



Six Monthly Compliance Report

EMP CLEARANCE

(J-11015/632/2007 1 A. II(M),
(Dated: 13/03/2020)

PERIOD: October 2022 to March 2023

TOPA RO-OCP (A) Mine

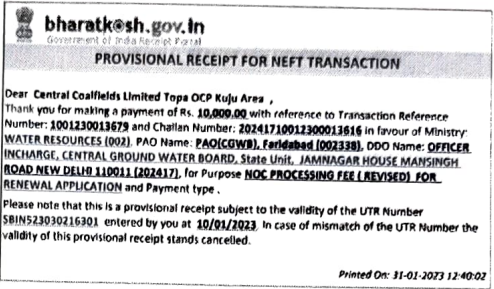
KUJU AREA
CENTRAL COALFIELDS LIMITED

Compliance Report of EC Vide Letter No J-11015/632/2007-IA. II (M) Dated 13.03.2020 in respect Topa Opencast Coal Mine (1.68 MTPA) of Kuju Area, CCL in an area of 276.66 Ha.

SN	Specific Condition	Compliance
i	EAC desired that the MoC may direct CIL subsidiaries to comply the EC/FC/CTO conditions strictly within certain time bound manner so that the mining operations will be environmentally sustainable/viable etc.	Complied. It is being ensured that the conditions stipulated in EC/FC/CTO are being complied, in a time-bound manner. The status of compliances & the cost incurred is submitted along with the six-monthly compliance report, to MoEFCC & JSPCB periodically.
ii	Compliance of EC conditions will be again reviewed by EAC after one year as most of the conditions are partially complied yet. If the conditions are not satisfactorily complied then EC will be revoked by the ministry.	Being complied All conditions laid down by the EAC will be completed satisfactorily within the specified time period.
iii	All the non-compliances and partially complied conditions reported by regional office in its report dated 22 nd January 2020 has to be complied by March-June 2020 (as committed by PP during EAC appraisal through letter dated 24 th January 2020)	Being Complied.
iv	Project Proponent to plant 50,000 nos. of native trees with broad leaves along the transportation route from mine to Railway Siding in one year of the issue of this letter. After completion of tree plantation, number of trees shall be duly endorsed from District Forest Officer.	Being complied. Plantation by seedball method along the slopes of external OB Dump has been carried out contractually, in the Monsoon of 2021 vide work order no. CCL/ Kuju/ Topa/ Civil/ AOW/ 2021-22/ 2864/169 dated 12.07.2021. Plantation through seedball method was carried out departmentally over the OB dump slopes in the Monsoon of 2022. Saplings were also planted at various sites in the Project in the monsoon of 2022, to increase the green belt cover. Further a total of 5.31 Ha land has been identified for plantation in the Monsoon of 2023.
v	The project proponent shall obtain Consent to establish from the State Pollution Control Boards for the proposed peak capacity of 1.68 MTPA (Peak) prior to commencement of the increased production	Being Complied CTE for the proposed peak capacity of 1.68 MTPA was accorded by JSPCB vide JSPCB/HO/RNC/CTE-7828032/2022/237 dated 04.06.2022. CTO for the proposed peak capacity of 1.68 MTPA has been accorded by JSPCB vide no. JSPCB/HO/RNC/CTO-7830040/2022/1594 on date 12.11.2022, valid till 30.09.2023.
3vi	Wire fencing of west old abandon quarry shall be carried out and shall be completed in one year.	Being complied
vii	Transportation of coal from Coal Handling Plant shall be through covered trucks.	Complied It is being ensured that all the trucks are properly covered by tarpaulin covering, so that no spillage takes

		place while transportation of coal. Photographs of tarpaulin covered trucks are enclosed as Annexure 1 .									
viii	To control the production of dust at source, the crusher and in-pit belt conveyors shall be provided with mist type sprinklers.	Complied Water sprinkling system has been provided at the Crusher unit installed at Topa Project at the hoppers and material transfer point to control the dust generated. Photographs of the sprinklers installed in crusher unit is enclosed as Annexure 1 .									
ix	Mitigating measures shall be undertaken to control dust and other fugitive emissions all along the roads by providing sufficient water sprinklers. Adequate corrective measures shall be undertaken to control dust emissions, which would include mechanized sweeping, water sprinkling/mist spraying on haul roads and loading sites, long range misting/fogging arrangement, wind barrier wall and vertical greenery system, green belt, dust suppression arrangement at loading and unloading points, etc.	Being Complied Following mitigation measures are being undertaken to control generation of dust & other fugitive emissions: a. Total of 105.38 Ha of plantation has been done till date. Also, 2000 saplings were distributed among villagers near the project in September-December quarter 2019. b. A total of 5.31 Ha land has been identified for plantation in the Monsoon of 2023. c. 25 nos. of fixed water sprinklers are provided at Kuju New Siding to control dust generation. d. Proposal for provision of fog canon at Topa and Kuju New Siding is under consideration, for controlling dust generation. e. 01 number of departmental water sprinkler of 28 KL capacity having an average working hour of 5 Hr/day is deployed for water sprinkling at Topa Project. f. 2.75 Ha of plantation has been developed under green belt along coal transportation road and other roads. g. 3 tier plantations have been carried out near the R&R site, also seed ball plantation was done on the slope of the external dump in the monsoon of 2018. h. Plantation through seed ball method in the monsoon of 2021 was carried out on the external dump slopes contractually vide Work order no. CCL/ Kuju/ Topa/ Civil/ AOW/ 2021-22/ 2864/169 dated 12.07.2021. i. Plantation through seedball method was carried out departmentally over the OB dump slopes in the Monsoon of 2022. j. Saplings were also planted at various sites in Topa Project and Kuju New Siding, in the monsoon of 2022, to increase the green belt cover.									
x	Continuous monitoring of occupational safety and other health hazards, and the corrective actions need to be ensured.	Being Complied Initial Medical Examination (IME) & Periodic Medical Examination (PME) of workers is being carried out for monitoring of occupational safety and other health hazards. The details of IME/PME are as follows: <table border="1" data-bbox="647 1774 1263 1957"> <thead> <tr> <th>Year</th> <th>IME</th> <th>PME</th> </tr> </thead> <tbody> <tr> <td>2021</td> <td>21</td> <td>62</td> </tr> <tr> <td>2022</td> <td>4</td> <td>166</td> </tr> </tbody> </table>	Year	IME	PME	2021	21	62	2022	4	166
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xi	Persons of nearby villages shall be given training on livelihood and skill development to make them employable.	<p>Being complied</p> <p>Trainings sessions on livelihood and skill development are carried out at Kuju Area, for making the nearby villagers more employable.</p>																																
xii	Thick green belt of adequate width at the final boundary in the down wind direction of the project site shall be developed to mitigate/check the dust pollution.	<p>Being Complied</p> <p>a. Plantation over a total area of 105.38 Ha of plantation has been carried out till date. In addition to it, 2000 saplings were distributed among villagers near the project in September-December quarter 2019.</p> <p>b. A total of 5.31 Ha land has been identified for plantation in the Monsoon of 2023.</p> <p>c. 2.75 Ha of plantation has been developed under green belt along coal transportation road and other roads.</p> <p>d. Plantation through seed ball method in the monsoon of 2021 was carried out on the external dump slopes contractually vide Work order no. CCL/ Kuju/ Topa/ Civil/ AOW/ 2021-22/ 2864/169 dated 12.07.2021.</p> <p>e. Plantation through seedball method was carried out departmentally over the OB dump slopes in the Monsoon of 2022.</p> <p>f. Saplings were planted at various sites in Topa Project and Kuju New Siding, in the monsoon of 2022, to increase the green belt cover.</p> <p>g. 3 tier plantations have been done near the R&R site, also seed ball plantation was done on the slope of the external dump in the monsoon of 2018.</p> <p>The details of plantation are as below:</p> <table border="1" data-bbox="633 1207 1281 1564"> <thead> <tr> <th>Year</th> <th>Area in Ha.</th> <th>No. of Plants</th> <th>Expenditure</th> </tr> </thead> <tbody> <tr> <td>1992-2001</td> <td>56.00</td> <td>51788.00</td> <td>2532321.24</td> </tr> <tr> <td>2004</td> <td>13.50</td> <td>33750.00</td> <td>903490.00</td> </tr> <tr> <td>2005</td> <td>8.42</td> <td>21050.00</td> <td>567210.00</td> </tr> <tr> <td>2006</td> <td>8.51</td> <td>21275.00</td> <td>1446510.00</td> </tr> <tr> <td>2008</td> <td>11.76</td> <td>29400.00</td> <td>1007150.00</td> </tr> <tr> <td>2011</td> <td>7.19</td> <td>17975.00</td> <td>1766410.00</td> </tr> <tr> <td>Total</td> <td>105.38</td> <td>175238</td> <td>8223091.244</td> </tr> </tbody> </table>	Year	Area in Ha.	No. of Plants	Expenditure	1992-2001	56.00	51788.00	2532321.24	2004	13.50	33750.00	903490.00	2005	8.42	21050.00	567210.00	2006	8.51	21275.00	1446510.00	2008	11.76	29400.00	1007150.00	2011	7.19	17975.00	1766410.00	Total	105.38	175238	8223091.244
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xiii	Efforts shall be made for utilizing alternate sources of surface water, abandoned mines or else whatsoever and thus minimizing the dependability on a single source.	<p>Being Complied</p> <p>Water stored in Mine pits is being utilized for various mining purposes viz. water sprinkling for dust suppression, fire-fighting etc.</p> <p>Water is being supplied, vide two community water supply schemes, to 3 Villages namely, Balsagra, Huwag and Toyera; from the abandoned 2A-West quarry of Topa OCP</p>																																
xiv	The company shall obtain approval of CGWA for use of groundwater for mining operations at its	<p>Being Complied</p> <p>Topa RO-OCP(A) Mine is located in Ramgarh District of Jharkhand, which falls in "Critical" category as per CGWA</p>																																

	<p>enhanced capacity of 1.68 MTPA.</p>	<p>categorization. Application for obtaining NOC is submitted to Central Ground Water Authority vide ref no: 21-4/1006/JH/MIN/2022 dated 29/10/2022. The copy of receipt is given below:</p> <div data-bbox="644 359 1186 768" style="border: 1px solid black; padding: 5px;">  <p style="text-align: center;">bharatkosh.gov.in Government of India Receipt Portal</p> <p style="text-align: center;">PROVISIONAL RECEIPT FOR NEFT TRANSACTION</p> <p>Dear Central Coalfields Limited Topa OCP Kuju Area , Thank you for making a payment of Rs. 10,009.00 with reference to Transaction Reference Number: 1001230013679 and Challan Number: 2024171001300013616 in favour of Ministry: WATER RESOURCES (002), PAO Name: PAO(CGWB), Faridabad (002338), DDO Name: OFFICER INCHARGE, CENTRAL GROUND WATER BOARD, State Unit, JAMNAGAR HOUSE MAHSINGH, ROAD NEW DELHI 110011 (202417), for Purpose NOC PROCESSING FEE (REVISED) FOR RENEWAL APPLICATION and Payment type . Please note that this is a provisional receipt subject to the validity of the UTR Number SRIN523030216301 entered by you at 10/01/2023. In case of mismatch of the UTR Number the validity of this provisional receipt stands cancelled.</p> <p style="text-align: right;"><small>Printed On: 31-01-2023 12:40:02</small></p> <p style="text-align: center;"><small>Courtesy :- Controller General of Accounts</small></p> </div>									
<p>xv</p>	<p>Continuous monitoring of occupational safety and other health hazards, and the corrective actions need to be ensured.</p>	<p>Complied Initial Medical Examination (IME) & Periodic Medical Examination (PME) of workers is being carried out for Continuous monitoring of occupational safety and health of workers. The details of IME/PME are as follows:</p> <table border="1" data-bbox="611 972 1196 1136"> <thead> <tr> <th>Year</th> <th>IME</th> <th>PME</th> </tr> </thead> <tbody> <tr> <td>2021</td> <td>21</td> <td>62</td> </tr> <tr> <td>2022</td> <td>4</td> <td>166</td> </tr> </tbody> </table>	Year	IME	PME	2021	21	62	2022	4	166
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<p>xvi</p>	<p>A third-party assessment of EC compliance shall be undertaken once in three years through agency like ICFRI /NEERI/IIT or any other expert agency identified by the Ministry.</p>	<p>Being Complied As directed, third-party assessment will be carried out for Topa OCP, once in three years, through expert agency recognized by MoEFCC.</p>									
<p>xvii</p>	<p>Active OB Dump should not be kept barren/open and should be covered by temporary grass to avoid air born particles</p>	<p>Being complied It is being ensured that the OB dump is not being kept barren and plantation is carried out on the slope. The details of plantation undertaken for Topa OCP are given in point no ix. Plantation through seedball method was carried out departmentally over the OB dump slopes in the Monsoon of 2022. Saplings were also planted at various sites in Topa Project and Kuju New Siding, in the monsoon of 2022, to increase the green belt cover. A total of 5.31 Ha land has been identified for plantation in the Monsoon of 2023.</p>									

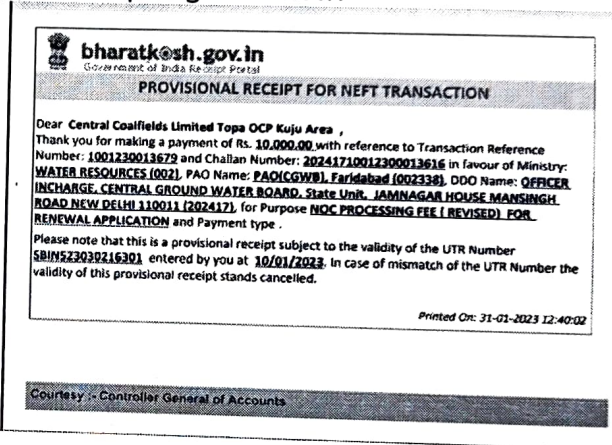
xviii	The activities and fund provisions for CER shall be made as per the guidelines issued by the ministry regarding CER on 1 st May, 2018.	<p>Complied</p> <p>A fund provision of Rs. 14.53 Crore has been allocated for Environment protection measures.</p>
xix	Project Proponent shall obtain blasting permission from DGMS for conducting mining operation near villages and also explore deployment of rock breakers of suitable capacity in the project to avoid blasting very near to villages. There shall be no damages caused to habitation/ structures due to blasting activity.	<p>Complied</p> <p>Blasting permission from DGMS has been obtained. All the statutory provisions laid down in The Mines Act 1952, Coal Mine Regulation 2017 and specific permission from DGMS relating to mining in general and opencast mining in particular are being adhered to and implemented in order to maintain day to day safety.</p>
xx	The Project Proponent shall comply with all the statutory requirements and judgment of Hon'ble Supreme Court dated the 2nd August 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors. State Government shall ensure that the entire compensation levied, if any, for illegal mining paid by the Project Proponent through their respective Department in strict compliance of judgment of Hon'ble Supreme Court dated the 2nd August 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors.	<p>Assured to comply</p> <p>All the statutory requirements and judgment of Hon'ble Supreme Court dated the 2nd August 2017 in Writ Petition (Civil) No. 114 of 2014, will be complied, if any, issued to Topa Project. However, no such direction has been issued to Topa OCP till date.</p>
xxi	Project Proponent shall obtain the necessary prior permission from the Central Ground Water Authority (CGWA) in case of intersecting the Ground water table. The intersecting ground water table can only be commenced after conducting detailed hydrogeological study and necessary permission from the CGWA. The Report on six monthly basis on changes in Ground water level and quality shall be submitted to the Regional Office of the Ministry, CGWA and State Pollution Control Board.	<p>Being Complied</p> <p>Topa RO-OCP(A) falls in Ramgarh District, which falls in "Critical" category as per CGWA categorization. Application for obtaining NoC was submitted to Central Ground Water Authority vide ref no: 21-4/1006/JH/MIN/2022 dated 29/10/2022. The copy of receipt is given below:</p> <div data-bbox="645 1533 1164 1848" style="border: 1px solid black; padding: 5px;"> <p>bharatkesh.gov.in Government of India Receipt Portal</p> <p>PROVISIONAL RECEIPT FOR NEFT TRANSACTION</p> <p>Dear Central Coalfields Limited Topa OCP Kujju Area , Thank you for making a payment of Rs. 10,000.00 with reference to Transaction Reference Number: 1001230013678 and Challan Number: 20241210013300013616 in favour of Ministry: WATER RESOURCES (002), PAO Name: PAO(CGWB), Faridabad (002338), DDO Name: OFFICER INCHARGE, CENTRAL GROUND WATER BOARD, State Unit, JAMNAGAR HOUSE MANSINGH ROAD NEW DELHI 110011 (202417), for Purpose NOC PROCESSING FEE (REVISED) FOR RENEWAL APPLICATION and Payment type .</p> <p>Please note that this is a provisional receipt subject to the validity of the UTR Number SBINS23020216981 entered by you at 10/01/2023. In case of mismatch of the UTR Number the validity of this provisional receipt stands cancelled.</p> <p style="text-align: right;">Printed On: 31-01-2023 12:40:02</p> </div> <p>Courtesy : Controller General of Accounts</p>

xxii	<p>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.</p>	<p>Being Complied Initial Medical Examination (IME) & Periodic Medical Examination (PME) of workers is being carried out for Continuous monitoring of occupational safety and health of workers. The details of IME/PME are as follows:</p> <table border="1" data-bbox="617 873 1191 1041"> <thead> <tr> <th>Year</th> <th>IME</th> <th>PME</th> </tr> </thead> <tbody> <tr> <td>2021</td> <td>21</td> <td>62</td> </tr> <tr> <td>2022</td> <td>4</td> <td>166</td> </tr> </tbody> </table>	Year	IME	PME	2021	21	62	2022	4	166
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xxiii	<p>Project Proponent shall follow the mitigation measures provided in Office Memorandum No. Z-11013/57/2014-IA. II (M), dated 29th October, 2014, titled "Impact of mining activities on Habitations-Issues related to the mining Projects wherein Habitations and villages are the part of mine lease areas or Habitations and villages are surrounded by the mine lease area".</p>	<p>Being Complied The mitigation measures proposed in Ministry's OM No. Z-11013/5712014-IA.11(M) dated 29th October, 2014, are being followed.</p>									

xxiv	<p>The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right for darkness and minimal noise levels at night. PPs must ensure that the biological clock of the villages is not disturbed; by orienting the floodlights/ masks away from the villagers and keeping the noise levels well within the prescribed limits for day light/night hours.</p>	<p>Being Complied It is ensured that noise levels are being maintained within the prescribed standards. Noise monitoring at different stations is being carried out by CMPDIL, Ranchi, and the monitoring reports regarding the same, are attached as Annexure 2. Floodlights are oriented towards the mining areas & transportation routes and it is ensured that habitations are not disturbed due to lights or noise generated during mining operations at night.</p>
xxv	<p>The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna, if any, spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. A copy of action plan shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office.</p>	<p>Being complied All precautionary measures will be taken during mining operation for conservation and protection of endangered fauna.</p>
xxvi	<p>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</p>	<p>Assured to comply After ceasing of mining operations, re-grassing and plantation of the mined-out area or any other area which may have been disturbed due to mining activities will be carried out to restore the land to the condition which is fit for growth of flora, fauna etc. Compliance of this condition will be done after the mining activity is over at the cost of the CCL. Progress report regarding the same will be submitted to the Regional Office of MoEF&CC periodically.</p>

	implementation report of the above said condition shall be sent to the Regional Office of the Ministry.	
xxvii	PP shall not dump any OB in external dump and necessary reclamation and stability action shall be conducted.	Being Complied External dumping has been discontinued and OB removed during the mining operations, is currently being dumped internally. Land Reclamation of the mined-out voids will be carried out as per Final Mine Closure Plan.
xxviii	Permission of OB dump from DGMS beyond 90m shall be taken	Being Complied Currently the height of the Dump is 59 m. If the height of the dump is raised beyond 90 m, permission from DGMS will be obtained.
xxix	R&R activity should be expedited to avoid effect of mining activity on villages located in project area	Being Complied. The R&R details could be seen as follows: Project Affected Families: 259 Families shifted at R&R site: 39 Families yet to be shifted at R&R site: 58 Families given the lumpsum amount: 139 Families desiring lumpsum amount: 23 Rehabilitation of the rest of the PAFs is expedited to avoid effect of mining activity on villages located in project area.
xxx	The external dumping should be stopped.	Being Complied External dumping has been discontinued and OB removed during the mining operations, is being dumped internally.

SN	Specific Condition	Compliance
(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	Complied
ii	The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.	This condition is not applicable for Topa OCP
iii	The project proponent shall prepare a Site-Specific Conservation Plan / Wildlife Management Plan and approved by the Chief Wildlife Warden. The recommendations of the approved Site-Specific Conservation Plan/Wildlife Management Plan shall be implemented in consultation with the State Forest Department. The	Being Complied As per the EMP, no endangered and endemic species of Flora and Fauna are found in the project area; therefore, no separate action plan has been prepared. The precautionary measures are being taken as per the approved EIA/EMP.

	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.	Complied The project has been accorded CTO vide letter no. JSPCB/HO/RNC/CTO-7830040/2022/1594 on date 12.11.2022, issued by JSPCB, valid till 30.09.2023 for 1.68 MTPA.
v	The project proponent shall obtain the necessary permission from the Central Ground Water Authority.	Being Complied Topa RO-OCP(A) falls in Ramgarh District, which falls in "Critical" category as per CGWA categorization. Application for obtaining NoC was made earlier to Central Ground Water Authority for taking NOC vide ref no: 21-4/1006/JH/MIN/2022 dated 29/10/2022. The copy of receipt is given below: 
vi	Solid/hazardous waste generated in the mines need to be addressed in accordance to the Solid Waste Management Rules, 2016/Hazardous & Other Waste Management Rules, 2016.	Being complied Solid & hazardous waste generated in the mines are disposed off in accordance to the Solid Waste Management Rules, 2016/Hazardous & Other Waste Management Rules, 2016.
(b) Air quality monitoring and preservation		
i	Continuous ambient air quality monitoring stations as prescribed in the statute be established in the core zone as well as in the buffer zone for monitoring of pollutants, namely PM ₁₀ , PM _{2.5} , SO ₂ and NO _x . Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with	Being Complied At present the ambient air quality is being monitored at four numbers of stations, on a fortnightly basis, in the core zone as well as in the buffer zone, for pollutants, namely PM ₁₀ , PM _{2.5} , SO ₂ and NO _x . Monitoring of Heavy Metals are also being carried out once every six months. The monitoring report is enclosed as Annexure 2 . PM ₁₀ Analyzer has been installed at Kuju New Siding for continuous dust monitoring and is linked with the JSPCB Servers.

