg/m3; As<0.1 ng/m3; Ni<3.2 ng/m3
N.D: Not detected * BDL: Below Detection Limit

BPDas
Authorized Signatory

Seal of Laboratory

Centre for Envotech & Management Consultancy Pvt. Ltd. ★ Environmental Laboratory

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ANNEXURE - '9'
476

CENTRAL POLLUTION CONTROL BOARD

CONTINUOUS AMBIENT AIR QUALITY

ANNEXURE - 3

Date: Wednesday, Feb 14 2024

Time: 12:19:20 PM

Station: Hakimapada, Angul - OSPCB
State: Odisha
City: Angul
Parameter: Benzene
Average Period: 24 Hours
From: 01-10-2022T00:00:00Z 00:00
To: 31-12-2022T12:22:59Z 00:00

Prescribed Standards		0-5
Exceeding Standards		NA
Remarks		
From Date	To Date	Benzene (ug/m3)
01-10-2022 00:00	02-10-2022 00:00	None
02-10-2022 00:00	03-10-2022 00:00	None
03-10-2022 00:00	04-10-2022 00:00	None
04-10-2022 00:00	05-10-2022 00:00	None
05-10-2022 00:00	06-10-2022 00:00	None
06-10-2022 00:00	07-10-2022 00:00	None
07-10-2022 00:00	08-10-2022 00:00	None
08-10-2022 00:00	09-10-2022 00:00	None
09-10-2022 00:00	10-10-2022 00:00	None
10-10-2022 00:00	11-10-2022 00:00	None
11-10-2022 00:00	12-10-2022 00:00	None
12-10-2022 00:00	13-10-2022 00:00	None
13-10-2022 00:00	14-10-2022 00:00	None
14-10-2022 00:00	15-10-2022 00:00	None
15-10-2022 00:00	16-10-2022 00:00	None
16-10-2022 00:00	17-10-2022 00:00	None
17-10-2022 00:00	18-10-2022 00:00	None
18-10-2022 00:00	19-10-2022 00:00	None
19-10-2022 00:00	20-10-2022 00:00	None

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EXPIRY DATE
31.12.28
Govt. of India

437

CENTRAL POLLUTION CONTROL BOARD

CONTINUOUS AMBIENT AIR QUALITY

CPCB

Date: Wednesday, Feb 14 2024

Time: 12:19:20 PM

20-10-2022 00:00	21-10-2022 00:00	None
21-10-2022 00:00	22-10-2022 00:00	None
22-10-2022 00:00	23-10-2022 00:00	None
23-10-2022 00:00	24-10-2022 00:00	None
24-10-2022 00:00	25-10-2022 00:00	None
25-10-2022 00:00	26-10-2022 00:00	None
26-10-2022 00:00	27-10-2022 00:00	None
27-10-2022 00:00	28-10-2022 00:00	None
28-10-2022 00:00	29-10-2022 00:00	None
29-10-2022 00:00	30-10-2022 00:00	None
30-10-2022 00:00	31-10-2022 00:00	None
31-10-2022 00:00	01-11-2022 00:00	None
01-11-2022 00:00	02-11-2022 00:00	None
02-11-2022 00:00	03-11-2022 00:00	None
03-11-2022 00:00	04-11-2022 00:00	None
04-11-2022 00:00	05-11-2022 00:00	None
05-11-2022 00:00	06-11-2022 00:00	None
06-11-2022 00:00	07-11-2022 00:00	None
07-11-2022 00:00	08-11-2022 00:00	None
08-11-2022 00:00	09-11-2022 00:00	None
09-11-2022 00:00	10-11-2022 00:00	None
10-11-2022 00:00	11-11-2022 00:00	None
11-11-2022 00:00	12-11-2022 00:00	None
12-11-2022 00:00	13-11-2022 00:00	None
13-11-2022 00:00	14-11-2022 00:00	None
14-11-2022 00:00	15-11-2022 00:00	None
15-11-2022 00:00	16-11-2022 00:00	None
16-11-2022 00:00	17-11-2022 00:00	None
17-11-2022 00:00	18-11-2022 00:00	None

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EXPIRY DATE
31.12.28
Govt. of India

478

CENTRAL POLLUTION CONTROL BOARD

CONTINUOUS AMBIENT AIR QUALITY

CPCB

Date: Wednesday, Feb 14 2024

Time: 12:19:20 PM

18-11-2022 00:00	19-11-2022 00:00	None
19-11-2022 00:00	20-11-2022 00:00	None
20-11-2022 00:00	21-11-2022 00:00	None
21-11-2022 00:00	22-11-2022 00:00	None
22-11-2022 00:00	23-11-2022 00:00	None
23-11-2022 00:00	24-11-2022 00:00	None
24-11-2022 00:00	25-11-2022 00:00	None
25-11-2022 00:00	26-11-2022 00:00	None
26-11-2022 00:00	27-11-2022 00:00	None
27-11-2022 00:00	28-11-2022 00:00	None
28-11-2022 00:00	29-11-2022 00:00	None
29-11-2022 00:00	30-11-2022 00:00	None
30-11-2022 00:00	01-12-2022 00:00	None
01-12-2022 00:00	02-12-2022 00:00	None
02-12-2022 00:00	03-12-2022 00:00	None
03-12-2022 00:00	04-12-2022 00:00	None
04-12-2022 00:00	05-12-2022 00:00	None
05-12-2022 00:00	06-12-2022 00:00	None
06-12-2022 00:00	07-12-2022 00:00	None
07-12-2022 00:00	08-12-2022 00:00	None
08-12-2022 00:00	09-12-2022 00:00	None
09-12-2022 00:00	10-12-2022 00:00	None
10-12-2022 00:00	11-12-2022 00:00	None
11-12-2022 00:00	12-12-2022 00:00	None
12-12-2022 00:00	13-12-2022 00:00	None
13-12-2022 00:00	14-12-2022 00:00	None
14-12-2022 00:00	15-12-2022 00:00	None
15-12-2022 00:00	16-12-2022 00:00	None
16-12-2022 00:00	17-12-2022 00:00	None

