



**OFFICE OF THE GENERAL MANAGER
BHUBANESWARI AREA**

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Ref. No: GM(BBSRI)/Envvt/FC/2024 -25/37

Dated: 27 /03/2025

To
The Divisional Forest Officer,
Angul Forest Division,
Angul, Odisha – 759122

Ref: Stage-I/in-principle approval letter No. 8-18/2002-FC(Vol) Dtd. 24.09.2024 of the AIGF, FC Division, Government of India MoEF&CC, New Delhi

Subject: Proposal for seeking prior approval of the Central Government under Section-2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 26.416 ha (originally proposed area is 20.383 ha) of forest land in favour of the Mahanadi Coalfields Ltd. for continuation of mining operation at Bhubaneswari expansion OCP within Mining Lease area over 658.724 ha under Angul Forest Division in Angul District, Odisha - Regarding. (Online proposal no. FP/OR/MIN/155017/2022).

Dear Sir,

Please find the attached herewith Compliance of Conditions stipulated in "In-Principal approval" accorded U/s 2(ii) of Forest (Conservation) Act, 1980 (Presently Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980) granted by MoEF&CC vide No. 8-18/2002-FC(Vol) Dtd. 24.09.2024 favour of the Mahanadi Coalfields Ltd. for diversion of 26.416 ha (originally proposed area is 20.383 ha) of forest land at Bhubaneswari expansion OCP within Mining Lease area over 658.724 ha under Angul Forest Division in Angul District, Odisha along with all Annexure.

This is for your kind information and needful action at your end please.

Yours faithfully
27/03/2025
General Manager
Bhubaneswari Area
महा प्रबंधक
एम.सी.एल., भुवनेश्वर क्षेत्र
MCL, Bhubaneswari Area

Copy for kind information to:

1. The TS to D(T/OP), D(T/P&P), MCL
2. The GM(Envvt.&Forest), MCL
3. The Project Officer, Bhubaneswari OCP
4. The Staff Officer (Envvt/L&R/Survey/Civil), BBSRI Area
5. Project Environment Officer, Bhubaneswari OCP.

Compliance of Conditions of FC for Bhubaneswari OCP EXP

8-18/2002-FC(vol) I/82877/2024 Dt:20.09.2024

| Sl No | CONDITIONS | COMPLIANCE |
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| 1. | Legal status of the diverted forest land shall remain unchanged | In compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted an Undertaking that the legal status of the diverted forest land shall remain unchanged. The copy of the undertaking is enclosed as Annexure-1 . |
| 2. | Compensatory Afforestation: | |
| i. | The Compensatory afforestation, over non-forest land, equal in extent to the forest land being diverted, shall be raised by the State Forest Department at the project cost | In compliance to this condition, the area of 62.725 ha Degraded Forest land in the village Karnapur under Talcher Tahsil in Talcher Range of Angul Forest Division has been identified. Further the CA Scheme at the current wage rate for an amount of Rs. 2,75,34,400.00/- has been deposited in State CAMPA fund through Online Parivesh portal vide UTR ICICR22024110606085518 dtd 06.11.2024 as per the demand Letter No.8046/DRP Dated:21.10.2024. (Demand Letter enclosed in Annexure-2) Accordingly, User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted the details of payment verified in the CAMPA portal which is enclosed as Annexure-2A . |
| ii. | The User Agency shall transfer the cost of raising and maintaining the compensatory afforestation as per the approved CA Scheme at the current wage rate in consultation with State Forest Department in the account of CAMPA of the concerned State through online portal | In compliance to this condition, the area of 62.725 ha Degraded Forest land in the village Karnapur under Talcher Tahsil in Talcher Range of Angul Forest Division has been identified. Further the CA Scheme at the current wage rate for an amount of Rs. 2,75,34,400.00/- has been deposited in State CAMPA fund through Online Parivesh portal vide UTR ICICR22024110606085518 dtd 06.11.2024 as per the demand Letter No.8046/DRP Dated:21.10.2024. |

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| | | <p>(Demand Letter enclosed in Annexure-3)</p> <p>Accordingly, User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted the details of payment verified in the CAMPA portal which is enclosed as Annexure-3A.</p> |
| iii. | The exact area involved in the proposal shall be verified after taking into account the already diverted area for Ananta OCP and the Stage2/Final approval shall be accordingly issued. The state shall ensure that the safety zone is maintained within the diverted area only and keeping in view the revised area the modifications in the mining plan as appropriate shall be made by the state/UA | <p>In compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted modified mining plan keeping in view the safety zone is maintained within the diverted area by the UA Annexure-4</p> <p>The copy of the undertaking is enclosed as Annexure-4A.</p> |
| iv. | The suitable non-forest land equivalent to the area proposed for diversion shall be identified and provided for raising compensatory afforestation. The area identified shall be transferred and mutated in favor of the State Forest Department and shall also be notified as RF/PF under IFA, 1927 or any state /local act before granting the Stage-II approval; | <p>In compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has deposited an amount of Rs. 41,17,57,500/- towards govt. fees for mutation of 62.72 ha of Degraded revenue forest land, in the Account of Tahasildar, Talcher through RTGS vide Treasury Reference ID 3A3C18E046 on dated 18.01.2025. Annexure-5</p> <p>The land for Compensatory Afforestation has already been alienated in the name of State Forest Department and a copy of RoR issued thereon has been enclosed as Annexure-5A.</p> <p>In this connection, the copy of the PF Notification by Addl. Chief Secretary to Government, vide No. FE-DIV-FLLD-0020-2022 (10F-(Cons)-66/2017-7514/FE&CC dtd 27.03.2025 enclosed as Annexure-5B.</p> |
| v. | All details (i.e. KML file, SOI topo sheet, DGPS map, approved CA Scheme, site suitability certificate etc.) of non-forest land equal in extant to the forest land being proposed for diversion shall be submitted by the State Government along with the compliance report of the Stage-I approval. | <p>In compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted all details KML file, SOI topo sheet, DGPS map, approved CA Scheme, site suitability certificate to the State Government along with the compliance report of the Stage-I approval for further Submission in a pen-drive.</p> |

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| vi. | The Nodal Officer shall report compliance in this regard along with a copy of the original notification declaring the non-forest land as RF/PF, along with compliance of 'in-principle' approval. | In compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted the original notification declaring the non-forest land as RF/PF in Annexure-6 |
| vii. | The cost of Survey, demarcation and erection of permanent pillars, if required on the identified CA land, shall be deposited in advance with the Forest Department by the user agency | In compliance to this condition, the survey, demarcation and erection of permanent pillars have been completed by the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher. |
| 3. | Net Present Value: | |
| i. | User Agency shall transfer the funds towards the cost of Net Present Value (NPV) of the forest land being diverted under this proposal from the User Agency, as per the orders of the Hon'ble Supreme Court of India dated 28.03.2008, 24.04.2008 and 09.05.2008 in Writ Petition (Civil) No. 202/1995 and the guidelines given under para 3 of the Chapter -3 of the Consolidate Guidelines and Clarifications issued under the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and Van (Sanrakshan Evam Samvardhan) Rules, 2023 published by the Ministry on 29.12.2023, through e-payment module on PARIVESH portal, into the account of CAMPA of the State concerned, managed by the National Authority (CAMPA); | In compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has deposited the Net Present Value (NPV) amount of Rs. 2,92,83,645.00/- for diversion of 26.416 ha (originally proposed area is 20.383 ha) in State CAMPA fund via Parivesh portal vide UTR ICICR22024110606085519 dtd 06.11.2024 as per the demand letter issued vide no.8043 Dated:21.10.2024. (Demand Letter and Transaction slip enclosed in Annexure-7) The details of payment verified in CAMPA portal is enclosed as Annexure-7A . |
| ii. | At the time of payment of the Net Present Value (NPV) at the present rate, the user agency shall furnish an undertaking to pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India; | In compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted the undertaking to pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India. The undertaking to this effect is enclosed as Annexure-8 . |
| 4. | Compensatory levies to be realized from the User Agency under the project shall be transferred/ deposited, through e-payment module on PARIVESH portal (https://parivesh.nic.in/), into the account of CAMPA of the State concerned, managed by the National Authority (CAMPA); | In compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has deposited Compensatory levies in the CAMPA account through e-payment module. The details of the payment & verification on the CAMPA portal is enclosed as Annexure-9 . |

| 5. | The KML files of diverted area, the CA areas, the proposed SMC treatment area and the WLMP area shall be uploaded on the e-Green watch portal with all requisite details prior to 'final' approval; | All requisite details and files have already been uploaded on the e-Green Watch Portal is enclosed as Annexure-10 . | | | | | | | | | | | | |
|--------|---|---|--------|--------------------------------|------|----------------|-------|---------------|--------|---------------|-------|---------------|------|-------------|
| 6. | <p>Following activities, as per approved plan / schemes, shall be undertaken in the lease area by the User Agency under the supervision of the State Forest Department. Approved scheme/plan shall be submitted to the Ministry along with compliance of ‘in-principle’ approval</p> <p>(i) Mitigation measures, to minimize soil erosion and choking of stream, shall be implemented within a period of two years with effect from the date of issue of order of diversion of forest land, in accordance with the approved Plan in consultation with the State Forest Department;</p> <p>(ii) Planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion in accordance with the approved scheme;</p> <p>(iii) Construction of check dams, retention /toe walls to arrest sliding down of the excavated material along the contour in accordance with the approved scheme;</p> <p>(iv) Stabilize the overburden dumps by appropriate grading/benching, in accordance with the approved scheme, so as to ensure that angles of repose at any given place is less than 280; and</p> <p>(v) No damage shall be caused to the top-soil and the user agency will follow the top soil management plan;</p> | <p>In Compliance to this condition the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted Five numbers of approved schemes with separate financial outlay, which has already been approved by the RCCF, Angul. An undertaking to the condition by User Agency has been enclosed as Annexure-11.</p> <table><tr><th>Scheme</th><th>Total Financial Outlay in (Rs)</th></tr><tr><td>6(i)</td><td>3,348,88,000/-</td></tr><tr><td>6(ii)</td><td>1,26,84,000/-</td></tr><tr><td>6(iii)</td><td>6,44,97,100/-</td></tr><tr><td>6(iv)</td><td>1,08,00,000/-</td></tr><tr><td>6(v)</td><td>45,20,200/-</td></tr></table> <p>The copy of the approved schemes 6(i) with undertaking is enclosed as Annexure-12.</p> <p>The copy of the approved schemes 6(ii) with undertaking is enclosed as Annexure-13.</p> <p>The copy of the approved schemes 6(iii) with undertaking is enclosed as Annexure-14.</p> <p>The copy of the approved schemes 6(iv) with undertaking is enclosed as Annexure-15.</p> | Scheme | Total Financial Outlay in (Rs) | 6(i) | 3,348,88,000/- | 6(ii) | 1,26,84,000/- | 6(iii) | 6,44,97,100/- | 6(iv) | 1,08,00,000/- | 6(v) | 45,20,200/- |
| Scheme | Total Financial Outlay in (Rs) | | | | | | | | | | | | | |
| 6(i) | 3,348,88,000/- | | | | | | | | | | | | | |
| 6(ii) | 1,26,84,000/- | | | | | | | | | | | | | |
| 6(iii) | 6,44,97,100/- | | | | | | | | | | | | | |
| 6(iv) | 1,08,00,000/- | | | | | | | | | | | | | |
| 6(v) | 45,20,200/- | | | | | | | | | | | | | |

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| | | The copy of the approved schemes 6(v) with undertaking is enclosed as Annexure-16. |
| 7. | User agency either himself or through the State Forest Department shall undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located in the area within 100 meters from outer perimeter of the mining lease. The plan for plantation and SMC activities will be prepared and submitted to MoEF&CC along with the compliance of 'in-principle' approval; | <p>In compliance to this condition, the Scheme for “Gap Planting, Soil & Moisture Conservation Activity to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located in the area within 100 meters from outer perimeter of the mining lease” has already been approved by the RCCF, Angul vide his Memo No. 4930 dt. 10.12.2024, with a total financial outlay of Rs.1,86,83,500/-</p> <p>The copy of the approved scheme no 7 with undertaking by User Agency is enclosed as Annexure-17.</p> |
| 8. | The User Agency shall prepare a list of existing village tanks and other water bodies with GPS co-ordinates located within five km from the mine lease boundary. This list is to be duly verified by the concerned Divisional Forest Officer. The User Agency shall regularly undertake desilting of these village tanks and other water bodies so as to mitigate the impact of siltation of such tanks/water bodies. A detailed approved plan for desilting of identified ponds and water bodies to be prepared in consultation with forest department and shall be submitted to MoEF& CC along with the compliance of 'in-principle' approval; | <p>In Compliance to this condition the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted the undertaking to implement the Scheme on “De-silting of these village tanks and other water bodies so as to mitigate the impact of siltation of such tanks/water bodies has been prepared and is duly approved by RCCF Angul vide his Memo No. 4930 dt. 10.12.2024, subsequently vide Memo no 10028 dtd 12.12.2024 from this Office</p> <p>The copy of the approved scheme no 8 with undertaking by User Agency is enclosed as Annexure-18.</p> |
| 9. | <p>Safety Zone Management: Following activities, at project cost, shall be undertaken by the user agency for the management of safety zone as per relevant guidelines issued by the Ministry’s guidelines</p> <p>i. User agency shall ensure demarcation of safety zone (7.5-meter strip all along the inner boundary of the mining lease area), and its fencing, protection and regeneration by erecting adequate number of 6 feet high RCC boundary pillars inscribed with DGPS</p> | <p>In Compliance to this condition the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted Four (4) nos. of undertaking in accordance with the Condition 9,9.i, 9.ii,9.iii and 9.iv respectively.</p> <p>Accordingly, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted undertaking which is enclosed as Annexure-19,20,21,22 & 23.</p> |

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| | <p>coordinates with barbed wire fencing and deploying adequate number of watchers under the supervision of the. State Forest Department.</p> <p>ii. Boundary of the safety zone of the mining lease, adjacent to habitation/roads, should be properly fenced by the user agency.</p> <p>iii. Safety zone shall be maintained as green belt around mining lease and to ensure dense canopy in the area, regeneration shall be taken up in this area by the user agency at project cost under the supervision of the State Forest Department.</p> <p>iv. The State Government and the user agency shall ensure that safety zone is maintained as per the prescribed norms</p> | |
| 10. | The cost of felling of trees shall be deposited by the User Agency with the State Forest Department; | <p>In compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted the undertaking to deposit the cost of felling of trees with the State Forest Department.</p> <p>The undertaking is enclosed as Annexure- 24.</p> |
| 11. | Trees should be felled in phased manner as per the requirement in the approved Mining Plan with prior permission of concerned DFO; | <p>In Compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted the undertaking that the trees will be felled in phased manner as per the requirement in the approved Mining Plan with prior permission of the DFO, Angul. The undertaking to this effect is enclosed as Annexure-25.</p> |
| 12. | The user agency shall explore the possibility of translocation of maximum number of trees identified to be felled and shall ensure that any tree felling shall be done only when it is unavoidable and that too under strict supervision of the State Forest Department; | <p>In Compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted the undertaking that they will explore the possibility of translocation of maximum number of trees identified to be felled and shall ensure that any tree felling shall be done only when it is unavoidable and that too under the strict supervision of the State Forest Department. The undertaking to this effect is enclosed as Annexure -26.</p> |
| 13. | The User Agency shall undertake mining in a phased manner after taking due care for reclamation of the mined over area. The concurrent | <p>In Compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted an</p> |

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| | <p>reclamation plan as per the approved mining plan shall be executed by the User Agency from the very first year, and an annual report on implementation thereof shall be submitted to the Nodal Officer, Forest (Conservation) Act, 1980, in the concerned State Government and the concerned Regional Office of the Ministry. If it is found from the annual report that the activities indicated in the concurrent reclamation plan are not being executed by the User Agency, the Nodal Officer or the concern Addl. Principle Chief Conservator of Forests (Central) may direct that the mining activities shall remain suspended till such time, such reclamation activities area satisfactorily executed;</p> | <p>undertaking that the mining will be done in a phased manner after taking due care for reclamation of the mined over area. The concurrent reclamation plan as per the approved mining plan shall be executed by the User Agency from the very first year, and an annual report on implementation thereof shall be submitted to the Nodal Officer, Forest (Conservation) Act, 1980, in the concerned State Government and the concerned Regional Office of the Ministry. If it is found from the annual report that the activities indicated in the concurrent reclamation plan are not being executed by the User Agency, the Nodal Officer or the concerned Addl. Principle Chief Conservator of Forests (Central) may direct that the mining activities shall remain suspended till such time, such reclamation activities are satisfactorily executed.</p> <p>Accordingly, the user agency has submitted an undertaking to this effect which is enclosed as Annexure-27.</p> |
| 14. | <p>The User Agency shall comply with the Hon'ble Supreme Court order on re-grassing, and re-grass the mining area and any other areas which may have been disturbed due to mining to restore them to a condition which is fit for growth of fodder, flora, fauna, etc. in a timely manner;</p> | <p>In Compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted an undertaking that to comply with the Hon'ble Supreme Court order on re-grassing, and re-grass the mining area and any other areas which have been disturbed due to mining to restore them to a condition which is fit for growth of fodder, flora, fauna, etc. in a timely manner;</p> <p>The user agency has submitted an undertaking to this effect which is enclosed as Annexure – 28.</p> |
| 15. | <p>Period of diversion of the said forest land under this approval shall be for a period co-terminus with the period of the mining lease proposed to be granted under the Mines and Minerals (Development and Regulation) Act, 1957, as amended and the Rules framed there-under;</p> | <p>In Compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted an undertaking that the period of diversion of the said forest land under this approval shall be for a period co-terminus with the period of the mining lease proposed to be granted under the</p> |

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| | | <p>Mines and Minerals (Development and Regulation) Act, 1957, as amended and the Rules framed there-under;</p> <p>The undertaking to this effect is enclosed as Annexure-29.</p> |
| 16. | The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required; | <p>In Compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted an undertaking for obtaining the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986.</p> <p>The undertaking to this effect is enclosed as Annexure-30.</p> |
| 17. | No labour camp shall be established on the forest land and the User Agency shall provide fuels preferably alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas; | <p>In Compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted an undertaking that no labour camp shall be established on the forest land and the User Agency shall provide fuels preferably alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas.</p> <p>The undertaking to this effect is enclosed as Annexure-31.</p> |
| 18. | The boundary of the diverted forest land, mining lease and safety zone, as applicable, shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS coordinates; | <p>In Compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted an undertaking to this effect which is enclosed as Annexure-32</p> |
| 19. | The layout plan of the mining plan/ proposal shall not be changed without the prior approval of the Central Government and the forest land shall not be used for any purpose other than that specified in the proposal; | <p>In Compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted an undertaking that the mining plan/ proposal will not be changed without the prior approval of the Central. Government and the forest land will not be used for any purpose other than that specified in the proposal. The user agency has submitted an undertaking to this effect which is enclosed as Annexure-33.</p> |
| 20. | The forest land proposed to be diverted shall under no circumstances be transferred to any other agency, department or person without prior approval of the Central Government; | <p>In Compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted an undertaking that forest land proposed to be diverted will under</p> |

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| | | <p>no circumstances be transferred to any other agency, department or person without prior approval of the Central Government.</p> <p>The user agency has submitted an undertaking to this effect which is enclosed as Annexure-34.</p> |
| 21. | No damage to the flora and fauna of the adjoining area shall be caused; | <p>In Compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted an undertaking for no damage to the flora and fauna of the adjoining area.</p> <p>The undertaking to this effect is enclosed as Annexure-35.</p> |
| 22. | Any other condition that the concerned Regional Office of this Ministry may stipulate with the approval of competent authority in the interest of conservation, protection and development of forests & wildlife; | <p>In Compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted an undertaking to abide with any other condition that the concerned Regional Office of this Ministry may stipulate with the approval of competent authority in the interest of conservation, protection and development of forests & wildlife.</p> <p>The undertaking to this effect is enclosed as Annexure-36.</p> |
| 23. | The user agency shall comply all the provisions of the all Acts, Rules, Regulations, Guidelines, relevant Hon'ble Court Order (S) and NGT Order (S), if any, or the time being in force, including compliance of the Schedule Tribes and Other Traditional Forest Dwellers (Recognition of Forests Rights) Act, 2006 as applicable to the project; | <p>In Compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted an undertaking that they will comply all the provisions of all the Acts, Rules, Regulations, Guidelines, Hon'ble Court Order (s) and NGT Order (s) pertaining to this project, if any, for the time being in force, as applicable to the project.</p> <p>The undertaking to this effect is enclosed as Annexure-37.</p> |
| 24. | Violation of any of these conditions will amount to violation of Forest (Conservation) Act, 1980 and action would be taken as prescribed in para 1.16 of Chapter 1 of the Consolidated Guidelines And Clarifications Issued Under Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and Van (Sanrakshan Evam Samvardhan) Rules, 2023 issued by this Ministry's letter No. 5-2/2017-FC dated 29.12.2023; | <p>In Compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted an undertaking that they will not do any violation of any of these conditions. Further, they have aware that any violation of these conditions will amount to the violation of Forest (Conservation) Act, 1980 and action would be taken as prescribed in para 1.21 of - Chapter 1 of the Handbook of comprehensive guidelines of</p> |

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| | | <p>Forest (Conservation) Act, 1980 as issued by this Ministry's letter No. 572/2017-FC dated 28.03.2019.</p> <p>The undertaking to this effect is enclosed as Annexure-38.</p> |
| 25. | The User Agency shall submit the annual self -compliance report in respect of the above stated conditions to the State Government, concerned Regional Office and to this Ministry by the end of March every year regularly; | <p>In Compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted an undertaking that they will submit the annual self -compliance report in respect of the above stated conditions to the State Government, concerned Regional Office and to the Ministry by the end of March every year regularly.</p> <p>The undertaking to this effect is enclosed as Annexure-39.</p> |
| 26. | The compliance report shall be uploaded on e-portal (https://parivesh.nic.in/). | <p>In Compliance to this condition, the User Agency i.e. General Manager, Bhubaneswari Area, MCL, Talcher has submitted an undertaking to the condition, which is enclosed as Annexure-40.</p> |



Office of the General Manager
(Bhubaneswari Area)
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Dist: Angul – 759103 (Odisha)
Website : www.mcl.gov.in
Email Id: cgm-bhubaneswari.mcl@coalindia.in



MCL

Annexure-1

UNDERTAKING

PROPOSAL NO:-FP / OR / MIN / 155017 / 2022

(In compliance to Condition No. 1 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "Legal status of diverted forest land shall remain unchanged".