	<p>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.</p>	
ii	<p>The Ambient Air Quality monitoring in the core zone shall be carried out to ensure the Coal Industry Standards notified vide GSR 742 (E) dated 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.</p>	<p>Being Complied Ambient air quality is being monitored by CMPDIL, Ranchi, on a fortnightly basis, in the core zone as well as in the buffer zone for ensuring compliance to the Coal Industry Standards notified vide GSR 742 (E) dated 25th September, 2000. Monitoring of Heavy Metals is also being carried out once every six months. The monitoring report is also being submitted to Regional Office of MoEFCC, JSPCB & CPCB along with six monthly compliance report & Environmental Statement. The monitoring report is enclosed as Annexure 2.</p>
iii	<p>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 etc shall be carried out in critical areas prone to air pollution (with higher values of PM10/PM25) 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.</p>	<p>Being Complied Transportation of coal, to the extent permitted by road, is being carried out by covered trucks. At present the following mitigation measures are being undertaken for control of dust & other fugitive emissions: a. 25 nos. of fixed water sprinklers are in operation at Kuju New Siding for control of dust. b. 01 number of departmental water sprinklers of 28/12 KL capacity having an average working hour of 5 Hr/day are deployed for water sprinkling. c. 2.75 Ha of plantation has been developed under green belt along coal transportation road and other roads. d. 3 tier plantations have been done near the R&R site, also seed ball plantation was done on the slope of the external dump in the monsoon of 2018. e. The monitoring of air parameters is being undertaken fortnightly. f. Plantation through seed ball method in the monsoon of 2021 was carried out on the external dump slopes contractually vide Work order no. CCL/ Kuju/ Topa/ Civil/ AOW/ 2021-22/ 2864/169 dated 12.07.2021 and departmentally in the Monsoon of 2022. g. A total of 5.31 Ha land has been identified for plantation in the Monsoon of 2023.</p>
iv	<p>The transportation of coal shall be</p>	<p>Being Complied</p>

	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.	The transportation of coal is being carried out as per the provisions and route envisaged in the approved Mining Plan or environment monitoring plan.
v	Vehicular emissions shall be kept under control and regularly monitored. All the vehicles engaged in mining and allied activities shall operate only after obtaining PUC certificate from the authorized pollution testing centers.	Being Complied All measures are being undertaken to keep the vehicular emissions under control. All the vehicles engaged in mining and allied activities are being operated only after obtaining PUC certificate from the authorized pollution testing centers.
vi	Coal stock pile/crusher/feeder and breaker material transfer points shall invariably be provided with dust suppression system. Belt-conveyors shall be fully covered to avoid air borne dust. Side cladding all along the conveyor gantry should be made to avoid air borne dust. Drills shall be wet operated or fitted with dust extractors.	Being complied Water sprinkling system has been provided in the crusher hoppers and material transfer points to mitigate dust generation. Photographs of the sprinklers installed in crusher unit is attached as Annexure 1 .
vii	Coal handling plant shall be operated with effective control measures wrt. various environmental parameters. Environmentally friendly sustainable technology should be implemented for mitigating such parameters.	Being complied Water sprinkling system has been provided in the crusher hoppers and material transfer points to mitigate dust generation. Photographs of the sprinklers installed in crusher unit is attached as Annexure 1 .
(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 Coal Industry Standards vide GSR 742 (E) dated 25th September, 2000 and as amended from time to time by the Central Pollution Control Board.	Complied Mine water of Topa OCP is being monitored fortnightly by CMPDIL, Ranchi, with respect to the parameters notified under the Water Act, 1974 Coal Industry Standards vide GSR 742 (E) dated 25th September, 2000. The latest monitoring reports of Topa OCP are enclosed as Annexure 2 .
(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	Being Complied The monitoring data is being displayed at CCL website with six monthly compliance reports & Environment Statement in Form-V.

	Change shall also be referred in this regard for its compliance.	
(iii)	Regular monitoring of ground water level and quality shall be carried out in and around the mine lease area by establishing a network of existing wells and constructing new piezometers during the mining operations. The monitoring of ground water levels shall be carried out four times a year i.e., pre-monsoon, monsoon, post-monsoon and winter. The ground water quality shall be monitored once a year, and the data thus collected shall be sent regularly to MOEFCC/RO.	Being Complied Regular monitoring of Ground water level is carried through series of wells and the data is maintained as per the laid down procedure.
(iv)	Monitoring of water quality upstream and downstream of water bodies shall be carried out once in six months and record of monitoring data shall be maintained and submitted to the Ministry of Environment, Forest and Climate Change/Regional Office.	Being Complied The monitoring of water quality upstream and downstream of Nallah is being carried out by CMPDIL, Ranchi, on a fortnightly basis. The monitoring reports of Topa OCP, with respect to Air quality, Water Quality and noise levels, are enclosed as Annexure 2 .
(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.	Complied. Ground water is not being utilized for mining operations. Rainwater harvesting structures have been constructed at both Topa Project Office and Kaju New Siding Office. Rain water harvesting is being done by making ponds in old quarries and nearby villages. Drinking water is being provided by making hand pumps and wells under CSR schemes. Water is being supplied, vide two community water supply schemes, to 3 Villages namely, Balsagra, Huwag and Toyera; from the abandoned 2A-West quarry of Topa OCP
(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 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	Complied A network of sedimentation ponds connected by catch drains is provided along the OB dump slope and toe of Top soil dump to prevent surface runoff and flow of sediments directly to natural water bodies. Sump capacity is also maintained to ensure to provide adequate retention period to allow proper settling of silt material. Catch drains and sedimentation ponds are regularly de-silted before monsoon every year. Details of plantation is given below: - a. Plantation through seed ball method in the monsoon of 2021 was carried out on the external dump slopes

	<p>into the drains. The drains/ponds so constructed shall be regularly desilted 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 utilized 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</p>	<p>contractually vide Work order no. CCL/ Kuju/ Topa/ Civil/ AOW/ 2021-22/ 2864/169 dated 12.07.2021.</p> <p>b. A total of 5.31 Ha land has been identified for plantation in the Monsoon of 2023.</p>
(vii)	<p>Adequate groundwater recharge measures shall be taken up for augmentation of groundwater. The project authorities shall meet water requirement of nearby village(s) after due treatment conforming to the specific requirement (standards).</p>	<p>Being Complied Ground water recharge is being carried out through the old abandoned quarries 2A West and 3 Central Quarry. Water is being supplied vide two community water supply schemes to 3 Villages (Balsagra, Huwag and Toyera) from abandoned 2A-West quarry of Topa OCP.</p>
(viii)	<p>Industrial waste water generated from CHP, workshop and other waste water, shall be properly collected and treated so as to conform to the standards prescribed under the standards prescribed under Water Act 1974 and Environment (Protection) Act, 1986 and the Rules made there under, and as amended from time to time. Adequate ETP /STP needs to be provided.</p>	<p>Being complied Oil & Grease trap is provided in the excavation workshop for treatment of workshop effluent.</p>
(ix)	<p>The water pumped out from the mine, after siltation, shall be utilized for industrial purpose viz. watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly.</p>	<p>Being complied The water pumped out from mine is being utilized for industrial purpose viz. water sprinkling to control dust generation, green belt development etc. The catch drains and sedimentation ponds are regularly de-silted before monsoon to ensure proper drainage.</p>
(x)	<p>The surface drainage plan including surface water conservation plan for the area of influence affected by the said mining operations, considering the presence of river/rivulet/pond/lake etc, shall be prepared and</p>	<p>Being complied No natural course of any surface water/nallah is being disturbed for the mining activities.</p>

	<p>implemented by the project proponent. The surface drainage plan and/or any diversion of natural watercourses shall be as per the approved Mining Plan/EIA/EMP report and with due approval of the concerned State/GoI Authority.</p> <p>The construction of embankment to prevent any danger against inrush of surface water into the mine should be as per the approved Mining Plan and as per the permission of DGMS or any other authority as prescribed by the law.</p>	
(xi)	<p>The project proponent shall take all precautionary measures to ensure riverine/riparian ecosystem in and around the coalmine up to a distance of 5 km. A riverine /riparian ecosystem conservation and management plan should be prepared and implemented in consultation with the irrigation / water resource department in the state government.</p>	<p>Being complied</p> <p>A study on impact of mining operations on surface water has been carried out as part of EIA/EMP study. Several conservation measures including construction of Ponds, check dams & siltation tanks have been undertaken as per the measures proposed in the EIA/EMP report.</p>
(d) Noise and Vibration monitoring and prevention		
(i)	<p>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 equipment (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.</p>	<p>Being complied</p> <p>The workers engaged in mine workings viz. drilling blasting, HEMM operation etc. are provided with PPE. Regular Training sessions are held to create awareness regarding the safety norms and best working practices to ensure safe working environment for the workers. The details of PPE issued & trainings conducted are enclosed as Annexure 3 & 4 respectively.</p>
(ii)	<p>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.</p>	<p>Being complied</p> <p>Controlled blasting techniques are adopted to mitigate the ground vibrations and to arrest fly rocks, noise, air blast etc. as per the guidelines laid down by DGMS.</p>
(iii)	<p>The noise level survey shall be carried out as per the prescribed guidelines to assess noise exposure of the workmen at vulnerable points in the mine premises, and report in</p>	<p>Complied</p> <p>Noise level monitoring is being carried out by CMPDIL, Ranchi, on a fortnightly basis. The noise levels recorded in the monitoring report were found to be within the permissible limits.</p>

this regard shall be submitted to the Ministry/RO on six-monthly basis.

The monitoring report is enclosed as **Annexure 2.**

(e) Mining Plan

(i)	Mining shall be carried out under strict adherence to provisions of the Mines Act 1952 and subordinate legislations made there-under as applicable.	Being complied. Mining is being carried out as per the provisions of Mines Act 1952 and subordinate legislations thereunder.
(ii)	Mining shall be carried out as per the approved mining plan (including Mine Closure Plan) abiding by mining laws related to coal mining and the relevant circulars issued by Directorate General Mines Safety (DGMS)	Being Complied. Mining is being carried out in accordance to the approved mining plan (including the Mine Closure Plan) and as per the statutes laid down 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	Being Complied. No Mining will be carried out in forest land without obtaining Forestry Clearance.
(iii)	Efforts should be made to reduce energy and fuel consumption by conservation, efficiency improvements and use of renewable energy.	Being Complied. Efforts are being made to improve efficiency of the technology used in mine working, increasing the use of renewable energy sources and adoption of conservation practices to reduce the energy and fuel consumption.

(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 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).	Complied. Digital Survey of entire core zone using Satellite Remote Sensing survey is being carried out once in three years. <thead> <tr> <th>Category</th> <th>Sub-category</th> <th>Area (Hectares)</th> <th>Area (Acres)</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Planned Area</td> <td>Forest Area</td> <td>6.28</td> <td>4.96</td> </tr> <tr> <td>Open Area</td> <td>0.50</td> <td>0.39</td> </tr> <tr> <td>Open Area (C)</td> <td>0.20</td> <td>0.16</td> </tr> <tr> <td>Open Area (D)</td> <td>0.20</td> <td>0.16</td> </tr> <tr> <td rowspan="4">Presently</td> <td>Open Area</td> <td>4.72</td> <td>3.71</td> </tr> <tr> <td>Open Area (C)</td> <td>0.14</td> <td>0.11</td> </tr> <tr> <td>Open Area (D)</td> <td>0.14</td> <td>0.11</td> </tr> <tr> <td>Open Area (E)</td> <td>0.14</td> <td>0.11</td> </tr> <tr> <td rowspan="2">Aggregation</td> <td>Open Area</td> <td>4.84</td> <td>3.81</td> </tr> <tr> <td>Open Area (C)</td> <td>0.14</td> <td>0.11</td> </tr> <tr> <td rowspan="4">Mining Area</td> <td>Open Area</td> <td>7.38</td> <td>5.79</td> </tr> <tr> <td>Open Area (C)</td> <td>4.57</td> <td>3.58</td> </tr> <tr> <td>Open Area (D)</td> <td>22.25</td> <td>17.68</td> </tr> <tr> <td>Open Area (E)</td> <td>20.96</td> <td>16.41</td> </tr> <tr> <td rowspan="4">Mined Area</td> <td>Open Area</td> <td>1.18</td> <td>0.92</td> </tr> <tr> <td>Open Area (C)</td> <td>1.18</td> <td>0.92</td> </tr> <tr> <td>Open Area (D)</td> <td>1.18</td> <td>0.92</td> </tr> <tr> <td>Open Area (E)</td> <td>1.18</td> <td>0.92</td> </tr> <tr> <td rowspan="4">Non-mining Area</td> <td>Open Area</td> <td>119.02</td> <td>93.46</td> </tr> <tr> <td>Open Area (C)</td> <td>119.02</td> <td>93.46</td> </tr> <tr> <td>Open Area (D)</td> <td>119.02</td> <td>93.46</td> </tr> <tr> <td>Open Area (E)</td> <td>119.02</td> <td>93.46</td> </tr> <tr> <td rowspan="4">Non-mining Area</td> <td>Open Area</td> <td>14.18</td> <td>11.18</td> </tr> <tr> <td>Open Area (C)</td> <td>14.18</td> <td>11.18</td> </tr> <tr> <td>Open Area (D)</td> <td>14.18</td> <td>11.18</td> </tr> <tr> <td>Open Area (E)</td> <td>14.18</td> <td>11.18</td> </tr> <tr> <td rowspan="4">Total Area</td> <td>Open Area</td> <td>1248.51</td> <td>979.38</td> </tr> <tr> <td>Open Area (C)</td> <td>1248.51</td> <td>979.38</td> </tr> <tr> <td>Open Area (D)</td> <td>1248.51</td> <td>979.38</td> </tr> <tr> <td>Open Area (E)</td> <td>1248.51</td> <td>979.38</td> </tr> </tbody>	Category	Sub-category	Area (Hectares)	Area (Acres)	Planned Area	Forest Area	6.28	4.96	Open Area	0.50	0.39	Open Area (C)	0.20	0.16	Open Area (D)	0.20	0.16	Presently	Open Area	4.72	3.71	Open Area (C)	0.14	0.11	Open Area (D)	0.14	0.11	Open Area (E)	0.14	0.11	Aggregation	Open Area	4.84	3.81	Open Area (C)	0.14	0.11	Mining Area	Open Area	7.38	5.79	Open Area (C)	4.57	3.58	Open Area (D)	22.25	17.68	Open Area (E)	20.96	16.41	Mined Area	Open Area	1.18	0.92	Open Area (C)	1.18	0.92	Open Area (D)	1.18	0.92	Open Area (E)	1.18	0.92	Non-mining Area	Open Area	119.02	93.46	Open Area (C)	119.02	93.46	Open Area (D)	119.02	93.46	Open Area (E)	119.02	93.46	Non-mining Area	Open Area	14.18	11.18	Open Area (C)	14.18	11.18	Open Area (D)	14.18	11.18	Open Area (E)	14.18	11.18	Total Area	Open Area	1248.51	979.38	Open Area (C)	1248.51	979.38	Open Area (D)	1248.51	979.38	Open Area (E)	1248.51	979.38
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| (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 interventions shall be provided for sustenance of aquatic life therein. The remaining area shall be backfilled and covered with thick | **Assured to comply.** The final mine void depth will be as per the approved mining plan. The remaining area will be backfilled and reclaimed as per the approved mine closure plan. A total amount of Rs. 1248.51 Lakhs has been deposited till 31.03.2022 out of the total mine closure corpus of Rs. 5792.55 Lakhs. |

	<p>and alive topsoil. 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.</p>	<p>The Mine closure plan of Topa is attached as Annexure 6.</p>
(iii)	<p>The entire excavated area, backfilling, external OS 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.</p>	<p>Assured to comply. It will be ensured that the land use of the project shall be in conformity with land use pattern as submitted in the approved mining plan & EIA/EMP report. The progressive compliance status vis-a-vis the post mining land use will be submitted.</p>
(iv)	<p>Fly ash shall be used for external dump of overburden, backfilling or stowing of mine as per provisions contained in clause (i) and (ii) of 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 MoEFCC, CPCB & SPCB</p>	<p>Assured to comply At present there is no fly ash is being dumped in the project. However, if the fly ash shall be used for dumping the provisions contained in clause (i) and (ii) of subparagraph (8) of fly ash notification issued vide SO 2804 (E) dated 3rd November, 2009, will be followed.</p>
(v)	<p>Further, it may be ensured that as per the time schedule specified in mine closure plan it should remain live till the point of utilization. The topsoil shall temporarily be stored at earmarked site(s) only and shall not be kept unutilized. The topsoil shall be used for land reclamation and plantation purposes. Active OB dumps shall be stabilized with native grass species to prevent erosion and surface run off. The other overburden dumps shall be vegetated with native flora species.</p>	<p>Being complied The time schedule specified in the mine closure plan will be adhered to. The void area created due to mining, will be backfilled and reclaimed as per the approved mine closure plan. A total amount of Rs. 1248.51 Lakhs has been deposited till 31.03.2022, out of the total mine closure corpus of Rs. 5792.55 Lakhs.</p>

	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.	
(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.	Complied At present, there is no grazing land is involved in the project area of 276.66 Ha.

(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.	Being Complied As per the EMP, no endangered and endemic species of Flora and Fauna are found in the project area; therefore, no separate action plan has been prepared. The precautionary measures are being taken as per the approved EIA/EMP.
(ii)	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.	Being Complied Details of plantation is given below: - a. Plantation through seed ball method in the monsoon of 2021 was carried out on the external dump slopes contractually vide Work order no. CCL/ Kuju/ Topa/ Civil/ AOW/ 2021-22/ 2864/169 dated 12.07.2021. b. 2.75 Ha of plantation has been developed under green belt along coal transportation road and other roads. c. 3 tier plantations have been done near the R&R site, also seed ball plantation was done on the slope of the external dump in the monsoon of 2018. d. Plantation through seedball method was carried out departmentally over the OB dump slopes in the Monsoon of 2022. e. Saplings were also planted at various sites in Topa Project and Kuju New Siding, in the monsoon of 2022, to increase the green belt cover. f. A total of 5.31 Ha land has been identified for plantation in the Monsoon of 2023.

(h) Public hearing and Human health issues											
(i)	<p>Adequate illumination shall be ensured in all mine locations (as per DGMS standards) and monitored weekly. The report on the same shall be submitted to this ministry & it's RO on six-monthly basis.</p>	<p>Being Complied It is being ensured that adequate illumination is available at all the mine locations. Illumination surveys at different mine locations are being carried out (as per DGMS standards).</p>									
(ii)	<p>The project proponent shall undertake occupational health survey for initial and periodical medical examination of the personnel engaged in the project and maintain records accordingly as per the provisions of the Mines Rules, 1955 and DGMS circulars. Besides regular periodic health check-up, 20% of the 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.</p>	<p>Being Complied Initial Medical Examination (IME) & Periodic Medical Examination (PME) of workers is being carried out for Continuous monitoring of occupational safety and health of workers. The details of IME/PME are as follows:</p> <table border="1"> <thead> <tr> <th>Year</th> <th>IME</th> <th>PME</th> </tr> </thead> <tbody> <tr> <td>2021</td> <td>21</td> <td>62</td> </tr> <tr> <td>2022</td> <td>4</td> <td>166</td> </tr> </tbody> </table>	Year	IME	PME	2021	21	62	2022	4	166
Year	IME	PME									
2021	21	62									
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(iii)	<p>Personnel (including outsourced employees) working in core zone shall wear protective respiratory devices and shall also be provided with adequate training and information on safety and health aspects.</p>	<p>Being Complied All personnel working in core zone have been provided with protective respiratory devices along with adequate training and information on safety and health aspects. The details of PPE issued & trainings conducted are enclosed as Annexure 3 & 4 respectively.</p>									
(iv)	<p>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.</p>	<p>Complied The issues raised during Public Hearing have been complied. R & R plan has been prepared as per the details submitted in EIA/EMP report and is being followed to provide the benefits as per the CIL approved R & R Policy.</p>									
(v)	<p>The project proponent shall follow the mitigation measures provided in this Ministry's OM No. Z-11013/5712014-1A.11 (M) dated 29th October, 2014, titled 'Impact of</p>	<p>Being Complied The mitigation measures proposed in Ministry's OM No. Z-11013/5712014-1A.11 (M) dated 29th October, 2014 are being followed.</p>									

	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'.	
(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 1 st May 2018, as applicable, regarding Corporate Environment Responsibility.	Complied A fund provision of Rs. 14.63 Crore has been allocated for Environmental protection measures.
(ii)	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.	Complied CCL has a well laid down environmental policy duly approved by the Board of Directors. The environmental policy prescribes standard operating procedures, to ensure proper checks and balances and to bring into focus any infringements/ deviation/ violation of the environmental/forest /wildlife norms/conditions. The approved Environmental Policy is also available at CCL website at: https://www.centralcoalfields.in/sutbs/pdf/17_12_19_CorporateEnvironmentalPolicy2018.pdf
(iii)	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.	Complied Separate Environmental cell has been setup at both levels i.e. at project level & company head quarter level.
(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 of action plan shall be reported to the Ministry/Regional Office along with the Six-Monthly	Complied

	Compliance Report.	
(v)	Self-environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.	Assured to comply As directed, a third-party assessment will be carried out for TOPA RO-OCP, once in three years through expert agency recognized by MoEF&CC. Self-environmental audit shall also be conducted annually and report will be submitted to MoEF&CC.
(j) 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 seven days and in addition this shall also be displayed in the project proponent's website permanently.	Complied Environment clearance letter has been uploaded on CCL Web Site. The link of the same is given below: https://www.centralcoalfields.in/sutbs/envr_clrnce.php The EC was also advertised in local Newspapers.
(ii)	The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.	Complied The copy of environmental clearance has been submitted to head of Panchayats & Municipal Bodies.
(iii)	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half yearly basis.	Complied The status of compliance is uploaded on CCL website along with results of monitored data. The web-link is given below: https://www.centralcoalfields.in/sutbs/six_mnthly.php
(iv)	The project proponent shall monitor the criteria pollutants level namely; PM ₁₀ , SO ₂ , NO _x (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.	Complied The criteria pollutants level namely; PM ₁₀ , PM _{2.5} , SO ₂ , NO _x is monitored by CMPDIL, Ranchi, on a fortnightly basis. The monitoring report data is being displayed at CCL website along with the six-monthly compliance reports & Environment Statement in Form-V.
(v)	The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the	Complied The six-monthly compliance report is submitted to the regional office of the MoEF&CC regularly.