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EXPIRY DATE
31.12.28

4789

CENTRAL POLLUTION CONTROL BOARD

CONTINUOUS AMBIENT AIR QUALITY

CPCB

Date: Wednesday, Feb 14 2024

Time: 12:19:20 PM

17-12-2022 00:00	18-12-2022 00:00	None
18-12-2022 00:00	19-12-2022 00:00	None
19-12-2022 00:00	20-12-2022 00:00	None
20-12-2022 00:00	21-12-2022 00:00	None
21-12-2022 00:00	22-12-2022 00:00	None
22-12-2022 00:00	23-12-2022 00:00	None
23-12-2022 00:00	24-12-2022 00:00	None
24-12-2022 00:00	25-12-2022 00:00	None
25-12-2022 00:00	26-12-2022 00:00	None
26-12-2022 00:00	27-12-2022 00:00	None
27-12-2022 00:00	28-12-2022 00:00	None
28-12-2022 00:00	29-12-2022 00:00	None
29-12-2022 00:00	30-12-2022 00:00	None
30-12-2022 00:00	31-12-2022 00:00	None
31-12-2022 00:00	31-12-2022 12:22	None

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Govt. of India

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CPCB

CENTRAL POLLUTION CONTROL BOARD

CONTINUOUS AMBIENT AIR QUALITY

Annexure - 4

Date: Wednesday, Feb 14 2024

Time: 12:14:35 PM

Station: Talcher Coalfields,Talcher - OSPCB
State: Odisha
City: Talcher
Parameter: Benzene
Average Period: 24 Hours
From: 01-10-2022T00:00:00Z 00:00
To: 31-12-2022T12:17:59Z 00:00

Prescribed Standards		0-5
Exceeding Standards		NA
Remarks		
From Date	To Date	Benzene (ug/m3)
01-10-2022 00:00	02-10-2022 00:00	0.0
02-10-2022 00:00	03-10-2022 00:00	0.0
03-10-2022 00:00	04-10-2022 00:00	0.0
04-10-2022 00:00	05-10-2022 00:00	0.0
05-10-2022 00:00	06-10-2022 00:00	0.0
06-10-2022 00:00	07-10-2022 00:00	0.0
07-10-2022 00:00	08-10-2022 00:00	0.0
08-10-2022 00:00	09-10-2022 00:00	0.0
09-10-2022 00:00	10-10-2022 00:00	0.0
10-10-2022 00:00	11-10-2022 00:00	0.0
11-10-2022 00:00	12-10-2022 00:00	0.0
12-10-2022 00:00	13-10-2022 00:00	0.0
13-10-2022 00:00	14-10-2022 00:00	0.0
14-10-2022 00:00	15-10-2022 00:00	0.0
15-10-2022 00:00	16-10-2022 00:00	0.0
16-10-2022 00:00	17-10-2022 00:00	0.0
17-10-2022 00:00	18-10-2022 00:00	0.0
18-10-2022 00:00	19-10-2022 00:00	0.0
19-10-2022 00:00	20-10-2022 00:00	0.01

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EXPIRY DATE
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CENTRAL POLLUTION CONTROL BOARD

CONTINUOUS AMBIENT AIR QUALITY

CPCB

Date: Wednesday, Feb 14 2024

Time: 12:14:35 PM

20-10-2022 00:00	21-10-2022 00:00	0.0
21-10-2022 00:00	22-10-2022 00:00	0.0
22-10-2022 00:00	23-10-2022 00:00	0.0
23-10-2022 00:00	24-10-2022 00:00	0.0
24-10-2022 00:00	25-10-2022 00:00	0.0
25-10-2022 00:00	26-10-2022 00:00	0.0
26-10-2022 00:00	27-10-2022 00:00	0.0
27-10-2022 00:00	28-10-2022 00:00	0.0
28-10-2022 00:00	29-10-2022 00:00	0.0
29-10-2022 00:00	30-10-2022 00:00	0.07
30-10-2022 00:00	31-10-2022 00:00	0.0
31-10-2022 00:00	01-11-2022 00:00	0.0
01-11-2022 00:00	02-11-2022 00:00	0.0
02-11-2022 00:00	03-11-2022 00:00	0.0
03-11-2022 00:00	04-11-2022 00:00	0.0
04-11-2022 00:00	05-11-2022 00:00	0.0
05-11-2022 00:00	06-11-2022 00:00	0.0
06-11-2022 00:00	07-11-2022 00:00	0.0
07-11-2022 00:00	08-11-2022 00:00	0.0
08-11-2022 00:00	09-11-2022 00:00	0.0
09-11-2022 00:00	10-11-2022 00:00	0.0
10-11-2022 00:00	11-11-2022 00:00	0.0
11-11-2022 00:00	12-11-2022 00:00	0.0
12-11-2022 00:00	13-11-2022 00:00	0.0
13-11-2022 00:00	14-11-2022 00:00	0.0
14-11-2022 00:00	15-11-2022 00:00	0.09
15-11-2022 00:00	16-11-2022 00:00	0.34
16-11-2022 00:00	17-11-2022 00:00	0.0
17-11-2022 00:00	18-11-2022 00:00	0.04