General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एम.सी.एल. भुवनेश्वरी क्षेत्र
MCL, Bhubaneswari Area

Divisional Forest Officer
Angul, Division

8 Annexure-2
Annexure-3

OFFICE OF THE DIVISIONAL FOREST OFFICER, ANGUL DIVISION: ANGUL-1024

Letter No. 8036 DRP/Dated. 21.10.2024

The General Manager,
Bhubaneswari Area, Mahanadi Coalfields Limited
At./P. O- Dera Colliery, Talcher, Angul-759103.

Sub: - Proposal for seeking prior approval of the Central Government under Section-2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 26.416 ha (originality proposed area is 20.383 ha) of forest land in favour of the Mahanadi Coalfields Ltd. for continuation of mining operation at Bhubaneswari expansion OCP within Mining Lease area over 658.724 ha under Angul Forest Division in Angul District, Odisha - Regarding.
(Online proposal no. FP/OR/MIN/155017/2022).
:- Demand for payment of compensatory levies through web portal.

Ref: - 1. Stage-I/in-principle approval letter No. 8-18/2002-FC(Vol) Dtd. 24.09.2024 of the AIGF, FC Division, Government of India MoEF&CC, New Delhi.
2. Memo No 18586 Dtd. 27.09.2024 of OSD-cum-SS to Government.
3. Memo No 20116 Dtd. 05.10.2024 of PCCF(Nodal), Bhubaneswar.

Sir,


With reference to the above-cited subject, it is to inform you that the Ministry of Environment, Forest, and Climate Change (MOEF&CC), Government of India, New Delhi has conveyed its approval for the Stage-I/ In-principle forest clearance vide Order No. 8-18/2002-FC (Vol) dated 24.09.2024 under section 2(1)(ii) of Forest (Conservation) Act, 1980 in favour of the Mahanadi Coalfields Ltd. for non-forestry 26.416 Ha of forest land for the use of continuation of mining operation at Bhubaneswari expansion OCP within Mining Lease area over 658.724 ha under Angul Forest Division in Angul District, Odisha

In this connection, as per the Stage-I/In-Principle approval condition Sl. No. 2(i), the scheme for Compensatory Afforestation in respect of your above proposal over an area of 62.725 Ha of Degraded Revenue Forest Land identified in Village Karnapur under Talcher Tahasil in Talcher Range of Angul Forest Division has been technically approved by the Principal Chief Conservator of Forests, Forest Diversion & Nodal Officer, F.C. Act O/o the PCCF & HoFF, Odisha, Bhubaneswar, vide his memo No. 20113 dated 05.10.2024, as per the matrix 2024-25 of approved One-time cost norm (copy enclosed for your reference) with a financial outlay of Rs. 2,75,34,400.00/- (Rupees Two Crores Seventy Five lakhs Thirty Four Thousand and Four Hundred only).

Hence, you are requested to deposit an amount of Rs. 2,75,34,400.00/- (Rupees Two Crores Seventy Five lakhs Thirty Four Thousand and Four Hundred) only towards the cost of Compensatory Afforestation levies through the web portal of MOEF&CC immediately and intimate the same to the undersigned for taking further action in the matter.


Encl :- This is for information and necessary action.
As above.

Yours faithfully,


Divisional Forest Officer
Angul Division


Memo No. 8047 / Dated. 21.10.2024

Copy forwarded to the Regional Chief Conservator of Forests, Angul Circle, Angul or favour of kind information and necessary action with reference to memo No. 20115 dt. 05.10.2024 of PCCT(Nodal)


Divisional Forest Officer
Angul Division

Memo No. 8048 / Dated. 21.10.2024

Copy forwarded to the Principal Chief Conservator of Forests, Forest Diversion & Nodal Officer, F.C. Act, O/o the Principal Chief Conservator of Forests, Odisha for favour of kind information and necessary action with reference to your memo No. 20113 dt. 05.10.2024.


Divisional Forest Officer
Angul Division



STATE FOREST HEADQUARTERS, ODISHA
OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS & HoFF
PLOT NO. GD-2/12, ARANYA BHAWAN, CHANDRASEKHARPUR
BHUBANESWAR-751023
E-mail:- nodal.pccfodisha@gmail.com

Memo No. **2013** /9F(MG)-377/2022
Dated, Bhubaneswar the **05th** October'2024

To

The Divisional Forest Officer
Angul Forest Division

Sub: Proposal for seeking prior approval of the Central Government under Section 2 (1) (ii) of the Van (Sanrankshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 26.416 ha (originally proposed area is 20.383 ha) of forest land in favour of Mahanadi Colafields Ltd. for continuation of mining operation at Bhubaneswari expansion OCP within Mining Lease area over 658.724 ha under Angul Forest Division in Angul District, Odisha (Online proposal no.FP/OR/MIN/155017/2022) Stage-I approval regarding.

Ref:- No. 8-18/2002-FC (Vol) dated 24.09.2024 of the Assistant Inspector General of Forests, FC Division, GoI, MoEF & CC, New Delhi.

Enclosed, please find herewith a copy of Letter No. 8-18/2002-FC (Vol) dated 24.09.2024 of the Assistant Inspector General of Forests, FC Division, GoI, MoEF & CC, New Delhi which is self-explanatory, for information and necessary action.

The financial outlay for Compensatory Afforestation Scheme over an area of **62.725 ha** of **Degraded Revenue Forest land** identified in village **Karnapur** under Talcher Tahasil in Talcher Range of Angul Forest Division in respect of the above mentioned project has been approved by PCCF (FD & Nodal Officer, FC Act) as per matrix 2024-25 of approved One-time cost norm for **Rs.2,75,34,400/-** (Rupees Two Crores seventy five lakhs thirty four thousand and four hundred) only is enclosed.

In this context, I am directed to request you to furnish the compliance to the conditions imposed in the above said letter through RCCF, Angul Circle for onward transmission to the GoI, MoEF & CC, (FC Division), New Delhi and also raise demand on the user agency for payment of compensatory levies through web portal of MoEF & CC and submit the deposit particulars of the amount paid in prescribed CAMPA format alongwith the Stage-I compliance.

Encl-As above


Chief Conservator of Forests (Nodal)

Memo No. 20114 Dt 05.10.2024

Copy alongwith its enclosure forwarded to the PCCF (WL) & CWLW, Odisha, Prakruti Bhawan, Plot No. 1459, Saheed Nagar, Bhubaneswar-751007 for favour of kind information & necessary action.

Ne 5/10/2024

Chief Conservator of Forests (Nodal)

Memo No. 20115 Dt 05.10.2024

Copy alongwith its enclosure forwarded to the RCCF, Angul Circle for information & necessary action.

Ne 5/10/2024

Chief Conservator of Forests (Nodal)

Memo No. 20116 Dt 05.10.2024

Copy alongwith its enclosure forwarded to the General Manager, Mahanadi Coal Fields Ltd., Bhubaneswari Area, Deracolliery, Talcher, Dist-Angul, Odisha, Pin-759103 for information and necessary action with reference to Letter No. 8-18/2002-FC (Vol) dated 24.09.2024 of the Assistant Inspector General of Forests, FC Division, GoI, MoEF & CC, New Delhi.

Ne 5/10/2024

Chief Conservator of Forests (Nodal)

**MCL****OFFICE OF THE GENERAL MANAGER
BHUBANESWARI AREA**

PO: BOREA COLLEGE, ANGUL, ODISHA, 759103

Ph - 067666 260528, 260529, 260751

e-mail - gm.bhubaneswari@mcl.co.in

Ref. No. - GM/BBSRI-OC/Env/2025/33

Date 24.03.2025

To**The Divisional Forest Officer,****Angul Forest Division,**

Angul, Odisha - 750122

Dfo.angul@odisha.gov.in

Subject: Proposal for seeking prior approval of the Central Government under Section-2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 26.416 ha (originally proposed area is 20.383 ha) of forest land in favour of the Mahanadi Coalfields Ltd. for continuation of mining operation at Bhubaneswari expansion OCP within Mining Lease area over 658.724 ha under Angul Forest Division in Angul District, Odisha - Regarding (Online proposal no. FP/OR/MIN/155017/2022) - **Deposition for Payments for NPV and Compensatory levies* through Web Portal**

Ref: 1. Stage - I FC vide 8-18/2002-FC(vol) 182877/2024 dated 24.09.2024

2. Memo No 20113 and 20116 Dtd 05.10.2024 of PCCF(Nodal), Bhubaneswar

3. Demand Letter No 8046 and 8043 Dated 21.10.2024 of DFO, Angul.

Dear Sir,

Please find the attached herewith Compliance of Conditions 2(i) and 3(i) stipulated in "In-Principal approval" accorded U/s 2(ii) of Forest (Conservation) Act, 1980 (Presently Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980) granted by MoEF&CC vide No. 8-18/2002-FC(Vol) Dtd. 24.09.2024 favour of the Mahanadi Coalfields Ltd. for diversion of 26.416 ha (originally proposed area is 20.383 ha) of forest land at Bhubaneswari expansion OCP within Mining Lease area over 658.724 ha under Angul Forest Division in Angul District, Odisha along with all Annexure.

It is to inform your good office that Bhubaneswari Open Cast Project, MCL As per demand of DFO, Angul, via Letter no 8046 and 8043 had demanded for deposition of **Compensatory Levies of Rs. 27534400/-**, Paid vide payment reference UTR **CMS4628090170** and **NPV of Rs. 29283645/-** Paid vide payment reference UTR **CMS4628094611** via Parivesh Portal (Online) for Application No **MIN1550172022490**.

This is for favour of kind information and further needful action at your end, please

Yours faithfully

[Signature]
General Manager
Bhubaneswari Area

महा प्रबंधक
General Manager
एम.सी.एल. पुनर्वनी क्षेत्र
MCL, Bhubaneswari Area

Enclosure:

1. As Mentioned.

Copy to:

1. The General Manager (Envt & Forest), MCL HQ, Sambalpur
2. The Staff Officer (Envt /P&P/Mining), Jagannath Area
3. The Project Envt Officer, Bhubaneswari OCP
4. Office copy

Annexure- 2A
Annexure- 3A

Help

Online payment history made by User Agency under CAMPA

| Slm. Proposal Detail | Application No | Application No (New) | Date of IN-PRINCIPLE | Amount to be Paid / Amount Paid (In Rs.) | Status | Payment Detail | Demand Letter |
|--|--------------------------|--------------------------|----------------------|--|--------|---|--|
| 1 PPT/CA/MBN/ISS017/2022 K. Newerpet.aspx? pid=FY/CA/MBN/ISS017/2022) BHUBANESWAR, OCP | MBN/ISS017/2022-49039010 | MBN/ISS017/2022-49039010 | 2024 Sep 2024 | CA: 2753400/- Add CA: 0/- PQA: 0/- CAT: 0/- Safety: 0/- Add PA: 0/- Zonet: 2023545/- Other: 0/- Charged: 0/- Other: 0/- Charged: 0/- Other: 0/- Charged: 0/- Total: 2753400/- | PAID | PAID Verified By: 24 Oct 2024 Nodal Officer: On Sent Name: Jagan Bhat Mode of Payment: NEFT/RTGS Challan Generated On: 19 Oct 2024 Challan Generated On: 19 Oct 2024 Transaction Date: 05 Nov 2024 | Demand Letter K. Northwardcity/Fundid(2) 3 10002 419-07039010, FROM/MBN/ISS017/2022, Jwar, Fund_Demanded, 8/9/21, pr Generated Challan (./UserAgency/Node, Chikan.aspx?pid=MBN/ISS017/2022-4903) |

(HTTPS://SWACHHIBHARAT.MYGOV.IN/)

(WWW.DIGITALINDIA.GOV.IN)

india.gov.in (HTTPS://INDIA.GOV.IN/)

GOV (HTTPS://WWW.MYGOV.IN/)

MeitY (HTTP://MEITY.GOV.IN/)

(HTTP://WWW.PMINDIA.GOV.IN/EN/)

(HTTP://WWW.NIC.IN/)

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Divisional Forest Officer
Angul, Division

(HTTPS://DATA.GOV.IN/)

प्रमुख प्रबंधक

For any Technical support, Please contact: **General Manager**, New Delhi,
monitoring-tc@nic(nic.gov.in)
एम. पी. एल, मुख्यालय
MCL, Bhubaneswar Area

ମହାନଦୀ କୋଲଫିଲ୍ଡସ୍ ଲିମିଟେଡ୍
Mahanadi Coalfields Limited
(A subsidiary of Coal India Limited)

Office of the Company Secretary
At/Po. Jagruti Vihar, Burla, MCL
Dist. Sambalpur - 768020 (Odisha)
CIN: U10102OR1992GOI003038
TeleFax No. 06632542977
Email id: cs.mcl@coalindia.in
Website: www.mahanadicoal.in



Ref. No. MCL/SBP/CS/BD-278/Excl/2025/14621

Date 11.03.2025

To
The GM(P&P)
MCL HQs

Sub: Extract from the minutes of the 278th Board meeting of MCL held at 05.00 PM on Sunday the 9th February 2025 at the Hotel Courtyard by Marriot, Shillong, Jail Road, Police Bazar, Shillong, Meghalaya, India, 793001.

ପ୍ରିୟ ମହୋଦୟ,

ଆପ କେ ସୂଚନାର୍ଥ ଏବଂ ଉଦ୍ଦିଷ୍ଟ କାର୍ଯ୍ୟବାହି ହେତୁ ଏମ.ସି.ଏଲ. ନିର୍ଦ୍ଦେଶକ ମଣ୍ଡଳ କି 278 ଥି ବୈଠକ କା ଉଦ୍ଧୃତ ଦିଆ ଜା ରହା ହେ।

278.C/1 Approval of Corrigendum-2 to Mining Plan and Mine Closure Plan for Bhubaneswari OCP (30.0 MTY) (Revision-2).

1.1 GM(P&P) explained the proposal to the Board in details. The Board deliberated on the proposal in detail and based on the clarifications offered by GM(P&P) approved the proposal of Corrigendum-2 to Mining Plan for Bhubaneswari OCP (30 MTY) (Revision-2) for the changes in the land use table of Chapter 1 & 6 in previously approved Mining Plan for submission to State Govt. & MoEF & CC, as per the details brought out in the agenda note.

278.D/1 Information to MCL Board regarding impact on IRR of Int. Lakhanpur-Belpahar-Lilari Project due to additional re-handling of overburden for a quantity of 236.99 M.Cum to be done in future from Lakhanpur Quarry beyond the sanctioned quantity of 468.65 M.Cum and totaling the OB re-handling to 705.64 M.Cum.

1.1 The Board noted the information as per the details brought out in the agenda note.

Yours faithfully


Company Secretary


11/03/2025

ମହାନଦୀ କୋଲଫିଲ୍ଡସ୍ ଲିମିଟେଡ୍
ପଞ୍ଜନା ଏବଂ ପରିଚାଳନା ବିଭାଗ
ନିର୍ଦ୍ଦେଶକ ମଣ୍ଡଳ
ନିର୍ଦ୍ଦେଶକ ମଣ୍ଡଳ
11/03/25



cmpdi
A Mini Ratna Company



बहुल कुटुम्ब
ONE EARTH - ONE FOREST - ONE FUTURE

सेन्ट्रल माईन प्लानिंग एण्ड डिजाइन इन्स्टीट्यूट लिमिटेड
(सीएल प्रॉपर्टीज लिमिटेड की अंतर्भुक्त कंपनी / भारत सरकार का एक लोक उद्योग)
सोमनाथवाड़ा ब्रिज, कान्के रोड, रांची - 834 031, झारखंड (भारत)
Central Mine Planning & Design Institute Limited
(A Subsidiary of Coal India Limited / Govt. of India Public Sector Undertaking)
Gondwana Place, Kanke Road, Ranchi - 834 031, Jharkhand (INDIA)
CORPORATE IDENTITY NUMBER - U14291JH1975GOI000123

CMPDI, RI-VII, Bhubaneswar
Dated: January 21, 2025

CORRIGENDUM

Subject: Corrigendum to Mine Plan (MP) and Mine Closure Plan (MCP) of Bhubaneswari Open Cast Project (OCP) - 30 Mty, Revision-2 (January 2025)

This corrigendum is being issued for the MP&MCP concerning the Bhubaneswari OCP, featuring a production capacity of 30 Mty, Revision 2. The purpose of this corrigendum is to integrate revision and offer current information within the mentioned MP&MCP.

Revised Version: MP&MCP of Bhubaneswari OCP, 30.0 Mty (Rev-2) minor modifications Jan, 2025

The following list provides a description of the changes made to the MP&MCP.

On the second page of Chapter 1, in Section 1.2.5, and on the first page of Chapter 6, in Section 6.1.1, the following tables appear:

| Sl. | Items | MP&MCP of Bhubaneswari (28 Mty), Revision-1 | | | Proposed MP&MCP of Bhubaneswari (30 Mty), Revision-2 | | |
|-----|---|---|------------|---------|--|------------|---------|
| | | Total Area in ha | | | Total Area in ha | | |
| | Particulars (ML-mining lease) | Forest | Non-forest | Total | Forest | Non-forest | Total |
| 1. | Quarry Excavation area | 105.808 | 477.944 | 583.752 | 125.576* | 488.531** | 614.107 |
| 2. | Safety zone | | 5.747 | 5.747 | 0.615 | 6.163** | 6.778 |
| 3. | Infrastructure (CHP, Washery, Silo point, project office, laying of railway lines for dispatch point) & Future working expansion Area** | 6.713 | 29.609 | 36.322 | 6.713 | 18.606 | 25.319 |
| 4. | Embankment | NIL | 12.52 | 12.52 | NIL | 12.52 | 12.52 |
| A. | Total ML area | 112.521 | 525.820 | 638.341 | 132.904 | 525.820 | 658.724 |

Note: *20.383 Ha of Forest land is taken under Quarry Excavation area.