	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.11 (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'.	Being Complied The mitigation measures proposed in Ministry's OM No. Z-11013/5712014-IA.11 (M) dated 29th October, 2014 are being followed.
(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.	Complied The environmental statement, in Form-V, is submitted to the Jharkhand State Pollution Control Board & the same is also displayed on the website of the company at: https://www.centralcoalfields.in/sutbs/envr_stmnt.php
(viii)	The project authorities shall inform to the Regional Office of the MOEFCC regarding commencement of mining operations.	Complied Topa OCP is an old mine of CCL. The progressive reports are being submitted periodically to MoEFCC, along with the six-monthly compliances.
(ix)	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.	Being Complied The stipulations made by the State Government & Jharkhand State Pollution Control Board are being strictly adhered to.
(x)	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the Expert Appraisal Committee.	Being Complied All the necessary action are being taken for fulfilment of the commitments and recommendations made in the EIA/EMP report, public hearing and the submissions made to MoEFCC. The updated status of the actions taken with respect to the commitments made, will be submitted to MoEFCC every six month, along with the compliance report.
(xi)	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change.	Agreed
(xii)	Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract	Agreed

	action under the provisions of Environment (Protection) Act, 1986.	
(xiii)	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	Agreed
(xiv)	The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.	Agreed
(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.	Agreed
(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 Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.	Agreed

Admitted
NO ENV


7/6/23

Project Officer
Topa RO-OCP, Kuju Area.
परियोजना पदाधिकारी
तोपा आर.ओ-ओ.सी.पी (ए) (माइन)



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सेंट्रल कोलफील्ड्स लिमिटेड

(भारत सरकार का उपक्रम)

CENTRAL COALFIELDS LIMITED

Office of the Project Officer, Topa Project

Kuju Area

Annexure 1

Photograph of Tarpaulin covered Truck



Photographs of Water sprinkling system has been provided at the Crusher unit installed at Topa Project



TEST REPORT

12/22 Test Report No. 2050	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Dec-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju

Project: Topa OC & UG

Stations: P.O Office

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ + >PM ₁₀)/TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Oct-22 1st FN	11/10/22-12/10/22	17-10-2022	17/10/22-31/10/22	225	101	50	< 25	< 6	East Sunny
Oct-22 2nd FN	25/10/22-26/10/22	01-11-2022	01/11/22-14/11/22	310	164	77	< 25	< 6	East Sunny
Nov-22 3rd FN	09/11/22-10/11/22	16-11-2022	16/11/22-24/11/22	246	117	43	< 25	< 6	East Sunny
Nov-22 4th FN	24/11/22-25/11/22	01-12-2022	01/12/22-15/12/22	138	71	32	< 25	< 6	East Sunny
Dec-22 5th FN	09/12/22-10/12/22	16-12-2022	16/12/22-29/12/22	232	95	51	< 25	< 6	East Sunny
Dec-22 6th FN	24/12/22-25/12/22	02-01-2023	02/01/23-12/01/23	219	93	48	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

12/22 Test Report No. 2051	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Dec-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG** **Stations:** Guest House

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ + >PM ₁₀)TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Oct-22 1st FN	11/10/22-12/10/22	17-10-2022	17/10/22-31/10/22	147	74	37	< 25	< 6	East Sunny
Oct-22 2nd FN	25/10/22-26/10/22	01-11-2022	01/11/22-14/11/22	142	76	34	< 25	< 6	East Sunny
Nov-22 3rd FN	09/11/22-10/11/22	16-11-2022	16/11/22-24/11/22	134	64	27	< 25	< 6	East Sunny
Nov-22 4th FN	24/11/22-25/11/22	01-12-2022	01/12/22-15/12/22	203	81	42	< 25	< 6	East Sunny
Dec-22 5th FN	09/12/22-10/12/22	16-12-2022	16/12/22-29/12/22	178	83	42	< 25	< 6	East Sunny
Dec-22 6th FN	24/12/22-25/12/22	02-01-2023	02/01/23-12/01/23	103	56	26	< 25	< 6	North Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

12/22 Test Report No. 2052	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Dec-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG** **Stations:** **Banwar Tola**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ +>PM ₁₀)TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Oct-22 1st FN	12/10/22-13/10/22	17-10-2022	17/10/22-31/10/22	172	87	42	< 25	< 6	East Sunny
Oct-22 2nd FN	26/10/22-27/10/22	01-11-2022	01/11/22-14/11/22	126	64	29	< 25	< 6	East Sunny
Nov-22 3rd FN	10/11/22-11/11/22	16-11-2022	16/11/22-24/11/22	112	51	23	< 25	< 6	East Sunny
Nov-22 4th FN	25/11/22-26/11/22	01-12-2022	01/12/22-15/12/22	152	73	32	< 25	< 6	East Sunny
Dec-22 5th FN	10/12/22-11/12/22	16-12-2022	16/12/22-29/12/22	235	97	51	< 25	< 6	North Sunny
Dec-22 6th FN	25/12/22-26/12/22	02-01-2023	02/01/23-12/01/23	222	93	50	< 25	< 6	North Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

12/22 Test Report No. 2053	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Dec-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG** **Stations:** **Topa Colony**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ +>PM ₁₀)TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Oct-22 1st FN	12/10/22-13/10/22	17-10-2022	17/10/22-31/10/22	246	114	53	< 25	< 6	East Sunny
Oct-22 2nd FN	26/10/22-27/10/22	01-11-2022	01/11/22-14/11/22	154	75	35	< 25	< 6	East Sunny
Nov-22 3rd FN	10/11/22-11/11/22	16-11-2022	16/11/22-24/11/22	190	86	43	< 25	< 6	East Sunny
Nov-22 4th FN	25/11/22-26/11/22	01-12-2022	01/12/22-15/12/22	208	97	50	< 25	< 6	East Sunny
Dec-22 5th FN	10/12/22-11/12/22	16-12-2022	16/12/22-29/12/22	136	74	37	< 25	< 6	North Sunny
Dec-22 6th FN	25/12/22-26/12/22	02-01-2023	02/01/23-12/01/23	138	73	36	< 25	< 6	North Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

12/22 Test Report No. 2054	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Dec-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju**

Project: **Topa OC & UG**

Stations: **Kuju New Siding**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ + >PM ₁₀)/TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Oct-22 1st FN	12/10/22-13/10/22	17-10-2022	17/10/22-31/10/22	209	86	41	< 25	< 6	East Sunny
Oct-22 2nd FN	26/10/22-27/10/22	01-11-2022	01/11/22-14/11/22	208	109	57	< 25	< 6	East Sunny
Nov-22 3rd FN	10/11/22-11/11/22	16-11-2022	16/11/22-24/11/22	156	71	35	< 25	< 6	East Sunny
Nov-22 4th FN	25/11/22-26/11/22	01-12-2022	01/12/22-15/12/22	237	104	44	< 25	< 6	East Sunny
Dec-22 5th FN	10/12/22-11/12/22	16-12-2022	16/12/22-29/12/22	280	142	55	< 25	< 6	North Sunny
Dec-22 6th FN	25/12/22-26/12/22	02-01-2023	02/01/23-12/01/23	242	123	63	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

12/22 Test Report No. 2056	Job No. 094322160	Year	FY2022-23
Type of Sample:	Effluent Water	Quarter Ending	Dec-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	MOEF -SCH-VI STANDARDS, Class 'A', LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG** **Stations:** **OC Lagoon Discharge**

Analysis Results of FN Effluent Water							
Parameters →				COD	O & G	pH value	TSS
Detection Limit				4	2	0.2	10
MOEF -SCH-VI, STANDARDS, Class 'A'				250	10	5.5 to 9.0	100
Month	Date of Sampling	Date of Receipt of Sample	Date of Analysis	Value in mg/l, except pH			
Oct-22 1st FN	13/10/22	17/10/22	17/10/22-31/10/22	12	<2.00	7.77	25
Oct-22 2nd FN	28/10/22	01/11/22	01/11/22-15/11/22	20	<2.00	8.06	40
Nov-22 3rd FN	12/11/22	16/11/22	16/11/22-30/11/22	16	<2.00	8	31
Dec-22 5th FN	12/12/22	16/12/22	16/12/22-30/12/22	16	<2.00	7.5	31
Dec-22 6th FN	27/12/22	02/01/23	02/01/23-13/01/23	16	<2.00	8.3	32
BIS Standard & Method				APHA, 23rd Edition, Closed Reflux, Titrimetric Method, 2017	IS 3025/39:1991, R : 2003, Partition Gravimetric	IS-3025/11:1983, R-1996, Electrometric	IS 3025/17:1984, R :1996, Gravimetric Method

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TEST REPORT

12/22 Test Report No. 2057	Job No. 094322160	Year	FY2022-23
Type of Sample:	Effluent Water	Quarter Ending	Dec-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	MOEF -SCH-VI STANDARDS, Class 'A', LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju **Project:** Topa OC & UG **Stations:** New Quarry OC Water

Analysis Results of FN Effluent Water							
Parameters →				COD	O & G	pH value	TSS
Detection Limit				4	2	0.2	10
MOEF -SCH-VI, STANDARDS, Class 'A'				250	10	5.5 to 9.0	100
Month	Date of Sampling	Date of Receipt of Sample	Date of Analysis	Value in mg/l, except pH			
Oct-22 1st FN	13/10/22	17/10/22	17/10/22-31/10/22	16	<2.00	7.86	31
Oct-22 2nd FN	28/10/22	01/11/22	01/11/22-15/11/22	16	<2.00	8.05	28
Nov-22 3rd FN	12/11/22	16/11/22	16/11/22-30/11/22	12	<2.00	8	28
Dec-22 5th FN	12/12/22	16/12/22	16/12/22-30/12/22	12	<2.00	7.5	25
Dec-22 6th FN	27/12/22	02/01/23	02/01/23-13/01/23	12	<2.00	8.4	25
BIS Standard & Method				APHA, 23rd Edition, Closed Reflux, Titrimetric Method, 2017	IS 3025/39:1991, R : 2003, Partition Gravimetric	IS-3025/11:1983, R-1996, Electrometric	IS 3025/17:1984, R :1996, Gravimetric Method

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TEST REPORT

12/22 Test Report No. 2058	Job No. 094322160	Year	2022-23
Type of Sample:	Effluent Water	Quarter Ending	Dec.'22
Customer / W. O. no. & Date:	CCL	Date of Receipt of Sample:	01/12/22
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	01/12/22-06/01/23
Testing /Sampling Protocol	MOEF -SCH-VI STANDARDS, Class 'A', LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area :	Kuju	Project:	Topa OC & UG
Stations:	1. OC Lagoon Discharge (Nov 2 nd FN) 2. New Quarry OC Water (Nov 2 nd FN)		Date of Sampling: 26/11/2022 26/11/2022

Sl.No.	Parameter	Sampling Stations			Detection Limit	MOEF -SCH-VI STANDARDS Class 'A'	BIS Standard & Method
		1	2	3			
1	Ammonical Nitrogen, mg/l, Max	0.25	0.44		0.02	50.0	IS 3025/34:1988, R : 2009, Nessler's Method
2	Arsenic (as As), mg/l, Max	<0.002	<0.002		0.002	0.2	IS 3025/37:1988 R : 2003, AAS-VGA
3	B.O.D (3 days 27°C), mg/l, Max	<2.00	<2.00		2.00	30.0	IS 3025 /44:1993, R:2003 3 day incubation at 27°C
4	Cadmium(as Cd), mg/l, Max	<0.0004	<0.0004		0.0004	2.0	APHA, 23rd Edition 3120 B ICP Method, 2017
5	COD, mg/l, Max	28	24		4.00	250.0	APHA, 23rd Edition, Closed Reflux, Titrimetric Method: 2017
6	Copper (as Cu), mg/l, Max	<0.02	<0.02		0.02	3.0	IS 3025/42: 1992, R : 2009, AAS (Air-Ac-Flame)
7	Dissolved Phosphate, mg/l, Max	<0.30	<0.30		0.30	5.0	APHA, 23rd Edition Molybdovanadate Method, 2017
8	Fluoride (as F) mg/l, Max	0.61	0.61		0.02	2.0	APHA, 23rd Edition, SPADNS Method, 2017
9	Free Ammonia, mg/l, Max	<0.02	<0.02		0.02	5.0	IS:3025/34:1988, Nessler's
10	Hexavalent Chromium, mg/l, Max	<0.01	<0.01		0.01	0.1	APHA, 23rd Edition, Diphenylcarbohydrazide
11	Iron (as Fe), mg/l, Max	<0.04	<0.04		0.04	3.0	IS 3025 /53: 2003, R : 2009 , AAS-(Air-Ac-Flame)
12	Lead (as Pb), mg/l, Max	<0.001	<0.001		0.001	0.1	APHA, 23rd Edition 3120 B ICP Method, 2017
13	Manganese(as Mn), mg/l, Max	<0.01	0.12		0.01	2.0	IS-3025/59:2006, AAS (Air-Ac-Flame)
14	Nickel (as Ni), mg/l, Max	<0.003	<0.003		0.003	3.0	APHA, 23rd Edition 3120 B ICP Method, 2017
15	Nitrate Nitrogen, mg/l, Max	0.50	0.50		0.50	10.0	APHA, 23rd Edition, UV-Spectrophotometric Method, 2017
16	Oil & Grease, mg/l, Max	<2.00	<2.00		2.00	10.0	IS 3025/39:1991, R : 2003, Partition Gravimetric Method
17	pH value	8.0	8.0		1.0	5.5 to 9.0	IS-3025/11:1983, R-1996, Electrometric Method
18	Phenolic compounds (as C ₆ H ₅ OH),mg/l, Max	<0.001	<0.001		0.001	1.0	APHA, 23rd Edition, 4- Amino Antipyrine Method, 2017
19	Selenium (as Se), mg/l, Max	<0.0005	<0.0005		0.0005	0.05	APHA, 23rd Edition 3120 B ICP Method, 2017
20	Sulphide (as S ²⁻), mg/l, Max	<0.005	<0.005		0.005	2.0	APHA, 23rd Edition Methylene Blue Method, 2017
21	Temperature (° C)	20.2	20.1		Shall not exceed 5° C above the receiving temp.		IS-3025/09:1984, R:2002, Thermometric
22	Total Chromium (as Cr), mg/l, Max	<0.002	<0.002		<0.002	2.0	APHA, 23rd Edition 3120 B ICP Method, 2017
23	Total Kjeldahl Nitrogen, mg/l, Max	1.4	1.4		1.00	100.0	APHA, 23rd Edition, Kjeldahl Method: 2017
24	Total Residual Chlorine, mg/l, Max	<0.02	<0.02		0.02	1.0	APHA, 23rd Edition, DPD Method, 2017
25	Total Suspended Solids, mg/l, Max	166	89		10.00	100.0	IS 3025/17:1984, R :1996, Gravimetric Method
26	Zinc (as Zn), mg/l, Max	<0.005	<0.005		0.005	5.0	IS 3025 /49: 1994, R: 2009, AAS (Air-Ac-Flame)

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TEST REPORT

12/22 Test Report No. 2059	Job No. 094322160	Year	FY2022-23
Type of Sample:	Surface Water	Quarter Ending	Dec-22
Customer	CCL	Date of Receipt:	17-10-2022
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	17.10.22-15.12.22
Testing/ Sampling Protocol	LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG**
Stations: 1. Topa Nala U/S **Date of Sampling:** 13-10-2022
 2. Topa Nala D/S 13-10-2022


Sl.No	Parameter	Sampling Stations				Detection Limit	BIS Standard & Method
		1	2	3	4		
1	Arsenic (as As), mg/l, Max	<0.002	<0.002			0.002	IS 3025/37:1988 R : 2003, AAS-VGA, Method
2	BOD (3 days 27°C), mg/l, Max	2.2	2.5			2.00	IS 3025 /44: 1993, R: 2003 3 day incubation at 27°C
3	Cadmium(as Cd), mg/l, Max	<0.0004	<0.0004			0.0004	APHA, 23rd Edition AAS-GTA Method, 2017
4	Chlorides (as Cl), mg/l, Max	14	16			2.00	IS-3025/32:1988, R-2007, Argentometric Method
5	Copper (as Cu), mg/l, Max	<0.02	<0.02			0.02	IS 3025/42: 1992, R : 2009, AAS (Air-Ac-Flame)
6	Dissolved Oxygen, min.	7.6	7.5			0.10	IS 3025/38: 1989, R:2003, Winkler Azide Method
7	Fluoride (as F) mg/l, Max	0.69	0.74			0.02	APHA, 23rd Edition, SPADNS Method, 2017
8	Hexavalent Chromium, mg/l, Max	<0.01	<0.01			0.01	APHA, 23rd Edition, 2017 Diphenylcarbohydrazide,
9	Iron (as Fe), mg/l, Max	<0.04	<0.04			0.04	IS 3025 /53: 2003, R : 2009, AAS (Air-Ac-Flame)
10	Lead (as Pb), mg/l, Max	<0.001	<0.001			0.001	APHA, 23rd Edition AAS-GTA Method, 2017
11	Nitrate (as NO ₃), mg/l, Max	6.79	7.14			0.50	APHA, 23rd Edition, UV - Spectrophotometric, 2017
12	pH value	8.1	7.9			1.0	IS-3025/11:1983, R-1996, Electrometric Method
13	Phenolic compounds (as C ₆ H ₅ OH), mg/l, Max	<0.001	<0.001			0.001	APHA, 23rd Edition, 2017, 4-Amino Antipyrine Method,
14	Selenium (as Se), mg/l, Max	<0.0005	<0.0005			0.0005	IS 3025/56:2003 AAS-VGA Method
15	Sulphate (as SO ₄) mg/l, Max	104	109			2.00	APHA, 23rd Edition Turbidity Method, 2017
16	Total Dissolved Solids, mg/l, Max	367	376			25.00	IS 3025 /16:1984 R : 2006, Gravimetric Method
17	Total Suspended Solids, mg/l, Max	31	36			10.00	IS 3025 /17:1984, R :1996, Gravimetric Method
18	Zinc (as Zn), mg/l, Max	<0.005	<0.005			0.005	IS 3025 /49: 1994, R : 2009, AAS (Air-Ac-Flame)

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TEST REPORT

 TC - 7470	Lab No. T-2187		
	12/22 Test Report No. Metal/09	Job No. 094322160	2022-23
Type of Sample	Ambient Air	Quarter Ending	Dec'22
Customer	CCL	Date of Receipt of Sample:	17/10/2022
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	05/11/22-23/12/22
Sampling Protocol:	USEPA IO-3.2: 1999, LQR 32		
Remarks & Observation:	All Samples placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results:-

Area : **Kuju** **Project:** **Topa OC & UG**

Stations: **4. Topa Colony** **Date of Sampling:** **12-13/10/2022**
5. UG Pit Office **12-13/10/2022**

S.No	Test Parameters	Units	Test Result				Method detection Limit	Limit (NAAQS-2011)	Test Method
			4	5					
Stations:			4	5					
1	Conc. of As in Air	ng/m ³	0.37	4.09			0.1	6.00	USEPA IO-3.2:1999
2	Conc. of Ni in Air	ng/m ³	8.18	10.49			0.1	20.00	USEPA IO-3.2:1999
3	Conc. of Pb in Air	µg/m ³	0.030	0.039			0.005	1.0	USEPA IO-3.2: 1999
4	Conc. of Cu in Air	ng/m ³	0.14	0.15			0.1	-	USEPA IO-3.2: 1999
5	Conc. of Cd in Air	ng/m ³	0.155	0.105			0.02	-	USEPA IO-3.2: 1999
6	Conc. of Cr in Air	ng/m ³	2.09	2.63			0.1	-	USEPA IO-3.2: 1999

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TEST REPORT

12/22 Test Report No. 2025	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	December-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG** **Stations:** **P.O Office**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in µg/m ³)	CO (in mg/m ³)	Ozone (in µg/m ³)	
Oct '22 1st FN	12/10/22	12/10/22	12/10/22	<20	0.574	<19.62	E to W
Oct '22 2nd FN	25/10/22	25/10/22	25/10/22	<20	0.641	<19.62	E to W
Nov '22 3rd FN	09/11/22	09/11/22	09/11/22	<20	0.451	<19.62	E to W
Nov. '22 4th FN	24/11/22	24/11/22	24/11/22	<20	0.309	<19.62	E to W
Dec. '22 5th FN	09/12/22	09/12/22	09/12/22	<20	0.410	<19.62	E to W
Dec. '22 6th FN	24/12/22	24/12/22	24/12/22	<20	0.658	<19.62	E to W

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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ENVIRONMENT LABORATORY , CMPDI (HQ) , RANCHI

TEST REPORT

12/22 Test Report No. 2026	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	December-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG** **Stations:** **Guest House**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in µg/m ³)	CO (in mg/m ³)	Ozone (in µg/m ³)	
Oct '22 1st FN	11/10/22	11/10/22	11/10/22	<20	0.521	<19.62	E to W
Oct '22 2 nd FN	25/10/22	25/10/22	25/10/22	<20	0.478	<19.62	N to S
Nov '22 3 rd FN	09/11/22	09/11/22	09/11/22	<20	0.487	<19.62	E to W
Nov. '22 4 th FN	24/11/22	24/11/22	24/11/22	<20	0.409	<19.62	E to W
Dec. '22 5 th FN	09/12/22	09/12/22	09/12/22	<20	0.644	<19.62	E to W
Dec. '22 6 th FN	24/12/22	24/12/22	24/12/22	<20	0.485	<19.62	E to W

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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ENVIRONMENT LABORATORY , CMPDI (HQ) , RANCHI**TEST REPORT**

12/22 Test Report No. 2027	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	December-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju **Project:** Topa OC & UG **Stations:** Banwar Tola

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in $\mu\text{g}/\text{m}^3$)	CO (in mg/m^3)	Ozone (in $\mu\text{g}/\text{m}^3$)	
Oct '22 1st FN	12/10/22	12/10/22	12/10/22	<20	0.568	<19.62	E to W
Oct '22 2 nd FN	26/10/22	26/10/22	26/10/22	<20	0.487	<19.62	N to S
Nov '22 3 rd FN	10/11/22	10/11/22	10/11/22	<20	0.402	<19.62	E to W
Nov. '22 4 th FN	25/11/22	25/11/22	25/11/22	<20	0.389	<19.62	E to W
Dec. '22 5 th FN	10/12/22	10/12/22	10/12/22	<20	0.511	<19.62	E to W
Dec. '22 6 th FN	25/12/22	25/12/22	25/12/22	<20	0.601	<19.62	E to W

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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ENVIRONMENT LABORATORY , CMPDI (HQ) , RANCHI**TEST REPORT**

12/22 Test Report No. 2028	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	December-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju

Project: Topa OC & UG

Stations: Topa Colony

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in $\mu\text{g}/\text{m}^3$)	CO (in mg/m^3)	Ozone (in $\mu\text{g}/\text{m}^3$)	
Oct '22 1st FN	12/10/22	12/10/22	12/10/22	<20	0.515	<19.62	E to W
Oct '22 2 nd FN	26/10/22	26/10/22	26/10/22	<20	0.524	<19.62	N to S
Nov '22 3 rd FN	10/11/22	10/11/22	10/11/22	<20	0.389	<19.62	E to W
Nov. '22 4 th FN	25/11/22	25/11/22	25/11/22	<20	0.274	<19.62	E to W
Dec. '22 5 th FN	10/12/22	10/12/22	10/12/22	<20	0.501	<19.62	E to W
Dec. '22 6 th FN	25/12/22	25/12/22	25/12/22	<20	0.496	<19.62	E to W

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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ENVIRONMENT LABORATORY , CMPDI (HQ) , RANCHI**TEST REPORT**

12/22 Test Report No. 2029	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	December-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju **Project:** Topa OC & UG **Stations:** Kuju New siding

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in µg/m ³)	CO (in mg/m ³)	Ozone (in µg/m ³)	
Oct '22 1st FN	12/10/22	12/10/22	12/10/22	<20	0.628	<19.62	E to W
Oct '22 2 nd FN	26/10/22	26/10/22	26/10/22	<20	0.561	<19.62	E to W
Nov '22 3 rd FN	10/11/22	10/11/22	10/11/22	<20	0.613	<19.62	E to W
Nov. '22 4 th FN	25/11/22	25/11/22	25/11/22	<20	0.393	<19.62	E to W
Dec. '22 5 th FN	10/12/22	10/12/22	10/12/22	<20	0.572	<19.62	E to W
Dec. '22 6 th FN	25/12/22	25/12/22	25/12/22	<20	0.581	<19.62	E to W

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
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TEST REPORT

06/22 Test Report No. 2045	Job No. 094321044	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Jun-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju**

Project: **Topa OC & UG**

Stations: **Guest House**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ +>PM ₁₀)TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Apr-22 1st FN	09/04/22-10/04/22	16-04-2022	16/04/22-22/04/22	112	72	38	< 25	< 6	East Sunny
Apr-22 2nd FN	25/04/22-26/04/22	02-05-2022	02/05/22-12/05/22	127	64	31	< 25	< 6	North Sunny
May-22 3rd FN	10/05/22-11/05/22	16-05-2022	16/05/22-27/05/22	170	67	42	< 25	< 6	East Sunny
May-22 4th FN	26/05/22-27/05/22	01-06-2022	01/06/22-10/06/22	197	91	43	< 25	< 6	North Sunny
Jun-22 5th FN	09/06/22-10/06/22	16-06-2022	16/06/22-23/06/22	285	91	55	< 25	< 6	East Sunny
Jun-22 6th FN	24/06/22-25/06/22	01-07-2022	01/07/22-08/07/22	152	59	23	< 25	< 6	West Cloud

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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ENVIRONMENT LABORATORY , CMPDI (HQ) , RANCHI

TEST REPORT

06/22 Test Report No. 2046	Job No. 094321044	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Jun-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG** **Stations:** **Banwar Tola**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ +>PM ₁₀)TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Apr-22 1st FN	10/04/22-11/04/22	16-04-2022	16/04/22-22/04/22	136	70	24	< 25	< 6	East Sunny
Apr-22 2nd FN	25/04/22-26/04/22	02-05-2022	02/05/22-12/05/22	217	88	38	< 25	< 6	North Sunny
May-22 3rd FN	10/05/22-11/05/22	16-05-2022	16/05/22-27/05/22	337	139	61	< 25	< 6	East Sunny
May-22 4th FN	27/05/22-28/05/22	01-06-2022	01/06/22-10/06/22	170	69	38	< 25	< 6	East Sunny
Jun-22 5th FN	10/06/22-11/06/22	16-06-2022	16/06/22-23/06/22	138	72	42	< 25	< 6	East Sunny
Jun-22 6th FN	25/06/22-26/06/22	01-07-2022	01/07/22-08/07/22	224	82	43	< 25	< 6	West Cloud

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

06/22 Test Report No. 2047	Job No. 094321044	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Jun-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG** **Stations:** **Topa Colony**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ +>PM ₁₀)TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Apr-22 1st FN	10/04/22-11/04/22	16-04-2022	16/04/22-22/04/22	159	73	33	< 25	< 6	East Sunny
Apr-22 2nd FN	25/04/22-26/04/22	02-05-2022	02/05/22-12/05/22	223	94	54	< 25	< 6	North Sunny
May-22 3rd FN	01/05/22-02/05/22	16-05-2022	16/05/22-27/05/22	113	63	36	< 25	< 6	East Sunny
May-22 4th FN	27/05/22-28/05/22	01-06-2022	01/06/22-10/06/22	220	92	53	< 25	< 6	East Sunny
Jun-22 5th FN	10/06/22-11/06/22	16-06-2022	16/06/22-23/06/22	338	134	72	< 25	< 6	East Sunny
Jun-22 6th FN	25/06/22-26/06/22	01-07-2022	01/07/22-08/07/22	146	73	39	< 25	< 6	West Cloud

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

06/22 Test Report No. 2048	Job No. 094321044	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Jun-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG** **Stations:** **UG Pit Office**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀₊ >PM ₁₀)/TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Apr-22 1st FN	10/04/22-11/04/22	16-04-2022	16/04/22-22/04/22	316	167	67	< 25	< 6	East Sunny
Apr-22 2nd FN	26/04/22-27/04/22	02-05-2022	02/05/22-12/05/22	223	108	46	< 25	< 6	South Sunny
May-22 3rd FN	11/05/22-12/05/22	16-05-2022	16/05/22-27/05/22	219	104	55	< 25	< 6	East Sunny
May-22 4th FN	27/05/22-28/05/22	01-06-2022	01/06/22-10/06/22	215	94	56	< 25	< 6	East Sunny
Jun-22 5th FN	10/06/22-11/06/22	16-06-2022	16/06/22-23/06/22	223	139	63	< 25	< 6	East Sunny
Jun-22 6th FN	25/06/22-26/06/22	01-07-2022	01/07/22-08/07/22	238	99	60	< 25	< 6	West Cloud

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

06/22 Test Report No. 2050	Job No. 094321044	Year	FY2022-23
Type of Sample:	Effluent Water	Quarter Ending	Jun-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	MOEF -SCH-VI STANDARDS, Class 'A', LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju **Project:** Topa OC & UG **Stations:** OC Lagoon Discharge

Analysis Results of FN Effluent Water							
Parameters →				COD	O & G	pH value	TSS
Detection Limit				4	2	0.2	10
MOEF -SCH-VI, STANDARDS, Class 'A'				250	10	5.5 to 9.0	100
Month	Date of Sampling	Date of Receipt of Sample	Date of Analysis	Value in mg/l, except pH			
Apr-22 1st FN	12/04/22	18/04/22	18/04/22-29/04/22	20	<2.00	7.98	27.9
Apr-22 2nd FN	27/04/22	02/04/22	02/04/22-13/05/22	16	<2.00	7.8	18.5
May-22 3rd FN	12/05/22	16/05/22	16/05/22-31/05/22	12	<2.00	0.64	23.7
May-22 4th FN	27/05/22	01/06/22	01/06/22-17/06/22	24	<2.00	8.3	25.7
Jun-22 5th FN	11/06/22	16/06/22	16/06/22-30/06/22	16	<2.00	8.1	30.9
Jun-22 6th FN	28/06/22	01/07/22	01/07/22-15/07/22	20	<2.00	8.4	34.1
BIS Standard & Method				APHA, 23rd Edition, Closed Reflux, Titrimetric Method, 2017	IS 3025/39:1991, R : 2003, Partition Gravimetric	IS-3025/11:1983, R-1996, Electrometric	IS 3025/17:1984, R :1996, Gravimetric Method

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TEST REPORT

06/22 Test Report No. 2051	Job No. 094321044	Year	FY2022-23
Type of Sample:	Effluent Water	Quarter Ending	Jun-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	MOEF -SCH-VI STANDARDS, Class 'A', LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju **Project:** Topa OC & UG **Stations:** New Quarry OC Water

Analysis Results of FN Effluent Water							
Parameters →				COD	O & G	pH value	TSS
Detection Limit				4	2	0.2	10
MOEF -SCH-VI, STANDARDS, Class 'A'				250	10	5.5 to 9.0	100
Month	Date of Sampling	Date of Receipt of Sample	Date of Analysis	Value in mg/l, except pH			
Apr-22 1st FN	12/04/22	18/04/22	18/04/22-29/04/22	24	<2.00	7.99	36.1
Apr-22 2nd FN	27/04/22	02/04/22	02/04/22-13/05/22	12	<2.00	7.68	22
May-22 3rd FN	12/05/22	16/05/22	16/05/22-31/05/22	16	<2.00	7.96	26.1
May-22 4th FN	27/05/22	01/06/22	01/06/22-17/06/22	28	<2.00	8.2	54.8
Jun-22 5th FN	11/06/22	16/06/22	16/06/22-30/06/22	20	<2.00	8	34.1
Jun-22 6th FN	28/06/22	01/07/22	01/07/22-15/07/22	16	<2.00	8.7	26.1
BIS Standard & Method				APHA, 23rd Edition, Closed Reflux, Titrimetric Method, 2017	IS 3025/39:1991, R : 2003, Partition Gravimetric	IS-3025/11:1983, R-1996, Electrometric	IS 3025/17:1984, R :1996, Gravimetric Method

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TEST REPORT

06/22 Test Report No. 2052	Job No. 094321044	Year	FY2022-23
Type of Sample:	Surface Water	Quarter Ending	Jun-22
Customer	CCL	Date of Receipt:	18-04-2022
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	18.04.22-13.06.22
Testing/ Sampling Protocol	LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju**
Stations:

Topa Nala

Project: **Topa OC & UG**
Date of Sampling:

12-04-2022

Sl.No	Parameter	Sampling Stations				Detection Limit	BIS Standard & Method
		1	2	3	4		
1	Arsenic (as As), mg/l, Max	<0.002				0.002	IS 3025/37:1988 R : 2003, AAS-VGA, Method
2	BOD (3 days 27°C), mg/l, Max	2.4				2.00	IS 3025 /44: 1993, R: 2003 3 day incubation at 27°C
3	Cadmium(as Cd), mg/l, Max	<0.0004				0.0004	APHA, 23rd Edition AAS-GTA Method, 2017
4	Chlorides (as Cl), mg/l, Max	22				2.00	IS-3025/32:1988, R-2007, Argentometric Method
5	Copper (as Cu), mg/l, Max	<0.02				0.02	IS 3025/42: 1992, R : 2009, AAS (Air-Ac-Flame)
6	Dissolved Oxygen, min.	6.2				0.10	IS 3025/38: 1989, R:2003, Winkler Azide Method
7	Fluoride (as F) mg/l, Max	1.34				0.02	APHA, 23rd Edition, SPADNS Method, 2017
8	Hexavalent Chromium, mg/l, Max	<0.01				0.01	APHA, 23rd Edition, 2017 Diphenylcarbohydrazide,
9	Iron (as Fe), mg/l, Max	<0.04				0.04	IS 3025 /53: 2003, R : 2009, AAS (Air-Ac-Flame)
10	Lead (as Pb), mg/l, Max	<0.001				0.001	APHA, 23rd Edition AAS-GTA Method, 2017
11	Nitrate (as NO ₃), mg/l, Max	0.68				0.50	APHA, 23rd Edition, UV - Spectrophotometric, 2017
12	pH value	7.79				1.0	IS-3025/11:1983, R-1996, Electrometric Method
13	Phenolic compounds (as C ₆ H ₅ OH), mg/l, Max	<0.001				0.001	APHA, 23rd Edition, 2017, 4-Amino Antipyrine Method,
14	Selenium (as Se), mg/l, Max	<0.0005				0.0005	IS 3025/56:2003 AAS-VGA Method
15	Sulphate (as SO ₄) mg/l, Max	26				2.00	APHA, 23rd Edition Turbidity Method, 2017
16	Total Dissolved Solids, mg/l, Max	336				25.00	IS 3025 /16:1984 R : 2006, Gravimetric Method
17	Total Suspended Solids, mg/l, Max	22.4				10.00	IS 3025 /17:1984, R :1996, Gravimetric Method
18	Zinc (as Zn), mg/l, Max	<0.005				0.005	IS 3025 /49: 1994, R : 2009, AAS (Air-Ac-Flame)

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TEST REPORT

06/22 Test Report No. 2053	Job No. 094321044	Year	FY2022-23
Type of Sample:	Drinking Water	Quarter Ending	Jun-22
Customer	CCL	Date of Receipt:	18-04-2022
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	18.04.22-13.06.22
Testing/ Sampling Protocol	IS:10500 Drinking Water Standards, LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG**
Stations: **1. Bore Hole water** **Date of Sampling:** **12-04-2022**


Sl.No	Parameter	Sampling Stations			Detection Limit	IS:10500 Drinking Water Standards	Standard / Test Method
		1	2	3			
1	Boron (as B), mg/l, Max	<0.20			0.20	0.5	APHA, 23rd Edition Carmine Method; 2017
2	Cadmium (as Cd), mg/l, Max	<0.0004			0.0004	0.003	APHA, 23rd Edition AAS-GTA Method, 2017
3	Calcium (as Ca), mg/l, Max	73.6			1.60	75	IS-3025/40:1991, EDTA
4	Chloride (as Cl), mg/l, Max	50			2.00	250	IS-3025/32:1988, R-2007, Argentometric Method
5	Copper (as Cu), mg/l, Max	<0.02			0.02	0.05	IS 3025/42: 1992, R : 2009, AAS (Air-Ac-Flame)
6	Fluoride (as F) mg/l, Max	1.32			0.02	1.0	APHA, 23rd Edition, SPADNS Method, 2017
7	Free Residual Chlorine, mg/l, Min	<0.02			0.02	0.2	APHA, 23rd Edition, DPD Method, 2017
8	Iron (as Fe), mg/l, Max	<0.04			0.04	1.0	IS 3025 /53: 2003, R : 2009 AAS (Air-Ac-Flame)
9	Lead (as Pb), mg/l, Max	<0.001			0.001	0.01	APHA, 23rd Edition AAS-GTA Method, 2017
10	Manganese (as Mn), mg/l, Max	<0.01			0.01	0.1	IS-3025/59:2006, AAS (Air-Ac-Flame) Method
11	Nickel (as Ni), mg/l, Max	<0.003			0.003	0.02	APHA, 23rd Edition, 3120 B, ICP Method: 2017
12	Nitrate (as NO ₃), mg/l, Max	0.90			0.5	45	APHA, 23rd Edition, UV-Spectrophotometric, 2017
13	Odour	Agreeable			Qualitative	Agreeable	IS 3025 /05:1983, R-2012, Qualitative
14	pH value	7.67			1.0	6.5 to 8.5	IS-3025/11:1983, R-1996, Electrometric Method
15	Phenolic compounds (as C ₆ H ₅ OH), mg/l, Max	<0.001			0.001	0.001	APHA, 23rd Edition, 4-Amino Autipyrine, 2017
16	Selenium (as Se), mg/l, Max	<0.0005			0.0005	0.01	IS 3025/56:2003 AAS-VGA Method
17	Sulphate (as SO ₄) mg/l, Max	17.2			2.00	200	APHA, 23rd Edition. Turbidity Method, 2017
18	Total Alkalinity (CaCO ₃), mg/l, Max	188			4.00	200	IS-3025/23:1986, R: 2009, Titration Method
19	Total Arsenic (as As), mg/l, Max	<0.002			0.002	0.01	IS 3025/ 37:1988 R : 2003, AAS-VGA: 1998
20	Total Chromium (as Cr), mg/l, Max	<0.002			0.002	0.05	APHA, 23rd Edition, 3120 B, ICP Method: 2017
21	Total Dissolved Solids, mg/l, Max	418			25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
22	Total Hardness (CaCO ₃), mg/l, Max	232			4.00	200	IS-3025/21:1983, R-2009, EDTA Method
23	Turbidity, NTU, Max	1			1.0	1	IS-3025/10:1984 R-1996, Nephelometric Method
24	Zinc (as Zn), mg/l, Max	<0.005			0.005	5.0	IS 3025 /49: 1994, R : 2009, AAS (Air-Ac-Flame)

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TEST REPORT

 TC - 7470	Lab No. T-2187		
	06/22 Test Report No. Metal/08	Job No. 094321044	2022-23
Type of Sample	Ambient Air	Quarter Ending	June '22
Customer	CCL	Date of Receipt of Sample:	16/04/2022
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	01/06/22-20/07/22
Sampling Protocol:	USEPA IO-3.2: 1999, LQR 32		
Remarks & Observation:	All Samples placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results:-


Area : **Kuju** **Project:** **Topa OC & UG**

Stations: **1. P.O Office** **Date of Sampling:** 09-10/04/2022
2. Guest House 09-10/04/2022
3. Banwar Tola 10-11/04/2022

S.No	Test Parameters	Units	Test Result				Method detection Limit	Limit (NAAQS-2011)	Test Method
			1	2	3				
Stations:									
1	Conc. of As in Air	ng/m ³	1.00	0.35	1.11	0.1	6.00	USEPA IO-3.2:1999	
2	Conc. of Ni in Air	ng/m ³	7.47	8.26	11.35	0.1	20.00	USEPA IO-3.2:1999	
3	Conc. of Pb in Air	µg/m ³	0.042	0.024	0.045	0.005	1.0	USEPA IO-3.2: 1999	
4	Conc. of Cu in Air	ng/m ³	0.10	0.15	0.14	0.1	-	USEPA IO-3.2: 1999	
5	Conc. of Cd in Air	ng/m ³	0.07	0.18	0.10	0.02	-	USEPA IO-3.2: 1999	
6	Conc. of Cr in Air	ng/m ³	2.35	2.13	2.63	0.1	-	USEPA IO-3.2: 1999	

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TEST REPORT

 TC - 7470	Lab No. T-2187		
	06/22 Test Report No. Metal/09	Job No. 094321044	2022-23
Type of Sample	Ambient Air	Quarter Ending	June '22
Customer	CCL	Date of Receipt of Sample:	16/04/2022
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	01/06/22-20/07/22
Sampling Protocol:	USEPA IO-3.2: 1999, LQR 32		
Remarks & Observation:	All Samples placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results:-

Area : **Kuju** **Project:** **Topa OC & UG**

Stations: 4. Topa Colony **Date of Sampling:** 10-11/04/2022
 5. UG Pit Office 10-11/04/2022

S.No	Test Parameters	Units	Test Result				Method detection Limit	Limit (NAAQS-2011)	Test Method
			4	5					
Stations:			4	5					
1	Conc. of As in Air	ng/m ³	0.78	4.62			0.1	6.00	USEPA IO-3.2:1999
2	Conc. of Ni in Air	ng/m ³	8.57	10.71			0.1	20.00	USEPA IO-3.2:1999
3	Conc. of Pb in Air	µg/m ³	0.033	0.044			0.005	1.0	USEPA IO-3.2: 1999
4	Conc. of Cu in Air	ng/m ³	0.16	0.24			0.1	-	USEPA IO-3.2: 1999
5	Conc. of Cd in Air	ng/m ³	0.17	0.12			0.02	-	USEPA IO-3.2: 1999
6	Conc. of Cr in Air	ng/m ³	2.91	2.83			0.1	-	USEPA IO-3.2: 1999

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TEST REPORT

03/23 Test Report No. 2044	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Mar-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : Kaju

Project: Topa OC & UG

Stations: P.O Office

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ +>PM ₁₀)TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Jan-23 1st FN	09/01/23-10/01/23	16-01-2023	16/01/23-30/01/23	235	132	73	< 25	< 6	East Sunny
Jan-23 2nd FN	24/01/23-25/01/23	01-02-2023	01/02/23-17/02/23	245	93	54	< 25	< 6	East Sunny
Feb-23 3rd FN	09/02/23-10/02/23	16-02-2023	16/02/23-28/02/23	167	73	36	< 25	< 6	East Sunny
Feb-23 4th FN	23/02/23-24/02/23	01-03-2023	01/03/23-20/03/23	207	124	54	< 25	< 6	East Sunny
Mar-23 5th FN	09/03/23-10/03/23	16-03-2023	16/03/23-29/03/23	210	95	41	< 25	< 6	East Sunny
Mar-23 6th FN	24/03/23-25/03/23	01-04-2023	01/04/23-17/04/23	169	78	35	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

03/23 Test Report No. 2045	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Mar-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju

Project: Topa OC & UG

Stations: Guest House

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter ($\text{PM}_{10} + >\text{PM}_{10}$)TPM	Particulate Matter (PM_{10})	Particulate Matter ($\text{PM}_{2.5}$)	Sulphur Dioxide (SO_2)	Nitrogen Oxides (as NO_x)	
Jan-23 1st FN	09/01/23-10/01/23	16-01-2023	16/01/23-30/01/23	211	94	55	< 25	< 6	East Sunny
Jan-23 2nd FN	24/01/23-25/01/23	01-02-2023	01/02/23-17/02/23	210	82	37	< 25	< 6	East Sunny
Feb-23 3rd FN	09/02/23-10/02/23	16-02-2023	16/02/23-28/02/23	141	62	29	< 25	< 6	East Sunny
Feb-23 4th FN	23/02/23-24/02/23	01-03-2023	01/03/23-20/03/23	162	76	34	< 25	< 6	East Sunny
Mar-23 5th FN	09/03/23-10/03/23	16-03-2023	16/03/23-29/03/23	266	83	46	< 25	< 6	East Sunny
Mar-23 6th FN	24/03/23-25/03/23	01-04-2023	01/04/23-17/04/23	144	78	43	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

03/23 Test Report No. 2046	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Mar-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju **Project:** Topa OC & UG **Stations:** Banwar Tola

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ + >PM ₁₀)/TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Jan-23 1st FN	10/01/23-11/01/23	16-01-2023	16/01/23-30/01/23	147	78	34	< 25	< 6	East Sunny
Jan-23 2nd FN	25/01/23-26/01/23	01-02-2023	01/02/23-17/02/23	209	95	50	< 25	< 6	East Sunny
Feb-23 3rd FN	10/12/23-11/12/23	16-02-2023	16/02/23-28/02/23	172	76	37	< 25	< 6	East Sunny
Feb-23 4th FN	24/02/23-25/02/23	01-03-2023	01/03/23-20/03/23	124	68	27	< 25	< 6	East Sunny
Mar-23 5th FN	10/03/23-11/03/23	16-03-2023	16/03/23-29/03/23	132	77	35	< 25	< 6	East Sunny
Mar-23 6th FN	25/03/23-26/03/23	01-04-2023	01/04/23-17/04/23	131	67	37	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