NOTARY KOLKATA ★ Govt. of India ★ ASIS KR ... EN NOTARY Regd. No.-13.. 2/18 EXPIRY DATE 31.12.28

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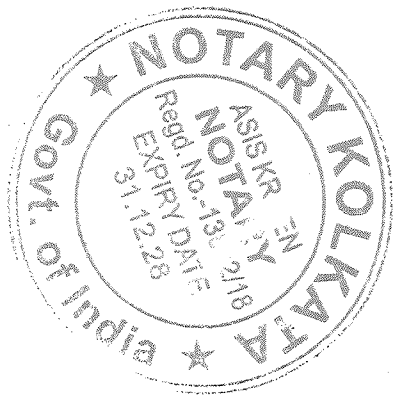
CENTRAL POLLUTION CONTROL BOARD

CONTINUOUS AMBIENT AIR QUALITY

Date: Wednesday, Feb 14 2024

Time: 12:14:35 PM

18-11-2022 00:00	19-11-2022 00:00	0.15
19-11-2022 00:00	20-11-2022 00:00	0.7
20-11-2022 00:00	21-11-2022 00:00	0.26
21-11-2022 00:00	22-11-2022 00:00	0.0
22-11-2022 00:00	23-11-2022 00:00	0.0
23-11-2022 00:00	24-11-2022 00:00	0.0
24-11-2022 00:00	25-11-2022 00:00	0.0
25-11-2022 00:00	26-11-2022 00:00	0.03
26-11-2022 00:00	27-11-2022 00:00	0.33
27-11-2022 00:00	28-11-2022 00:00	0.37
28-11-2022 00:00	29-11-2022 00:00	0.0
29-11-2022 00:00	30-11-2022 00:00	0.0
30-11-2022 00:00	01-12-2022 00:00	0.0
01-12-2022 00:00	02-12-2022 00:00	0.0
02-12-2022 00:00	03-12-2022 00:00	0.0
03-12-2022 00:00	04-12-2022 00:00	0.0
04-12-2022 00:00	05-12-2022 00:00	0.0
05-12-2022 00:00	06-12-2022 00:00	0.0
06-12-2022 00:00	07-12-2022 00:00	0.14
07-12-2022 00:00	08-12-2022 00:00	0.3
08-12-2022 00:00	09-12-2022 00:00	0.38
09-12-2022 00:00	10-12-2022 00:00	0.2
10-12-2022 00:00	11-12-2022 00:00	0.44
11-12-2022 00:00	12-12-2022 00:00	0.11
12-12-2022 00:00	13-12-2022 00:00	0.07
13-12-2022 00:00	14-12-2022 00:00	0.04
14-12-2022 00:00	15-12-2022 00:00	0.11
15-12-2022 00:00	16-12-2022 00:00	0.15
16-12-2022 00:00	17-12-2022 00:00	0.4



4X3

CENTRAL POLLUTION CONTROL BOARD

CONTINUOUS AMBIENT AIR QUALITY

CPCB

Date: Wednesday, Feb 14 2024

Time: 12:14:35 PM

17-12-2022 00:00	18-12-2022 00:00	0.34
18-12-2022 00:00	19-12-2022 00:00	0.15
19-12-2022 00:00	20-12-2022 00:00	0.11
20-12-2022 00:00	21-12-2022 00:00	0.18
21-12-2022 00:00	22-12-2022 00:00	0.23
22-12-2022 00:00	23-12-2022 00:00	0.21
23-12-2022 00:00	24-12-2022 00:00	0.39
24-12-2022 00:00	25-12-2022 00:00	0.37
25-12-2022 00:00	26-12-2022 00:00	0.54
26-12-2022 00:00	27-12-2022 00:00	0.3
27-12-2022 00:00	28-12-2022 00:00	0.39
28-12-2022 00:00	29-12-2022 00:00	0.07
29-12-2022 00:00	30-12-2022 00:00	0.12
30-12-2022 00:00	31-12-2022 00:00	0.3
31-12-2022 00:00	31-12-2022 12:17	0.17

NOTARY KOLKATA
ASIS KR SEN
NOTARY
Regd. No.-13/ 2018
EXPIRY DATE
31.12.23
Govt. of India

484 ANNEXURE- 'R'

12. DISCLOSURE OF CONSULTANT

12.1 INTRODUCTION

Vardan Environet is a pioneer consulting organisation of India specializing in Environmental Protection, Industrial Pollution Control, Environmental & Mechanical testing, and engineering field. Vardan assists clients in comprehensive environmental and engineering services ranging from conceptual planning and preliminary investigation to detailed engineering designs. Local knowledge coupled with national and international experience of proven technical know-how and a strong commitment from our team of experts enables Vardan to assist in solving the clients environmental and engineering problems successfully with competence by first analysing then visualizing and finally utilizing technically strong and dedicated skill.