**The area under Future Expansion area is annexed under the proposed quarry excavation area and safety zone.

NOTE

- Additional 11.003 ha of future expansion area showed in Revision-1 goes to the Quarry area (10.587 ha) and partly to the safety zone of (0.416 ha), making it to a total of 11.003 ha. This was the non-forest area adjacent to the forest area of 20.383 ha blocked because of non-clearance of this forest area.
- Additionally 149.57 Ha of non-forest land may be required for residential colony, Rehabilitation & resettlement
- 6.033 Ha which was kept as safety zone outside mine lease will be taken under Quarry Excavation in future expansion project.



cmpdi
A Mini Kailash Company



भारत 2023
एक साथ - एक परिवार - एक भविष्य

सेन्ट्रल माईन प्लानिंग एण्ड डिजाइन इन्स्टीट्यूट लिमिटेड
(कोल इण्डिया लिमिटेड की अनुपूर्व कंपनी / भारत सरकार का एक लोक उद्योग)
गोन्दावारा प्लेस, कान्के रोड, रांची - 834 031, झारखंड (भारत)
Central Mine Planning & Design Institute Limited
(A Subsidiary of Coal India Limited / Govt. of India Public Sector Undertaking)
Gondwana Place, Kanke Road, Ranchi - 834 031, Jharkhand (INDIA)
CORPORATE IDENTITY NUMBER - U14292JB1975GOI001223

This should read as in both the places (reference: Chapter-1, page-2, section-1.2.5, as well as Chapter-6, page-1, Section-6.1.1):

| Items | | MP&MCP of Bhubaneswari (28 Mty), Revision-1 | | | Proposed MP&MCP of Bhubaneswari (30 Mty), Revision-2 | | |
|-------------------------|---|---|----------------|----------------|--|----------------|----------------|
| Sl. | Particulars | Total Area in ha | | | Total Area in ha | | |
| | (ML-mining lease) | Forest | Non-forest | Total | Forest | Non-forest | Total |
| 1. | Quarry Excavation area | 105.808 | 477.944 | 583.752 | 125.576* | 488.531** | 614.107 |
| 2. | Safety zone | | 5.747 | 5.747 | 0.615 | 6.163** | 6.778 |
| 3. | Infrastructure (CHP, Washery, Silo point, project office, laying of railway lines for dispatch point) and Future working expansion Area** | 6.713 | 29.609 | 36.322 | 6.713 | 18.606 | 25.319 |
| 4. | Embankment | NIL | 12.52 | 12.52 | NIL | 12.52 | 12.52 |
| A. Total ML area | | 112.521 | 525.820 | 638.341 | 132.904 | 525.820 | 658.724 |
| NOTE | <p>Note: *Out of 20.383 Ha of Forest land, 19.768 ha is taken under Quarry Excavation area and 0.615 Ha is kept as safety zone area</p> <p>**The area under Future Expansion area is annexed under the proposed quarry excavation area and safety zone.</p> | | | | | | |
| | <ul style="list-style-type: none"> Additional 11.003 ha of future expansion area showed in Revision-1 goes to the Quarry area (10.587 ha) and partly to the safety zone of (0.416 ha), making it to a total of 11.003 ha. This was the non-forest area adjacent to the forest area of 20.383 ha blocked because of non-clearance of this forest area. Additionally, 149.57 Ha of non-forest land may be required for residential colony, Rehabilitation and resettlement. 6.033 Ha which was kept as safety zone outside mine lease will be taken under Quarry Excavation in future expansion project Out of 6.033 Ha of safety zone forest land, an area of 1.344 Ha of forest land is covered under already diverted forest land of adjacent Ananta OCP. The forest diversion is required for balance 4.689 Ha of forest land falling in the safety zone of Bhubaneswari OCP. The above safety zone forest land which was kept outside mine lease will be taken under Quarry Excavation in future expansion project of Bhubaneswari OCP. | | | | | | |



Office of the General Manager
(Bhubaneswari Area)
At/Po :Dera Colliery
Dist: Angul – 759103 (Odisha)
Website :www.mcl.gov.in
Email Id: cgm-bhubaneswari.mcl@coalindia.in



MCL

Annexure-4A

UNDERTAKING

PROPOSAL NO.:- FP/OR/MIN/155017/2022

(In compliance to Condition No. 2 (iii) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "The exact area involved in the proposal shall be verified after taking into account the already diverted area for Ananta OCP and the Stage 2/Final approval shall be accordingly issued. The state shall ensure that the safety zone is maintained within the diverted area only and keeping in view the revised area the modifications in the mining plan as appropriate shall be made by the state/UA".


Divisional Forest Officer
Angul, Division


General Manager
Bhubaneswari Area, MCL
महा प्रबंधक
General Manager
एन.पी.एल. भुवनेश्वर क्षेत्र
MCL, Bhubaneswari Area

File No. G-PnP/19/14/0001/2022-PnP, MCL HQ-MAHANADI COALFIELDS LIMITED

Coal India Limited

CIL - eOffice

MAHANADI COALFIELDS LIMITED

O/O HEAD OF P&P DIVISION,MCL HQ

SUBJECT

| | | |
|----------------------|---|---|
| Main Category | : | Correspondences - PnP |
| Sub Category | : | Technical Studies |
| Description | : | Urgency Note for Minutes of the 246th Meeting of MCL Board held on 25.04.2022 |

OTHER DETAILS

| | | |
|-----------------|---|---------|
| Language | : | English |
| Remarks | : | |

No correspondence is attached in this file.

Note No. #1**Sub: Urgency Note for Minutes of the 246th Meeting of MCL Board held on 25.04.2022**

The following Agenda were placed before the MCL Board in its 246th meeting held on 25.04.2022:

1. Approval of Project Report of Gopalji-Kaniha Expansion OCP (Normative capacity 30.0 Mty & Peak Capacity 37.5 Mty) Cost Base January, 2020 with Incremental capacity (20 MTY) with an additional capital requirement of Rs.5569.95 Cr. (Rupees Five Thousand Five Hundred Sixty Nine Crores and Ninety Five Lakhs) to be implemented in Outsourcing Variant and dovetailing of earlier approved capital of Rs.537.92 Crores of 10 Mty PR. The total Capital requirement will be Rs.6107.87 Cr. (Rupees Six Thousand One Hundred Seven Crores and Eighty Seven Lakhs)
2. Approval of Mining Plan for Bhubaneswari OCP (30 MTY) REV-II with estimated mine closure cost of Rs.4119.142 Lakhs compounded @ 5% annually for 05 years.

The approved Mining Plan of Bhubaneswari OCP is required for application of the Environmental Clearance for compliance of the directives of the MoEF & CC as brought in the agenda note.

The change in mode of operation of Gopalji-Kaniha Expansion OCP will be required to be updated in the SAP for monitoring of the CAPEX.

Under the above circumstance, the outcome of the aforesaid Board meeting may please be communicated urgently for further course of action.

Submitted for obtaining Competent Approval from Director (Tech/P&P) for submission to Company Secretary.

Director (Tech/P&P)

Company Secretary

26/04/2022 8:41 AM

SUNIL TRIPATHY
(MANAGER(MINING 2ND CLASS))

Note No. #2

Submitted for kind approval for submission to Company Secretary.

26/04/2022 10:19 AM

MADHU SUDAN SHARMA
(GENERAL MANAGER(P&P)/HOD)

Note No. #3

Agreed

26/04/2022 5:29 PM

JUGAL KUMAR BORAH

(DIRECTOR(TECHNICAL/PROJECT & PLANNING))

Note No. #4

The proposals were placed before 246th Board Meeting held on 25.04.2022 .
The Board deliberated the proposals in details and approved as per the details brought out in the agenda note.

The structured minutes will follow in due course.
Necessary action may be taken at your end accordingly.

26/04/2022 6:24 PM

SUMANTA KUMAR BEHERA
(COMPANY SECRETARY)

Note No. #5

for needful.

26/04/2022 6:36 PM

MADHU SUDAN SHARMA
(GENERAL MANAGER(P&P)/HOD)

Note No. #6

For needful.

26/04/2022 6:51 PM

M P DARGAR
(GENERAL MANAGER(MINING))

Note No. #7

The hard copy is yet to receive. The soft copy is enclosed for processing the application of FC & EC for 30 MTY. May be forwarded to GM (E&F) for needful.
Submitted.



Final MP&MCP BBSRI 30MTY.pdf

27/04/2022 10:12 AM

SUNIL TRIPATHY
(MANAGER(MINING 2ND CLASS))

Note No. #8

The hard copy is yet to receive. The soft copy is enclosed for processing the application of FC & EC for 30 MTY. Forwarded to GM (E&F) for needful.

27/04/2022 12:17 PM

M P DARGAR
(GENERAL MANAGER(MINING))

Note No. #9

For needful

27/04/2022 12:19 PM

MADHU SUDAN SHARMA
(GENERAL MANAGER(P&P)/HOD)

Note No. #10

Please examine for further needful.

27/04/2022 12:59 PM

P P GUPTA
(GENERAL MANAGER(MINING))

Note No. #7

Attachment:Final MP&MCP BBSRI 30MTY.pdf

STRICTLY RESTRICTED
FOR COMPANY USE ONLY

The information given in this report is not to be communicated
either directly or indirectly to the press or to any person not holding
an official position in the CIL/Government.

MINING PLAN AND MINE CLOSURE PLAN FOR BHUBANESWARI OCP 30 MTY

Modified Mining Plan seeking approval under Rule 22E of MCR, 1960

Coal Block Name: (1) Bhubaneswari Integrated Coal Block
Area in hectare (ha):

| | | |
|--------------|---|-------------|
| Block Area | : | 1455.000 ha |
| Lease Area | : | 658.724* ha |
| Project Area | : | 808.294 ha |

TALCHER COALFIELD, BHUBANESWARI AREA,
Talcher tehsil, Dist. Angul, State: Odisha

Applicant: GENERAL MANAGER, BHUBANESWARI AREA
MAHANADI COALFIELDS LIMITED
ANGUL, ODISHA
Email – gm-bhubaneswari.mcl@coalindia.in

Targeted Capacity:

(a) Rated capacity: 30.00 Million Tonne per year (Mty)

Name of the Accredited Mining Plan Preparing Agency (MPPA)
preparing the mining plan with details:



APRIL, 2022

CENTRAL MINE PLANNING & DESIGN INSTITUTE LIMITED
(A Subsidiary of Coal India Ltd.)
REGIONAL INSTITUTE-VII

Plot No. E-4; At: Samantapuri, P.O. – RRL; Bhubaneswar – 751013.

Note No. #7

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**MINING PLAN AND MINE CLOSURE PLAN FOR
BHUBANESWARI OCP (30 MTY) (REVISION-2)****CONTENTS**

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| ANNEXURE-X | Expansion [under 7(ii) of EIA Notification 2006] of Bhubaneswari Opencast project from 20 MTPA to 25 MTPA in ML AREA 638.341 ha (658.724 ha – 20.383 ha = 638.341 ha); Latitude 20°57'59" to 20°58'43" & Longitude 85°09'10" to 85°11'37" of M/s Mahanadi Coalfields Ltd. Village: Hensmul, Dist.: Angul, Orissa – Environmental Clearance – reg. | 1 | to | 11 |
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| | | |
|-----|---|---------|
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CHECKLIST

| Details | | (✓/ ×) |
|--------------|---|---------------------|
| | Expert Review Report | × |
| Chapter-1 | Project Information | ✓ |
| Chapter-2 | Exploration, Geology, Seam Sequence, Coal Quality and Reserve | ✓ |
| Chapter-3 | Mining | ✓ |
| Chapter-4 | Safety Management | ✓ |
| Chapter-5 | Infrastructure Facilities Proposed and Their Location | ✓ |
| Chapter-6 | Land Requirement | ✓ |
| Chapter-7 | Environment Management | ✓ |
| Chapter-8 | Progressive and Final Mine Closure Plan | ✓ |
| Annexure | Copy of Allotment Order / Vesting Order | × |
| Annexure | Certificate of Qualified Person/Accredited Mining Plan Preparing Agency, whether project area is confined within the vested / allotted block boundary | NA |
| Annexure | Certificate by Mines & Geology Department of State Government- (a) Intent of the State Government for grant of lease beyond the vested geological boundary (b) Non-existence of coal in the area beyond vested /allotted geological block boundary to rule out the issue of encroachment and use of coal bearing area beyond the vested geological boundary | NA |
| Annexure-I | Approval of the Company Board | × After Final MP |
| Annexure-II | Sanction Order for approval of Project Report for Bhubaneswari OCP (20 Mty) by MCL | ✓ |
| Annexure-III | Approval of Mining Plan for Bhubaneswari OCP Normative Capacity 20 Mty [Normative Capacity 25 Mty] MCL dated July,2013 by MoC | ✓ |
| Annexure-IV | Bhubaneswari Opencast Expansion from 25 MTPA to 28 MTPA in existing ML area of 638.341ha of M/s Mahanadi Coalfields Limited, Environmental clearance – regarding | ✓ |
| Annexure -V | Certificate of Accreditation | ✓ |
| Annexure -VI | Mining Plan showing EC boundary | ✓ |

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| | | |
|------------------|--|--|
| Annexure -VII | Consent letter from SPCB, Odisha vide letter No.2631, dtd.24.02.2014 (Office Memorandum) for enhancement of production from 20.0 Mty to 25.0 Mty. | ✓ |
| Annexure -VII(A) | Consent letter from SPCB, Odisha vide letter No.2385, dtd.06.03.2018 (Office Memorandum) for enhancement of production from 25.0 Mty to 28.0 Mty. | ✓ |
| Annexure -VIII | Diversion of 132.904 ha of forest land in Talcher Coalfields of Angul District in favour of Bhubaneswari OCP of Mahanadi Coalfields Ltd., Odisha. | ✓ |
| Annexure -IX | Bhubaneswari OCP Coal Mine (10.0 Mty) of M/s Mahanadi Coalfields Ltd. Located at Village(s), Nakulbaspur, Ambamunda, Balugaon-Khamar, Kandhal, Anadipur, Hensamul/Jilinda, Naraharipur, Longijoda, Madanmohanpur, Alhadnagar (Uninhabited), Bira-Ramchandrapur and Khandulbahal, Tehsil, Talcher, Dist. Angul of Orissa – environmental clearance – reg. | ✓ |
| Annexure -X | Expansion [under 7(ii) of EIA Notification 2006] of Bhubaneswari Opencast project from 20 MTPA to 25 MTPA in ML AREA 638.341 ha (658.724 ha – 20.383 ha = 638.341 ha); Latitude 20°57'59" to 20°58'43" & Longitude 85°09'10" to 85°11'37") of M/s Mahanadi Coalfields Ltd. Village: Hensmul, Dist.: Angul, Orissa – Environmental Clearance – reg. | ✓ |
| Annexure -XI | Environmental clearance for expansion of Coal Mining Projects Exemption from Public Hearing – reg. | ✓ |
| Annexure -XII | Approval of MP & MCP of Bhubaneswari OCP Rev-1 Extract from the minutes of 243 rd meeting dtd.20.1.2022 held at MCL | ✓ |
| Annexure -XIII | Work Order for preparation MP & MCP in respect of Bhubaneswari OCP | ✓ |
| Plate GEN-I | Location Plan | ✓ |
| Plate | Plan certified by Qualified Person/Accredited Mining Plan Preparing Agency, if project area is confined within the vested / allotted block boundary | NA |
| Plate | Plan certified by Qualified Person/Accredited Mining Plan Preparing Agency with plan showing cardinal coordinates duly certified by Mines & Geology Department of State Government | X Certificate may be necessary from ORSAC |

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| | | |
|---|---|---|
| Plate GEN-VI | KML Boundary of proposed Mining Lease superimposed on dated satellite image, duly certified by accredited agency | ✓ |
| Plate GEN-IV | Cadastral Plan showing approved block boundary vis-à-vis proposed Mining Lease and mine boundary, showing land use and infrastructure | ✓ |
| Plate G-2 | Geological Plan showing all drilled boreholes and boreholes to be drilled with allotted block boundary and required mining lease | ✓ |
| Plate G-III | Representative Graphic Litholog | ✓ |
| Plate GEN-V | Surface Plan showing drainage system, contours (at minimum 3 m intervals), location of bore holes | ✓ |
| Plate GEN-V | Conceptual Plan showing infrastructure facilities including colony, boundary of mining area, mine entries, roads and road diversion alignments etc. | ✓ |
| Plate GEN-IV | Tentative Land Use Plan showing land types (Government, Forest, Tenancy) with its data source | ✓ |
| Plates G-5 to G-10; G-11 to G-15 and G-16 to G-20 | Floor Contour Plans, Seam Folio Plans with Iso-Grade lines and Iso Parting Plans between Seams. | ✓ |
| Plate G-4 | Geological Cross-sections | ✓ |
| Plate G-1 | Topographical Plan | ✓ |
| Plate MIN-I | Final Stage Quarry Plan showing haul road alignment | ✓ |
| Plate MIN-II | Existing Mine Working Plan | ✓ |
| Plate MIN-III | Plan showing Mine Stage during 1 st Year (Yr-1) | ✓ |
| Plate MIN-IV | Plan showing Mine Stage during 3 rd Year (Yr-3) | ✓ |
| Plate MIN-V | Final Stage Dump Plan | ✓ |
| Plate MIN-VI | Final Mine Closure Plan (Reclamation Plan) | ✓ |

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LIST OF ABBREVIATIONS

| | | |
|-------|---|--|
| A% | - | Ash percentage |
| CESCO | - | Central Electric Supply Company |
| cum | - | cubic meter |
| CMPDI | - | Central Mine Planning & Design Institute Limited |
| CMP | - | Comprehensive Master Plan |
| CPP | - | Captive Power Plant |
| CV | - | Calorific Value |
| dmmf | - | dry mineral matter free |
| E&M | - | Electrical & Mechanical |
| GCV | - | Gross Calorific Value |
| GR | - | Geological Report |
| Ha/HA | - | Hectares |
| HEMM | - | Heavy Earth Moving Machinery |
| HFL | - | High Flood Level |
| IDCO | - | Odisha Industrial Infrastructure Development Corporation |
| M% | - | Moisture percentage |
| m | - | Meter |
| Mcum | - | Million cubic meter |
| MECL | - | Mineral Exploration Corporation Limited |
| Max | - | Maximum |
| Min | - | Minimum |
| Mld | - | Million liter per day |
| MoC | - | Ministry of Coal |
| MoEF | - | Ministry of Environment & Forest |

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| | | |
|----------|---|---|
| Mt | - | Million metric tonne |
| Mty, MTY | - | Million metric tonne per year |
| MVA | - | Mega Volt Ampere |
| MW | - | Megawatt |
| MCL | - | Mahanadi Coalfields Limited |
| OC | - | Open Cast |
| OMC | - | Odisha Mining Corporation |
| P&M | - | Plant & Machinery |
| PR | - | Project Report |
| RF | - | Reduction Factor |
| RH | - | Relative Humidity |
| UTES | - | A Government of India Public limited Consulting Company |
| ROM | - | Run off Mines |
| SH | - | State Highway |
| t | - | Metric tonne |
| tph | - | tonne per hour |
| T | - | US TON |
| TAMDA | - | Talcher Angul Meramandali Development Authority |
| TCF | - | Talcher Coal Field |
| Yr | - | Year |
| UG | - | Under Ground |
| UHV | - | Useful Heat Value |
| V.M.% | - | Volatile Matter percentage |
| OB | - | Overburden |
| MP & MCP | - | Mining Plan and Mine Closure Plan |

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TEXT

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Chapter - 1

PROJECT INFORMATION

| | Parameters | Details |
|------------|---|--|
| 1.1 | INTRODUCTION | |
| 1.1.1 | Name of Coal/Lignite Block | 1. Integrated Bhubaneswari, Arkhapal-A and Sakhigopal-A block 2. Parts of Ananta Extension, Subhadra East and Lingaraj Blocks |
| 1.1.2 | Name of the Coalfield/ Lignite Field | Talcher coalfield |
| 1.1.3 | Base data of Mining Plan/ Mine Closure Plan | Cost base of mine closure : March 2022 |
| 1.1.4 | Linked End Use Plant | This mine has been planned to meet the demand of the present and future thermal power stations (basket linkage). |
| 1.1.5 | Distance of End use Plant from the pit head of the projection in "km" | NA |
| 1.1.6 | Mode of Coal Transport | 1) Within the Mine: Truck transportation from mine face to pit top. 2) Surface Coal Transport: By belt conveyor from pit top to loading point & loading onto railway wagons through rapid loading system for major part of production. |
| 1.2 | LOCATION, TOPOGRAPHY AND COMMUNICATION | |
| 1.2.1 | Location of coal deposit (District and State) | Location: Eastern part of Talcher coalfield, Dist. Angul, State: Odisha |
| 1.2.2 | Communication: PWD roads, railway lines, Air | <ul style="list-style-type: none"> ▪ NH 23 lies to the east of Project area. The project area is connected by an all-weather road to Talcher town which is about 9km away. NH no.23, passes near Talcher town and connects with NH 42, the distance being about 13 km. ▪ The nearest railhead is Talcher on Bhubaneswar-Talcher-Sambalpur line of East Coast railway and is located at a distance of 6km. ▪ The nearest port at Bay of Bengal - Distance of Paradeep and Dhamra ports of Odisha are about 200 km and 160 km respectively from Talcher. ▪ The nearest airport from the block- Bhubaneswar. The area is connected by all-weather metaled road to Bhubaneswar |