03/23 Test Report No. 2047	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Mar-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju

Project: Topa OC & UG

Stations: Topa Colony

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter ($\text{PM}_{10} + >\text{PM}_{10}$)TPM	Particulate Matter (PM_{10})	Particulate Matter ($\text{PM}_{2.5}$)	Sulphur Dioxide (SO_2)	Nitrogen Oxides (as NO_x)	
Jan-23 1st FN	10/01/23-11/01/23	16-01-2023	16/01/23-30/01/23	133	65	27	< 25	< 6	East Sunny
Jan-23 2nd FN	25/01/23-26/01/23	01-02-2023	01/02/23-17/02/23	122	65	31	< 25	< 6	East Sunny
Feb-23 3rd FN	10/12/23-11/12/23	16-02-2023	16/02/23-28/02/23	125	86	48	< 25	< 6	East Sunny
Feb-23 4th FN	24/02/23-25/02/23	01-03-2023	01/03/23-20/03/23	165	80	38	< 25	< 6	East Sunny
Mar-23 5th FN	10/03/23-11/03/23	16-03-2023	16/03/23-29/03/23	213	91	55	< 25	< 6	East Sunny
Mar-23 6th FN	25/03/23-26/03/23	01-04-2023	01/04/23-17/04/23	242	84	51	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

03/23 Test Report No. 2048	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Mar-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju **Project:** Topa OC & UG **Stations:** Kuju New Siding

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ + >PM ₁₀)TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Jan-23 1st FN	10/01/23-11/01/23	16-01-2023	16/01/23-30/01/23	214	106	64	< 25	< 6	East Sunny
Jan-23 2nd FN	25/01/23-26/01/23	01-02-2023	01/02/23-17/02/23	152	69	34	< 25	< 6	East Sunny
Feb-23 3rd FN	10/12/23-11/12/23	16-02-2023	16/02/23-28/02/23	640	313	127	< 25	< 6	East Sunny
Feb-23 4th FN	24/02/23-25/02/23	01-03-2023	01/03/23-20/03/23	148	67	41	< 25	< 6	East Sunny
Mar-23 5th FN	10/03/23-11/03/23	16-03-2023	16/03/23-29/03/23	226	82	54	< 25	< 6	East Sunny
Mar-23 6th FN	25/03/23-26/03/23	01-04-2023	01/04/23-17/04/23	207	85	52	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

03/23 Test Report No. 2049	Job No. 094322160	Year	FY2022-23
Type of Sample:	Noise	Quarter Ending	Mar-23
Customer	CCL		
Testing/ Sampling Protocol	'The noise pollution (Regulation and Control), Rules,2000, LQR 34		
Remarks:			

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG**

Station Name	Noise Level dB(A) Leq					
	Jan-23 1st FN	Jan-23 2nd FN	Feb-23 3rd FN	Feb-23 4th FN	Mar-23 5th FN	Mar-23 6th FN
	Day/Night	Day/Night	Day/Night	Day/Night	Day/Night	Day/Night
Date of recording	09-01-2023	24-01-2023	09-02-2023	23-02-2023	09-03-2023	24-03-2023
1. Guest House	52.3/47.4	51.5/48.2	51.9/48.6	50.2/48.1	51.8/48.5	50.3/48.6
Date of recording	10-01-2023	25-01-2023	10-02-2023	24-02-2023	10-03-2023	25-03-2023
2. Banwar Tola	49.4/43.6	48.8/46.9	49.1/47.2	49.3/47.5	48.3/46.8	47.8/45.3
Date of recording	10-01-2023	25-01-2023	10-02-2023	24-02-2023	10-03-2023	25-03-2023
3. Kuju New Siding	52.5/47.4	53.4/50.6	53.9/49.6	54.7/51.4	49.5/46.1	55.2/52.8

Ambient Air Quality Standards in respect of Noise as per 'The noise pollution (Regulation and Control), Rules,2000		
Time Frame	Limits in dB(A) Leq	
	Day Time 6.00 AM to 10.00 PM	Night Time 10.00 PM to 6.00 AM
Industrial Area	75	70
Commercial Area	65	55
Residential area	55	45
Silence Zone	50	40

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TEST REPORT

03/23 Test Report No. 2050	Job No. 094322160	Year	FY2022-23
Type of Sample:	Effluent Water	Quarter Ending	Mar-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	MOEF -SCH-VI STANDARDS, Class 'A', LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju **Project:** Topa OC & UG **Stations:** OC Lagoon Discharge

Analysis Results of FN Effluent Water							
Parameters →				COD	O & G	pH value	TSS
Detection Limit				4	2	0.2	10
MOEF -SCH-VI, STANDARDS, Class 'A'				250	10	5.5 to 9.0	100
Month	Date of Sampling	Date of Receipt of Sample	Date of Analysis	Value in mg/l, except pH			
Jan-23 1st FN	12/01/23	16/01/23	16/01/23-31/01/23	16	<2.00	8.2	34.2
Jan-23 2nd FN	27/01/23	01/02/23	01/02/23-15/02/23	20	<2.00	8.1	44.3
Feb-23 3rd FN	11/02/23	16/02/23	16/02/23-28/02/23	16	<2.00	7.6	38.9
Feb-23 4th FN	26/02/23	01/03/23	01/03/23-15/03/23	24	<2.00	7.7	87
Mar-23 5th FN	11/03/23	16/03/23	16/03/23-31/03/23	16	<2.00	8	34
Mar-23 6th FN	27/03/23	03/04/23	03/04/23-13/04/23	16	<2.00	8.2	45
BIS Standard & Method				APHA, 23rd Edition, Closed Reflux, Titrimetric Method, 2017	IS 3025/39:1991, R : 2003, Partition Gravimetric	IS-3025/11:1983, R-1996, Electrometric	IS 3025/17:1984, R :1996, Gravimetric Method

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TEST REPORT

03/23 Test Report No. 2051	Job No. 094322160	Year	FY2022-23
Type of Sample:	Effluent Water	Quarter Ending	Mar-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	MOEF -SCH-VI STANDARDS, Class 'A', LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju **Project:** Topa OC & UG **Stations:** New Quarry OC Water

Analysis Results of FN Effluent Water							
Parameters →				COD	O & G	pH value	TSS
Detection Limit				4	2	0.2	10
MOEF -SCH-VI, STANDARDS, Class 'A'				250	10	5.5 to 9.0	100
Month	Date of Sampling	Date of Receipt of Sample	Date of Analysis	Value in mg/l, except pH			
Jan-23 1st FN	12/01/23	16/01/23	16/01/23-31/01/23	20	<2.00	8.3	43.9
Jan-23 2nd FN	27/01/23	01/02/23	01/02/23-15/02/23	16	<2.00	8.2	39.2
Feb-23 3rd FN	11/02/23	16/02/23	16/02/23-28/02/23	20	<2.00	7.5	43.1
Feb-23 4th FN	26/02/23	01/03/23	01/03/23-15/03/23	16	<2.00	8	54
Mar-23 5th FN	11/03/23	16/03/23	16/03/23-31/03/23	20	<2.00	8.1	47
Mar-23 6th FN	27/03/23	03/04/23	03/04/23-13/04/23	12	<2.00	8.5	34
BIS Standard & Method				APHA, 23rd Edition, Closed Reflux, Titrimetric Method, 2017	IS 3025/39:1991, R : 2003, Partition Gravimetric	IS-3025/11:1983, R-1996, Electrometric	IS 3025/17:1984, R :1996, Gravimetric Method

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TEST REPORT

03/23 Test Report No. 2052	Job No. 094322160	Year	FY2022-23
Type of Sample:	Surface Water	Quarter Ending	Mar-23
Customer	CCL	Date of Receipt:	16-01-2023
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	16.01.23-03.04.23
Testing/ Sampling Protocol	LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju**
Stations:

Project: **Topa OC & UG**
Date of Sampling:

1. Topa Nala U/S
2. Topa Nala D/S

12-01-2023

Sl.No	Parameter	Sampling Stations				Detection Limit	BIS Standard & Method
		1	2	3	4		
1	Arsenic (as As), mg/l, Max	<0.002				0.002	IS 3025/37:1988 R : 2003, AAS-VGA, Method
2	BOD (3 days 27°C), mg/l, Max	4.1				2.00	IS 3025 /44: 1993, R: 2003 3 day incubation at 27°C
3	Cadmium(as Cd), mg/l, Max	<0.0004				0.0004	APHA, 23rd Edition AAS-GTA Method, 2017
4	Chlorides (as Cl), mg/l, Max	30				2.00	IS-3025/32:1988, R-2007, Argentometric Method
5	Copper (as Cu), mg/l, Max	<0.02				0.02	IS 3025/42: 1992, R : 2009, AAS (Air-Ac-Flame)
6	Dissolved Oxygen, min.	7.3				0.10	IS 3025/38: 1989, R:2003, Winkler Azide Method
7	Fluoride (as F) mg/l, Max	1.15				0.02	APHA, 23rd Edition, SPADNS Method, 2017
8	Hexavalent Chromium, mg/l, Max	<0.01				0.01	APHA, 23rd Edition, 2017 Diphenylcarbohydrazide,
9	Iron (as Fe), mg/l, Max	<0.04				0.04	IS 3025 /53: 2003, R : 2009, AAS (Air-Ac-Flame)
10	Lead (as Pb), mg/l, Max	<0.001				0.001	APHA, 23rd Edition AAS-GTA Method, 2017
11	Nitrate (as NO ₃), mg/l, Max	51.26				0.50	APHA, 23rd Edition, UV - Spectrophotometric, 2017
12	pH value	8.1				1.0	IS-3025/11:1983, R-1996, Electrometric Method
13	Phenolic compounds (as C ₆ H ₅ OH), mg/l, Max	<0.001				0.001	APHA, 23rd Edition, 2017, 4-Amino Antipyrine Method,
14	Selenium (as Se), mg/l, Max	<0.0005				0.0005	IS 3025/56:2003 AAS-VGA Method
15	Sulphate (as SO ₄) mg/l, Max	439				2.00	APHA, 23rd Edition Turbidity Method, 2017
16	Total Dissolved Solids, mg/l, Max	907				25.00	IS 3025 /16:1984 R : 2006, Gravimetric Method
17	Total Suspended Solids, mg/l, Max	121				10.00	IS 3025 /17:1984, R :1996, Gravimetric Method
18	Zinc (as Zn), mg/l, Max	<0.005				0.005	IS 3025 /49: 1994, R : 2009, AAS (Air-Ac-Flame)

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TEST REPORT

03/23 Test Report No. 2053	Job No. 094322160	Year	FY2022-23
Type of Sample:	Drinking Water	Quarter Ending	Mar-23
Customer	CCL	Date of Receipt:	16-01-2023
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	16.01.23-03.04.23
Testing/ Sampling Protocol	IS:10500 Drinking Water Standards, LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area :

Kuju

Project:

Topa OC & UG

Stations:

1. Bore Hole water

Date of Sampling:

12-01-2023

Sl.No	Parameter	Sampling Stations			Detection Limit	IS:10500 Drinking Water Standards	Standard / Test Method
		1	2	3			
1	Boron (as B), mg/l, Max	<0.20			0.20	0.5	APHA, 23rd Edition Carmine Method; 2017
2	Cadmium (as Cd), mg/l, Max	<0.0004			0.0004	0.003	APHA, 23rd Edition AAS-GTA Method, 2017
3	Calcium (as Ca), mg/l, Max	57.6			1.60	75	IS-3025/40:1991, EDTA
4	Chloride (as Cl), mg/l, Max	40			2.00	250	IS-3025/32:1988, R-2007, Argentometric Method
5	Copper (as Cu), mg/l, Max	<0.02			0.02	0.05	IS 3025/42: 1992, R : 2009, AAS (Air-Ac-Flame)
6	Fluoride (as F) mg/l, Max	1.75			0.02	1.0	APHA, 23rd Edition, SPADNS Method, 2017
7	Free Residual Chlorine, mg/l, Min	0.03			0.02	0.2	APHA, 23rd Edition, DPD Method, 2017
8	Iron (as Fe), mg/l, Max	<0.04			0.04	1.0	IS 3025 /53: 2003, R : 2009 AAS (Air-Ac-Flame)
9	Lead (as Pb), mg/l, Max	<0.001			0.001	0.01	APHA, 23rd Edition AAS-GTA Method, 2017
10	Manganese (as Mn), mg/l, Max	0.1			0.01	0.1	IS-3025/59:2006, AAS (Air-Ac-Flame) Method
11	Nickel (as Ni), mg/l, Max	<0.003			0.003	0.02	APHA, 23rd Edition, 3120 B, ICP Method: 2017
12	Nitrate (as NO ₃), mg/l, Max	24.27			0.5	45	APHA, 23rd Edition, UV-Spectrophotometric, 2017
13	Odour	Agreeable			Qualitative	Agreeable	IS 3025 /05:1983, R-2012, Qualitative
14	pH value	7.3			1.0	6.5 to 8.5	IS-3025/11:1983, R-1996, Electrometric Method
15	Phenolic compounds (as C ₆ H ₅ OH), mg/l, Max	<0.001			0.001	0.001	APHA, 23rd Edition, 4-Amino Antipyrine, 2017
16	Selenium (as Se), mg/l, Max	<0.0005			0.0005	0.01	IS 3025/56:2003 AAS-VGA Method
17	Sulphate (as SO ₄) mg/l, Max	81			2.00	200	APHA, 23rd Edition. Turbidity Method, 2017
18	Total Alkalinity (CaCO ₃), mg/l, Max	108			4.00	200	IS-3025/23:1986,R: 2009, Titration Method
19	Total Arsenic (as As), mg/l, Max	<0.002			0.002	0.01	IS 3025/ 37:1988 R : 2003, AAS-VGA: 1998
20	Total Chromium (as Cr), mg/l, Max	<0.002			0.002	0.05	APHA, 23rd Edition, 3120 B, ICP Method: 2017
21	Total Dissolved Solids, mg/l, Max	348			25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
22	Total Hardness (CaCO ₃), mg/l, Max	236			4.00	200	IS-3025/21:1983, R-2009, EDTA Method
23	Turbidity, NTU, Max	1			1.0	1	IS-3025/10:1984 R-1996, Nephelometric Method
24	Zinc (as Zn), mg/l, Max	<0.005			0.005	5.0	IS 3025 /49: 1994, R : 2009, AAS (Air-Ac-Flame)

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TEST REPORT

09/22 Test Report No. 2044	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Sep-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG** **Stations:** **P.O Office**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ +>PM ₁₀)TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Jul-22 1st FN	09/07/22-10/07/22	18-07-2022	18/07/22-23/07/22	212	90	37	< 25	< 6	East Sunny
Jul-22 2nd FN	25/07/22-26/07/22	01-08-2022	01/08/22-13/08/22	255	119	64	< 25	< 6	East Sunny
Aug-22 3rd FN	09/08/22-10/08/22	16-08-2022	16/08/22-22/08/22	229	120	67	< 25	6	East Sunny
Aug-22 4th FN	24/08/22-25/08/22	01-09-2022	01/09/22-09/09/22	148	72	35	< 25	< 6	East Rain
Sep-22 5th FN	09/09/22-10/09/22	16-09-2022	16/09/22-21/09/22	193	81	51	< 25	< 6	East Sunny
Sep-22 6th FN	24/09/22-25/09/22	03-10-2022	03/10/22-15/10/22	276	120	66	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

09/22 Test Report No. 2045	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Sep-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG** **Stations:** **Guest House**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ +>PM ₁₀)/TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Jul-22 1st FN	09/07/22-10/07/22	18-07-2022	18/07/22-23/07/22	120	58	23	< 25	< 6	East Sunny
Jul-22 2nd FN	26/07/22-27/07/22	01-08-2022	01/08/22-13/08/22	150	72	34	< 25	< 6	East Sunny
Aug-22 3rd FN	09/08/22-10/08/22	16-08-2022	16/08/22-22/08/22	118	66	33	< 25	< 6	East Sunny
Aug-22 4th FN	24/08/22-25/08/22	01-09-2022	01/09/22-09/09/22	190	85	40	< 25	< 6	East Rain
Sep-22 5th FN	09/09/22-10/09/22	16-09-2022	16/09/22-21/09/22	137	64	30	< 25	< 6	East Sunny
Sep-22 6th FN	24/09/22-25/09/22	03-10-2022	03/10/22-15/10/22	178	69	37	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

09/22 Test Report No. 2046	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Sep-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG** **Stations:** **Banwar Tola**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ + >PM ₁₀)/TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Jul-22 1st FN	10/07/22-11/07/22	18-07-2022	18/07/22-23/07/22	136	64	25	< 25	< 6	East Sunny
Jul-22 2nd FN	26/07/22-27/07/22	01-08-2022	01/08/22-13/08/22	161	67	33	< 25	< 6	East Sunny
Aug-22 3rd FN	10/08/22-11/08/22	16-08-2022	16/08/22-22/08/22	140	50	28	< 25	< 6	East Sunny
Aug-22 4th FN	25/08/22-26/08/22	01-09-2022	01/09/22-09/09/22	159	69	36	< 25	< 6	East Rain
Sep-22 5th FN	10/09/22-11/09/22	16-09-2022	16/09/22-21/09/22	254	96	54	< 25	< 6	East Sunny
Sep-22 6th FN	25/09/22-26/09/22	03-10-2022	03/10/22-15/10/22	354	128	68	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

09/22 Test Report No. 2047	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Sep-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju**

Project: **Topa OC & UG**

Stations: **Topa Colony**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ +>PM ₁₀)/TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Jul-22 1st FN	10/07/22-11/07/22	18-07-2022	18/07/22-23/07/22	159	83	40	< 25	< 6	East Sunny
Jul-22 2nd FN	26/07/22-27/07/22	01-08-2022	01/08/22-13/08/22	105	52	26	< 25	< 6	East Sunny
Aug-22 3rd FN	10/08/22-11/08/22	16-08-2022	16/08/22-22/08/22	173	76	42	< 25	< 6	East Sunny
Aug-22 4th FN	25/08/22-26/08/22	01-09-2022	01/09/22-09/09/22	211	92	54	< 25	< 6	East Rain
Sep-22 5th FN	10/09/22-11/09/22	16-09-2022	16/09/22-21/09/22	117	53	21	< 25	< 6	East Sunny
Sep-22 6th FN	25/09/22-26/09/22	03-10-2022	03/10/22-15/10/22	207	97	55	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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ENVIRONMENT LABORATORY , CMPDI (HQ) , RANCHI

TEST REPORT

09/22 Test Report No. 2048	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Sep-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG** **Stations:** **UG Pit Office**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ +>PM ₁₀)TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Jul-22 1st FN	10/07/22-11/07/22	18-07-2022	18/07/22-23/07/22	229	125	64	< 25	< 6	East Sunny
Jul-22 2nd FN	27/07/22-28/07/22	01-08-2022	01/08/22-13/08/22	171	87	45	< 25	< 6	East Sunny
Aug-22 3rd FN	10/08/22-11/08/22	16-08-2022	16/08/22-22/08/22	210	94	56	< 25	< 6	East Sunny
Aug-22 4th FN	25/08/22-26/08/22	01-09-2022	01/09/22-09/09/22	187	87	48	< 25	< 6	East Rain
Sep-22 5th FN	10/09/22-11/09/22	16-09-2022	16/09/22-21/09/22	174	79	45	< 25	< 6	East Sunny
Sep-22 6th FN	25/09/22-26/09/22	03-10-2022	03/10/22-15/10/22	249	109	54	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

09/22 Test Report No. 2050	Job No. 094322160	Year	FY2022-23
Type of Sample:	Effluent Water	Quarter Ending	Sep-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	MOEF -SCH-VI STANDARDS, Class 'A', LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju **Project:** Topa OC & UG **Stations:** OC Lagoon Discharge

Analysis Results of FN Effluent Water							
Parameters →				COD	O & G	pH value	TSS
Detection Limit				4	2	0.2	10
MOEF -SCH-VI, STANDARDS, Class 'A'				250	10	5.5 to 9.0	100
Month	Date of Sampling	Date of Receipt of Sample	Date of Analysis	Value in mg/l, except pH			
Jul-22 1st FN	12/07/22	18/07/22	18/07/22-30/07/22	20	<2.00	8.4	37.2
Jul-22 2nd FN	28/07/22	01/08/22	01/08/22-13/08/22	20	<2.00	8.3	28.4
Aug-22 3rd FN	10/08/22	16/08/22	16/08/22-30/08/22	20	<2.00	8.4	37.3
Aug-22 4th FN	27/08/22	01/09/22	01/09/22-15/09/22	12	<2.00	8.3	31.8
Sep-22 5th FN	12/09/22	16/09/22	16/09/22-30/09/22	12	<2.00	8.1	38
Sep-22 6th FN	27/09/22	01/10/22	01/10/22-14/10/22	12	<2.00	8.26	55
BIS Standard & Method				APHA, 23rd Edition, Closed Reflux, Titrimetric Method, 2017	IS 3025/39:1991, R : 2003, Partition Gravimetric	IS-3025/11:1983, R-1996, Electrometric	IS 3025/17:1984, R :1996, Gravimetric Method

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TEST REPORT

09/22 Test Report No. 2051	Job No. 094322160	Year	FY2022-23
Type of Sample:	Effluent Water	Quarter Ending	Sep-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	MOEF -SCH-VI STANDARDS, Class 'A', LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju **Project:** Topa OC & UG **Stations:** New Quarry OC Water

Analysis Results of FN Effluent Water							
Parameters →				COD	O & G	pH value	TSS
Detection Limit				4	2	0.2	10
MOEF -SCH-VI, STANDARDS, Class 'A'				250	10	5.5 to 9.0	100
Month	Date of Sampling	Date of Receipt of Sample	Date of Analysis	Value in mg/l, except pH			
Jul-22 1st FN	12/07/22	18/07/22	18/07/22-30/07/22	16	<2.00	8.2	33.8
Jul-22 2nd FN	28/07/22	01/08/22	01/08/22-13/08/22	16	<2.00	8.3	30.7
Aug-22 3rd FN	10/08/22	16/08/22	16/08/22-30/08/22	12	<2.00	8.2	35.1
Aug-22 4th FN	27/08/22	01/09/22	01/09/22-15/09/22	12	<2.00	8.3	25.4
Sep-22 5th FN	12/09/22	16/09/22	16/09/22-30/09/22	12	<2.00	8.2	33
Sep-22 6th FN	27/09/22	01/10/22	01/10/22-14/10/22	32	<2.00	8.23	69
BIS Standard & Method				APHA, 23rd Edition, Closed Reflux, Titrimetric Method, 2017	IS 3025/39:1991, R : 2003, Partition Gravimetric	IS-3025/11:1983, R-1996, Electrometric	IS 3025/17:1984, R :1996, Gravimetric Method