Vardan has successfully completed a wide range of multi-disciplinary assignments/reports. The company's project formulation requires preliminary and detailed project investigation. The objective of the investigation is to assess the technical viability and cost effectiveness of the proposals vis-à-vis the objective and benefit. Vardan was founded in 2012 and brought together a number of consultancy services with a track record of performance in the environmental Science and Engineering field.

Headquartered in Gurugram, Vardan has prominent presence in Delhi-NCR, Rajasthan, Maharashtra, Madhya Pradesh, West Bengal and Jharkhand. With a man-power of over more than 200 professionals, the organization comprises of senior retired government officers from various departments like Pollution Control Board, Mines & Geology, Civil Services, SAIL, GAIL, NEERI who have decades of experience in the field of environmental management. The team also Comprises of young, dynamic and progress driven Environment, Civil, Mechanical & Chemical engineers, Geologists, GIS experts, Ecologists and Auditors.

Vardan Envirolab, a sister concern provides reliable and precise testing services for a wide range of Environmental, Chemical, Food testing, Microbiology and Building Materials with in-house Equipment/Instruments of advance technology along with experienced technical staff.

12.2 SERVICES OF VARDAN ENVIRONET

- Environmental Impact Assessment (EIA), Environmental Management Plan (EMP), Environmental Compliance, Mining Plan, Social Impact Assessment,

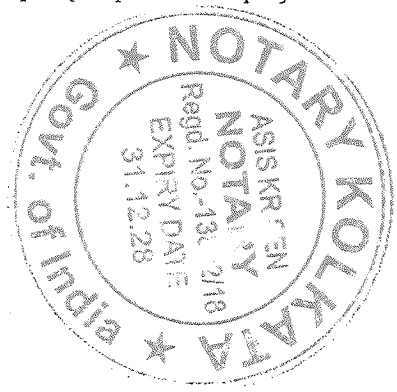
- Testing of water, Waste water, Ambient & work zone air, stack emissions, noise, soil, limestone, dolomite, iron ore, coal, cement, bricks, concrete, blocks, steel bars & wires, Indoor Air Quality monitoring, Sludge.
- Hydrological surveys for ground water clearance.
- Approvals/NOC/Clearances from various Government Authorities.
- Detailed Project report/Feasibility report/Plans/Designs.
- Environmental Quality Monitoring and analysis.
- Geotechnical investigations, Topographical Survey, Planning and Designs.
- EHS, Energy and water Audit, risk/hazard studies and disaster management plan (both onsite and off-site)

12.3 RECOGNITIONS

- Approved by NABET in 21 sectors for preparation of EIA/EMP reports.
- Vardan EnviroLab is recognized by Ministry of Environment, Forest & Climate Change, Govt. of India under Environmental Protection Act 1986.
- Vardan EnviroLab is accredited by NABL in the field of Testing.
- Vardan EnviroLab is certified by OHSAS 18001:2007.
- Vardan EnviroLab is certified by ISO 14001:2015.
- Vardan EnviroLab is certified by ISO 9001:2015.
- Vardan EnviroLab is approved by HSPCB & RSPCB.

12.4 LIST OF SOFTWARE MODELS FOR ENVIRONMENTAL STUDIES

- Multisource Dispersion Model based on Gaussian Model (ISCST3, AERMOD)
- Noise Propagation Model (Dhawani Pro)
- Risk and Hazard studies through Aloha model
- GIS mapping through Arc GIS, watershed & area drainage mapping, cadastral mapping, DGPS survey, 3D modelling, Urban/Rural area planning & management and Digital Elevation Model.
- Transect and line intercepts for Ecology and Biodiversity studies
- Extrapolative method & Intuitive technique (Delphi technique) in socio-economic assessment.



12.5 KEY MANAGEMENT PERSONNEL OF VARDAN

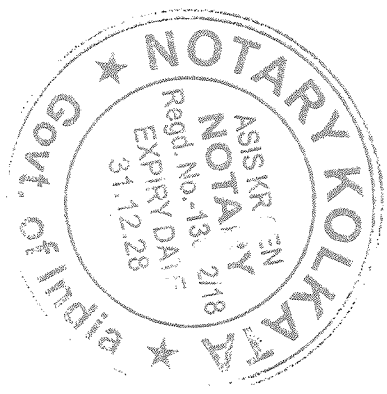
Table 12.1: Key Management Personnel of Vardan

S. No.	Name	Designation	Experience (Years)
1.	R.S. Yadav	Managing Director	32
2.	Roopika Sharma	CEO	12
3.	Aman Sharma	Partner	14
4.	Anshul Yadav	Partner	10

12.6 EMINENT CLIENTELE OF VARDAN

Vardan has executed around 1500 projects across all over India in a short span of time covering both public and private sectors. Following are some of our reputed clients.

Indian Oil, HPCL, NTPC, NHPC, BPCL, Delhi Metro, GAIL, GPIL, SAIL, NHAI, APCPL, RITES, MPPGCL, Indian Railways, JK Lakshmi Cement Ltd., L&T, Tata, Adani, Hero, Honda, HCL, Panasonic, Jaypee group, DLF, Godrej, Haldiram's, Unitech, JBM, Trident hotels, Lanco, Aditya Birla, Mangalam cement, JW Marriot, Eros group and many others.