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Chapter-1, Page - 1

MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

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| | | which is at a distance of about 170 km. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------|---|---|------------|---------|---|------------|---------|-------|--|---|--|--|---|--|--|-----|-------------|------------------|--|--|------------------|--|--|-------------------|--------|------------|-------|--------|------------|-------|----|------------------------|---------|---------|---------|----------|-----------|---------|----|-------------|--|-------|-------|--|---------|-------|----|---|-------|--------|--------|-------|--------|--------|----|------------|-----|-------|-------|-----|-------|-------|----|---------------|---------|---------|---------|---------|---------|---------|
| 1.2.3 | Availability of power supply, water, etc. | Power from existing 132/33 kV substation at Nandira. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.2.4 | Prominent physiographic features, drainage pattern, natural water courses, rainfall data | <ul style="list-style-type: none"> Block (majorly) predominantly soil covered and gently undulating with paddy fields. Block is undulating and is used for agricultural purpose and some patches of barren lands. Altitude of the block: 92 m to 137 m above MSL. Bangaru Jhor - one seasonal nallah (partly forms northern boundary). The main drainage of is controlled by southerly flowing Brahmani river on the eastern side. Climate of the area is Tropical. The maximum rainfall recorded in the area is 15.4 cm in 24 hours on 09.09.1977. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.2.5 | Land use and ownership/ occupancy & involvement of forest land | <table border="1"> <thead> <tr> <th colspan="2">Items</th><th colspan="3">MP&MCP of Bhubaneswari (28 Mty), Revision-1</th><th colspan="3">Proposed MP&MCP of Bhubaneswari (30 Mty), Rev-2</th></tr> <tr> <th rowspan="2">Sl.</th><th>Particulars</th><th colspan="3">Total Area in ha</th><th colspan="3">Total Area in ha</th></tr> <tr> <th>(ML-mining lease)</th><th>Forest</th><th>Non-forest</th><th>Total</th><th>Forest</th><th>Non-forest</th><th>Total</th></tr> </thead> <tbody> <tr> <td>1.</td><td>Quarry Excavation area</td><td>105.808</td><td>477.944</td><td>583.752</td><td>126.191*</td><td>488.531**</td><td>614.722</td></tr> <tr> <td>2.</td><td>Safety zone</td><td></td><td>5.747</td><td>5.747</td><td></td><td>6.163**</td><td>6.163</td></tr> <tr> <td>3.</td><td>Infrastructure (CHP, Washery, Silo point, project office, laying of railway lines for dispatch point) and Future working expansion Area**</td><td>6.713</td><td>29.609</td><td>36.322</td><td>6.713</td><td>18.606</td><td>25.319</td></tr> <tr> <td>4.</td><td>Embankment</td><td>NIL</td><td>12.52</td><td>12.52</td><td>NIL</td><td>12.52</td><td>12.52</td></tr> <tr> <td>A.</td><td>Total ML area</td><td>112.521</td><td>525.820</td><td>638.341</td><td>132.904</td><td>525.820</td><td>658.724</td></tr> </tbody> </table> <p>Note: *20.383 Ha of Forest land is taken under Quarry Excavation area. **The area under Future Expansion area is annexed under the proposed quarry excavation area and safety zone.</p> <ul style="list-style-type: none"> Additional 11.003 ha of future expansion area showed in Revision-1 goes to the Quarry area (10.587 ha) and partly to the safety zone of (0.416 ha), making it to a total of 11.003 ha. This was the non-forest area adjacent to the forest area of 20.383 ha blocked because of non-clearance of this forest area. Additionally 149.57 Ha of non-forest land may be required for residential colony, Rehabilitation & resettlement. | | | | | | Items | | MP&MCP of Bhubaneswari (28 Mty), Revision-1 | | | Proposed MP&MCP of Bhubaneswari (30 Mty), Rev-2 | | | Sl. | Particulars | Total Area in ha | | | Total Area in ha | | | (ML-mining lease) | Forest | Non-forest | Total | Forest | Non-forest | Total | 1. | Quarry Excavation area | 105.808 | 477.944 | 583.752 | 126.191* | 488.531** | 614.722 | 2. | Safety zone | | 5.747 | 5.747 | | 6.163** | 6.163 | 3. | Infrastructure (CHP, Washery, Silo point, project office, laying of railway lines for dispatch point) and Future working expansion Area** | 6.713 | 29.609 | 36.322 | 6.713 | 18.606 | 25.319 | 4. | Embankment | NIL | 12.52 | 12.52 | NIL | 12.52 | 12.52 | A. | Total ML area | 112.521 | 525.820 | 638.341 | 132.904 | 525.820 | 658.724 |
| Items | | MP&MCP of Bhubaneswari (28 Mty), Revision-1 | | | Proposed MP&MCP of Bhubaneswari (30 Mty), Rev-2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sl. | Particulars | Total Area in ha | | | Total Area in ha | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | (ML-mining lease) | Forest | Non-forest | Total | Forest | Non-forest | Total | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. | Quarry Excavation area | 105.808 | 477.944 | 583.752 | 126.191* | 488.531** | 614.722 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. | Safety zone | | 5.747 | 5.747 | | 6.163** | 6.163 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. | Infrastructure (CHP, Washery, Silo point, project office, laying of railway lines for dispatch point) and Future working expansion Area** | 6.713 | 29.609 | 36.322 | 6.713 | 18.606 | 25.319 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. | Embankment | NIL | 12.52 | 12.52 | NIL | 12.52 | 12.52 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. | Total ML area | 112.521 | 525.820 | 638.341 | 132.904 | 525.820 | 658.724 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.2.6 | Important surface features within the project area and | Nil, Bangaru jhor passing towards north of block, suitable embankment will be constructed. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| | | |
|--|--|--|
| | major diversion or shifting involved | |
| 1.3 DETAILS OF THE ALLOTTMENT AGREEMENT | | |
| 1.3.1 | Name of the Alottee | MAHANADI COALFIELDS LIMITED (MCL) |
| 1.3.2 | Status of the Applicant Company | Central Public Sector Undertaking (A Subsidiary of Coal India Ltd.) A Govt. of India Undertaking Registered Under Companies Act, 1956 |
| 1.3.3 | Details of allotment/ vesting order | NA |
| 1.3.4 | Name and address of the applicant | Mahanadi Coalfields Limited Jagruti vihar, Burla Dist: Sambalpur (Odisha) – 768020 |
| 1.3.5 | Relationship between the applicant and allottee company | MCL is a subsidiary of Coal India Ltd. which is a Govt. of India Undertaking. |
| 1.3.6 | Name of the previous allottee of the Block | NA |
| 1.3.7 | Starting date of the mine as per CMDPA | NA |
| 1.3.8 | Rated capacity as per CMDPA | 28.0 Mty (approved); 30.0 Mty (proposed) |
| 1.3.9 | Production schedule as per opening permission (meeting provisions of CMDPA if any) | |
| 1.3.10 | End Use of Coal/Lignite as per allotment order if any | ▪ To satisfy needs of different present and future customers of MCL |
| 1.4 DETAILS OF THE PREVIOUS APPROVAL OF MINING PLAN | | |
| 1.4.1 | Date of Approval | 1) MP&MCP for Bhubaneswari OCP (28 Mty), Rev-1 was approved by the Board of Directors of MCL on 20.01.2022. 2) MP&MCP for Bhubaneswari OCP (28 Mty) was approved by MoC, Govt. of India on 20.11.2017. 3) Add. to MP&MCP for Bhubaneswari OCP (25 Mty, Peak capacity) was approved by MoC, Govt. of India on 03.02.2014. 4) MP for Bhubaneswari OCP (20 Mty) was approved by MoC, Govt. of India on 16.07.2013. |
| 1.4.2 | Conditions, if any | |
| 1.4.3 | Scheduled year of start of production | Already a running mine. |
| 1.4.4 | Proposed year of achieving the | Year-1 |

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|--|--|--|-----------|------|---|-----------------------|-----------|------|-------|-----------------------|
| | targeted production | | | | | | | | | |
| 1.4.5 | Date of actual commencement of mining operations, if operations already started | 2006-2007 | | | | | | | | |
| 1.4.6 | Likely date of mining operations, if operations not yet started & reasons for non-commencement of operations | NA | | | | | | | | |
| 1.4.7 | Planned production and actual levels achieved in last 3 years (Coal in Mte, OB in MM ³ , SR in M ³ /te) | Calendar Year | Planned | | | Actual | | | | |
| | | | Coal “Mt” | | | OB “Mm ³ ” | Coal “Mt” | | | OB “Mm ³ ” |
| | | | UG | OC | Total | | UG | OC | Total | |
| | | 2018-19 | | 28.0 | 28.0 | 20.5 | | 28.0 | 28.0 | 14.09 |
| | | 2019-20 | | 28.0 | 28.0 | 20.5 | | 28.0 | 28.0 | 15.07 |
| | | 2020-21 | | 28.0 | 28.0 | 20.5 | | 28.0 | 28.0 | 18.21 |
| 1.4.8 | Statutory obligations vis-à-vis compliance status in a tabular form | | | | | | | | | |
| 1.4.9 | Reasons for difference between the planned and actual production levels | NA | | | | | | | | |
| 1.5 PARAMETERS OF APPROVED MINING PLAN VIS-À-VIS PROPOSED MINING PLAN | | | | | | | | | | |
| | | Approved Mining Plan | | | Proposed Mining Plan | | | | | |
| 1.5.1 | Block Area in “Ha” | 1455 | | | 1455 | | | | | |
| 1.5.2 | Block Area Projected “Ha” | 638.341 | | | 658.724 | | | | | |
| 1.5.3 | Lease area “Ha” | 638.341 | | | 658.724 | | | | | |
| 1.5.4 | Project Area “Ha” | 787.911 | | | 808.294 | | | | | |
| 1.5.5 | Life of the Project “Yrs” | 5 (balance life as on 01.04.2021) | | | 5 (balance life as on 01.04.2022) | | | | | |
| 1.5.6 | Minimum and Maximum Depth of working “m” | Minimum - 97.99 m Maximum – 217.5 m | | | Minimum - 97.99 m Maximum – 217.5 m | | | | | |
| 1.5.7 | Net Geological Area “Ha” | 583.752 | | | 614.722 | | | | | |
| 1.5.8 | Production Target “MTPA” | 28.0 | | | 30.0 | | | | | |
| 1.5.9 | Seams Available “As per GR” | 13 seams/22 section | | | 13 seams/22 section | | | | | |
| 1.5.10 | Seams not considered for Mining with Reasons | Reserves have been estimated for all thirteen coal seams/splits. | | | Reserves have been estimated for all thirteen coal seams/ sections. | | | | | |

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| | | | |
|--------|--|---|---|
| 1.5.11 | Gross Geological Reserve (within pit) "Mt" | 420.77 | 465.73 |
| 1.5.12 | Net Geological Reserve (within pit) "Mt" | 378.69 | 419.15 |
| 1.5.13 | Mineable Reserve "Mt" | 365.98 | 396.52 |
| 1.5.14 | Extractable Reserves "Mt" | 365.98 | 396.52 |
| 1.5.15 | % of Extraction/recovery | 86.98 | 85.14 |
| 1.5.16 | Reserve Depleted (till the base date) Reserves "Mt" | 244.06 (as on 01.04.2021) | 272.06 (as on 01.04.2022*) |
| 1.5.17 | Balance Extractable reserve "Mt" | 121.92 (as on 01.04.2021) | 124.46 (as on 01.04.2022*) |
| 1.5.18 | Average Grade | mostly G11 to G13 | mostly G11 to G13 |
| 1.5.19 | OB in MM ³ | Insitu OB: 115.12 OB with rehandle: 170.11 | Insitu OB: 131.43 OB with rehandle: 186.42 |
| 1.5.20 | SR MM ³ /te | 0.94 (insitu) 1.40 (working) (as on 01.04.2021) | 1.06 (insitu) 1.50 (working) (as on 01.04.2022) |
| 1.5.21 | Mining Technology | Shovel-Dumper and Surface miner-front end loader-dumper | Shovel-Dumper and Surface miner-front end loader-dumper |
| 1.5.22 | Coal Beneficiation envisaged | Beneficiation not envisaged | Beneficiation not envisaged |
| 1.5.23 | Handling of Rejects | NA | NA |
| 1.5.24 | | | |
| 1. | Excavation Area | 583.752 | 614.722 |
| 2. | Top Soil Dump | - | - |
| 3. | External Dump | - | - |
| 4. | Safety Zone | 5.747 | 6.163 |
| 5. | Embankment | 12.52 | 12.520 |
| 6. | Infrastructure area | 36.322 | 25.319 |
| 7. | Green Belt | | |
| 8. | Garland drain | | |
| 9. | Undisturbed Area (Blasting danger zone & other future Expn area) | - | - |
| 10. | Total Lease area | 638.341 | 658.724 |

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| | | | |
|---|--|--|----------------|
| 11. | Residential colony, R&R, other area for road diversion and railway siding (may vary in actual) | 149.57 | 149.57** |
| | Total Project area | 787.911 | 808.294 |
| 1.5.25 | Reasons for revision | <ul style="list-style-type: none">• Change in quarry excavation area and project area• Change in mineable reserve, life and stripping ratio• Change in production – rate, built up and schedule | |
| <i>Note: * Production of Coal & OB value has been assessed considering the coal target as communicated by MCL.</i> <i>** This may actually vary as per the requirement of the company, i.e. MCL.</i> | | | |

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Chapter – 2

EXPLORATION, GEOLOGY, SEAM SEQUENCE, COAL QUALITY AND RESERVE

| | Particulars | Details | | | |
|-------|--|---|---|--|--|
| 2.1 | DETAILS OF THE BLOCK | | | | |
| 2.1.1 | Particulars of adjacent blocks: North, South, East, West | North: North of Arkhapal-Srirampur Block and Arkhapal-A Block in rest of the area. | South: Lingaraj Block and part of Ananta Extn. Block. | East: Sakhigopal-A coal block Fault F11-F11 with straightening in the north and south. | West: Ananta Exp OCP & Subhadra east coal block. |
| 2.1.2 | Location of the Block District/State | Angul district, Odisha | | | |
| 2.1.3 | Area of the Block “Ha” | 577 Ha (Bhubaneswari coal block) 1455 Ha (combined Bhubaneswari, Sakhigopal-A, Arkhapal-A coal blocks) | | | |
| 2.1.4 | Area of the geological block projectised “in Ha” (Area of the geological block considered for liquidation of coal reserve) | 658.724 Ha (6.58 sq.km) | | | |
| 2.1.5 | Balance area yet to be projectised “Ha” | 796.276 | | | |
| 2.1.6 | Likely Reserve in the area yet to be projectised “Mte” | around 1437.25 | | | |
| 2.1.7 | Co-ordinates of the Block Boundary | Co-ordinates of the Block Boundary | | | |
| | | ID | Latitude | Longitude | |
| | | 1 | 20°57'5 9” N | 85°09'10” E | |
| | | 2 | 20°58'43” N | 85°11'37” E | |
| 2.1.8 | The project area, lease area and geological block area in “Ha” shall also be envisaged. | Geological block area: 1455 Ha (<i>Figure 2.1</i>) Lease area: 658.724* Ha Project area : around 808.294* Ha (includes *20.383 Ha of non-diverted forest area under process of diversion) | | | |
| 2.1.9 | KML file of the proposed lease and geological block | Included in plates | | | |

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| | | |
|--------|--|--|
| 2.1.10 | Whether the proposed project area is confined within the allotted block boundary, if not, the reason for deviation from allotted block boundary, may be given | Mine excavation area falls within allotted block. |
| 2.1.11 | If the project area extends outside the allotted block boundary, confirmation about non-occurrence of coal/lignite in the area under reference needs to be furnished | NA |
| 2.1.12 | Type of the project (Operating/under implementation) and year of starting | Opencast Coal mining under operation and started in 2006-07. |

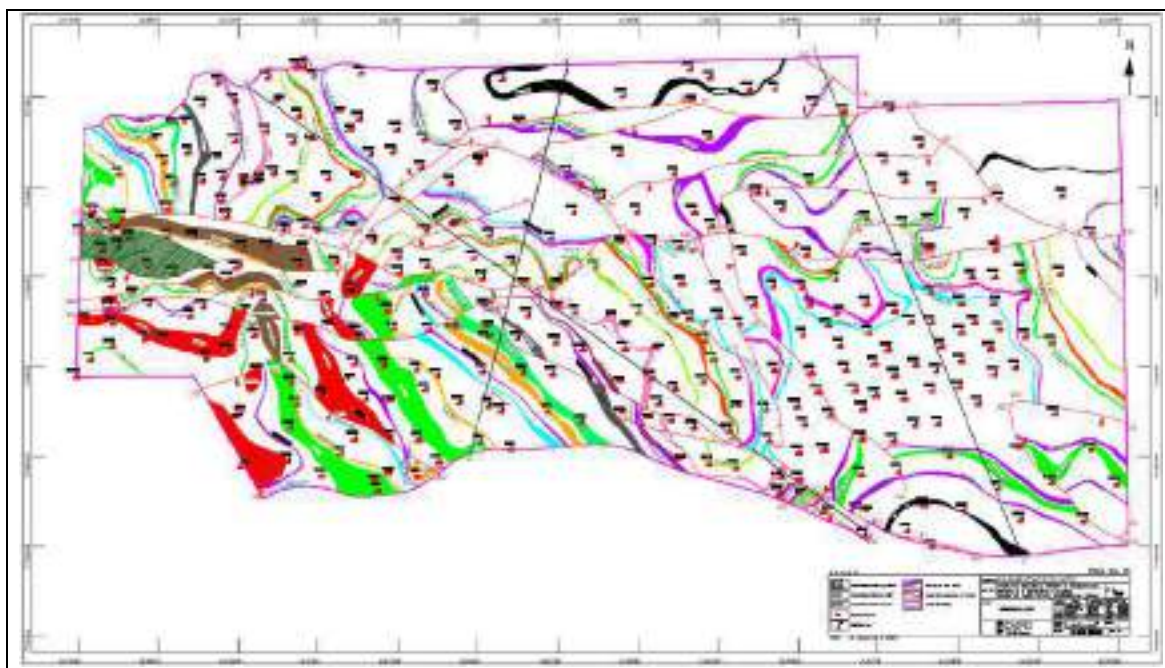


Figure 2.1 : Plan showing the Geological Block boundary

2.2 EXPLORATION, GEOLOGY AND ASSESSMENT OF RESERVE

This integrated block is located in the eastern part of the Talcher coalfield in Odisha state. It spans over an area of 14.55 sq. km between Latitude 20°57'47.779" & 20°59'19.442" North and Longitude 85°08'48.990" & 85°12'36.312" East. The block is covered under Survey

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of India Toposheet No.F45T1 on R.F. 1:50000 and special toposheets nos. D1, D2, E1 & E2 on R.F. 1:10000 and falls within Angul district.

The GR of Integrated Bhubaneswari, Arkhapal-A and Sakhigopal-A block was submitted in December 2016.

The limits of integrated block in terms of cardinal points is given below:

| Boundary | Limit | Cardinal Points |
|-----------------|---|-----------------------------------|
| East | Part of Western boundary of Sakhigopal-B and Northern Extension Block | NE 3126002.47717, 776984.89901 |
| West | Eastern boundary of Subhadra East | SW 3119486.67591 775446.49114 |
| North | Southern boundary of North of Arkhapal-Srirampur block | NW 3119539.58119 776829.76106 |
| South | Northern boundary of Lingaraj Block and part of northern boundary of Ananta Extension (Ext) Block | SE 3126061.13781 774509.52601 |

The total quantum of exploratory drilling for coal carried out in the integrated block is provided in the following table in Table 2.1.

Table 2.1

Agency wise boreholes drilled within the block boundary of Integrated GR

| Agency | Series of Borehole | No. of boreholes | Year of drilling | Total Meterage | Remarks |
|---------------|---------------------------|-------------------------|--------------------------|-----------------------|--|
| CMPDI | CMTL | 199 | MARCH, 1984 TO MAY, 2011 | 37046.70 | LITHOLOGICAL DATA OF BH NO. CMTL-124, 178, 429, 433, 434, 435, 438 NOT AVAILABLE |
| | CMTS | 67 | | 17876.60 | |
| | CTAR | 34 | | 7252.7 | |
| | CMTD | 01 | | 482.25 | |
| MECL | METAX | 01 | | 206.00 | |
| DGO | DGB | 21 | | 4892.15 | |
| GSI | TCS | 01 | | 464.70 | |
| | | 324 | | 68221.10 | |

2.2.1 REGIONAL GEOLOGICAL SET UP OF THE AREA, LOCAL GEOLOGY, STRUCTURE, STRATIGRAPHIC SEQUENCE, CHARACTERISTICS OF THE LITHO-LOGICAL UNITS (COAL SEAMS/PARTINGS/OVERBURDEN)

Barakar and Karharbari are the two coal bearing formations in the block with Barakar being the store house of majority of coal seams (II to XV).