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TEST REPORT

09/22 Test Report No. 2052	Job No. 094322160	Year	FY2022-23
Type of Sample:	Surface Water	Quarter Ending	Sep-22
Customer	CCL	Date of Receipt:	18-07-2022
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	18.07.22-07.09.22
Testing/ Sampling Protocol	LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju**
Stations:

Topa Nala

Project: **Topa OC & UG**
Date of Sampling:

12-07-2022

Sl.No	Parameter	Sampling Stations				Detection Limit	BIS Standard & Method
		1	2	3	4		
1	Arsenic (as As), mg/l, Max	<0.002				0.002	IS 3025/37:1988 R : 2003, AAS-VGA, Method
2	BOD (3 days 27°C), mg/l, Max	2.4				2.00	IS 3025 /44: 1993, R: 2003 3 day incubation at 27°C
3	Cadmium(as Cd), mg/l, Max	<0.0004				0.0004	APHA, 23rd Edition AAS-GTA Method, 2017
4	Chlorides (as Cl), mg/l, Max	16				2.00	IS-3025/32:1988, R-2007, Argentometric Method
5	Copper (as Cu), mg/l, Max	<0.02				0.02	IS 3025/42: 1992, R : 2009, AAS (Air-Ac-Flame)
6	Dissolved Oxygen, min.	6.6				0.10	IS 3025/38: 1989, R:2003, Winkler Azide Method
7	Fluoride (as F) mg/l, Max	0.9				0.02	APHA, 23rd Edition, SPADNS Method, 2017
8	Hexavalent Chromium, mg/l, Max	<0.01				0.01	APHA, 23rd Edition, 2017 Diphenylcarbohydrazide,
9	Iron (as Fe), mg/l, Max	<0.04				0.04	IS 3025 /53: 2003, R : 2009, AAS (Air-Ac-Flame)
10	Lead (as Pb), mg/l, Max	<0.001				0.001	APHA, 23rd Edition AAS-GTA Method, 2017
11	Nitrate (as NO ₃), mg/l, Max	12.31				0.50	APHA, 23rd Edition, UV - Spectrophotometric, 2017
12	pH value	8.2				1.0	IS-3025/11:1983, R-1996, Electrometric Method
13	Phenolic compounds (as C ₆ H ₅ OH), mg/l, Max	<0.001				0.001	APHA, 23rd Edition, 2017, 4-Amino Antipyrine Method,
14	Selenium (as Se), mg/l, Max	<0.0005				0.0005	IS 3025/56:2003 AAS-VGA Method
15	Sulphate (as SO ₄) mg/l, Max	372				2.00	APHA, 23rd Edition Turbidity Method, 2017
16	Total Dissolved Solids, mg/l, Max	598				25.00	IS 3025 /16:1984 R : 2006, Gravimetric Method
17	Total Suspended Solids, mg/l, Max	34				10.00	IS 3025 /17:1984, R :1996, Gravimetric Method
18	Zinc (as Zn), mg/l, Max	<0.005				0.005	IS 3025 /49: 1994, R : 2009, AAS (Air-Ac-Flame)

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ENVIRONMENT LABORATORY , CMPDI (HQ) , RANCHI

TEST REPORT

09/22 Test Report No. 2053	Job No. 094322160	Year	FY2022-23
Type of Sample:	Drinking Water	Quarter Ending	Sep-22
Customer	CCL	Date of Receipt:	18-07-2022
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	18.07.22-07.09.22
Testing/ Sampling Protocol	IS:10500 Drinking Water Standards, LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG**
Stations: **1. Bore Hole water** **Date of Sampling:** **12-07-2022**


Sl.No	Parameter	Sampling Stations			Detection Limit	IS:10500 Drinking Water Standards	Standard / Test Method
		1	2	3			
1	Boron (as B), mg/l, Max	<0.20			0.20	0.5	APHA, 23rd Edition Carmine Method; 2017
2	Cadmium (as Cd), mg/l, Max	<0.0004			0.0004	0.003	APHA, 23rd Edition AAS-GTA Method, 2017
3	Calcium (as Ca), mg/l, Max	76.8			1.60	75	IS-3025/40:1991, EDTA
4	Chloride (as Cl), mg/l, Max	44			2.00	250	IS-3025/32:1988, R-2007, Argentometric Method
5	Copper (as Cu), mg/l, Max	<0.02			0.02	0.05	IS 3025/42: 1992, R : 2009, AAS (Air-Ac-Flame)
6	Fluoride (as F) mg/l, Max	2.02			0.02	1.0	APHA, 23rd Edition, SPADNS Method, 2017
7	Free Residual Chlorine, mg/l, Min	<0.02			0.02	0.2	APHA, 23rd Edition, DPD Method, 2017
8	Iron (as Fe), mg/l, Max	<0.04			0.04	1.0	IS 3025 /53: 2003, R : 2009 AAS (Air-Ac-Flame)
9	Lead (as Pb), mg/l, Max	<0.001			0.001	0.01	APHA, 23rd Edition AAS-GTA Method, 2017
10	Manganese (as Mn), mg/l, Max	<0.01			0.01	0.1	IS-3025/59:2006, AAS (Air-Ac-Flame) Method
11	Nickel (as Ni), mg/l, Max	<0.003			0.003	0.02	APHA, 23rd Edition, 3120 B, ICP Method: 2017
12	Nitrate (as NO ₃), mg/l, Max	15.00			0.5	45	APHA, 23rd Edition, UV-Spectrophotometric, 2017
13	Odour	Agreeable			Qualitative	Agreeable	IS 3025 /05:1983, R-2012, Qualitative
14	pH value	8.01			1.0	6.5 to 8.5	IS-3025/11:1983, R-1996, Electrometric Method
15	Phenolic compounds (as C ₆ H ₅ OH), mg/l, Max	<0.001			0.001	0.001	APHA, 23rd Edition, 4-Amino Autipyrine, 2017
16	Selenium (as Se), mg/l, Max	<0.0005			0.0005	0.01	IS 3025/56:2003 AAS-VGA Method
17	Sulphate (as SO ₄) mg/l, Max	80			2.00	200	APHA, 23rd Edition. Turbidity Method, 2017
18	Total Alkalinity (CaCO ₃), mg/l, Max	196			4.00	200	IS-3025/23:1986, R: 2009, Titration Method
19	Total Arsenic (as As), mg/l, Max	<0.002			0.002	0.01	IS 3025/ 37:1988 R : 2003, AAS-VGA: 1998
20	Total Chromium (as Cr), mg/l, Max	<0.002			0.002	0.05	APHA, 23rd Edition, 3120 B, ICP Method: 2017
21	Total Dissolved Solids, mg/l, Max	429			25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
22	Total Hardness (CaCO ₃), mg/l, Max	248			4.00	200	IS-3025/21:1983, R-2009, EDTA Method
23	Turbidity, NTU, Max	1			1.0	1	IS-3025/10:1984 R-1996, Nephelometric Method
24	Zinc (as Zn), mg/l, Max	<0.005			0.005	5.0	IS 3025 /49: 1994, R : 2009, AAS (Air-Ac-Flame)

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TEST REPORT

 TC - 7470	Lab No. T-2187		
	09/22 Test Report No. Metal/08	Job No. 094322160	2022-23
Type of Sample	Ambient Air	Quarter Ending	Sept '22
Customer	CCL	Date of Receipt of Sample:	18/07/2022
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	16/08/22-23/09/22
Sampling Protocol:	USEPA IO-3.2: 1999, LQR 32		
Remarks & Observation:	All Samples placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results:-


Area : **Kuju** **Project:** **Topa OC & UG**

Stations: 1. P.O Office **Date of Sampling:** 09-10/07/2022
 2. Guest House 09-10/07/2022
 3. Banwar Tola 10-11/07/2022

S.No	Test Parameters	Units	Test Result				Method detection Limit	Limit (NAAQS-2011)	Test Method
			1	2	3				
Stations:			1	2	3				
1	Conc. of As in Air	ng/m ³	1.01	0.35	1.10		0.1	6.00	USEPA IO-3.2:1999
2	Conc. of Ni in Air	ng/m ³	7.46	8.25	11.35		0.1	20.00	USEPA IO-3.2:1999
3	Conc. of Pb in Air	µg/m ³	0.041	0.023	0.045		0.005	1.0	USEPA IO-3.2: 1999
4	Conc. of Cu in Air	ng/m ³	<0.10	0.14	0.14		0.1	-	USEPA IO-3.2: 1999
5	Conc. of Cd in Air	ng/m ³	0.07	0.17	0.09		0.02	-	USEPA IO-3.2: 1999
6	Conc. of Cr in Air	ng/m ³	2.37	2.14	2.64		0.1	-	USEPA IO-3.2: 1999

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TEST REPORT

 TC - 7470	Lab No. T-2187		
	09/22 Test Report No. Metal/09	Job No. 094322160	2022-23
Type of Sample	Ambient Air	Quarter Ending	Sept '22
Customer	CCL	Date of Receipt of Sample:	18/07/2022
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	16/08/22-23/09/22
Sampling Protocol:	USEPA IO-3.2: 1999, LQR 32		
Remarks & Observation:	All Samples placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results:-

Area : **Kuju** **Project:** **Topa OC & UG**

Stations: **4. Topa Colony** **Date of Sampling:** **10-11/07/2022**
5. UG Pit Office **10-11/07/2022**

S.No	Test Parameters	Units	Test Result				Method detection Limit	Limit (NAAQS-2011)	Test Method
			4	5					
Stations:			4	5					
1	Conc. of As in Air	ng/m ³	0.79	4.62			0.1	6.00	USEPA IO-3.2:1999
2	Conc. of Ni in Air	ng/m ³	8.58	6.70			0.1	20.00	USEPA IO-3.2:1999
3	Conc. of Pb in Air	µg/m ³	0.034	0.043			0.005	1.0	USEPA IO-3.2: 1999
4	Conc. of Cu in Air	ng/m ³	0.17	0.24			0.1	-	USEPA IO-3.2: 1999
5	Conc. of Cd in Air	ng/m ³	0.16	0.11			0.02	-	USEPA IO-3.2: 1999
6	Conc. of Cr in Air	ng/m ³	2.90	2.83			0.1	-	USEPA IO-3.2: 1999

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TEST REPORT

09/22 Test Report No. 2025	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	September-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG** **Stations:** **P.O Office**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in µg/m ³)	CO (in mg/m ³)	Ozone (in µg/m ³)	
July '22 1st FN	09/07/22	09/07/22	09/07/22	12.36	0.629	16.20	W to E
July '22 2nd FN	25/07/22	25/07/22	25/07/22	13.63	0.660	17.78	E to W
Aug. '22 3rd FN	09/08/22	09/08/22	09/08/22	12.65	0.711	16.66	E to W
Aug. '22 4th FN	24/08/22	24/08/22	24/08/22	12.08	0.732	16.32	E to W
Sept. '22 5th FN	09/09/22	09/09/22	09/09/22	13.64	0.694	16.89	E to W
Sept. '22 6th FN	24/09/22	24/09/22	24/09/22	12.87	0.603	15.74	W to E

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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ENVIRONMENT LABORATORY , CMPDI (HQ) , RANCHI**TEST REPORT**

09/22 Test Report No. 2026	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	September-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju**Project:** Topa OC & UG**Stations:** Guest House

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in µg/m ³)	CO (in mg/m ³)	Ozone (in µg/m ³)	
July '22 1st FN	09/07/22	09/07/22	09/07/22	15.64	0.709	11.95	E to W
July '22 2 nd FN	25/07/22	25/07/22	25/07/22	14.14	0.714	9.48	N to S
Aug. '22 3 rd FN	09/08/22	09/08/22	09/08/22	15.51	0.696	12.65	E to W
Aug. '22 4 th FN	24/08/22	24/08/22	24/08/22	16.91	0.675	11.54	E to W
Sept. '22 5 th FN	09/09/22	09/09/22	09/09/22	15.99	0.623	12.79	E to W
Sept. '22 6 th FN	24/09/22	24/09/22	24/09/22	15.43	0.692	12.82	W to E

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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ENVIRONMENT LABORATORY , CMPDI (HQ) , RANCHI**TEST REPORT**

09/22 Test Report No. 2027	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	September-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju **Project:** Topa OC & UG **Stations:** Banwar Tola

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in µg/m ³)	CO (in mg/m ³)	Ozone (in µg/m ³)	
July '22 1st FN	10/07/22	10/07/22	10/07/22	11.58	0.506	14.13	E to W
July '22 2 nd FN	26/07/22	26/07/22	26/07/22	11.61	0.426	13.63	N to S
Aug. '22 3 rd FN	10/08/22	10/08/22	10/08/22	12.84	0.484	15.61	W to E
Aug. '22 4 th FN	25/08/22	25/08/22	25/08/22	11.90	0.414	15.37	E to W
Sept. '22 5 th FN	10/09/22	10/09/22	10/09/22	12.07	0.453	15.80	E to W
Sept. '22 6 th FN	25/09/22	25/09/22	25/09/22	12.43	0.423	14.91	W to E

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

Analysed By

Authorized Signatory

- Note: 1) This Report refers to the values obtained at the time of testing and results related to the items tested
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ENVIRONMENT LABORATORY , CMPDI (HQ) , RANCHI**TEST REPORT**

09/22 Test Report No. 2028	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	September-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : Kuju**Project: Topa OC & UG****Stations: Topa Colony**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in µg/m ³)	CO (in mg/m ³)	Ozone (in µg/m ³)	
July '22 1st FN	10/07/22	10/07/22	10/07/22	14.36	0.549	13.26	E to W
July '22 2nd FN	26/07/22	26/07/22	26/07/22	17.67	0.625	10.37	N to S
Aug. '22 3rd FN	10/08/22	10/08/22	10/08/22	16.93	0.666	10.65	W to E
Aug. '22 4th FN	25/08/22	25/08/22	25/08/22	16.02	0.589	11.42	E to W
Sept. '22 5th FN	10/09/22	10/09/22	10/09/22	17.05	0.611	10.55	E to W
Sept. '22 6th FN	25/09/22	25/09/22	25/09/22	16.23	0.605	11.09	W to E

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

Analysed By

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ENVIRONMENT LABORATORY , CMPDI (HQ) , RANCHI

TEST REPORT

09/22 Test Report No. 2029	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	September-22
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : **Kuju** **Project:** **Topa OC & UG** **Stations:** **UG Pit Office**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in µg/m ³)	CO (in mg/m ³)	Ozone (in µg/m ³)	
July '22 1st FN	10/07/22	10/07/22	10/07/22	12.9	0.673	15.33	E to W
July '22 2nd FN	26/07/22	26/07/22	26/07/22	12.62	0.728	16.00	E to W
Aug. '22 3rd FN	10/08/22	10/08/22	10/08/22	11.03	0.751	15.22	W to E
Aug. '22 4th FN	25/08/22	25/08/22	25/08/22	11.83	0.715	15.47	E to W
Sept. '22 5th FN	10/09/22	10/09/22	10/09/22	12.89	0.764	15.65	E to W
Sept. '22 6th FN	25/09/22	25/09/22	25/09/22	12.17	0.697	14.82	W to E

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

Analysed By

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(भारत सरकार का उपक्रम)

CENTRAL COALFIELDS LIMITED

Office of the Project Officer, Topa Project

Kuju Area

Annexure 3 and 4

Year-wise details of PPE distribution

Sl. no.	PPE	Year of issue	Number
1	Safety Goggles	2020	150
		2021	26
		2022	26
		2023	4
2	Dust Mask	2019	200
		2020	200
3	Folding Stretcher	2017	2
4	Welding Glass	2019	10
		2020	10
5	Welding Apron	2019	11
6	Safety Belt	2018	10
		2019	3
7	Ear plug	2020	200
8	Mechanical Siren	2020	2
9	Safety Helmet	2020	68
		2021	80
		2022	454
		2023	78
10	Safety Shoes	2020	320

		2021	232
		2022	414
		2023	76
11	Female boot	2019	27
		2021	03
		2023	76
12	Water bottle	2019	712
13	Life Saving Jacket	2020	10
		2021	10
14	Fluorescent Jackets	2021	500
		2022	350
		2023	409
15	First Aid Box	2022	15
16	Gum Boots	2023	16

Year-wise details of Training received by employees

Year	VTC		Special Training
	Departmental Employees	Contractual Employees	Departmental Employees
2016	80	75	09
2017	35	05	Nil
2018	85	32	Nil
2019	119	37	Nil
2020	108	35	11
2021	117	16	51
2022	143	23	51
2023(upto May)			25



सीएमपीडीआई
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A Mini Ratna Company

MINING PLAN & MINE CLOSURE PLAN OF EXPANSION OF TOPA R.O. OCP

Project Area (Ha)	Normative/ Peak Capacity (MTPA)
277.66 Ha	1.68

**(Kuju Area)
Central Coalfields Limited
(April, 2018)**

Prepared at

Regional Institute – III

**Central Mine Planning & Design Institute Ltd.
(A Subsidiary of Coal India Ltd.)
Gondwana Place, K9anke Road
Ranchi-834008, Jharkhand**

MINING PLAN & MINE CLOSURE PLAN OF TOPA REORGANISATION OCP (1.68 MTY)

1.0 BACKGROUND OF THE PROJECT

Topa Reorganisation Opencast Project of Central Coalfields Limited is located in West Bokaro Coalfields in Hazaribagh District of Jharkhand. This mine is located in between Kuju OCP in East and Pindra OCP in West. It is mainly a medium coking coal project.

The Topa block was under extensive mining activities during pre-nationalization period. Almost entire property is dotted with open pits and incline mouths. These mines were operated by private owners of that time and no systematic and scientific way of mining was adopted by them. Topa block has numerous scattered incline mouths as evident from the plan. The underground workings extended to seam V, VI, VII, VI/VII combined, VIII, IX and X.

After nationalization it was producing coal from different scattered underground as well as opencast workings. Underground mining was being done by conventional Bord and Pillar system and opencast by mechanized and manual both.

In 1987, it was proposed to increase the capacity of the project to 1.20 MTY to meet the requirement of Giddi Washery and was assessed that it would not be feasible to increase substantially the production by underground mining due to complex structure of coal seams. It was therefore proposed to resort to mechanised opencast mining only. With the opening of the new opencast mine the existing small underground and opencast units would be gradually closed. This was considered essential to improve production and productivity of the project and concept of Re-organisation came into light.

1.1 PROJECT REPORT FOR TOPA RE-ORGANISATION OCP (1.20 MTY)

The Project report of Topa Re-organisation OCP was prepared in August' 1987 with rated capacity of 1.20 MTY. The quarriable coal reserve was estimated as 52.50 Mte and the corresponding volume of OB as 142.00 Mcum with average stripping ratio of 2.33 Cum/Te. The total capital investment was Rs. 58.45 Crs. The project Report was approved by CCL in November, 1987 and by CIL Board in its 13th meeting of the Empowered Sub Committee on 30.12.87 held at Kolkatta.

IMG Meeting:

Updated economics of the Project (Feb'91) for the project was discussed by the IMG in its meeting on 12.7.91 and 24.9.97. IMG desired a further updating and the PR was finally updated in Dec' 99.

IMG recommended this project to PIB for consideration in its meeting held on 02.03.98 subject to the following observations.

- Availability of fund during IX Five Year Plan for this Project.
- Variant with road transport of coal from Topa OCP to Giddi Washery was accepted.
- Reduction of projected manpower by 2% was suggested.

PIB Meeting:

After complying the observation of IMG, the PR for Topa Re-Organisation OCP (1.20 MTY) was discussed in the PIB meeting held on 12.9.2000 in the Department of Expenditure, Ministry of Finance, New Delhi. The Project was discussed in detail and the Chairman of the PIB desired that the following actions need to be taken by the CCL and rated information may be sent to PIB for further action in this regard.

- Washability analysis report of all the coking coal seams may be done in the leasehold area of Topa OCP.
- Possibility of the provision of HEMM on the basis of wet leasing / dry leasing for the purpose of OB removal along with its economics may be examined and economic analysis done for comparison purpose. Economic analysis may be done on like to like basis for HEMM provided in the Project report vis-à-vis to be provided in wet / dry lease.
- Environmental clearance for the project has not been formally received. MOEF should be approached for issuance of environmental clearance before the next meeting of PIB.

As desired by PIB, an alternative with wet leasing of HEMM for OBR has been studied. In this study, it has been assumed:

- Drilling. Excavation, loading, transport and dumping of overburden will be carried out with leased HEMM by external agency. Hence no HEMM has been provided for OBR. The external agency shall deploy its HEMM for OBR only for exposing coal to be mined by departmental means.
- Blasting in both coal and OB benches will be carried out by departmental means.
- The operation and maintenance of the HEMM deployed in OBR will be carried out by the external agency.
- The provision in both excavation and E&M workshop has been reduced with the objective of maintaining the HEMM deployed in coal benches and common HEMM.

- The power supply arrangement will be done by CCL and the external agency will draw power from CCL's feeder for operation of its HEMM.
- The manpower for the operation and maintenance of the HEMM for OBR will be employed by external agency.

On the basis of PIB observation as stated above, economics of the project with leased equipment for OBR was estimated as Rs. 63.09 Crs (Base price, June 2000) and forwarded to PIB.

Ministry of coal vide letter no- 43011/8/88-CPAM dated 12.03.2000 intimated to CIL that the capital cost of the project is less than Rs. 100 Crs. Therefore, they returned the proposal and requested to process the project for approval under the delegated power of CIL. Finally the PR of Topa re-organisation OCP was approved by CIL Board for a rated capacity of 1.20 MTY for an initial capital of Rs. 65.25 Crs in March 2002.

1.2 LOCATION AND APPROACH

The Topa Block is located in the south-western part of the West Bokaro Coalfield in Hazaribagh district of Jharkhand. This block is bounded by latitudes 23°44'08"N & 23°45'11"N and longitudes 85°27'49"E & 85°28'47"E. The block is covered by the survey of India Topo sheet No.73 E/6 (1"=1 mile) and top sheet No.3 & 5.

The Topa Block is situated about 7 km west of the Kuju Township and 20 km from Ramgarh cantonment. It is approachable by a metalled road taking off from NH-33 (connecting Ranchi-Hazaribagh) near Naya More. This road passes through Kuju GM office and Orla village and further westward connecting Pindra colony and Rabodh village. The block is about at 5 km west of Naya More. There is another fair weather road connecting the block and passes via Banwar village.