12.7 CERTIFICATIONS OF VARDAN

QCI

Quality Council of India

National Accreditation Board for Education & Training

NABET

Certificate of Accreditation

<u>Vardan Environet, Gurugram</u>

Plot No. 82-A, Sector 5, IMT Manesar, Gurugram, Haryana

*The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –*

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including opencast/ underground mining	1	1 (a) (i)	A
2	Offshore & Onshore Oil and gas exploration, development & production	2	1 (b)	B
3	River Valley projects	3	1 (c)	A
4	Thermal power plants	4	1 (d)	B
5	Coal washeries	6	2 (a)	A
6	Mineral beneficiation	7	2 (b)	A
7	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	A
8	Cement Plants	9	3(b)	A
9	Coke oven plants	11	4 (b)	A
10	Chemical fertilizers	16	5 (a)	A
11	Petro-chemical complexes	18	5 (c)	A
12	Synthetic organic chemicals industry	21	5 (f)	A
13	Distilleries	22	5 (g)	A
14	Sugar Industry	25	5 (j)	B
15	Oil & gas transportation pipeline, passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG termina	27	6 (a)	A
16	Isolated storage & handling of hazardous chemicals	28	-	B
17	Airports	29	7 (a)	A
18	Industrial estates/ parks/ complexes/ Areas, export processing zones (EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	31	7 (c)	A
19	Highways	34	7 (f)	A
20	Building and construction projects	38	8 (a)	B
21	Townships and Area development projects	39	8 (b)	B

***Note:** Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated April 21, 2023 posted on QCI-NABET website.*

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/23/2751 dated May 01, 2023. The accreditation needs to be renewed before the expiry date by Vardan Environet, Gurugram following due process of assessment.

Sr. Director, NABET
Dated: May 01, 2023

Certificate No.
NABET/EIA/2326/RA 0284

Valid up to
May 04, 2026

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

NOTARY KOLKATA
ASIS KR SEN
NOTARY
Regd. No-13 2/18
EXPIRY DATE
31.12.28
GOVT. OF India

12.8 ENVIRONMENTAL MONITORING AND ANALYSIS LABORATORY

Environmental Baseline data generation has been carried out by NABL Accredited laboratory Vardan Envirolab, Sector-5, IMT Manesar, Gurgoan, Haryana. The laboratory has also been accorded recognition as Environment Laboratory by CPCB (MoEF&CC). NABL Accreditation Certificate of Vardan Envirolab is given below.

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय भारत सरकार
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE GOVT. OF INDIA

F.No. LB/99/7/2021-INST LAB-HO-CPCB-HO/Pvt./ 8030 — Dated:24th January 2023

Provisional Certificate

To,

Head of Laboratory,
M/s Vardan Enviro Lab,
Plot No. 82 A, Sector 5 / IMT Manesar, Gurgaon-122051,
Haryana.

Subject: Recognition of M/s Vardan Enviro Lab, Plot No. 82 A, Sector 5 / IMT Manesar, Gurgaon-122051, Haryana, as Environmental laboratory under the Environmental (Protection) Act- 1986.

Sir,

I am directed to refer the online application, dated 05/10/2022 for the recognition of your laboratory under Environmental (Protection) Act, 1986. Based on the recommendations of the concerned Division, approval of Competent Authority for recognition of Environmental laboratories and your acceptance of the revised terms and conditions at Annexure-III & IV of the guidelines for recognition of environmental laboratories, CPCB approves the renewal of recognition **M/s Vardan Enviro Lab, Plot No. 82 A, Sector 5 / IMT Manesar, Gurgaon-122051, Haryana** and shall be notified in the Gazette of India. Considering the current requirement of mandatory accreditation/ certifications of the laboratory, **this recognition shall be valid up to 27/08/2024.**

2 As sought in the aforementioned application, **M/s Vardan Enviro Lab, Plot No. 82 A, Sector 5 / IMT Manesar, Gurgaon-122051, Haryana** may undertake the following tests:

i. **Physical Tests-**Conductivity, Colour, pH, Fixed & Volatile Solids, Total Solids, Total Dissolved Solids, Total Suspended Solids, Turbidity, Temperature, Velocity & Discharge Measurement of Industrial Effluent Stream, Flocculation Test (Jar test), Odour, Salinity, Settleable Solids and Sludge Volume Index.

ii. **Inorganic (General and Non-metallic):** Acidity, Alkalinity, Ammonical Nitrogen, Chloride, Chlorine Residual, Dissolved Oxygen, Fluoride, Total Hardness, Total Kjeldahl Nitrogen (TKN), Nitrite Nitrogen, Nitrate Nitrogen, Phosphate, Sulphate, Bromide, Chlorine Demand, Iodine, Sulphite Silica, Cyanide and Sulphide.

iii. **Inorganic (Trace Metals):** Boron, Cadmium, Calcium, Total Chromium, Chromium Hexavalent, Copper, Iron, Lead, Magnesium, Mercury, Nickel, Potassium, Sodium, Sodium Absorption Ratio, Zinc, Arsenic, Aluminium, Beryllium, Barium, Lithium, Manganese, Selenium, Silver, Strontium, Antimony, Cobalt and Vanadium.