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The sedimentary strata of this block are recent sediments, Barakar, Karharbari and Talchir Formations lying over Pre-Cambrian metamorphic basements. The geological succession of the block is tabulated below:

Table-2.2

Geological succession, Integrated Arkhpal-A, Bhubaneswari and Sakhigopal- Block, Talcher coalfield

| Group | Age | Formation | Depth of Occurrence (m) | | Lithology |
|----------------------|--------------------------------------|---------------------------|-----------------------------|--------------------|--|
| | | | Min | Max | |
| | Recent | Recent deposits | 0.00 | 15.25 (CMTL-188) | Soil, Sub-soil etc. |
| GONDWANA SUPER GROUP | Lower Permian | Barakar Formation | 26.40 (CMTL-430) | 393.25 (CMTD-029) | Medium to coarse grained greyish feldspathic sandstone, grey to dark grey shale and coal seams XV to IIB in descending order with oligomictic conglomerate (around 40m) at bottom. |
| | Lower Permian | Karharbari Formation | 62.09 (CMTL-111) | 163.15 (TCS - 002) | Pale brownish yellow colored massive medium to coarse grained sandstone, containing clasts of Talchir shale and coal seams I (in 5 to 6 splits) |
| | Upper Carboniferous to Lower Permian | Talchir Formation | Not encountered in BH. | - | Diamictite, sandstone, needle shale, turbidite, rhythmites and varves with khaki green tint. |
| Unconformity | | | | | |
| | Archaean to Lower Proterozoic | Pre-Cambrian Metamorphics | Not encountered in borehole | | Granites, gneisses and associated supracrustals. |

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2.2.2 LOCAL GEOLOGY, STRUCTURE, STRATIGRAPHIC SEQUENCE, CHARACTERISTICS OF THE LITHO-LOGICAL UNITS (COAL SEAMS/ PARTINGS/ OVERBURDEN)

GEOLOGICAL STRUCTURE

Mostly soil, alluvium or weathered mantle cover the area in succession. As such, the geological features of the block are interpreted mainly on sub-surface data. The sub-surface borehole data as well as floor contour and cross-sections across the block reveal that the block is traversed by 25 faults, trending both east-west and northwest-southeast. Some east-west trending faults dip northerly and some southerly.

The northwest-southeast trending faults also dip both ways. There is one major east-west trending fault F_1 - F_1 which almost cuts across the block in the central portion, which is dipping towards north and has a varying throw of around 150 m to 10 m. There is also another major fault F_{24} - F_{24} in the southeastern boundary of the block, whose throw varies from 180 metre to almost nil within a short distance. This fault is continuing from adjacent Lingaraj block where its throw is around 250 metres. All other faults are minor having an average throw of around 20 to 30 metres throw. Most of the faults are truncated by other faults while some faults die out. The central and western part of the block is traversed by more number of faults and so the structure in this portion is complicated. Truncation of faults against other faults and block boundary forms the basis of sector formation for reserve estimation in the block. The data of the adjacent block has been fully utilized for ensuring the continuity of the seams, nomenclature, structural continuity, thickness and parting between the seams.

The block is traversed by 25 faults viz. F_1 - F_1 to F_{25} - F_{25} . While 7 no. of faults throw northerly with slight variations, rest 18 of the faults throw southerly with minor variations. Except faults F_1 - F_1 , F_{10} - F_{10} & F_{24} - F_{24} , rest of the faults have low to medium magnitude of throw.

The faults extending from adjacent blocks have been tallied with the structural interpretation within the block. Since 25 faults have been deciphered, the nomenclatures of the faults have been given afresh following certain pattern.

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STRIKE AND DIP

The structure of the block is complicated as the entire block is traversed by 25 nos. of faults. The E-W trending F1-F1 fault which passes through the entire length divides the block into two sectors i.e. north of F1-F1 and south F1-F1. The Strike of the formation vary considerably as we move from west to east. The strike is NW to SE in the west whereas when we move towards east, the strike gradually swings to NE to SW i.e. on the southern side of F1-F1. There is also striking change in the dip of formation on the both sides of F1-F1 in the eastern part of the block. Towards north of F1-F1, the formation dips towards north whereas in the south, it dips towards south. In the central and eastern portion i.e. on the northern side of faults F1-F1, the strike becomes almost E-W. The gradient of the seams generally varies from 1 in 8 to 1 in 30 with local variations

SEQUENCE OF COAL SEAMS AND ITS DESCRIPTION

In Integrated block, the Karharbari Formation contains seam I and Barakar Formations contain seam XV to II Bottom. Altogether, 31 nos. of seams / sections are reported in Barakar Formation. Among these, seam II TOP, II COMB, V, III COMB, IV and IV+LOC 1 are the most potential coal horizons in this block.

This integrated block is covered by soil of thickness varying generally from 0.6 metres to 8.6 metres. It consists of sandy soil, clay and lateritic soil.

The general thickness of weathered mantle ranges from around 3.3 metres to 13.6 metres and consists of laterite, sandstone, sandy shale, intercalation of shale and sandstone, carbonaceous shale etc.

SEAM XV

Seam XV is the youngest coal seam in the block. Full seam intersection of seam XV has been encountered in 7 boreholes. The maximum thickness of the seam XV is 6.36 metres and its maximum depth of occurrence is 32.45 metres. The seam is interbanded in nature. Determined Proximate analysis data is not available for any of the boreholes drilled in

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this block. But the Moisture, Ash & GCV values have been calculated on the basis of approximate M100 values taken from adjacent block. The proximate analysis on 60% RH and 40°C of seam XV on I₁₀₀ sample shows moisture%, and ash% varying from 6.1 to 6.5 & 44.9 to 47.7 respectively. The GCV varies from 3179 kcal/kg to 3384 kcal/kg. The grade varies from G13 to G14 and the general grade of the seam is G14. This is the topmost seam in the block with a total of 2.773 MT of net proved resource (0.15% of total net proved resource). Resources are maximum in the GCV band of G-14.

SEAM XIII TOP

Full seam intersection of seam XIII TOP has been occurred in 39 boreholes. The maximum thickness of the seam XIII TOP is 7.14 metres and its maximum depth of occurrence is 69.04 metres. The seam is less interbanded and contains mostly less than 1 metre inseam dirt bands. The proximate analysis on 60% RH and 40°C of seam XIII on I₁₀₀ sample shows moisture%, ash% and volatile matter% as 4.3% to 9.5%, 20.2% to 57.6% and 30.1% to 30.1%. The GCV varies from 2984 kcal/kg to 5272 kcal/kg. The grade varies from G7 to G17. A total of 5.985 MT of net proved resource has been estimated for seam XIII TOP in this block. This is about 0.32% of total estimated net proved resource of the entire block. Out of this, 2.322 MT fall in the category of G-15 band and 2.302 MT in G-14 category.

SEAM XIII BOT

Full seam intersection of seam XIII BOT has been occurred in 44 boreholes. The maximum thickness of the seam XIII BOT is 5.94 metres and its maximum depth of occurrence is 72.70 metres. The seam is less interbanded and contains mostly less than 1 metre inseam dirt bands except few boreholes which contain more than 1 m dirt bands. The proximate analysis on 60% RH and 40°C of seam XIII BOT on I₁₀₀ sample shows moisture%, ash% and volatile matter% as 4.9% to 6.5%, 42.6% to 54.2% and 24.3% to 24.3%. The GCV varies from 2742 kcal/kg to 3600 kcal/kg. The grade varies from G13 to G16 and the general grade of the seam is G13 to G15. Total estimated net proved resource comes to 4.551 MT for XIII BOT in this block. This is about 0.25% of total net proved resource of the block. Out of this 4.551 MT, 1.661 MT falls in G14 category, 1.436 in G13 Category and 1.354 in G15 category.

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Full seam intersection of seam XII TOP has been occurred in 44 boreholes. The maximum thickness of the seam XII TOP is 2.41 metres and its maximum depth of occurrence is 125.72 metres. The seam is less interbanded and contains only less than 1 metre inseam dirt bands. The proximate analysis on 60% RH and 40°C of seam XII TOP on I100 sample shows moisture% and ash% as 4.8% to 5.4% and 50.6 to 55.2. The GCV varies from 2662 kcal/kg to 3008 kcal/kg. The grade varies from G15 TO G16 and the general grade of the seam is G15 to G16. A total of 1.027MT of net proved resource has been estimated for this seam in this block, which is about 0.06% of total estimated resource of the block. Out of this, 0.504 MT falls in the G16 band.

SEAM XII BOT

Full thickness of seam XII BOT has been encountered in 119 boreholes. The maximum thickness of the seam XII BOT is 3.12 metres and its maximum depth of occurrence is 126.27 metres. The seam is less interbanded and contains mostly less than 1 metre inseam dirt bands. The proximate analysis on 60% RH and 40°C of seam XII BOT on I100 sample shows moisture%, ash% and volatile matter% as 4.6% to 9.5%, 15.5% to 51.4% and 23.7% to 34.4%. The GCV varies from 3005 kcal/kg to 5714 kcal/kg. The grade varies from G15 to G6 and the general grade of the seam is G7 to G13. A total of 6.871 MT of net proved resource has been estimated for this seam in this block, which is about 0.37% of total estimated resource of the block. Out of this, 1.082 MT falls in the G12 band & 1.041 MT falls in G8 band.

SEAM XI TOP

Full seam intersection of seam XI TOP has been occurred in 144 boreholes. The maximum thickness of the seam XI TOP is 3.01 metres and its maximum depth of occurrence is 141.86 metres. The seam is less interbanded and devoid of more than 1 metre thick inseam dirt bands. The proximate analysis on 60% RH and 40°C of seam XI TOP on I100 sample shows moisture%, ash% and volatile matter% as 4.3% to 7.0%, 31.2% to 55.3% and 21.0% to 29.0%. The GCV varies from 2711 kcal/kg to 4600 kcal/kg. The grade varies from G9 to G16 and the general grade of the seam is G10 to G14. A total of 3.68 MT of net

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proved resource has been estimated for this seam in this block, which is about 0.20 % of total estimated resource of the block. Out of this, 0.767 MT falls in the G13 band.

SEAM XI BOT

Full seam intersection of seam XI BOT has been occurred in 151 boreholes. The maximum thickness of the seam XI BOT is 3.76 metres and its maximum depth of occurrence is 145.89 metres. The seam is devoid of more than 1 metre in-seam dirt bands. The proximate analysis on 60% RH and 40°C of seam XI BOT on I100 sample shows moisture%, ash% and volatile matter% as 4.6% to 9.9%, 17.1% to 56.4% and 26.9% to 28.8%. The GCV varies from 2578 kcal/kg to 5505 kcal/kg. The grade varies from G6 to G16 and the general grade of the seam is G10 to G14. A total of 15.691 MT of net proved resource has been estimated for this seam in this block, which is about 0.85 % of total estimated resource of the block. Out of this, 4.05 MT falls in the G12 band, 3.5 MT in G13 band, 2.94 MT in G14 band & 2.226 MT in G11 band.

SEAM X

Full seam intersection of seam X has been occurred in 169 boreholes. The maximum thickness of the seam X is 3.75 metres and its maximum depth of occurrence is 152.70 metres. The seam is less interbanded and devoid of more than 1 metre thick in-seam dirt bands. The proximate analysis on 60% RH and 40°C of seam X on I100 sample shows moisture%, ash% and volatile matter% as 5.4% to 9.8%, 17.7% to 50.5% and 26.3% to 32.8%. The GCV varies from 3017 kcal/kg to 5704 kcal/kg. The grade varies from G6 to G15 and the general grade of the seam is G8 to G12. A total of 12.428 MT of net proved resource has been estimated for this seam in this block, which is about 0.67 % of total estimated resource of the block. Out of this, 3.681 MT falls in the G10 band, 2.42 MT in G9 band, 1.95 in G11 band and 1.671 in G8 band.

SEAM IX

Full seam intersection of seam IX has been occurred in 187 boreholes. The maximum thickness of the seam IX is 4.24 metres and its maximum depth of occurrence is 172.02 metres. Some boreholes of seam IX has more than 1 metre in-seam dirt bands. The

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proximate analysis on 60% RH and 40°C of seam IX on I100 sample shows moisture%, ash% and volatile matter% as 4.2% to 9.2%, 22.3% to 58.1% and 21.7% to 29.5%. The GCV varies from 2447 kcal/kg to 5118 kcal/kg. The grade varies from G8 to G17 and the general grade of the seam is G10 to G14. A total of 10.264 MT of net proved resource has been estimated for this seam in this block, which is about 0.56 % of total estimated resource of the block. Out of this, 2.473 MT falls in the G13 band, 2.193 in G12 band and 2.051 in G11 band.

SEAM VIII TOP

Full seam intersection of seam VIII TOP has been occurred in 167 boreholes. The maximum thickness of the seam VIII TOP is 4.01 metres and its maximum depth of occurrence is 177.07 metres. The seam is less interbanded and contains mostly less than 1 metre inseam dirt bands. The proximate analysis on 60% RH and 40°C of seam VIII TOP on I100 sample shows moisture%, ash% and volatile matter% as 4.2% to 8.5%, 18.7% to 54.9% and 26.9% to 29.2%. The GCV varies from 2594 kcal/kg to 5439 kcal/kg. The grade varies from G7 to G16 to and the general grade of the seam is G10 to G14. A total of 10.286 MT of net proved resource has been estimated for this seam in this block, which is about 0.56 % of total estimated resource of the block. Out of this, 2.796 MT falls in the G12 band, 2.304 in G13 band, 2.162 in G14 band and 1.57 in G11 band.

SEAM VIII BOT

Full seam intersection of seam VIII BOT has been occurred in 177 boreholes. The maximum thickness of the seam VIII BOT is 3.44 metres and its maximum depth of occurrence is 179.63 metres. The seam is interbanded and contains more than 1 metre inseam dirt bands in some boreholes. The proximate analysis on 60% RH and 40°C of seam VIII BOT on I₁₀₀ sample shows moisture%, ash% and volatile matter% as 4.2% to 8.5%, 18.7% to 54.9% and 26.9% to 29.2%. The GCV varies from 2778 kcal/kg to 5558 kcal/kg. The grade varies from G6 to G16 and the general grade of the seam is G9 to G13. A total of 5.204 MT of net proved resource has been estimated for this seam in this block, which is about 0.28 % of total estimated resource of the block. Out of this, 1.013 MT falls in the G10 band, 0.959 in G9 band and 0.896 in G13 band.

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Full seam intersection of seam VII has been occurred in 201 boreholes. The maximum thickness of the seam VII is 10.09 metres and its maximum depth of occurrence is 187.69 metres. The seam is interbanded and contains more than 1 metre in seam dirt bands in some boreholes. The proximate analysis on 60% RH and 40°C of seam VII on I₁₀₀ sample shows moisture%, ash% and volatile matter% as 5.4% to 10.3%, 11.8% to 42.9% and 24.5% to 35.3%. The GCV varies from 3295 kcal/kg to 6339 kcal/kg. The grade varies from G4 to G14 and the general grade of the seam is G8 to G12. A total of 72.959 MT of net proved resource has been estimated for this seam in this block, which is about 3.96 % of total estimated resource of the block. Out of this, 17.578 MT falls in the G10 band, 16.259 MT in G9 band, 13.82 in G8 band, 13.13 in G11 band & 5.398 in G 7 band.

SEAM VI B TOP

Full seam intersection of seam VI B TOP has been occurred in 202 boreholes. The maximum thickness of the seam VI B TOP is 9.70 metres and its maximum depth of occurrence is 206.79 metres. The seam is interbanded and contains more than 1 metre in seam dirt bands in some boreholes. The proximate analysis on 60% RH and 40°C of seam VI B TOP on I₁₀₀ sample shows moisture%, ash% and volatile matter% as 3.6% to 9.1%, 23.2% to 63.5% and 20.4% to 26.6%. The GCV varies from 2056 kcal/kg to 5048 kcal/kg. The grade varies from Ungraded to G8 and the general grade of the seam is G12 to G16. A total of 40.883 MT of net proved resource has been estimated for this seam in this block, which is about 2.22 % of total estimated resource of the block. Out of this, 10.829 MT falls in the G14 band, 10.026 MT in G15 band, 9.107 in G13 band and 7.053 in G16 band.

SEAM VI B BOT

Full seam intersection of seam VI B BOT has been occurred in 210 boreholes. The maximum thickness of the seam VI B BOT is 9.95 metres and its maximum depth of occurrence is 212.63 metres. The seam is less interbanded and contains mostly less than 1 metre in seam dirt bands but in some boreholes the in seam band more than 1 m thickness occurs. The proximate analysis on 60% RH and 40°C of seam VI B BOT on I₁₀₀ sample shows moisture%, ash% and volatile matter% as 3.1% to 8.9%, 24.7% to 67.5% and 20.8% to 28.8%. The GCV varies from 1752 kcal/kg to 5091 kcal/kg. The grade varies from

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Ungraded to G8 and the general grade of the seam is G11 to G15. A total of 63.604 MT of net proved resource has been estimated for this seam in this block, which is about 3.45 % of total estimated resource of the block. Out of this, 18.443 MT falls in the G13 band, 16.764 in G12 band, 13.64 in G14 band and 7.185 in G11 band.

SEAM VI A TOP

Full seam intersection of seam VI A TOP has been occurred in 72 boreholes. The maximum thickness of the seam VI A TOP is 5.71 metres and its maximum depth of occurrence is 207.41 metres. The seam is less interbanded and contains mostly less than 1 metre in-seam dirt bands. The proximate analysis on 60% RH and 40°C of seam VI A TOP on I100 sample shows moisture%, ash% and volatile matter% as 5.1% to 10.7%, 11.5% to 52.6% and 25.3% to 30.2%. The GCV varies from 2578 kcal/kg to 5916 kcal/kg. The grade varies from G16 to G5 and the general grade of the seam is G10 to G14 . A total of 8.615 MT of net proved resource has been estimated for this seam in this block, which is about 0.47 % of total estimated resource of the block. Out of this, 2.659 MT falls in the G12 band, 1.833 MT in G11 band, 1.743 in G13 band and 1.308 in G10 band.

SEAM VI A

Full seam intersection of seam VI A has been occurred in 24 boreholes. The maximum thickness of the seam VI A is 10.26 metres and its maximum depth of occurrence is 156.31 metres. The seam is less interbanded and contains mostly less than 1 metre in-seam dirt bands except three boreholes. The proximate analysis on 60% RH and 40°C of seam VI A on I₁₀₀ sample shows moisture% and ash% as 5.2% to 7.7% and 33.5% to 52.2%. The GCV varies from 2886 kcal/kg to 4282 kcal/kg. The grade varies from G15 to G11 and the general grade of the seam is G14 to G11. A total of 11.523 MT of net proved resource has been estimated for this seam in this block, which is about 0.62 % of total estimated resource of the block. Out of this, 4.766 MT falls in the G12 band, 4.032 MT in G13 band and 1.535 in G11 band.

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Full seam intersection of seam VI A BOT has been occurred in 72 boreholes. The maximum thickness of the seam VI A BOT is 6.75 metres and its maximum depth of occurrence is 214.12 metres. The seam is less interbanded and contains mostly less than 1 metre inseam dirt bands except few boreholes. The proximate analysis on 60% RH and 40°C of seam VI A BOT on I100 sample shows moisture%, ash% and volatile matter% as 4.6% to 10.7%, 11.5% to 56.4% and 23.3% to 30.2% respectively. The GCV varies from 2578 kcal/kg to 5916 kcal/kg. The grade varies from G5 to G16 and the general grade of the seam is G14. A total of 63.604 MT of net proved resource has been estimated for this seam in this block, which is about 3.45 % of total estimated resource of the block. Out of this, 18.443 MT falls in the G13 band, 16.764 MT in G13 band, 13.64 in G14 band and 7.185 in G11 band.

SEAM LOC 3

Full seam intersection of seam LOC 3 has been occurred in 176 boreholes. The maximum thickness of the seam LOC 3 is 3.78 metres and its maximum depth of occurrence is 230.00 metres. The seam is less interbanded and contains mostly less than 1 metre inseam dirt bands. The proximate analysis on 60% RH and 40°C of seam LOC 3 on I100 sample shows moisture% and ash% as 3.8% to 8.6% and 26.5% to 62.0% respectively. The GCV varies from 2168 kcal/kg to 4810 kcal/kg. The grade varies from Ungraded to G9 and the general grade of the seam is G16 to G12. A total of 6.208 MT of net proved resource has been estimated for this seam in this block, which is about 0.34 % of total estimated resource of the block. Out of this, 1.601 MT falls in the G15 band and 1.147 MT in G14 band.

SEAM V

Full seam intersection of seam V has been occurred in 214 boreholes. The maximum thickness of the seam V is 19.50 metres and its maximum depth of occurrence is 231.78 metres. The seam is interbanded and some boreholes contain more than 1 metre inseam dirt bands. The proximate analysis on 60% RH and 40°C of seam V on I100 sample shows moisture%, ash% and volatile matter% as 4.3% to 8.1%, 26.4% to 56.4% and 23.8% to 28.1%. The GCV varies from 2622 kcal/kg to 4892 kcal/kg. The grade varies from G16 to

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G9. The general grade is G11 to G14. A total of 222.028 MT of net proved resource has been estimated for this seam in this block, which is about 12.04 % of total estimated resource of the block. Out of this, 65.167 MT falls in the G12 band, 55.741 MT in G13 band, 42.09 in G11 band and 30.273 in G14 band.

SEAM LOC 2

Full seam intersection of seam LOC 2 has been occurred in 209 boreholes. The maximum thickness of the seam LOC 2 is 5.04 metres and its maximum depth of occurrence is 246.05 metres. The seam is less interbanded and contains mostly less than 1 metre in seam dirt bands except few boreholes. The proximate analysis on 60% RH and 40°C of seam LOC 2 on I100 sample shows moisture%, ash% and volatile matter% as 3.9% to 8.6%, 24.3% to 57.1% and 20.6% to 35.3%. The GCV varies from 2614 kcal/kg to 5133 kcal/kg. The grade varies from G16 to G8. The general grade is G14 to G10. A total of 25.988 MT of net proved resource has been estimated for this seam in this block, which is about 1.41 % of total estimated resource of the block. Out of this, 6.334 MT falls in the G15 band, 5.695 MT in G13 band, 5.28 in G12 band, 3.947 in G14 band and 2.752 in G11 band.