The nearest railway station is Kuju station on loop line taking off Gomoh-Barkakana line of the Eastern Railway at a distance of about 5 Km from the project. The nearest railway siding is Kuju siding at about 4 km from the project.

1.3 PHYSIOGRAPHY AND CLIMATE

The climate is tropical with severe summer. The temperature during summer goes to high as 45 degree Celsius. The summer days are hot with dusty winds but nights are generally pleasant. The minimum summer temperature is around 20 deg Celsius. The winters are cold and the minimum temperature recorded is 4 degree Celsius.

The rainy season is generally from June to October. The total rainfall in a year on an average is about 1200 mm of which 70% of the precipitation is during rainy season only.

The Topa block is characterized by more or less flat terrain with gentle undulations. The raised ground of the block is generally occupied by weathered iron stone shale and sandstone ridges while the low ground by paddy fields and nalas. The ground in general slopes towards north east. The maximum elevation of 430 m is noticed near the borehole no- CCT-20 located in the southern part of the block. The minimum elevation of 366 m is observed near CCT-36 located in the eastern part of the block.

The drainage of the block is controlled mainly by the meandering Chowtha nala flowing North West to south east near the north eastern block boundary. The most prominent nala of the block is Naniadana nala flowing in north western part of the Topa property. There is another less prominent nala flowing almost parallel to Naniadana nala in the eastern part joins Chowtha nala north of CCT-36. About 50% of the total run off of the block goes into the Naniadana and about 30% into the less prominent nala flowing parallel to the Naniadana nala in the eastern part. The remaining 20% run off of the south eastern part goes directly into the Chowtha nala through small rivulets of the block. The Chowtha nala discharges its load into the Chowtha River flowing west to east along the northern boundaries of Kuju and Ara properties located east of the block. The Chowtha River is one of the important tributaries of mighty Bokaro River flowing in the southern part of the West Bokaro Coalfield.

1.4 PRESENT STATUS OF MINE

Topa OCP is an existing opencast working mine. The PR of Topa re-organisation OCP was approved by CIL Board for a rated capacity of 1.20 MTY for an initial capital of Rs. 65.25 Crs in March 2002. EIA/EMP of Topa Re-organisation OCP (1.20 MTY) was prepared by CMPDI and EC was obtained on 31.03.2008 vide letter no: J-11015/632/2007-IA-II(M). Coal wining in Topa OCP is done departmentally, whereas OB removal is outsourced.

1.5 Purpose of the report

MoEF issued guidelines for granting environmental clearance for expansion of coal mining projects involving one time production capacity expansion of upto 40% in the existing operation. The guidelines have been issued vide office memorandum No.J-11015/224/2015-IA.II(M) dated 15.09.2017.

Therefore, this mining plan is being prepared based on the approved PR with capacity enhancement from 1.20 MTPA to 1.68 MTPA within the truncated project area of 276.66 Ha.

2.0 BRIEF GEOLOGY

The Topa block is a part of the southern synform of the coalfield. It lies on the southern limb of this synform, the axis of which runs in almost E-W direction. The Gondwana sedimentary sequence in the block is represented by rocks of Barren Measures, Barakar and Karharbari Formations. The rocks of Barakars and Barren Measures outcrop within the block. The Karharbaris do not crop out in the block due to a major fault passing along the southern block boundary. It rests directly on Metamorphics as Talchirs have not been deposited in this region. The Barren Measures crop out near the northern block boundary and Barakars in the remaining area of the block. The Topa block having an area of 3.56 Sq. Km. is located in the south western part of the West Bokaro Coalfield in the Ramgarh district of Jharkhand. A total of 10871.51m of drilling in 75 boreholes has been done in the block by CCL (CDT, CCT & CCTR Series) and CMPDI (CWBM & CMWT Series)

2.1 Deposit Structure

The strike of the formation in the Topa block is broadly east-west with northerly dip of about 5° to 14°. The gradient of strata is 1 in 4 to 1 in 12. Geological structure of the Topa Block is simple to moderately complex. The block is traversed by 27 faults of different magnitudes ranging in throw from less than 5m to over 100m.

2.2 Coal Seam

Seams of the Barakar Formation are well preserved in Topa block. Sequence of coal seams and their intervening parting as established from the borehole records of CCL, and CMPDI is given below:

Table: The sequence of coal seams and partings in the Topa Block

Coal seams/Parting	Thickness Range (m)	BH Intersec.	Reserve (MT)	
			Proved	Indicated
XIII	0.42-1.57	7	0.594	
Parting	5.82-14.40			
XII	0.50-2.20	8	0.456	
Parting	7.25-17.47			
XIA	0.83-1.72	11	1.146	
Parting	3.40-9.00			
XI	3.77-11.00	12	7.242	
Parting	0.59-5.14			

**MINING PLAN & MINE CLOSURE PLAN OF TOPA REORGANIATION OCP
(Expansion from 1.20 MTPA to 1.68 MTPA)
Kuju Area, Central Coalfields Limited**

Coal seams/Parting	Thickness Range (m)	BH Intersec.	Reserve (MT)	
XA	0.50-2.17	12		
Parting	4.53-11.16			
X TOP	0.50-2.62	19		
Parting	3.18-13.52			
X MIDDLE	0.65-2.44	20		
Parting	0.92-14.37			
X BOTTOM	1.64-6.93	22	7.955	
Parting	9.97-20.50			
IXA	0.35-1.60	27		
Parting	1.24-22.91			
IX	1.05-3.45	34	6.114	
Parting	3.05-12.00			
VIII C	0.30-1.53	27		
Parting	2.69-14.78			
VIII B	0.22-1.72	29		
Parting	2.91-19.06			
VIII A	0.14-0.85	12		
Parting	2.95-17.03			
VIII	1.39-4.52	46	10.823	
Parting	1.56-17.88			
VII C	0.17-1.86	28		
Parting	3.14-19.53			
VII B	0.10-1.47	45	1.504	
Parting	2.08-10.70			
VII A	0.10-1.20	42		
Parting	3.87-20.77			
VII	3.36-5.43	18	5.606	
Parting	0.00-3.80			
VI	1.16-2.71	18	2.551	
VII/VI COMBINED	2.80-7.29	27	14.637	0.812

**MINING PLAN & MINE CLOSURE PLAN OF TOPA REORGANIATION OCP
(Expansion from 1.20 MTPA to 1.68 MTPA)
Kuju Area, Central Coalfields Limited**

Coal seams/Parting	Thickness Range (m)	BH Intersec.	Reserve (MT)	
Parting	1.35-21.27			
VA	0.42-5.30	43	8.704	0.259
Parting	1.87-29.78			
V	4.79-13.45	46	35.167	3.310
Parting	1.30-18.84			
IV	2.02-4.09	22	8.276	
Parting	0.00-6.00			
IIIA	0.10-1.43	21	1.640	
IIIA/IV COMBINED	1.43-1.74	30	8.305	0.941
Parting	0.65-6.51			
III	0.55-5.04	54	9.136	0.963
Parting	1.10-7.89			
IIB	0.15-1.54	30		
Parting	4.60-17.40			
IIA	0.16-1.58	15		
Parting	8.71-16.84			
II	0.62-3.27	30	3.159	3.197
Parting	2.54-24.86			
I	0.46-3.48	20	2.053	2.116
TOTAL			135.068	11.598

2.3 QUALITY:

Details of quality parameters of seams in Topa Block is given below:

Proximate Analysis and Coking Propensity of seams in Topa Block

Seam	Proximate Analysis (Inband)			Unit VM%	CV (K.cal/Kg)	Grade
	On 60%RH & 40°C					
	M%	A%	VM%			
XI	2.8-4.6	36.4-43.1	22.3-24.4	34.8-36.8	5175-6205	F-G
XA	4.4	35.8-38.2	23.8	34.5	6410	D-F
X TOP	3.1-5.6	25.4-30.5	23.7-25.2	32.2-34.2	5345	C-F

**MINING PLAN & MINE CLOSURE PLAN OF TOPA REORGANISATION OCP
(Expansion from 1.20 MTPA to 1.68 MTPA)
Kuju Area, Central Coalfields Limited**

X MID	3.0-5.5	32.4-37.3	22.2-32.5	34.4-35.9	5735	C-F
X BOT	1.7-5.0	21.1-28.6	24.6-28.6	32.8-35.7	5890-6520	C-F
IXA	4.7	20.5	25.2	31.9		
IX	2.1-5.1	22.1-39.5	24.8-28.0	32.6-37.0	5740-6335	C-F
VIII	1.7-4.4	22.2-41.5	22.5-26.3	32.0-39.2	5070-6380	W-II/ UNG
VIIC	3.3-3.7	24.4	26.0-28.8	34.5		W-II/ UNG
VIIIB	3.4	18.9	27.5	32.7-38.9	6345-6590	ST-I/ UNG
VIIA	3.5	26.0-43.8	26.0-30.0	34.3-38.5	-	W-I/ UNG
VII	1.8-5.1	14.8-20.8	26.2-28.9	34.1-36.4	6140-6675	ST-I/ W-II
VI	3.5	16.6-26.1	26.4-28.7	34.1-34.8	6015-6345	ST-II/ W-IV
VI/VII	2.7-3.0	20.5-23.7	27.0-28.9	34.0-35.7	6040-6655	W-I/IV
VA	2.5-3.7	21.0-29.1	28.6-32.8	34.3-40.9	5680-6470	ST-I/ UNG
V	2.0-3.5	25.9-37.5	24.6-29.3	34.7-39.7	4670-6155	W-I/ UNG
IV	2.0-3.6	28.3-32.2	25.6-27.6	35.1-38.5	5600-6320	W-III/ UNG
IIIA	2.6-3.6	32.6-38.7	23.1-38.7	35.9-38.7	5050-5910	W-III/ UNG
IIIA/IV	2.0-4.0	26.4-40.1	25.3-33.7	29.7-38.0	5640-6110	W-III/ UNG
III	1.8-3.5	29.0-42.0	23.1-28.0	33.9-38.6	4100-6205	W-III/ UNG

Coal of seam XI, XII and XIII are high volatile weakly caking in nature. Seam III to X are high volatile medium to strongly caking in nature (caking property has improved). Their general grade varies from WG II to ungraded. However the product mix grade comes to WG IV.

2.3.1 PROJECTED COAL QUALITY

The overall grade of the product mix of Topa Re-organization Opencast Project will be WG-IV.

3.0 MINING, DUMPING AND MINE SCHEDULE

The method of mining adopted to extract coal and OB in Topa RO OCP is inclined slicing with Shovel-Dumper combination. This method has been proposed considering the following Geo mining conditions of the quarry.

- i) Moderate gradient of seams.
- ii) Multiple seams.
- iii) Thin and developed seams.
- iv) Sufficient strike length.

- v) Variable thickness of OB/Partings.

Topa OCP is a working mine, it has advanced in dip side by about 300m (average) from incrop of Seam-III. The strike is not opened to its full extent due to some surface constraints and land acquisition. After overcoming the constraints with proper benches formation, the mine will advance in dip direction on planned strike length to achieve the targeted production.

3.1 CONSTRAINTS ON MINE DEVELOPMENT

3.1.1 OLD WORKINGS

Topa OCP is a working mine, in past the mine was extensively worked out by underground and opencast in small patches. Most of the excavated patches are filled up with OB which needs to be rehandled during latter stage of mine operation, when mine is approaching near Naniadana nala.

3.1.2 FIRE

Most of the seams within the quarry are partly developed or depillared by Bord and Pillar method. There is an evidence of fire in Seam-VIII at dip side of proposed quarry. The extension of this fire is not known, so while working the developed seams in future; the occurrence of fire cannot be ruled out, hence suitable statutory precautions need to be taken during the extraction of these seams.

3.1.3 REHABILITATION

Mangardaha, Banwar villages and Ravidas tola of Topa are located in the mining zone. A detailed R&R plan for 234 PAFs from the above mentioned villages including tribals to be displaced from the project area has been prepared and implemented in process.

Out of 234 PAFs, 122 families have already been rehabilitated and the status is as given below.

Name of Villages	No. of PAFs	PAFs already rehabilitated	Proposals under Process
Mangardaha, Banwar villages and Ravidas tola	234	122	32

Details of Employment for Land Losers:

Name of Villages	Total Employment Proposed	Employment provided till date	Proposals under Process
Mangardaha, Banwar villages and Ravidas tola	306	205	01

Future Action Plan for R&R:

Description	Total No.	Year of Shifting				
		2018-19	2019-20	2020-21	2021-22	2022-23
Rehabilitation of PAFs	112	32	30	20	20	10
Employment for Land losers	101	31	20	20	20	10

The compensation is proposed as per R&R Policy of CIL was revised with effect from 5th April, 2012.

3.1 PIT FORMUALTION STRATEGY

The pit formulation strategy adopted is typically suitable for maximising extraction of the coal reserve keeping in view of economics, important surface infrastructures and safety of the mine workings. The safety of the mine working will become important as the final depth of the quarry reaches 150m at the end of the mine life. The working of the quarry will continue with base seam, Seam-III and gradually advance towards the dip side of the mine. The surface limit of proposed quarry is restricted up to the forest land which is presently not acquired.

Mining in Topa OCP in past has been done in haphazard manner. ie OB is partly dumped within the quarriable area which requires rehandling during mine operation in very latter stage. The present working status of seams within Topa OCP is as follows.

Table: Present Working Status of Topa RO OCP

Seams	Present Status
Seam-VIII	Developed and partly depillared
Seam-VI/VIC	Developed and being quarried out
Seam-V	Developed and being quarried out
Seam-IV	Being quarried out
Seam-III	Being quarried out

3.3 QUARRY BOUNDARY

The boundaries of the proposed quarry as shown in the Final Stage Quarry Plan have been fixed in the following manner.

Northern Boundary:

In northern side the surface boundary has been fixed 7.5m from forest boundary and 100m from non- forest area.

Eastern Boundary:

In eastern side, the quarry floor has been fixed along Fault F15-F15.

Southern Boundary:

In southern side, the quarry floor has been fixed along the incrop of Seam-III.

Western Boundary:

In western side, the quarry floor has been fixed along Fault F1-F1.

3.4 MINEABLE RESERVE

There are all together seven coal seams namely Seam-III, Seam-III A/IVC, Seam-V, Seam-VA, Seam-VI/VIIC, Seam-VII, and Seam-VIII occurring within the proposed quarriable block of Topa RO OCP. The strike of the strata is broadly E-W with northerly dip of about 5 degree to 14 degree (1 in 4 to 1 in 12) with varying thickness.

All the nine seams within the proposed quarriable area have potential for opencast mining. While calculating the reserves, area having less than a meter seam thickness has been excluded for all seams of the block. Most of the seams are generally devoid of any dirt bands. The dirt bands one metre and above in thickness was considered as parting. In the region of merger of seams-VI and VII, bands more than 0.30m but less than 1m were present in some area and its volume was considered with coal. Similar consideration was adopted with combined seam-III A and IV also.

The cumulative mineable reserves within the proposed working area have been estimated as on 19.6.2018 is 10.20 MTe with corresponding OB removal of 17.60 Mcum with an average stripping ratio of 1.73 cum/Te. While calculating the mineable reserve a geological loss of 10% and mining loss depending on seam thickness have been considered to arrive at the net mineable reserve.

For underground developed seams, percentage of extraction of working section has been considered in the following manner, while estimating net geological reserve.

Table: Underground extraction percentage of Topa UG

Seams	Seam wise Percentage of UG Extraction
Seam-X Bot	25%
Seam-IX	35%
Seam-VIII	35%
Seam-VI/VIIC	25%
Seam-V	15%

3.4.1 SECTORWISE MINEABLE RESERVES

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The calendar programme has been drawn by dividing the whole mining block into different sectors. The sector wise mineable reserves have been given in the following table.

Table: Seamwise Sectorwise Mineable reserves

COAL (MT)	SEC-1	SEC-2	SEC-3	SEC-4	TOTAL
VIII	0.00	0.00	0.02	0.20	0.22
VII	0.03	0.23	0.25	0.36	0.87
VI/VI-VIIC	0.03	0.27	0.35	0.56	1.21
VA	0.06	0.28	0.34	0.51	1.19
V	0.24	0.82	1.18	1.98	4.22
IV/IV-IIIAC	0.07	0.28	0.41	0.66	1.42
III	0.04	0.19	0.30	0.54	1.07
TOTAL COAL (MT)	0.48	2.06	2.85	4.81	10.20

3.4.2 SECTORWISE VOLUME OF OBR

Table: Sectorwise and partingwise details of OBR (Mcum)

TOTAL OB (MCum)	SEC-1	SEC-2	SEC-3	SEC-4	TOTAL
TOP OB	0.23	1.30	0.97	1.64	4.14
PART IX & VIII	0.00	0.00	0.00	0.39	0.39
PART VIII & VII	0.00	0.23	1.75	2.96	4.93
PART VII & VI/VI-VIIC	0.01	0.30	0.25	0.30	0.85
PART VI & VA	0.07	0.14	0.16	0.26	0.62
PART VA & V	0.18	0.61	0.85	1.29	2.93
PART V & IV	0.16	0.56	0.88	1.50	3.10
PART IV & III	0.03	0.12	0.18	0.30	0.65
TOTAL OB	0.67	3.25	5.05	8.63	17.60

3.5 MINE PARAMETERS

Table: Final Stage Mine Parameters (Topa RO OCP)

Parameters	Unit	Min	Max
Mineable reserves	(MT)	10.20	
Total OB	(MCum)	17.60	
Average Stripping Ratio	(Cum/T)	1.73	
Capacity (Maximum)	(MTY)	1.68	
Length along strike at floor	Km	0.60	1.20
Length along strike at surface	Km	0.70	1.50

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Width along dip at floor	Km	0.40	0.70
Width along dip at surface	Km	0.50	0.85
Depth of quarry	m	100	
Area of Excavation at floor	Sq Km	0.58	
Area of Excavation at surface	Sq Km	0.92	

3.6 STRIPPING RATIO

Particulars	
Coal (Mte)	10.20
OBR (Mcum)	17.60
Stripping Ratio (Cum/te)	1.73

3.7 TARGET OUTPUT AND QUARRY LIFE

Topa RO OCP has been planned for nominal capacity of 1.20 MTY with peak capacity 1.68 MTY. The peak production will be achieved in 3rd year of quarry operation.

3.7.1 Quarry Life

The total life of the project is 7 years. The break-up is as under:

- Construction period: Nil
- Production build-up period: 2 years
- Production period with peak capacity: 4 years
- Tapering period: 1 year
- Total period: 7 years.

3.8 MINING STRATEGY

Altogether seven coal seams have been considered within the proposed quarriable area of mining in this proposal. All the coal seams as stated earlier have potential for opencast mining within the proposed quarriable area. The Seam-III has been considered as base seam. The mine will open it strike to full extent so that the planned capacity can be achieved. Once the desired strike length is opened the mine will progress in dip direction. The mine will follow the inclined slicing method of mining by drilling and blasting. Keeping in view of acute shortage of dumping space, the layout of this mine has been designed to maximize the internal dumping. No central haul road has been provided on the floor of base seam. The coal and OB both would be transported from batter's road only.

3.9 DUMPING STRATEGY

The dumping strategy has been formulated with due consideration of the following aspect:

1. Minimal use of the land for external dumping.
2. Rationalization of the lead distance for hauling.
3. Stability of the dump both internal and external, which ultimately leads to the safety of the person working in the mine.

Based on the above criteria the following dumping strategy has been adopted.

3.10 DUMPING ARRANGEMENT

The total volume of OB to be removed from Topa OCP is estimated as 17.60 Mcum. It is proposed to dump OB externally and internally both. The external dumping would be undertaken during the initial years. Presently OB dumping is being done externally. Once the sufficient space is created in the decolaed area, internal dumping may be undertaken. However, the toe of the dump at any stage of internal dumping shall not be within 100m from the running face of lowermost bench.

The external dump is located in south western part of the Topa village. The toe of this proposed dump has been kept 100 m away from the existing rehabilitation site. It would be better from environment point of view, if shifting of Rehabilitation site to other place is looked for. Garland drain where ever required around the dump and retaining wall in between dump toe and rehabilitation area have been provided from safety point of view.

3.11 DESIGN CRITERIA

Following design criteria has been adopted for the mining operation.

Nos. of annual working days	-	330
Nos. of Daily shift	-	3
Duration of each shift	-	8 hrs

The opencast mine is to be worked on the above three shifts per day and seven days per week, schedule and the number of working days per year are adopted as 330.

3.12 WORKING REGIME

The opencast mine would be worked on the above 3 shift/day basis and 7 days/week schedule and the number of working days /year are adopted as 330 considering annual public holidays, unscheduled delays and bad weather effect particularly in rainy season.

Annual 330 working days has been calculated considering following assumptions:-

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Calendar days per annum	-	365
Less- Public Holidays	-	(-) 8
Unscheduled delays	-	(-) 5
Bad weather effect	-	(-) 22
Available Working days per annum		
with Sunday as working day:	-	330
Number of days of working in a year	-	330
Number of shifts	-	3
Number of hours/shift	-	8
Excavation category assumed.		
(i) Coal	:	Cat. III
(ii) O.B	:	50% Cat.III + 50% Cat.IV
(iii) Alluvium	:	Cat. I/II
Insitu volume weight of OB in T/Cum	-	2.4
Av. Insitu volume weight of coal in T/Cum	-	1.6
The material having compressive strength between 125 to 250 kg/cm ² is classified as Cat III and between 250 to 1250 kg/cm ² as Cat IV.		
Av. Specific Gravity of Coal in different coal seams		
i) Seam-XI	-	1.54
ii) Seam-X	-	1.54
iii) Seam-IX	-	1.54
iv) Seam-VIII	-	1.64
v) Seam-VII	-	1.49
vi) Seam-VI/VIC	-	1.52
vii) Seam-VA	-	1.52
viii) Seam-V	-	1.61
ix) Seam-IIIA/IVC	-	1.67
x) Seam-III	-	1.64

Strength parameters of coal and rock if any compressive, tensile, shear strength, young modules etc. – Not Available

3.13 ANNUAL PRODUCTIVITY OF HEMM

The main mining and transport equipment will be operating on 3 shifts/day and 7 days/week operating schedule. The number of operating days/year has been adopted as 330.

The annual productivity of excavators has been calculated on the following basis:

(a) Excavation Category

(b) Average overall standard utilization of shift hours

Electric Hydraulic Shovel : 61% (3 shifts/day)

Diesel Hydraulic Shovel : 61% (3 shifts/day)

Based on the above operating conditions the estimated annual productivity of proposed excavators and Rear Dumper as per CMPDI norms are given below in Table.