iv. **Organics (General) and Trace Organics:** Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Oil and Grease, Phenolic Compounds, Pesticides (each) (Organo-Chlorine and Organo Nitrogen-Phosphorus), Total Organic Carbon, Surfactant, Poly-Nuclear Aromatic Hydrocarbon (PAH), Poly-Chlorinated Biphenyl (PCBs) each, Organic Carbon (in Solid) and Carbon/Nitrogen Ratio.

v. **Microbiological Test:** Total Coliform, Faecal Coliform, *E. coli*, *Faecal Streptococci* and Total Plate Count, *Coliphage* and *Enterococcus*.

vi. **Toxicological Tests:** Bioassay Method for Evaluation of Toxicity using Fish and Measurement of toxicity factor using zebra fish (dimensionless toxicity test

vii. **Biological Test:** Benthic Organism Identification and Count, Planktonic Identification Count and Chlorophyll.

viii. **Characterization of Hazardous Waste:** Preparation of Leachate (TCLP Extract/Water Extract), Corrosivity, Ignibility (Flash point), Reactivity, Toxicity and Measurement of Heavy Metals/Pesticides in the Waste/Leachate.

ix. **Soil/Sludge/Sediment and Solid Waste:** Boron, Cation Exchange Capacity (CEC), Electrical

Contd.

'परिवेश भवन' पूर्वी अर्जुन नगर, दिल्ली-110032
Parivesh Bhawan, East Arjun Nagar, Delhi-110032
दूरभाष/Tel : 43102030, 22305792, वेबसाईट/Website : www.cpcb.nic.in

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Conductivity, Nitrogen (Available), Organic Carbon/Matter (Chemical Method), pH, Phosphorous (Available), Phosphate (Ortho), Phosphate (Total), Potassium, SAR in Soil Extract, Sodium, Soil moisture, TKN, Calorific Value, Ammonia, Bicarbonate, Calcium, Calcium Carbonate, Chloride, Colour, Exchangeable Sodium Percentage (ESP), Heavy Metal, Magnesium, Nitrate, Nitrite, PAH, Pesticide, Sulphate, Sulphur, Total Organic Carbon, Total Water Soluble Salt and Water Holding Capacity.

x. **Ambient Air/ Fugitive Emissions:** Nitrogen Dioxide (NO_2), Sulphur Dioxide (SO_2), Total Suspended Particulate Matter, Respirable Suspended Particulate Matter PM_{10}, Ammonia, Carbon Monoxide, Chlorine, Fluoride, Lead, Methane, Non-Methane Hydrocarbon, Ozone, Benzene Toluene Xylene (BTX), Polycyclic Aromatic Hydrocarbon (PAH), Benzo-a-Pyrine & others, $PM_{2.5}$ and Volatile Organic Carbon.

xi. **Stack Gases/ Source Emission:** Particulate Matter, Sulphur Dioxide, Velocity & Flow, Carbon Dioxide, Carbon Monoxide, Temperature, Oxygen, Oxides of Nitrogen, Acid Mist, Ammonia, Chlorine, Fluoride (Particulate), Fluoride (Gaseous), Hydrochloric acid, Total Hydro Carbon, Hydrogen Sulphide and Carbon Disulphide.

xii. **Noise Level:** Noise Level Measurement (20-140 dBa) and Ambient Noise and Source Specific Noise.

xiii. **Meteorological:** Ambient Temperature, Wind Direction, Wind Speed, Relative Humidity and Rainfall.

3. Further, the following analysts have been approved as Government Analysts.

   i. Sh. Gaurav Pratap Singh
   ii. Dr. Shiv Prakash Singh
   iii. Ms. Deepika Mehta

4. The laboratory shall compulsorily participate in the Analytical Quality Exercise conducted by the Central Pollution Control Board (CPCB) to ascertain the capability of the laboratory and analysis carried out and shall submit quarterly progress report to CPCB.

5. The surprise inspection/periodic surveillance of the recognized environment laboratory will be undertaken by CPCB to assess its proper functioning systematic operation and reliability of data generated at the laboratory.

6. It is also mandatory for the laboratory to have requisite accreditations of the ISO: 17025 and ISO:45001 and its renewal as per accreditation rules. This recognition is subject to such accreditations and renewals as applicable. The laboratory is required to apply online for further renewal of recognition through CPCB web portal after renewal of the mandatory accreditations / certifications concerned.

7. The laboratory should compulsorily follow the accepted terms and conditions. In case of serious non-compliance of any of the terms and conditions, the laboratory may be black listed for a minimum period of two years and civil/criminal proceedings, as applicable, may be initiated for performing functions on behalf of the Government in an unauthorized manner.

Yours faithfully,

24/1/2023

Divisional Head
Instrumentation laboratory

NOTARY KOLKATA ★ Govt. of India ★
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NOTARY
Regd. No.-13[illegible]2/18
EXPIRY DATE-
31.12.23

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National Accreditation Board for Testing and Calibration Laboratories

NABL

CERTIFICATE OF ACCREDITATION

VARDAN ENVIRO LAB

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

PLOT NO. 82A, SECTOR 5, IMT MANESAR, GURGAON, HARYANA, INDIA

in the field of

TESTING

Certificate Number: TC-6299

Issue Date: 28/08/2022 Valid Until: 27/08/2024

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : VARDAN ENVIRO LAB

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

NOTARY KOLKATA ★ Govt. of India ★ ASIS KR SEN NOTARY Regd.No-13C 2/18 EXPIRY DATE 31.12.23

CERTIFICATE OF REGISTRATION

INTERNATIONAL CERTIFICATION & INSPECTION UK LTD.