SEAM IV

Full seam intersection of seam IV has been occurred in 139 boreholes. The maximum thickness of the seam IV is 19.62 metres and its maximum depth of occurrence is 253.39 metres. The seam is less interbanded and contains mostly less than 1 metre in seam dirt bands except few boreholes. The proximate analysis on 60% RH and 40°C of seam IV on I100 sample shows moisture%, ash% and volatile matter% as 4.5% to 7.2%, 24.5% to 49.1% and 22.5% to 32.3%. The GCV varies from 3280 kcal/kg to 5202 kcal/kg. The grade varies from G14 to G7 and the general grade of the seam is G10 to G13. A total of 153.299 MT of net proved resource has been estimated for this seam in this block, which is about 8.31 % of total estimated resource of the block. Out of this, 50.774 MT falls in the G10 band, 41.181 MT in G11 band, 39.515 in G21 band and 11.937 in G9 band.

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Full seam intersection of seam LOCAL 1 has been occurred in 149 boreholes. The maximum thickness of the seam LOCAL 1 is 5.32 metres and its maximum depth of occurrence is 267.40 metres. The seam is less interbanded and contains mostly less than 1 metre in-seam dirt bands. The proximate analysis on 60% RH and 40°C of seam LOCAL 1 on I100 sample shows moisture%, ash% and volatile matter% as 3.8% to 8.1%, 16.1% to 55.4% and 21.8% to 34.6%. The GCV varies from 2789 kcal/kg to 5861 kcal/kg. The grade varies from G16 to G5 and the general grade of the seam is G8 to G13. A total of 16.985 MT of net proved resource has been estimated for this seam in this block, which is about 0.92 % of total estimated resource of the block. Out of this, 4.435 MT fall in G11 band, 3.387 MT in the G9 band, 2.903 MT in G10 band, and 1.672 in G12 band.

SEAM IV+LOC 1

Full seam intersection of seam IV+LOC 1 has been occurred in 90 boreholes. The maximum thickness of the seam IV+LOC 1 is 24.66 metres and its maximum depth of occurrence is 245.80 metres. The seam is less interbanded and contains mostly less than 1 metre in-seam dirt bands except few boreholes. The proximate analysis on 60% RH and 40°C of seam IV+LOC 1 on I100 sample shows moisture%, ash% and volatile matter% as 5.0% to 7.5%, 26.9% to 47.7% and 24.7% to 29.1% respectively. The grade varies from G14 to G8. The general grade is G12 to G9. A total of 92.484 MT of net proved resource has been estimated for this seam in this block, which is about 5.02 % of total estimated resource of the block. Out of this, 32.045 MT falls in the G10 band, 25.738 MT in G11 band, 16.198 in G9 band and 15.302 in G12 band.

SEAM III TOP

Full seam intersection of seam III TOP has been occurred in 58 boreholes. The maximum thickness of the seam III TOP is 13.73 metres and its maximum depth of occurrence is 278.95 metres. The seam is less interbanded and contains mostly less than 1 metre in-seam dirt bands, except in few boreholes where it contains in-seam dirt band of more than 1 metre thickness. The proximate analysis on 60% RH and 40°C of seam III TOP on I₁₀₀ sample shows moisture%, ash% and volatile matter% as 4.8% to 7.6%, 21.1% to 44.5% and

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25.2 to 28.1 respectively. The GCV varies from 3640 kcal/kg to 5464 kcal/kg. The grade varies from G7 to G13. The general grade is G9 to G12. A total of 61.76 MT of net proved resource has been estimated for this seam in this block, which is about 3.35 % of total estimated resource of the block. Out of this, 23.159 MT falls in the G10 band, 16.481 MT in G11 band and 14.346 in G9 band.

SEAM III BOTTOM

Full seam intersection of seam III BOTTOM has been occurred in 58 boreholes. The maximum thickness of the seam III BOTTOM is 5.75 metres and its maximum depth of occurrence is 291.61 metres. The seam is less interbanded and practically devoid of more than 1 metre dirt band except few boreholes where the in-seam dirt band thickness exceeds 1 m. The proximate analysis on 60% RH and 40°C of seam III BOTTOM on I100 sample shows moisture%, ash% and volatile matter% as 4.0% to 7.5%, 21.0% to 53.0% and 20.9% to 31.4% respectively. The GCV varies from 2972 kcal/kg to 5575 kcal/kg. The grade varies from G6 to G15. The general grade is G8 to G11. A total of 16.853 MT of net proved resource has been estimated for this seam in this block, which is about 0.91 % of total estimated resource of the block. Out of this, 5.645 MT falls in the G10 band, 5.271 MT in G10 band and 3.113 in G11 band.

SEAM III COMBINED

Full seam intersection of seam III BOTTOM has been occurred in 192 boreholes. The maximum thickness of the seam III COMB 16.84 metres and its maximum depth of occurrence is 272.42 metres. The seam is less interbanded and practically devoid of more than 1 metre dirt band except few boreholes where the in-seam dirt band thickness exceeds 1 m. The proximate analysis on 60% RH and 40°C of seam III BOTTOM on I100 sample shows moisture%, ash% and volatile matter% as 3.8% to 6.9%, 22.9% to 47.8% and 24.6% to 29.9% respectively. The GCV varies from 3431 kcal/kg to 5425 kcal/kg. The grade varies from G7 to G13. The general grade is G8 to G11. A total of 174.704 MT of net proved resource has been estimated for this seam in this block, which is about 9.47 % of total estimated resource of the block. Out of this, 60.947 MT falls in the G10 band, 50.048 MT in G8 band, 35.869 in G11 band and 19.947 in G18 band.

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SEAM II TOP

Full seam intersection of seam II TOP has been occurred in 161 boreholes. The maximum thickness of the seam II TOP is 44.99 metres and its maximum depth of occurrence is 304.08 metres. The seam is highly interbanded and contains non cumbustable dirt bands upto 14% of its thickness. The proximate analysis on 60% RH and 40°C of seam II TOP on I100 sample shows moisture, ash and volatile matter as 4.4% to 6.3%, 26.9% to 43.9% and 23.9% to 27.4% respectively. The GCV varies from 3745 kcal/kg to 5107 kcal/kg. The grade varies from G8 to G12. The general grade is G9 to G11. A total of 512.243 MT of net proved resource has been estimated for this seam in this block, which is about 27.78 % of total estimated resource of the block. Out of this, 232.601 MT falls in the G10 band, 148.352 MT in G11 band, 108.687 in G9 band and 22.603 in G12 band.

SEAM II BOTTOM

Full seam intersection of seam II BOTTOM has been occurred in 136 boreholes. The maximum thickness of the seam II BOTTOM is 5.86 metres and its maximum depth of occurrence is 335.75 metres. The seam has upto 5 numbers of in-seam dirt bands which constitutes about 39% of its thickness. The proximate analysis on 60% RH and 40°C of seam II BOTTOM on I100 sample shows moisture%, ash% and volatile matter% as 2.8% to 6.0% and 28.8% to 54.2% respectively. The GCV varies from 2238 kcal/kg to 5645 kcal/kg. The grade varies from G6 to G17 to E. The general grade is G9 to G13. A total of 27.172 MT of net proved resource has been estimated for this seam in this block, which is about 1.47 % of total estimated resource of the block. Out of this, 8.991 MT falls in the G10 band, 5.076 MT in G12 band and 3.281 in G9 band.

SEAM II COMB

Full seam intersection of seam II COMB has been occurred in 81 boreholes. The maximum thickness of the seam II COMB is 49.61 metres and its maximum depth of occurrence is 288.35 metres. The seam has upto 22 numbers of in-seam dirt bands which constitutes about 16% of its thickness. The proximate analysis on 60% RH and 40°C of seam II COMB on I100 sample shows moisture%, ash% and volatile matter% as 4.2% to 6.0%, 24.1% to 43.6% and 23.6% to 26.1% respectively. The GCV varies from 3750 kcal/kg

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to 5414 kcal/kg. The grade varies from G7 to G12 to E. The general grade is G9 to G12. A total of 231.358 MT of net proved resource has been estimated for this seam in this block, which is about 12.55 % of total estimated resource of the block. Out of this, 117.971 MT falls in the G11 band, 38.01 MT in G10 band, 36.722 in G9 band and 24.708 in G12 band.

COAL RESOURCE ESTIMATION - COAL BEARING AREA OF THE BLOCK

The integrated block covers an area of 14.55 sq. kms. The correlation of coal seams in this integrated block has been established in accordance with that established in the earlier prepared GRs on Bhubaneswari, Arkhapal-A and Sakhigopal-A Blocks with minor modifications. The minor modification is due to recent change in the norms of inclusion of Low Carbonaceous Shale having ash plus moisture percentage of 65 within the seam. Seam II BOT to XV occurring in Barakar Formation are considered potential for quarriable prospect and the exploration was carried out for proving reserve upto seam II BOT. However, information on Seam-I is limited in this integrated block as only 26 boreholes have been drilled in Karharbari formation. The study on Seam-I needs further detailed exploration. In this block altogether 31 distinct splits/combination of Barakar Formation, including 4 local seams in ascending order viz, Seam-II BOT, II COMB, II TOP, L0, III BOT, III COMB, III TOP, Loc 1, IV+Loc 1, IV, Loc 2, V, Loc 3, VI A TOP, VI A, VI A BOT, VI B TOP, VI B BOT, VII, VIII TOP, VIII BOT, IX, X, XI TOP, XI BOT, XII TOP, XII BOT, XIII TOP, XIII BOT, XIV, and XV. Out of these, 1 local coal seam L0 has been identified as either not so potential or having localized development and hence, is not dealt in detail. The remaining 30 coal seams of Barakar Formation from seams II BOT to XV including three locals Loc 1, Loc 2, Loc 3 are studied and assessed in detail in the present report.

Seam folio plans showing block boundary, seam incrops, effective thickness, in-seam dirt band if any, iso-chors and iso-grads (GCV band based) on I100 samples were generated and plotted through MINEX 6.4.2 software and have been used as base for estimation of coal resources and also the volume of coal having less than 1 metre thickness, ungraded coal as well as in-seam dirt bands. For different Grade bands of coal, different input of prescribed specific gravity were taken in database. The intersections of all the grids such as effective thickness, GCV and in-seam dirt band with limit of seam thickness of 1m and above, seam incrop, fault and block boundary were taken as input data and put in database of MINEX through Seam Model /Detailed Resources Reporting operations menu of MINEX

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6.4.2 software. From the above operation, seam-wise, grade-band wise total area of each seam, total coal volume, Gross coal resource and total volume of waste were calculated and output obtained on CSV format. The CSV data were further brought to EXCEL format and different tables were prepared as per requirement. A 10 % deduction has been made to account for unforeseen geological disturbances from Gross Proved Resource to obtain Net Proved Resources of the seams. Net Proved Geological Resources is shown in Figure 2.2.

QUALITY OF COAL SEAMS

The coal seams occurring in this integrated block are interbanded in nature. The coal is generally having high moisture, high ash and high volatile matter contents and belongs to sub-bituminous rank under non-coking coal category. Moisture %, Ash% and VM% on 60% RH & 40°C generally vary between 2.8–10.7 %, 11-65 % and 18-35 % respectively on I100 samples. Generally the grade of the coal seams varies from G9 - G12.

COAL RESERVES

Altogether 30 no. of coal seams of Barakar Formation, in descending order. The Barakar seams viz., II BOT to XV have been considered for OC potentiality. The major contribution of reserves comes from the seams viz., II TOP, II COMB, V, III COMB, IV, IV+LOC 1 & VII. For the Karharbari seams the reserves has not been estimated due to the scanty of data. A total of 1843.989 MT of Net Proved resource have been estimated for entire block. Out of this, some of the coal resources have already been mined out through Bhubaneswari OCP. The Barakar seams viz., II BOT to XV have been considered for OC potentiality. The major contribution of reserves comes from the seams viz., II TOP, II COMB, V, III COMB, IV, IV+LOC 1 & VII. For the Karharbari seams the reserves has not been estimated due to the scanty of data.

The resources are estimated for the entire block and placed under Proved category, and net Proved resource after making 10 % deduction from the gross Resource. Seam wise, GCV grade/band-wise and depth wise coal Resources are calculated.

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As such, volumes of total waste of 1713.8976 million cubic metres are worked out against total net proved coal resources of 1843.989 million tonnes with resultant Stripping Ratio around 0.9 cubic meters of waste per tonne of coal upto seam II BOT/II COMB for integrated block

| SEAM | Grade-wise Net Proved Resources in million tonnes | | | | | | | | | | | | | | Net Proved Resources (MT) | Seam-wise (%) |
|-----------------------|---|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|---------------------------|---------------|
| | G-4 | G-5 | G-6 | G-7 | G-8 | G-9 | G-10 | G-11 | G-12 | G-13 | G-14 | G-15 | G-16 | G-17 | | |
| XV | 0 | 0 | 0 | 0 | 0 | 0 | 0.215 | 0.308 | 0.192 | 0.323 | 1.735 | 0 | 0 | 0 | 2.773 | 0.15% |
| XIV | 0 | 0 | 0 | 0 | 0 | 0.025 | 0.244 | 0.375 | 1.014 | 0.534 | 0.725 | 0.223 | 0.102 | 0.007 | 3.249 | 0.18% |
| XIII TOP | 0 | 0 | 0 | 0.005 | 0.033 | 0.039 | 0.029 | 0.096 | 0.17 | 0.576 | 2.302 | 2.322 | 0.413 | 0 | 5.985 | 0.32% |
| XIII BOT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.078 | 1.436 | 1.661 | 1.354 | 0.022 | 0 | 4.551 | 0.25% |
| XII TOP | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.006 | 0.014 | 0.026 | 0.271 | 0.504 | 0.206 | 1.027 | 0.06% |
| XII BOT | 0 | 0 | 0.232 | 0.702 | 1.041 | 0.993 | 0.824 | 0.835 | 1.082 | 0.831 | 0.268 | 0.06 | 0.003 | 0 | 6.871 | 0.37% |
| XI TOP | 0 | 0 | 0 | 0 | 0 | 0.028 | 0.547 | 0.524 | 0.487 | 0.767 | 0.38 | 0.683 | 0.264 | 0 | 3.68 | 0.20% |
| XI BOT | 0 | 0 | 0 | 0.023 | 0.276 | 0.399 | 1.382 | 2.226 | 4.05 | 3.5 | 2.94 | 0.872 | 0.023 | 0 | 15.691 | 0.85% |
| X | 0 | 0 | 0.051 | 0.509 | 1.671 | 2.42 | 3.681 | 1.95 | 1.411 | 0.614 | 0.107 | 0.014 | 0 | 0 | 12.428 | 0.67% |
| IX | 0 | 0 | 0 | 0 | 0.15 | 0.594 | 1.069 | 2.051 | 2.193 | 2.473 | 1.022 | 0.308 | 0.248 | 0.156 | 10.264 | 0.56% |
| VIII TOP | 0 | 0 | 0 | 0.021 | 0.043 | 0.17 | 0.631 | 1.57 | 2.796 | 2.304 | 2.162 | 0.516 | 0.073 | 0 | 10.286 | 0.56% |
| VIII BOT | 0 | 0 | 0.005 | 0.041 | 0.308 | 0.959 | 1.013 | 0.84 | 0.803 | 0.896 | 0.249 | 0.078 | 0.012 | 0 | 5.204 | 0.28% |
| VII | 0.082 | 0.219 | 0.733 | 5.398 | 13.82 | 16.26 | 17.578 | 13.13 | 4.461 | 1.022 | 0.233 | 0.024 | 0 | 0 | 72.959 | 3.96% |
| VIB TOP | 0 | 0 | 0 | 0 | 0.013 | 0.076 | 0.167 | 0.752 | 2.801 | 9.107 | 10.829 | 10.026 | 7.053 | 0.059 | 40.883 | 2.22% |
| VI B BOT | 0 | 0 | 0 | 0 | 0.065 | 0.476 | 1.794 | 7.185 | 16.764 | 18.443 | 13.64 | 4.218 | 0.926 | 0.093 | 63.604 | 3.45% |
| VI A TOP | 0 | 0 | 0.006 | 0.058 | 0.194 | 0.367 | 1.308 | 1.833 | 2.659 | 1.743 | 0.447 | 0 | 0 | 0 | 8.615 | 0.47% |
| VI A BOT | 0 | 0.008 | 0.022 | 0.032 | 0.619 | 0.485 | 1.438 | 3.663 | 4.299 | 3.438 | 3.693 | 3.982 | 1.635 | 0 | 23.314 | 1.26% |
| VI A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.535 | 4.766 | 4.032 | 1.023 | 0.167 | 0 | 0 | 11.523 | 0.62% |
| LOCAL 3 | 0 | 0 | 0 | 0 | 0 | 0.059 | 0.1 | 0.257 | 0.652 | 0.981 | 1.147 | 1.601 | 0.756 | 0.655 | 6.208 | 0.34% |
| V | 0 | 0 | 0 | 0 | 0 | 0.608 | 15.62 | 42.09 | 65.167 | 55.741 | 30.273 | 9.778 | 2.751 | 0 | 222.03 | 12.04% |
| LOCAL 2 | 0 | 0 | 0 | 0 | 0.059 | 0.512 | 1.132 | 2.752 | 5.28 | 5.695 | 3.947 | 6.334 | 0.277 | 0 | 25.988 | 1.41% |
| IV | 0 | 0 | 0 | 0.012 | 1.944 | 11.94 | 50.774 | 41.181 | 39.515 | 7.456 | 0.48 | 0 | 0 | 0 | 153.3 | 8.31% |
| LOCAL 1 | 0 | 0.005 | 0.057 | 1.162 | 2.219 | 3.387 | 2.903 | 4.435 | 1.672 | 0.664 | 0.333 | 0.141 | 0.007 | 0 | 16.985 | 0.92% |
| IV + LOCAL 1 | 0 | 0 | 0 | 0 | 0.149 | 16.2 | 32.045 | 25.738 | 15.302 | 2.795 | 0.257 | 0 | 0 | 0 | 92.484 | 5.02% |
| III TOP | 0 | 0 | 0 | 1.947 | 3.528 | 14.35 | 23.159 | 16.481 | 2.292 | 0.007 | 0 | 0 | 0 | 0 | 61.76 | 3.35% |
| III BOT | 0 | 0 | 0.152 | 0.48 | 1.67 | 5.271 | 5.645 | 3.113 | 0.356 | 0.166 | 0 | 0 | 0 | 0 | 16.853 | 0.91% |
| III COMB | 0 | 0 | 0 | 1.439 | 19.947 | 50.05 | 60.947 | 35.869 | 4.478 | 1.976 | 0 | 0 | 0 | 0 | 174.7 | 9.47% |
| II TOP | 0 | 0 | 0 | 0 | 0 | 108.7 | 232.6 | 148.35 | 22.603 | 0 | 0 | 0 | 0 | 0 | 512.24 | 27.78% |
| II BOT | 0 | 0 | 0 | 0 | 0 | 3.281 | 8.991 | 7 | 5.076 | 2.824 | 0 | 0 | 0 | 0 | 27.172 | 1.47% |
| II COMB | 0 | 0 | 0 | 0.205 | 13.742 | 36.72 | 38.01 | 117.97 | 24.708 | 0 | 0 | 0 | 0 | 0 | 231.36 | 12.55% |
| ALL SEAMS | 0.082 | 0.232 | 1.258 | 12.03 | 61.491 | 274.3 | 503.85 | 484.11 | 237.13 | 130.36 | 79.879 | 42.972 | 15.07 | 1.176 | 1843.989 | 100% |
| GRADE-WISE PERCENTAGE | 0.00% | 0.01% | 0.07% | 0.65% | 3.33% | 14.88% | 27.32% | 26.25% | 12.86% | 7.07% | 4.33% | 2.33% | 0.82% | 0.06% | 100% | |

Figure 2: Seam-wise, Grade-wise Net Proved Geological Resources of Bhubaneswari, Arkhapal A & Sakhigopal A blocks, Talcher Coalfield

OVERBURDEN

The overburden consists of soil, weathered mantle and argillaceous as well as arenaceous rocks. The parting between two seams consists of argillaceous and arenaceous rocks with thin coal /carbonaceous bands. Broadly, the overburden and parting above seam II BOT has been divided into 5 categories as follows:

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- i) Soil, weathered mantle and overburden above all the seams which incrop within the block.
- ii) Parting between respective seam and next lower seam from XV to II BOT/II COMB in descending order.
- iii) Volume of dirt bands of above 1 meter thickness occurring within coal seams has been added to the overburden /parting lying above.
- iv) Volume of unworkable coal seams having thickness less than 1 meter.
- v) Volume of ungraded coal ($GCV \leq 2200$ K.cal /kg).