Table: (Shovel Productivity (Mcum per year)

Particulars	60Te Dumper	60Te Dumper
	Coal	OB
5.5-6.5 Cum Diesel Hydraulic Shovel	1.77	1.63

Table: (Dumper Productivity (Mcum per year)

Lead (Km)	5.5-6.5 Cum DHS with 60 Te Dumper	5.5-6.5 Cum DHS with 60 Te Dumper
	Coal	OB
1	0.3696	0.3020
2	0.2769	0.2282
3	0.2301	0.1888
4	0.1977	0.1617

3.14 SHOVEL DUMPER COMBINATION

The equipment selection process is the most critical part of the project planning. The following selection criteria have been considered for selecting the size and type of the equipment:

- The strike length of the mine.
- Annual rate of advance/deepening.
- Total volume of overburden and coal to be handled annually.
- The individual thickness of coal seam and partings.
- The geo-mining condition of the mine.
- The type of mining system to be used like Inclined Slicing or Horizontal Slicing.
- The intuitive economics of the mine.

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- Presence of geological disturbances like faults, intrusions etc.

Based on the above selection criteria and keeping in view of the Geological and Mining parameters of Topa Expansion OC, Shovel-dumper combination of mining system is most suitable one in the area under consideration. The proposed opencast mine has therefore, been designed to be operated by shovel dumper with inclined slicing method.

The proposed place of deployment (in partings, seams, etc.) of the selected equipment is given below.

List of HEMM

Particulars	Capacity
COAL	
Diesel Hyd Back Hoe	5.5-6.5 cum
Rear Dumpers	60 Te
RBH Drill (Diesel)	160mm
Dozer / Wheel Dozer	460 HP
OB	
Diesel Hyd Shovel	5.5-6.5 cum
Rear Dumpers	60 Te
RBH Drill (Diesel)	160 mm
Dozer / Wheel Dozer	460 HP
COMMON	
Diesel Hyd. Shovel (with backhoe)	3.2-3.8 Cum
Grader	280 HP
Mobile Crane	8-14 Te
FE Loader	5-6 Cum.
Water Sprinkler (Mist spray online highway)	28 kL
Dump Trucks	10 Te
Fire Tender	4.5 kL
Diesel Bowser	16 kL
Tyre Handler	3.5 Te
RECLAMATION	
FE Loader	5-6 cum
Dozer	410 HP
Water Sprinkler	28 kL

3.14.1 Coal Winning

Coal will be mined by 5.5-6.5 cum diesel hydraulic shovel with back hoe attachment in conjunction with 60T rear dumpers. 5.5-6.5 cum Diesel Hydraulic Shovel with backhoe attachment is provided for mixed benches working and selective mining to avoid grade slippage. This attachment will also be useful in handling faulted area operation and temporary sump formation. For the estimation of

the dumpers population in coal, the lead for coal transportation has been considered for each year and for each seam. FE Loader has also been provided in common category for different mining operations and to cater to multiple thin seams. One backhoe with smaller capacity is proposed in common to deal with developed workings from upper bench. Coal will be transported through batter's road only. Inter bench transport ramps are designed (1 in 10 gradient) to facilitate HEMM movement in between different horizons. Possibility of haul road on floor is ruled out to maximize the internal dumping. Major coal will be transported from the coal face to the CHP/stock yard through batter roads of the mine.

3.14.2 OB removal

Considering the annual work load of overburden/ partings and geo mining characteristics, the equipment combination of 5.5-6.5 cum diesel hydraulic face shovel in conjunction with 60 T dumpers has been envisaged for working this opencast project. OB will be transported through batters on the flanks of the mine similar to Coal transportation. Inter bench transport ramps is provided (1 in 10 gradient) to facilitate HEMM movement in between different horizon or inter benches. Horizon of each haul road from both flanks is linked with the internal dump horizon in the quarry. Gradient of the floor is moderately steeper, so safety of dump slope towards running face of the mine is prime concern for internal dumping. In light of this, the gap between two dump horizon/levels has been kept 40m. At some places the floor gradient has become steep, where floor blasting is proposed before dumping so as to increase the friction along floor dump.

3.15 CALENDER PROGRAMME:

The mining schedule has been formulated based upon the adopted sequence of mine development. For making the calendar programme of excavation the reserves of coal and volume of OB have been calculated in different sectors or horizons. The calendar programme envisages to produce 1.20 Mte coal in first year of quarry operation. The western extent the proposed quarry including safety zone falls partly within the colony area. Few miner's & officer's quarters with other infrastructures may be required to dismantle in initial stage of quarry operation for opening planned strike length of the mine. Based on the annual targeted Capacity of 1.20 MTY with peak production of 1.68 MTY, the proposed mining schedule is generated for 7 years of project life.

The summarised mining schedule for coal extraction and corresponding natural and adjusted overburden load for the project has been provided in the Table given below.

Particulars/Years	1	2	3	4	5	6	7	TOTAL
Coal (Mte)	1.20	1.40	1.68	1.68	1.68	1.68	0.88	10.20

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OB (Mcum)	1.81	2.22	2.97	2.99	3.02	3.02	1.59	17.60
Stripping Ratio (Cum/Te)	1.51	1.58	1.77	1.78	1.80	1.80	1.80	1.73

3.16 LAND DETAILS

The total requirement of land in the present proposal for Topa Reorganization Opencast Project has been estimated as 276.66 Ha. The total requirement of land includes 69.18 Ha. of forest land and 207.48 Ha. of non-forest land. Out of 207.48 Ha non forest land, 154.71 Ha is tenancy and remaining 52.77 Ha. is GMK.

The Details of land use are as given below.

Description	Forest land in Ha.	Non Forest Land (Ha)		Total land in Ha.
		GMK	Tenancy	
Quarry	18.37	25.07	48.69	92.13
External OB	0.00	4.76	46.52	51.28
Infrastructure	0.16	3.55	5.50	9.21
Rehabilitation site	0.23	0.08	10.48	10.79
Existing colony	38.19	2.04	0.27	40.50
Safety zone	0.00	8.37	31.93	40.30
Vacant land/ Green Belt	12.23	8.90	11.31	32.45
Total	69.18	52.77	154.71	276.66

The Forest land involved within the project area has already been Stage II diverted and released. The details of Forest clearance of Topa RO-OCP is as given below.

- i. 77.30 ha Stage II diverted vide 8-77/2003-FC Dated 30-07-2008.
- ii. 17.30 ha Stage II diverted vide 8-82/90-FC dated 27.03.1997.

3.17 SAFETY MEASURES

Safety of men and machine deployed in the mining area should be properly taken care of irrespective of whether the mining activities are performed by departmental or by outsourcing option. All the regulations & schedules of Coal Mines Regulations 2017 relating to opencast mining have to be adhered to and implemented in order to maintain day to day safety as per stature.

3.17.1 SAFETY ASPECT OF WORKMEN & HEMM

Special precaution should be taken while deploying workers in the mine. Before employing any labour to the mine proper vocation training should be imparted and recommendations of VIII Safety Conference should be strictly followed. Some of the major aspects are as follows:-

A) FOR PERSONS

- i) No persons shall be deployed unless he is trained at VTC
- ii) Records in Form-B Form-D shall be maintained.
- iii) Records of Vocational training Certificate and driving license of operators shall be kept by competent authority and shall be made readily available for inspection by management.
- iv) No person shall be employed unless person holds VTC. A record of it shall be maintained.
- v) Adequate supervision shall be maintained by qualified competent persons only.

B) FOR MACHINERIES

Provisions of Coal Mines Regulation and DGMS Cir. (Tech.) 1 of 1999 should be strictly adhered to along with the following:

- i) All machinery and plant used in connection with working of a mine shall be of good design, sound construction, and suitable material, adequate strength, free from patent defect and properly maintained.
- ii) The owner, agent and manager shall provide adequate training facilities and ensure proper training of persons employed for operation and maintenance of machinery and plant.
- iii) No person except an engineer or other competent person under his supervision shall undertake any work on machinery and plant in which technical knowledge or experience is required.
- iv) All the machineries to be deployed in mines shall be so designed as to afford the operator clear and uninterrupted vision all around.
- v) Every heavy earth moving machineries, including trucks and tippers, used in mine shall be fitted with adequate safety features or devices as specified by DGMS. All equipment shall be provided with audiovisual alarms, proper light for use at night and fitted with suitable type of the fire extinguishers.
- vi) Truck mounted drill machines designed for tube well drilling for sources of water shall not be used and only proper type of blast hole drill machine, especially designed for mining purpose, shall be used in the mine.
- vii) Every heavy earth moving machinery shall be under the charge of a competent person (Operator or Driver), authorized in writing by the Manager.

- viii) All persons employed or to be employed to operate heavy earth moving machinery shall be trained and their competency shall be evaluated by a Board constituted by the management, who shall be persons who are not connected with imparting of training.
- ix) A proper record of repair and maintenance along with inspection done by competent authority and defect pointed out shall be maintained and signed by authorized person.
- x) Only such fitters or mechanics possessing driver's or operator's license, shall be allowed to carry out test-run of heavy earth moving machineries.
- xi) No person other than the operator or the driver or any person so authorized in writing by the manager shall be allowed to ride on a heavy earth moving machinery

3.17.2 STABILITY OF BENCHES, QUARRY HIGHWALLS & SPOIL DUMPS

During quarry operations, it is necessary to adopt required mining parameters for the stability of benches, highwalls and spoil dumps. It is also mandatory to examine systematically the fencing of mine workings, landslides and cracks between benches. It is required to maintain well-graded and wide roads on benches keeping the width of working areas sufficient for spreading of blasted rock and movement of the mining and transport equipment.

During actual mining operation, systematic observations of the condition of benches, high wall slopes and spoil dumps should be carried out and the dimensions be modified if necessary to suit the local conditions. To ascertain the optimum slope angles for stability of quarry benches, highwalls and spoil dumps, scientific study of slope stability along with hydro-geological study of the area needs to be undertaken. Provisions laid down under Coal Mines regulation shall be strictly adhered to for the safety of quarry and OB/ spoil dumps. In addition to this, the following precaution should be considered:

- i) The spoil dump height should not exceed 90m from immediate surface level with an overall slope of 28° or less. In the event of encountering steep floor gradient, floor blasting should be done and the area properly levelled by dozer before spoil dumping.
- ii) No working or construction should be allowed within the 60m toe of the OB dump.
- iii) Before dumping the OB on the floor of seam, at least 10m length all along the strike length should be made horizontal at every 50 meter by floor dinting/blasting.
- iv) Dump should be created in such a way that there is no chance of accumulation of water in and around the base of dump as it will adversely affect the shear strength of the base material of dump. It must be ensured that there is no stagnant water at the toe of dump and the top of the dump.

- v) The toe and face of the dump should not be eroded or cut at any point of time to avoid slope failure.
- vi) Formation of dumping should be done in square or circular or any regular shape as far as possible.
- vii) Proper drainage system should be provided to bring down rain water by construction of inclined drain on dump face and catch drain on all benches.
- viii) During active period of dump, all rain water should be diverted away from mining site as far as possible.
- ix) Sump and pumping capacity should be sufficient to accommodate peak surface run-off and seepage of water.
- x) Gabion wall and garland drain should be constructed and maintained to trap the surface run-off and sludge coming from dump.
- xi) Plantation and grassing should be done on top and slope of the dump respectively.
- xii) Regular monitoring is required for development of tension crack, gullies, movement of soil mass, stagnation of water and any other unusual occurrence. In case of dump movement, rate of movement of dump should be monitored. Special attention should be given at curve area/turning area of the dump.

3.17.3 OTHER PRECAUTIONS AND SAFETY MEASURES IN SPOIL DUMPING

With increasing size of opencast mine, the quantity of OB removal is also increasing. The dumping of OB can be external, internal or both. The stability of spoil dump is the main concern for an opencast mine. Poor management of overburden dump results the instability of dump slope in opencast mine. In few decades destabilizations especially internal dumps have taken place in coal mines, therefore, it has become necessary to adopt the scientific methodology for spoil dumping along with the following statutory steps / measures.

- a) The width of any bench in waste dumps shall not be less than its height and a scientific study is to be made, in case the planned height of the dump is beyond 30m.
- b) In case of any existence of any road nearby, dumping shall be done in such a way that the distance between the toe of the dump and road is not less than twice the overall dump height. If it is inevitable, arrangement shall be made for diversion of road; so that it is away from the stated safe distance.
- c) The top soil and sludge shall not be dumped at the floor to create the base of the dump.

- d) For reducing the ground water pressure in the dump rock above phreatic surface, effective drainage system shall be provided both inside and outside the overburden dump. In this regard, the guidelines provided in DGMS Circular (Tech) No-2 of 2001 in designing pit slope shall be followed.
- e) The dump area shall be substantially fenced, in accordance with the CMR, to prevent inadvertent entry of any person to the dump.
- f) Precautions shall be taken to prevent spontaneous heating and fire in the carbonaceous shale and coal dumped along with overburden.
- g) Gabion walls, wherever required shall be provided round the periphery of dump for prevention of floor heaving and to facilitate the drainage of water accumulated near toe of external dump. It also acts as retaining wall to some extent.
- h) Internal dumping on the seam floor having steeper gradient shall not be carried out unless, it is ensured that the dump stability factor of safety is well within the allowable range. For this a scientific study on slope stability of dump considering the geo-engineering/mining parameters must be carried out and dumping shall be done in accordance with guidelines as suggested in the study report.

In addition to the above precautions and measures, it is also necessary to comply the statutory guidelines issued by DGMS or any statutory/safety bodies from time to time regarding OB dumping in opencast mines.

3.17.4 PRECAUTIONS AGAINST DANGER OF INUNDATION FROM SURFACE WATER

Following are the precautions required to be taken against danger of inundation from surface water:

- a) Adequate protection against any danger of inrush of surface water into the mine or part shall be provided and maintained to the satisfaction of DGMS, whose decision shall be final.
- b) The entrance into the mine shall be so designed, constructed and maintained that its lowest point (which means the point at which a body of rising water on surface can enter the mine) shall not be less than 3.0 meters above the highest flood level at that point.
- c) Every year, during the rains constant watch shall be kept on the flood levels on the surface of the mine and if at any time the levels cross the highest levels earlier recorded, such levels shall be marked by permanent posts along the edges of water and the new highest

levels thus observed shall be recorded with the date as the highest flood level on the plans by an actual survey.

- d) If water dams or reservoirs are built across rivers and water courses on the upstream side of the mine, arrangements shall be made for communication between appropriate authorities for the purpose of ascertaining the quantity and timing of water released from the dams which is likely to endanger safety of the mine and arrangement for similar communication shall be made when water level rises on the upstream side which is likely to endanger the mine.
- e) The highest flood levels and danger levels at least 1.2 meters below the highest flood level, shall be permanently marked at appropriate places on the surface and whenever water rises towards the danger level at any place, all persons shall be withdrawn from the mine sufficiently in advance and for this purpose adequate arrangements of quick communication to all parts of the mine by effective systems shall be provided and maintained.
- f) No working shall be made in the mine at any spot lying within a horizontal distance of 15 meters from either bank of a river or nala.
- g) A competent person shall, once at least in every fourteen days during the rainy season and once at least in every thirty days during other periods of the year, examine every protective measure provided; whether in use or not, for their stability, and a report of every such examination shall be recorded. The protective measures and workings shall also be inspected, once at least in every quarter by the Manager personally.
- h) A careful assessment is to be made against the danger from surface water before the onset of rainy season. The necessary precautions should be clearly laid down and implemented. A garland drain needs to be provided to drain away the surface rainwater from coming into the mine.
- i) Standing order for withdrawal of working persons in case of apprehended danger. During heavy rain inspection of vulnerable points is essential. In case of any danger persons are to be withdrawn to safer places.

3.17.5 PROTECTION OF EQUIPMENT DEPLOYED AT BOTTOM HORIZONS FROM FLOODING

During the heavy monsoon period, the mining operation in the lower-most bench may have to be stopped. Therefore, it is proposed to drown the lower-most bench, which would work as a sump. The water will be pumped out and discharged into the nearby Nallah / River.

For ensuring safety of the equipment while working out bottom horizons with no access to surface profile, the following measures should be taken:

- (a) Drivage of initial trenches if any and coal cutting on bottom benches should be done during the dry period of the year.
- (b) Ramps should be made for quick shifting of equipment from bottom horizons, liable to be flooded during monsoon period, to the top horizons.

3.17.6 PRECAUTIONS AGAINST DANGER FROM BLASTING

Following measures should be taken while drilling and blasting operations in the quarry:

- a) Drilling and Blasting in quarry should be done in accordance with the provisions of Mines Safety Act, rules and regulations.
- b) Adequate safety measures have to be taken during blasting operation in the quarry so that men / machine are not affected.
- c) Blasting pattern and area to be blasted should be carefully evolved for best results and the blasted coal should be loaded as early as possible.
- d) Controlled or muffled blasting will be practiced near the important surface infrastructures and also within 100m of the vacant land. Besides this, necessary safety precautions should be clearly laid down and implemented whenever, any important surface features like public roads, rail, civil infrastructures / buildings etc. fall within radius of the blasting zone.

3.17.7 SAFETY MEASURES FOR WORKING OVER DEVELOPED COAL SEAMS

- (a) For deployment and movement of HEMM minimum solid parting of 3m must be ensured over developed workings, which should be mined by Hydraulic Backhoe as far as possible.
- (b) Accurate survey plan of development workings must be prepared for safe operation of the HEMM.
- (c) Precautions laid down by DGMS (Tech. 3/1980 & 4/1983) to prevent coal dust explosion and subsequent fire in underground due to blow through shots shall be adhered too.

3.17.8 OTHER PRECAUTIONS AND NECESSARY ACTION

- a) During quarry operations, it is necessary to maintain well-graded and wide roads on benches keeping the width of working areas sufficient for spreading of blasted rock and movement of the mining and transport equipment.
- b) Backfilling of old worked out quarry will be started from first year of quarry operation.
- c) The proposed 60m barrier left against the water logged old quarry will be mined out judiciously with safety and precautionary measures after completion of backfilling the void of old quarry and consolidation of dumped material. However, during extraction any symptoms of seepage of water / water matter is observed through the barrier, mine workings / operations should be immediately stopped till stoppage of seepage of water or any other water matters.
- d) Top soil quarried out from the proposed quarry will be used in reclamation of the dumps to its fullest extent from environmental view point.

4.0 Mine Closure of Topa Re-Organization OCP

Details of Escrow Fund for Mine Closure

As per MOC guidelines, a corpus escrow account @ Rs. 6.0 lakhs per Ha of the property leasehold shall be opened with the coal controller organization to meet the expenses of final mine closure. Thus the total expenditure on this front may be calculated in following manner:

The cost expenditure after closure of mine will be met from the corpus escrow account deposited by the mine operator. However, the additional amount beyond the escrow account will be provided by the mine operator after estimating the final mine closure cost five years prior to mine closure (as per the mine closure guideline).

The progressive mine closure will deal the land reclamation as per the calendar plan of project report. The cost of progressive land reclamation is already part of the project cost. Therefore, the escrow account for mine closure will deal only the final mine closure.

Basis of Calculation

The total mine lease area is 276.66 Ha, so the corpus based on August, 2009 rate is Rs. 1659.96 Lakh @ Rs. 6.0 Lakh/Ha of lease area. The wholesale price index in August, 2009 and April, 2018 is 129.60 and 182.32 (including base year conversion factor of 1.561) respectively. So the current value of corpus is Rs 1659.96 x 182.32/129.60 Lakh, which comes to Rs. 2335.22 lakh. The amount already deposited in the escrow account including interest is 934.08 lakhs. Therefore, net amount to be deposited is 1401.14 lakhs. Since this is an operating/existing mine, this corpus is to be divided by balance life of mine. The balance life of the mine is 07 years. So, by dividing by 07 years, the annual corpus comes to Rs. 200.16 Lakh.

Year	Amount in Lakh (Rs.)
1	200.16
2	210.17
3	220.68
4	231.71
5	243.30
6	255.47
7	268.24
Total	1629.73
Total Mine closure cost (in Rs Lakhs)	2563.81

As per above an amount will be deposited every year up to the last year of mine life. The amount calculated by the above formula shall be deposited every year by CCL in the Escrow amount opened with the Coal Controller organization in a scheduled Bank. An agreement, outlining detailed terms and conditions of operating the said Escrow Account shall be executed amongst CCL, the Coal Controller and the commercial Bank.

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However the additional amount beyond the escrow account, if any estimated later on, will be provided by the mine operator after estimating the final mine closure cost five years prior to mine closure (as per the mine closure guideline).

The break-up of Mine Closure Cost as per CMPDI Norms

The above escrow account will meet the cost of different activities of Mine Closure cost which is given in the table below:

	Total Amount in Escrow A/c (in Rs Lakhs)	2563.81		Expansion of Topa re- organization OCP
SL. NO.	ACTIVITY	% OF TOTAL MINE CLOSURE COST	AMOUNT IN LAKH (RS.)	Remarks
A	Dismantling of Structures			To be included in final mine closure plan
	Service Buildings	0.20	5.13	
	Residential Buildings	2.67	68.45	
	Industrial structures like CHP, Workshop, field sub-station etc.	0.30	7.69	
B	Permanent Fencing of mine void and other dangerous area			To be included in final mine closure plan
	Random rubble masonry of height 1.2 metre including levelling up in cement concrete 1:6:12 in mud mortar	1.50	38.46	
C	Grading of highwall slopes			To be included in final mine closure plan
	Levelling and grading of highwall slopes	1.77	45.38	
D	OB Dump Reclamation			71% for progressive and 17.66% for final mine closure Equal weightage throughout the life of the mine
	Handling/ Dozing of OB Dump and back filling	88.66	2273.07	
	Bio-reclamation including soil spreading, plantation and post care	0.40	10.26	
E	Landscaping			Equal weightage throughout the life of the mine
	Landscaping of the open space in lease hold area for improving its esthetic	0.30	7.69	
F	Plantation			To be included in final mine closure plan Equal weightage throughout the life of the mine
	Plantation over cleared area obtained after dismantling	0.50	12.82	
	Plantation around the quarry area and in safety zone	0.20	5.13	
	Plantation over the external OB Dump	0.02	0.51	
G	Post Closure Env Monitoring/ testing of parameters for three years			For three years after mine closure
	Air Quality	0.22	5.64	
	Water Quality	0.20	5.13	

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H	Enterpreneurship Development (Vocational/skill development training for sustainable income of affected people	0.26	6.67	Equal weightage throughout the life of the mine
I	Miscellaneous and other mitigative measures	2.00	51.28	Equal weightage throughout the life of the mine
J	Post Closure Manpower cost for supervision	0.80	20.51	To be included in final mine closure plan
TOTAL		100.00	2563.81	