ICI UK

This is to certify that the management system of

M/S VARDAN ENVIROLAB

has been formally assessed by

INTERNATIONAL CERTIFICATION & INSPECTION UK LTD.

and found to comply with the requirements of

ISO 9001:2015

(Quality Management Systems)

Scope of Registration:

PROVISION OF TESTING DISCIPLINE FOR ENVIRONMENTAL, CHEMICAL, FOOD MICROBIOLOGICAL AND MECHANICAL SAMPLES.

Registered Site (s):

PLOT NO.82-A, SECTOR-5, IMT MANESAR, GURUGRAM - 122051, HARYANA, INDIA.

:: Certificate No :: ICIINDI/3807/XX

Date of initial registration:	07 January 2020
First Surveillance Audit on or before:	10 December 2020
Second Surveillance Audit on or before:	10 December 2021
Re-certification Due:	06 January 2023

This Certificate is property of ICI UK Ltd. and remains valid subject to satisfactory surveillance audits.

Peter Collins

Executive Director

International Certification & Inspection UK Limited.

71-75 Shelton Street Covent Garden London, WC2H 9JQ United Kingdom

ABCB ACCREDITATION BOARD FOR CERTIFICATION BODIES

ICI CERTIFIED

To check validity of the certificate please visit at www.ici-uk.co

This certification of registration is issued by International Certification & Inspection UK Limited accredited with Accreditation Board For Certification bodies (www.ab-cb.org). This certificate remains the property of International Certification & Inspection UK Limited and must be returned upon request.

NOTARY KOLKATA ★ Govt. of India ★ ASIS KR SEN NOTARY Regd. No.-13/2/18 EXPIRY DATE 31.12.28

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CERTIFICATE OF REGISTRATION

INTERNATIONAL CERTIFICATION & INSPECTION UK LTD.

ICI UK

This is to certify that the management system of

VARDAN ENVIROLAB

has been formally assessed by
INTERNATIONAL CERTIFICATION & INSPECTION UK LTD.
and found to comply with the requirements of

ISO 14001:2015

Environmental Management Systems

Scope of Registration:

Testing of Environmental Parameters, Food Products, Pharmaceuticals, Building Materials, Disinfection Services, Auditing and Other Technical Services.

Registered Site (s):

Plot No. 82-A, Sector - 5, IMT Manesar, Gurugram - 122051, (Haryana), India.

:: Certificate No :: ICIINDI/4534/XX

Date of initial registration:	20 June 2020
First Surveillance Audit on or before:	10 May 2021
Second Surveillance Audit on or before:	10 May 2022
Re-certification Due:	19 June 2023

This Certificate is property of ICI UK Ltd. and remains valid subject to satisfactory surveillance audits.

Peter Collins
Executive Director
International Certification & Inspection UK Limited.
27 Old Gloucester Street, London, WC1N 3AX, United Kingdom

ACCREDITATION BOARD FOR CERTIFICATION BODIES

To check validity of the certificate please visit at www.ici-uk.co

This certification of registration is issued by International Certification & Inspection UK Limited accredited with Accreditation Board For Certification bodies (www.ab-cb.org). This certificate remains the property of International Certification & Inspection UK Limited and must be returned upon request.

NOTARY KOLKATA ★ ASIS KR. EN NOTARY Regd. No.-13c 2/18 EXPIRY DATE 31.12.26 ★ Govt. of India

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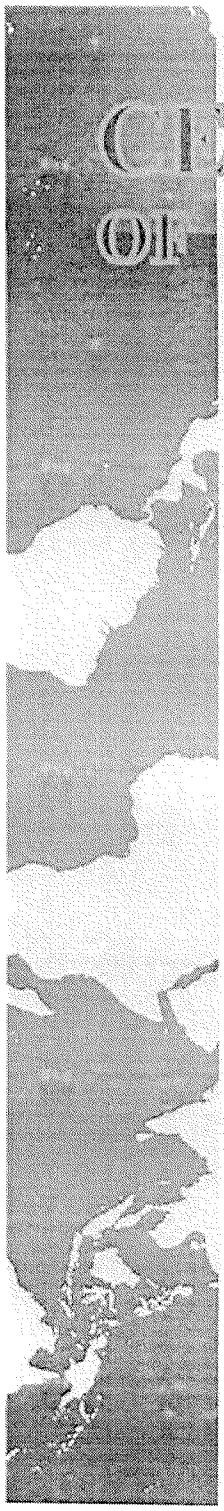

CERTIFICATE OF REGISTRATION

INTERNATIONAL CERTIFICATION & INSPECTION UK LTD.

ICI UK

This is to certify that the management system of

M/S VARDAN ENVIROLAB

has been formally assessed by

INTERNATIONAL CERTIFICATION & INSPECTION UK LTD.

and found to comply with the requirements of

ISO 45001:2018

Occupational Health and Safety

Scope of Registration:

PROVISION OF TESTING SERVICES FOR ENVIRONMENTAL SAMPLE (WATER, WASTE WATER, MBIENT AIR, NOISE, STACK EMISSION), BUILDING MATERIALS SAMPLE (CEMENT, CONCRETS, BRICKS, PAVOUR BLOCK, STEEL), DRUGS AND PHARMACEUTICAL SAMPLE & FOOD AND AGRICULTURAL PRODUCTS.