Overburden/waste for integrated block have been estimated to assess the stripping ratio and to take as an input for project planning. Following methodology has been adopted for estimation of overburden above all the seams and parting for respective coal seams upto seam II BOT/II COMB in descending order (Figure 3).

| SEAM | TOTAL RESERVES (MT) | Volume of OIL PARTING & In seam band > 1m (MCUM) | Volume of SEAM < 1M (MCUM) | Volume of Ungraded Coal (MCUM) | Total volume of Waste (MCUM) | Seam-wise stripping Ratio (CUM/T) | Successive Cumulative Reserve (MT) | Volume Of Successive Cumulative Waste (MCUM) | Successive cumulative Stripping Ratio (CUM/T) |
|--------------|---------------------|--|----------------------------|--------------------------------|------------------------------|-----------------------------------|------------------------------------|--|---|
| XV | 2,773 | 17,08,264.2 | 0 | 0 | 17,08,264.2 | 6.2 | 2,773 | 17,08,264.2 | 6.2 |
| XIV | 3,340 | 41,14,215.2 | 0 | 0 | 41,14,215.2 | 12.7 | 6,113 | 58,22,479.4 | 9.7 |
| XIII TOP | 3,985 | 47,82,72 | 0 | 0 | 47,82,72 | 8 | 10,097 | 1,06,05,194 | 8.9 |
| XIII BOT | 4,581 | 9,38,112.7 | 0 | 0 | 9,38,112.7 | 2.1 | 14,678 | 1,15,43,307.1 | 7 |
| XII TOP | 1,027 | 234,338.7 | 0 | 0 | 234,338.734 | 238.2 | 15,705 | 1,48,74,326 | 16.9 |
| XII BOT | 8,871 | 19,67,132 | 0 | 0 | 19,67,132 | 2.9 | 24,576 | 1,68,41,457 | 16.1 |
| XI TOP | 3,98 | 63,34,328 | 0 | 0 | 63,34,328 | 17.2 | 28,136 | 1,82,78,784 | 16.4 |
| XI BOT | 18,981 | 82,79,882 | 0 | 0 | 18,79,882 | 1.3 | 47,117 | 1,91,52,627 | 16.3 |
| X | 12,428 | 12,78,33 | 0 | 0 | 12,78,33 | 6.4 | 60,545 | 1,18,71,957 | 9.2 |
| IX | 18,264 | 181,441 | 0 | 0 | 181,441 | 17.7 | 78,819 | 1,36,82,631 | 16.5 |
| VIII TOP | 18,288 | 72,004,948 | 0 | 0 | 72,004,948 | 7 | 97,105 | 1,72,23,679 | 16.1 |
| VIII BOT | 5,284 | 17,67,914 | 0 | 0 | 17,67,914 | 3.4 | 102,809 | 1,78,91,593 | 9.5 |
| VII | 72,969 | 123,38,881 | 0 | 0 | 123,38,889 | 1.7 | 175,778 | 1,91,19,941 | 9.9 |
| VIS TOP | 48,883 | 198,43,79 | 0 | 0 | 198,43,79 | 3.7 | 224,661 | 1,96,53,976 | 9.4 |
| VI BOT | 63,964 | 37,21,199 | 0 | 0 | 37,26,857 | 6.8 | 288,625 | 1,99,90,742 | 4.2 |
| VA TOP | 8,645 | 79,98,842 | 3,57,182 | 0 | 83,49,025 | 9.7 | 297,370 | 1,183,43,477 | 4.6 |
| VA BOT | 23,314 | 17,44,295 | 0 | 0 | 17,43,816 | 8.7 | 321,184 | 1,20,08,138 | 4.1 |
| VA | 11,523 | 4,14,823 | 0 | 0 | 4,14,824 | 8.4 | 332,707 | 1,24,23,020 | 4 |
| LOCAL 3 | 6,385 | 81,38,538 | 0 | 0 | 81,38,538 | 10.7 | 343,118 | 1,27,1,47 | 4.1 |
| V | 223,828 | 29,56,832 | 0 | 0 | 29,56,832 | 8.1 | 372,945 | 1,30,1,829 | 2.5 |
| LOCAL 2 | 28,888 | 81,28,148 | 0 | 0 | 81,28,148 | 3.4 | 404,133 | 1,36,73,785 | 3.6 |
| IV | 163,298 | 58,44,638 | 0 | 0 | 58,48,153 | 8.4 | 462,631 | 1,47,91,721 | 2 |
| LOCAL 1 | 18,969 | 80,15,152 | 3,13,863 | 0 | 83,29,015 | 3.7 | 475,940 | 1,48,2,498 | 2 |
| IV + LOCAL 1 | 92,884 | 24,19,912 | 0 | 0 | 24,19,912 | 8.3 | 518,854 | 1,50,62,986 | 1.8 |
| III TOP | 81,78 | 38,47,712 | 0 | 0 | 38,47,712 | 6.4 | 580,636 | 1,52,1,09,27 | 1.7 |
| III BOT | 18,883 | 14,79,708 | 0 | 0 | 14,84,536 | 6.9 | 605,519 | 1,54,5,481.3 | 1.7 |
| III COMB | 174,704 | 87,15,212 | 0 | 0 | 88,16,021.2 | 8.3 | 693,216 | 1,63,1,95.34 | 1.5 |
| II TOP | 812,240 | 44,83,852 | 0 | 0 | 44,83,852 | 8.1 | 778,459 | 1,68,5,44.23 | 1 |
| II BOT | 27,172 | 39,43,572 | 0 | 0 | 39,46,837 | 1.3 | 815,631 | 1,67,03,81 | 1 |
| II COMB | 231,398 | 38,89,432 | 0 | 0 | 38,89,432 | 8.1 | 854,589 | 1,71,8,97.94 | 0.9 |
| TOTAL | 1848,988 | 1,79,3,824 | 7,42,248 | 8,11,304 | 1,713,891.6 | | | | |

Figure 3: Detail of Total Waste Upto Seam II COMB, for Bhubaneswari, Arkhapal A & Sakhigopal A blocks, Talcher Coalfield

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| | Particulars | Details |
|--------|--|---|
| 2.2.3 | Geological Block Area "Ha" | 1674.71 Ha (Integrated block) |
| 2.2.4 | Status of Exploration of the block | GR of Integrated Bhubaneswari, Arkhapal-A and Sakhigopal-A block was submitted in December 2016. |
| 2.2.5 | Area covered by 'detailed' exploration within the block (sq.km) | Approx. Area = 17 sq.km. |
| 2.2.6 | Whether entire lease area has been covered by 'detailed' exploration | Yes |
| 2.2.7 | No. of boreholes drilled within the block | Total boreholes drilled: 324 nos. Drill Meterage: 68224.10 m |
| 2.2.8 | Whether any further exploration/study is required or suggested and time frame in which it is to be completed | No |
| 2.2.9 | Year wise future programme of exploration | NA |
| 2.2.10 | Overall borehole density within the block (no./sq.km) | Integrated block – 22 (approx.) |
| 2.2.11 | No of seams available as per GR (Geological Report) | 31 |
| 2.2.12 | Seams not considered for Mining with Reasons | Reserves have been estimated for all twenty-nine coal seams/splits. |
| 2.2.13 | Dip of the seam | <ul style="list-style-type: none"> The strata dips southerly at 2°– 7° Gradient: (1 in 8 to 1 in 30) North of F1-F1, it dips towards north, and In the south, it dips towards south. |
| | | |

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| | | |
|--------|--|---|
| 2.2.15 | Methodology of reserves estimation (also mention if any software package has been used). | <p>Basic Assumptions & Norms Followed :</p> <ol style="list-style-type: none"> 1) In seam dirt bands of 1m and above thickness have been excluded from the thickness of the coal seams and considered as Intra-seam burden for which separate Iso-dirt bands have been drawn in respective seam Folio plans for estimating volume of in seam overburden. 2) Coal seam having minimum 1m thickness & consistent development has been considered for reserves estimation. 3) Seams/sections having less than (<) 1m thickness have been accounted for OB above the corresponding seam. 4) Normally, two coal seams or splits are considered separate if the intervening parting is 1m and more. However, depending upon regional continuity of the intervening parting the splits having even < 1m. Parting (at places) has also been considered as separate seams. 5) Reserves have been estimated on I100 basis for full thickness as well as for incrop zones separately. 6) All the reserves of coal seams from II BOT to seam XV (in ascending order) have been placed under 'proved category'. 7) Specific gravity for each grade has been calculated by using the following formula. $\text{Sp. Gr.} = 1.29 + 0.01 \times \text{Ash}$ 8) Useful heat value (UHV) has been calculated by the following formulae. $\text{UHV} = 8900 - 138 (\text{Ash} + \text{Moisture})$ 9) Coal seam with UHV 1300 K.cal./Kg or less has been placed under upgraded category. |
|--------|--|---|

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| | | | |
|--------|---|---|---------------|
| 2.2.16 | Average GCV of the total block | F (in UHV) – contributes 46% of total coal grade (Tentative weighted average GCV: G11) | |
| 2.2.17 | Gross Geological Reserve of the block “Mte” | Total Block | 2048.87 |
| | | Projectised Area | 465.73 |
| 2.2.18 | Net Geological Reserve of the block “Mte” | Total Block | 1843.98 |
| | | Projectised Area | 419.15 |
| 2.2.20 | Mineable Reserve of the block “Mte” (Projectised Area) | | 396.52 |
| 2.2.21 | Corresponding extractable reserve of the block “Mte” (Projectised Area) | | 396.52 |
| 2.2.22 | Percentage of Extraction(Projectised Area) | | 85.14 |
| 2.2.23 | Reserve already depleted (Base date of Mining Plan) (Projectised Area) | | 272.06 |
| 2.2.24 | Balance Reserve (as on Base Date) (Projectised Area) | | 124.46 |

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Chapter – 3

MINING

| | <i>Particulars</i> | <i>Details</i> |
|------------|---|--|
| 3.1 | MINING METHOD | |
| 3.1.1 | Existing method of mining if the mine is under operation | Opencast (OC) mining (shovel-dumper mining for overburden (OB)/parting, surface miner, FEL and truck/ dumper for coal extraction), all the mining operations are being done through outsourcing. |
| 3.1.2 | Proposed method of mining with justification on suitability of method of mining | <p>The same method will be continued.</p> <p>The proposed mining block represents the presence of moderately flat multiple coal seams with intermediate varying parting. Thick seams occur at shallow depth in more expansive areas having power-grade coal reserves. So this will make the project most viable by adopting the opencast mining method.</p> <p>OB REMOVAL: The shovel-dumper mining method is adopted for overburden removal. This is very flexible and offers convenient mining operations to deal with sudden occurrences of unworkable or poor quality patches and changes of floor position due to repeated faulting and varying seam gradient and thickness. It also offers flexibility for an easy transition to any other technology or equipment configuration.</p> <p>COAL EXTRACTION: Coal seams are mostly thick with varying intermediate bands. Surface miners and front-end loader and dumper will be mostly used to extract coal from major seams. Surface miners will work in the windrowing method as per current practice.</p> <p>Thin horizons of both coal and partings are proposed to be ripped, dozed, and loaded by Front-End-Loaders onto trucks/dumpers.</p> |

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| | | | | | | | | |
|--------|---|--|--------------------------|---------------|--------------|---------------|--------------|---------------|
| 3.1.3 | Coal production capacity proposed "Mtpa" | 30 | | | | | | |
| 3.1.4 | Justification for optimization Coal production capacity | Considering available strike length, the thickness of seams and dumping requirement capacity of 30 Mty is justified. | | | | | | |
| 3.1.5 | Calendar year from which the production will start | Running Mine | | | | | | |
| 3.1.6 | Year of Achieving rated production | Year-1 (Working mine) | | | | | | |
| 3.1.7 | Coal production plan "MT" | OC (opencast mining) - Proposed ; UG (Underground mining) – Not proposed. | | | | | | |
| | Year | | Coal Production Schedule | | | OB "Mcum" | RH "Mcum" | SR "cum/t" |
| | Year of Operation | Calendar Year | UG | OC | Total | | | |
| | Yr-1 | 2022-23 | - | 30.00 | 30.00 | 32.00 | 23.00 | 1.83 |
| | Yr-2 | 2023-24 | - | 30.00 | 60.00 | 32.00 | 24.00 | 1.87 |
| | Yr-3 | 2024-25 | - | 30.00 | 90.00 | 32.00 | 7.99 | 1.33 |
| | Yr-4 | 2025-26 | - | 28.00 | 118.00 | 30.00 | 0.00 | 1.07 |
| | Yr-5 | 2026-27 | - | 6.46 | 124.46 | 5.43 | 0.00 | 0.84 |
| | TOTAL | | | 124.46 | | 131.43 | 54.99 | 1.50 |
| 3.1.8 | Peak/Rated Capacity | 30 | | | | | | |
| | - By OC | 30 | | | | | | |
| | - By UG | NA | | | | | | |
| | - Overall | 30 | | | | | | |
| 3.1.9 | Life of the mine: | 5 (as of 01.04.2022*) | | | | | | |
| | - By OC | 5 | | | | | | |
| | - By UG | NA | | | | | | |
| | - Overall | 5 | | | | | | |
| 3.1.10 | Whether the proposed external OB dumpsite is coal/lignite bearing: If so, whether coal/lignite below the waste disposal area is extractable | 100% Internal dumping only. No External dumping is proposed. | | | | | | |
| 3.1.11 | Whether negative proving for coal/lignite in the proposed site for OB dump/ infrastructure has been done | NA No External dumping. | | | | | | |

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| | | |
|--------|--|---|
| 3.1.12 | Results of any investigation carried out for scientific mining, conservation of minerals and protection of environment; future proposals | No |
| 3.1.13 | Type of Equipment/ HEMM proposed | Mining is continuing with total Outsourcing variant, the variant approved for the PR. |

3.2 CHOICE OF TECHNOLOGY

The proposed mining block represents the presence of multiple coal seams with intermediate varying partings. Seams occur in wide areas having power-grade coal reserves. So this will make the project most viable by adopting the opencast mining method.

The geological exploration has established 13 coal seams of Barakar formation for opencast quarrying, including 3 local seams, occurring as 22 distinct splits, viz. Seam II Bot, II Top, II Comb, III Bot, III Top, III Comb, L1, IV, IVL1, L2, V, L3, VIAB, VIAT, VIBB, VIBT, VII, VIII Top, VIII Bot, IX, X, XI Bot and XI Top occurring in ascending order. The block is traversed by altogether 25 faults. Fault F1-F1 traverses midway through the block dividing the block into two sectors, with throw varying from 8-120m.

3.3 MINE BOUNDARIES

The total area of this integrated coal block of Bhubaneswari, Sakhigopal-A & Arkhahal-A is 14.55 sq. km. As per the earlier approved mining plan, mine excavation was limited to the Bhubaneswari coal block & some part of the Subhadra east coal block. Now MCL has advised viding e-office note E543918 to expand the mine boundary further north in Arkhahal-A coal block in the area where external dumping has been done. As per the earlier approved mining plan, this proposed expansion area was marked for external dumping, and the same was done in the initial days of operation. This northern area is a downthrown area where coal is marginally deep-seated due to the occurrence of a fault. MCL has advised extending the mine excavation boundary towards the north and extracting coal below this external dump after rehandling the same. This external dump is within the mine lease area. Mine Lease Area has been taken from the "EC Plan of Bhubaneswari OCP" supplied by the concerned Project office on 01.11.2021.

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Revised mine excavation boundaries have been fixed as described below:

Based on the criteria explained above, mine boundaries adopted are summarised below (ref. plate MIN-I).

- | | | |
|--------------|---|---|
| <i>North</i> | : | Fault F1 – F1 and over the part where Arkhapal-A block is being taken, the surface boundary is fixed after leaving a surface barrier of 60 m against Bangaru jhor and leaving a safety zone of 7.5m against North of Arkhapal-Srirampur, a non-CIL block. |
| <i>East</i> | : | The boundary is aligned from the borehole no. CTAR-177 and CMTL-042. |
| <i>South</i> | : | The floor boundary is the Northern boundary of Lingaraj block and part of the northern boundary of Ananta Extn. Block. The surface boundary is projected correspondingly. |
| <i>West</i> | : | About 300m west of geological block boundary, near borehole METAX-43 (same as in approved PR, 20 Mty. |

3.4 RESERVES AND STRIPPING RATIO

It is estimated that **124.46** Mt of mineable coal would be available for extraction as on 01.04.2022.

Correspondingly, the overburden to be removed is estimated as 131.43 Mcum. Additionally, a total volume of 36.99 Mcum of overburden lying as an External dump over Arkhapal-A Block and 18.00 Mcum of backfill dump is to be rehandled for the quarry extension back to the proposed internal dump of the Extension quarry. Thus the total overburden to be removed and rehandled amounts to 186.42 Mcum. The overall stripping ratio works out to 1.50 cum/t.

Also, 109.55 Mcum of internal dump (as on 01.04.2022) is lying on the worked-out portion of Bhubaneswari expansion quarry.

The total mineable coal within the mine boundaries explained in section 3.4 is estimated as 124.46 Mt with corresponding total overburden of 186.42 Mcum. The stripping ratio of the proposed mine will be 1.50 cum/t as on 01.04.2022.

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It may be mentioned here that mineable reserve is arrived at after a 10% deduction from the Gross Geological reserves (to arrive at the Net Geological reserve) and after considering suitable deduction for mining losses. So, actual reserve realization during mining may vary compared to the estimated mineable reserves due to geological uncertainty and mining methods. Losses due to mining and geological uncertainty may be reviewed during actual mining operations if the mine is operated through outsourcing means.

Table - 3.1
The break-up of total Overburden handling

| Sl. | Overburden (OB) Details | Measured vol. (Mcum) |
|---|---|----------------------|
| 1. | Insitu-OB for the proposed mine life | 131.43 |
| 2. | Rehandling of External OB (existing at the northern patch of Arkhapal-A Block)* <i>*Quantity of overburden dump as measured by Project Authority</i> | 36.99 |
| 3. | Rehandling of Internal backfilled OB (Northern Quarry part adjacent to the existing external dump for quarry expansion) | 18.00 |
| Total overburden volume to be handled (<i>Million cubic metres-Mcum</i>) | | 186.42 |

3.4.1 SPECIFIC GRAVITY

As already mentioned, grade-wise specific gravities are adopted to calculate coal quantity and are detailed in table 3.2.

Table - 3.2
Grade wise specific gravity of coal

| <i>Grade of coal</i> | <i>Specific Gravity</i> |
|----------------------|-------------------------|
| G1 | 1.33 |
| G2 | 1.41 |
| G3 | 1.43 |
| G4 | 1.47 |
| G5 | 1.50 |
| G6 | 1.53 |
| G7 | 1.57 |
| G8 | 1.60 |
| G9 | 1.62 |
| G10 | 1.66 |
| G11 | 1.70 |
| G12 | 1.72 |
| G13 | 1.75 |
| G14 | 1.78 |
| G15 | 1.82 |
| G16 | 1.86 |
| G17 | 1.88 |

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- i) Net Geological Reserve as given in Chapter-2 has been arrived after providing 10 % loss on Gross Reserve to account for geological uncertainties.
- ii) Due to multiple seams of different thicknesses and in-seam bands of more than 1 m thickness, **Mining Loss** has been estimated for each seam separately to arrive at **Mineable Coal Reserve**.

3.4.2 MINING LOSSES

Seam-wise mining losses are calculated based on the average thickness of the coal seam and presence of thick bands (>1m). A deduction has been made from net geological coal to calculate mineable coal based on these assessed losses. Details of seam-wise mining losses adopted are given in table 3.3.

Table - 3.3
Seam-wise mining losses

| Seam | Mining Loss (%) |
|---------------|-----------------|
| Seam IIBOT | 14 |
| Seam IITOP | 2 |
| Seam II Comb | 2 |
| Seam IIIBOT | 3 |
| Seam IIITOP | 3 |
| Seam III Comb | 3 |
| Seam L 1 | 29 |
| Seam IV | 4.5 |
| Seam IVL1 | 4.5 |
| Seam L 2 | 29 |
| Seam V | 4 |
| Seam L 3 | 29 |
| Seam VIABOT | 6.5 |
| Seam VIATOP | 6.5 |
| Seam VIBBOT | 6.5 |
| Seam VIBTOP | 6.5 |
| Seam VII | 6.5 |
| Seam VIIIBOT | 15 |
| Seam VIIITOP | 15 |
| Seam IX | 10 |
| Seam X | 16 |
| Seam XIBOT | 12 |
| Seam XITOP | 12 |
| Seam XIIBOT | 12 |
| Seam XIITOP | 12 |

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3.5 ANNUAL TARGET AND LIFE

An annual target of 30 Mt is proposed. At the targeted capacity, the balance mine life would be 5 years for the revised excavation area.