Registered Site (s):

PLOT NO. 82 - A, SECTOR -5, IMT MANESAR - 122051, HARYANA, INDIA.

:: Certificate No :: ICIINDI/3806/XX

Date of initial registration:	07 January 2020
First Surveillance Audit on or before:	10 December 2020
Second Surveillance Audit on or before:	10 December 2021
Re-certification Due:	06 January 2023

This Certificate is property of ICI UK Ltd. and remains valid subject to satisfactory surveillance audits.

Peter Collins

Executive Director

international Certification & Inspection UK Limited.

71-75 Shelton Street Covent Garden London, WC2H 9JQ United Kingdom

ACCREDITATION BOARD FOR CERTIFICATION BODIES

To check validity of the certificate please visit at www.ici-uk.co

This certification of registration is issued by International Certification & Inspection UK Limited accredited with Accreditation Board For Certification bodies (www.ab-cb.org). This certificate remains the property of International Certification & Inspection UK Limited and must be returned upon request.

NOTARY KOLKATA ASIS KR. SEN NOTARY Regd. No.-13... 2/18 EXPIRY DATE 31.12.28

Table 3.7: National Ambient Air Quality Standards vide GSR 826 (E), Dt.16.11.09

Sr. No.	Parameter	Time Weighted Average	Concentration in Ambient Air	
			Industrial Area, Residential, Rural & Other Areas	Ecologically Sensitive Area (Notified by Central Government)
1	SO_2 (µg/m³)	Annual*	50	20
		24 Hours**	80	80
2	NOx (µg/m³)	Annual*	40	30
		24 Hours**	80	80
3	PM_{10} (µg/m³)	Annual*	60	60
		24 Hours**	100	100
4	$PM_{2.5}$ (µg/m³)	Annual*	40	40
		24 Hours**	60	60
5	CO (mg/m³)	8 hours**	2.0	2.0
		1 hour**	4.0	4.0
6	Ozone, O_3 (µg/m³)	8 hours**	100	100
		1 hour**	180	180
7	Lead Pb (µg/m³)	Annual*	0.5	0.5
		24 Hours**	1.0	1.0
8	Ammonia (µg/m³)	Annual*	100	100
		24 Hours**	400	400
9	Benzene (µg/m³)	Annual	05	05
10	Benzo (a) Pyrene (BaP) (ng/m³)	Annual	01	01
11	Arsenic (ng/m³)	Annual	06	06
12	Nickel (ng/m³)	Annual	20	20

Table 3.8: Techniques Adopted/Protocols for Ambient Air Quality Monitoring

S. No	Parameters	Techniques	Technical Protocol
1	Sulphur Dioxide (SO_2)	West & Gaeke	IS:5182 (P2)
2	Nitrogen Dioxide (NO_2)	Jacob & Hochheiser	IS:5182 (P6)
3	Particulate Matter PM_{10}	Gravimetric	IS:5182 (P23)
4	Particulate Matter $PM_{2.5}$	Gravimetric	IS:5182 (P24)

S. No	Parameters	Techniques	Technical Protocol
5	Carbon-monoxide as CO	NDIR	IS: 5182 (P-10)
6	Ammonia	Spectrophotometric Method	IS 5182 (P-25): 2018
7	Arsenic	ICPMS/AAS Method	VEL/ENV/STP/110, Issue No. 01 dated on 01/11/2021
8	Benzene	GC-FID Method	IS: 5182 (P-11): 2006 RA: 2017
9	Benzo(a)pyrene	GC-FID Method	IS: 5182 (P-12): 2004, RA: 2019
10	Lead	ICPMS/AAS Method	IS: 5182 (P-22):2004 RA: 2019
11	Nickel	ICPMS/AAS Method	IS: 5182 (P-26), 2020
12	Ozone	Spectrophotometric Method	IS 5182 (P-9):1974 RA: 2019
13	Mercury as Hg	ICPMS/AAS Method	VEL/ENV/STP/129, Issue No. 01 dated on 01/11/2021

Source: Baseline Monitoring Report, Vardan enviro Lab

3.4.2.3 Air Quality Monitoring

Ambient air quality analysis reports are appended below in the **Table 3.9** and attached as **Annexure IX**. The graphical representations of the results are depicted in **Figure 3.4, 3.5, 3.6 & 3.7.**

3.4.2.4 Data Analysis

The Ambient Air Quality survey has been carried out within 10 km radius of mine site. Eight (8) locations were set up post-monsoon monitoring for a period of October - December 2022. Measurement of Particulate matter (PM_{10} & $PM_{2.5}$), SO_2, NOX, CO, O_3, NH3, Benzene, Ba(P), arsenic, Nickel, Lead, Mercury levels helps to understand the existing environmental scenario. The results of PM_{10}, $PM_{2.5}$, SO2, NOX, O3, NH3, Benezen are expressed in $\mu g/m^3$ whereas the results of CO are expressed in mg/m^3 and results of Ba(P), Aresenic, Nickel, Lead, Mercury are expressed in ng//m^3. The results of all the locations were further computed for statistical parameters like 98 Percentile and Arithmetic mean (AM). The results are shown in **Table 3.9**. The graphical representations of the results are depicted in Figure 3.4, 3.5, 3.6 & 3.7. Lab Reports are enclosed as **Annexure-IX.**