3.6 GEO-MINING CHARACTERISTICS

The block is about 6.3 km along strike (East-West) and 2.4 km along with the dip (South-North). The remaining two blocks, Ananta Extn. Block and Subhadra East block already form a part of approved Bhubaneswari OC Project, 20 Mty. Further, on the eastern part, the southern batter of the quarry falls in Lingaraj block. Geo-mining characteristics of the proposed quarry are given in table 3.4.

Table - 3.4
Geo-mining Characteristics (Including mined out area)

| Sl. | Particulars | Unit | As per Expn. Project (30 Mty) |
|------|------------------------------------|-------------------|----------------------------------|
| 1. | Area | | |
| i) | Along floor (Total) | ha | 425.925 |
| ii) | Along surface(Total) | ha | 614.722 |
| 2. | Mineable Reserve* | Mt | 124.46 |
| 3. | Overburden* | Mcum | 186.42 |
| 4. | Stripping ratio* | m ³ /t | 1.50 |
| 5. | Annual production | Mt | 30 |
| 6. | Life of quarry* | year | 5 |
| 7(a) | Strike length along floor | | |
| i) | Minimum | m | 189.86 |
| ii) | Maximum | m | 2100 |
| 7(b) | Strike length along surface | | |
| i) | Minimum | | 550.54 |
| ii) | Maximum | | 2400 |
| 8. | Depth of quarry | | |
| i) | Minimum | m | 97.99 |
| ii) | Maximum | m | 217.50 |
| 9. | Avg. seam thickness | m | 95.30 |
| 10. | Gradient | - | 2° – 7° |
| 11. | Quarry perimeter Total | m | 11858.70 |

*balance life as on 01.04.2022

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GEOLOGICAL DISTURBANCES

The block is traversed by altogether 25 faults, viz. F1-F1 to F25-F25, of which seven nos. throw northerly, and the rest throw southerly. They are trending east-west and northwest-southeast. One major east-west trending fault, F1-F1, almost cuts across the block in the central section, dipping towards the north and has a varying throw of around 150 m to 10 m. This fault divides the block into two sectors, i.e., north of F1-F1 and south of F1-F1. One other major fault, F24-F24 is on the southern boundary with throw varying from 180m to almost nil within a short distance. While seven nos. of faults throw northerly with slight variations, rest 18 throw southerly with minor variations. Except faults F1-F1, F10-F10 & F24-F24, rest of the faults have low to the medium magnitude of throw.

3.7 OPENING OF DEPOSIT AND SEQUENCE OF WORKING

The top-soil is proposed to be removed and stacked either in temporary storage areas or directly transported to a backfilled area and leveled for reclamation. Coal is proposed to be excavated by deploying a surface miner and a combination of Front End Loader (FEL) and rear dumpers.

In the original approved PR, an access trench for the main quarry had been proposed from the southwestern end of the quarry. The main haul road is proposed to be advanced straight along the (approx.) dip direction of the quarry, generally parallel to the southern floor boundary of the final quarry.

In the previous MP&MCP of Bhubaneswari OCP, Revision-1, the quarry extension is proposed over the northern patch in the Arkhapal-A block. A new access trench was proposed in the south of CMTL-168 from the surface RL of 87.0 m through the western and northern batter touching the floor at – 60 mRL. For Revision-2, the working quarry has to be extended over the easatern part to take the forest area and the left-out area due to forest, the new extension area is aligned by the borehole no. CTAR-177 and CMTL-042.

For coal deposits in the block under consideration, surface miner-pay loader-dump truck mining is being proposed. In the earlier approved report, a shovel dumper mining system was proposed to remove OB above the seams. The same is to continue.

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Operation of the surface miner is found to be successful and environment friendly as it does not require drilling, blasting, and crushing of coal. It is proposed that surface miners will do the total coal production of 30 Mty. The total extraction of coal will be done through an outsourcing agency as per existing practice.

Top overburden above various seams will be continued to be removed by shovel dumper method through existing outsourcing agency.

3.8 MINING SYSTEM

Benchs will be aligned along the general strike. The bench floor should follow its own seam floor/roof or that of an adjacent seam. Main bench parameters for the above-mentioned types of equipment are:

Working Coal bench width will be kept at a minimum width of 50 m for surface miner operations.

Working angle : 70° with horizontal for individual working bench.

Again, bench dimensions may vary with different equipment deployed.

3.9 HEMM CONFIGURATION

The approved variants for working the proposed mine is,

- ***Coal production and overburden removal by outsourcing means, by the approved variant.***

3.10 DUMPING AND EMBANKMENT

The initial overburden has been dumped externally during earlier mining operations as per the approved Project report towards the north of the mine boundary. This external dump area is the coal-bearing area of Arkhapal-A block, where the coal is deep-seated due to a downthrown fault, and the remaining overburden has been dumped internally. At present, the working mine has many patches of the void that are being filled up by overburden removed from existing benches.

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Keeping in view the Bangaru Jhor Nala flowing eastwardly adjacent to Arkhapal-A block on its north, provision of an embankment to protect the mine from water ingress has been made. The embankment has been made 3 meters above the Highest Flood Level (HFL) of the adjacent water body, i.e., the Nala. The HFL, as indicated in the Working Plan of the quarry dated 01.10.2021, is 84.65 MRL (Base year given – August 1974). The embankment has been proposed with slopes of 1:3 on the Nala side and 1:2 on the quarry side. The top of the embankment is proposed to have 5-meter wide road. This embankment is proposed with the overburden removed from the quarry, consuming a total volume of 0.36 Million cubic meters (Mcum). The construction of embankment must be completed by year-1. It is also recommended that regular monitoring of the embankment should be carried out. While preparing the embankment, due safety statutory compliances shall be adhered to.

In the present working quarry, the overburden removed from the first year will be dumped internally over the existing quarry and void created by the mine advancement. The total volume of in-situ overburden removed corresponding to the total production of 124.46 Mt is 131.43 Mcum. Again the External and Internal Dumps lying over the quarry area is 36.99 Mcum (to be rehandled back to the proposed internal dump of the Expansion quarry) and 109.55 Mcum respectively. In addition to the external dump rehandling, a measured volume of 18.00 Mcum of the northern backfilled part adjacent to the external dump is to be rehandled for the quarry extension over the northern patch of the Arkhapal-A block.

The calendar program of dumping/backfilling is given in Table-3.5. The table shows the break-up of the in situ volume of overburden (131.43 Mcum) along with the rehandled volume of External dump (36.99 Mcum) and the internal backfilled portion (18.00 Mcum). In the initial years of working, around 33.0 Mcum of overburden will have to be accommodated within the existing void of quarry or Ananta Expn OCP. This dumping may be accommodated inside the internal dump of existing quarry, depending upon the evacuation of Hensmul Village and Sahara sahi basti. This amount may vary as per actual void availability in Bhubaneswari OCP. It is assessed that the total accommodation capacity of the final stage is 265.97 Mcum, including 109.55 Mcum of the existing backfill. Accordingly, the calendar program of dumping proposes the distribution of overburden removed to over Bhubaneswari OCP (Internal Dump 1) and Bhubaneswari OCP*/Ananta Expn. OCP (Internal Dump 2).

Therefore, strategically the extra load of External OB Dump of 36.99 Mcum over Arkhapal-A block is to be shared by the backfilling space of Ananta Expansion OCP or inside

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the Bhubaneswari OCP Expn quarry (depending upon the void availability), over which 33.00 Mcum will have to be moved in the initial years to avoid the shortage of internal dumping space area mostly during year 1 and year 2. The Remainder rehandled volume of 3.99 Mcum of External dump and 18.00 Mcum of Internal dump is to be fully accommodated in Bhubaneswari OCP's void itself.

Mine stage, including dumps during Year 1, Year 3, and Final stage dump plan of operation are shown in **Plate Nos. MIN-III, MIN-IV, and MIN-V** respectively. Final stage excavation Plan is shown in **Plate No. MIN-I**.

Table-3.5
Calendar Programme of Backfilling

| <i>Year of Operation</i> | <i>Programmed total coal (Yearly)</i> | <i>Programmed total OB (Yearly)</i> | <i>OB to Internal Dump 1 (Yearly)</i> | <i>OB to Internal Dump 2 (Yearly)</i> |
|--------------------------|---------------------------------------|-------------------------------------|---------------------------------------|---------------------------------------|
| Year 1 | 30.00 | 55.00 | 37.00 | 18.00 |
| Year 2 | 30.00 | 56.00 | 41.00 | 15.00 |
| Year 3 | 30.00 | 39.99 | 39.99 | 0.00 |
| Year 4 | 28.00 | 30.00 | 30.00 | 0.00 |
| Year 5 | 6.46 | 5.43 | 5.43 | 0.00 |
| Total : | 124.46 | 186.42 | 153.42 | 33.00 |

3.11 DRILLING AND BLASTING

Overburden and parting are to be drilled and blasted before excavation. Coal is to be mined using blast free method. Drilling and blasting parameters are to be arrived after conducting a series of trial blasts. However, the following blasting pattern is tentatively suggested based on the assumed powder factors of 0.35 kg/cum for OB and is given in Table-3.6.

Table – 3.6
Blasting pattern

| Description | Bench height | Blasting pattern |
|--------------------|---------------------|-------------------------|
| Overburden | 10-15m | 9m x 7.5m |

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3.12 CALENDAR PROGRAMME OF EXCAVATION

It is already a working mine, and the proposed quarry extension is over the eastern side of the Bhubaneswari Block. To continue with the production of 30 Mty, the evacuation of villages and the forest clearance of 20.383 Ha are to be done at the earliest possible.

The yearly schedule of overburden removal and coal extraction is based on sector-wise quantities of coal and overburden. Year-wise schedules of coal production and overburden removal and stripping ratio are given in Table nos. 3.7 and 3.8. Mine capacity is 30.0 Mty. It is envisaged that the production of 30 Mty can be achieved under present geo-mining conditions.

Table – 3.7
Production Programme

| YEAR | Coal(Mt) | OB (Mcum) | SR(cum/t) |
|------------------|---------------|---------------|-------------|
| Year 1 (2022-23) | 30.00 | 55.00 | 1.83 |
| Year 2 (2023-24) | 30.00 | 56.00 | 1.87 |
| Year 3 (2024-25) | 30.00 | 39.99 | 1.33 |
| Year 4 (2025-26) | 28.00 | 30.00 | 1.07 |
| Year 5 (2026-27) | 6.46 | 5.43 | 0.84 |
| TOTAL | 124.46 | 186.42 | 1.50 |

Table – 3.8
Production Program

| Year | Coal(Mt) | Insitu OB (Mcum) | Rehandling (Mcum) | TOTAL OB (Mcum) | SR (cum/t) |
|------------------|---------------|------------------|-------------------|-----------------|-------------|
| Year 1 (2022-23) | 30.00 | 32.00 | 23.00 | 55.00 | 1.83 |
| Year 2 (2023-24) | 30.00 | 32.00 | 24.00 | 56.00 | 1.87 |
| Year 3 (2024-25) | 30.00 | 32.00 | 7.99 | 39.99 | 1.33 |
| Year 4 (2025-26) | 28.00 | 30.00 | 0.00 | 30.00 | 1.07 |
| Year 5 (2026-27) | 6.46 | 5.43 | 0.00 | 5.43 | 0.84 |
| TOTAL : | 124.46 | 131.43 | 54.99 | 186.42 | 1.50 |

The above calendar programme is subject to timely possession of land, forestry clearance/ EMP clearance/ R & R etc.

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Chapter - 4

SAFETY MANAGEMENT

4.1 SAFETY MANAGEMENT

The opencast mining operation, in general, is associated with several hazards/risks. Some of the various anticipated sources of danger are enumerated as under:

- Slope failure.
- Dangers due to handling and use of explosives and accidents due to fly-rocks and air-blasts following a faulty heavy blast.
- Hazards associated with use of electricity.
- Accidents due to unruly operation of HEMM.
- Dust hazards.
- Fire hazards due to spontaneous heating of coal in stockpiles and exposed benches.
- Fire hazards in stores & workshops where inflammable & highly inflammable materials are stored or used.
- Danger of inundation from surface and groundwater.

Adequate provisions have been made for safe working of the mine in form of design of operational systems, provision of safety measures for safe use of explosives, electricity and HEMM etc. Sufficient financial provisions have been made under different heads for the procurement of necessary safety equipment.

Adequate skilled and trained manpower has also been provided for compliance with safety provisions. Regular training/refresher courses, "on job" training shall be conducted & mock rehearsals shall be made to make the workforce conversant with various rules, regulations, methods of prevention & combat with hazards.

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4.1.1 INUNDATION

Major threat of Inundation is from Bangaru jhor, which flows along the northern boundary of the block. Due care should be taken during mining to prevent water ingress operations from the higher ground local rivers/reservoir. Embankment with a height of three meter above the HFL has been proposed against Bangaru jhor. Provisions of coal Mine Regulations shall be followed. There are three sources of water in the mine:

i) Surface run-off from the surrounding area and nallah flowing over the property:

Seasonal nallah flowing through the mine should be observed property, as also their catchment area. Due to mining operations, the existing drainage pattern will be disrupted. Hence, it is suggested in the PR for re-coursing of surface run-off from the catchment area of the nallah through suitable watercourse directed towards the Bangaru nallah flowing ultimately to Brahmhane river.

**ii) Direct Precipitation
Rain Water**

- a) Garland drains along the periphery of the excavated area of the mine shall be provided to stop rainwater from the surface entering into the mine. Garland drains shall be kept clean without any obstruction and shall be inspected regularly during the monsoon.
- b) All rainwater in the catchment area of the opencast mine shall be channelized to gravitate into the main sump constructed in the dip most of the mine. An adequate pumping arrangement shall be kept to pump out water from the sump to the surface.

iii) Seepage from Strata: There is no danger of inundation due to the make of water in the mine while mining coal. The water will gravitate into the sump and will be pumped out.

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4.1.2 DUST SUPPRESSION

Inventory of Dust Generation Sources

The likely dust generation sources due to various mining operations in the project are envisaged as under:

- Drilling, blasting, excavation, and transportation of overburden material ;
- Drilling, blasting, excavation, crushing, and transportation of run-of-mine (ROM) coal;
- Construction and demolition activities like land clearing, material/debris storage and handling, etc.;
- Loading of coal at stockpile, reclaiming from pile and movement of vehicle and loading equipment;
- Wind erosion;
- Movement of vehicles on haul roads (black topped and non-black topped) for transportation of coal and overburden.

Dust Pollution Control Measures

Systematic and regular air quality monitoring is necessary to examine the status of compliance with the statutory standards and make an accurate assessment of ambient air quality.

The following measures are suggested in the PR to contain the pollution arising out of dust emission within limits:

- All the drills are provided with well-designed dust extraction/suppression system;
- Blasting operations are designed in such a way so that these produce minimum dust;

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- Effective use of sprinklers and dust suppression units during loading, transportation, and handling of ROM/processed coal and overburden;
- Dust extraction/suppression system is proposed in coal handling plant;
- Provision of greenbelt around quarry, industrial and residential areas, and avenue plantation along the haul roads on the surface;
- Black-topping of permanent service roads besides proper maintenance, wetting the surface by deploying water tankers/sprinklers to reduce dust generation from haul roads.

4.1.3 FIRE AND SPONTANEOUS HEATING

Fire Due to Spontaneous Heating in Coal Benches & Ground Stocks

The following measures will be taken to avoid spontaneous heating:

- a) Coal bench slopes and seam outcrops will be overlain with an impervious layer of soil/clay.
- b) Treatment of exposed coal seams & outdoor coal stocks with anti-pyrogenic substances.
- c) Exposure of coal benches for long time shall be avoided.

Fire in Project Stores and Workshops

Sufficient provision has been made to prevent fire control in the project store, both E&M/HEMM workshops, and sub-stations by installing fire extinguishers of the right type & size. Timely inspection and refilling of fire extinguishers will be done.

The systematic layout of both stores & workshops has been made so that inflammable and highly inflammable materials do not come in contact with any spark or flame. An adequate number of cautions in the form of hoardings will be displayed near such places.

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4.1.4 SLOPE STABILITY

The exposed ends of the coal seams and OB shall be left with a safe slope to avoid slope failure and collapse of benches. Similarly, at the end of the mining operation, a safe terminal pit slope is provided to prevent pit failure. At the design stage, a safe angle of not steeper than 40 degrees has been proposed as a quarry slope. Detailed site-specific tests for slope stability shall be carried out and site-specific parameters determined. Present provision is a broad guideline. **Continuous monitoring of working mine slope & dump slope should be done with the latest technique & instrument available. All the necessary prevalent guidelines of slope monitoring and precautions by a statutory agency should be followed.**

Considering the gradient of coal seam (2° - 7°) with local variations in this project area, it is proposed to excavate top OB by level slicing. Higher capacity shovels are proposed to be deployed for both top overburden and thicker parting removal. Thinner partings are proposed to be removed by smaller capacity shovels. Benches will be aligned along general strike. Bench floor should follow own seam floor/roof or that of adjacent seam. Main bench parameters are given below.

FOR COAL SEAMS

Coal bench width will be kept at a minimum width of 50m for surface miner operations. Bench height and angle should as per guidelines from statutory authority & will vary with equipment size.

OB DUMP

In the quarry, the overburden removed completely from the first year is to be dumped over the existing quarry void created by the mine advancement. The total volume of insitu overburden removed corresponding to the total production of 124.46 Mt is 131.43 Mcum. The external dump lying over the northern part of the quarry excavation area is of 36.99 Mm³ and the internal dump is of 18.00 Mcum. So, the overburden of 54.99 Mm³ is to be rehandled back into the proposed internal dump of the extended quarry. The internal Dump of 109.55 Mm³ is already lying on the existing void of the quarry as on 01.04.2022. The total volume of OB programmed for the proposed excavation area is of 186.42 Mm³.

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Overall slope of internal dump is 26°, individual dump tiers will be constructed at a maximum height of 30 m at an angle of 37° and a leveled berm of width 30 m is kept between individual tiers. The height of each dump may even be kept at a lesser height where the dump is near any road or locality. Berm between each dump tier should be properly graded, and drains should be provided at toe with proper gradient. Fencing may be done near the bottom-most tier to stop unauthorized entry near the dump, adequate safety distance on the surface from dump toe should be maintained to avoid any accident due to slope failure.

For better stability of internal dumps, it is suggested to rip the mine floor in strips before backfilling. It is suggested to level the dumps and grade them outward properly to obviate water accumulation and will be followed by garland drains all along the periphery of the dump.

B) HAZARD AND RISK ASSESSMENT OF OB DUMPS

The hazard of OB dump failure is mainly governed by the following factors:

1. Height of benches.
2. Slope of benches.
3. Nature of material.
4. Slope of foundation rock.
5. Nature of foundation rock.
6. Drainage of foundation.
7. Depth of groundwater table.

The following precautions will be taken to reduce the risk of dump failure:

1. OB benches will be made of <30 m height in each tier.
2. The dumped material shall be allowed to settle at the natural angle of repose of the material as prescribed in Reg. 108(2) of CMR, 2017. The spoil bank face shall not be retained by artificial means at an angle in excess of its natural angle of repose. The angle of repose of individual OB benches will be around 37°.
3. The topsoil should not be mixed with Overburden (OB) and dumped at the bottom or middle of the dump. It should be stacked separately and spread at the top of the dump for plantation as prescribed in Reg.108 (1) of CMR, 2017.

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4. The slope of the ground is kept mild so that it will not have any adverse effect.
5. The soil from the foundation ground should be scrapped before starting of OB dumping.
6. Garland drain to be made around OB dump area to avoid water flow during monsoon below the OB dump.
7. Ground water table is generally 3-5 m below ground level hence may have no adverse impact.
8. Leveling, grading and drainage arrangement for top of OB dumps will be done.
9. Technical & Biological reclamation will be done.
10. The remnant or insitu coal rib (barrier) shall not be left unextracted within opencast workings. The presence of the rib on the dip-side of the dump acts as a barrier. It checks the flow of the collected water near the dump toe and the natural flow of dumped material, thereby exerting pressure on the rib, ultimately leading to the failure of the rib. The presence of coal pillars in the workings may lead to spontaneous heating of the coal and thereby fire in the coal pillar.
11. The OB shall not be dumped in the sump. In unavoidable circumstances, the water and slush in the sump shall be cleared up to the hard floor of the pit. The hard floor of the pit shall be broken to improve the frictional resistance at the base of the dump before starting the dumping. It should be filled with the OB consisting of coarse-grained sandstone. It will facilitate the passage of water through the dump floor, thus preventing water accumulation at the base of the dump.
12. The water shall not be allowed to accumulate over the dumps. Proper levelling of the dumped material should be done.
13. The backfilled area shall be kept benched, and the distance of any active mine workings (faces) from the toe of the bottom-most backfilled face (bench) shall not be less than 100 m or height of the OB dump whichever is higher without prior permission from this directorate based on scientific study. Blasting shall not be carried out within 300 m of the OB dump without prior consent from this directorate.
14. The discontinuous dumping shall be avoided to check water accumulation between heaps as far as practicable. The open cracks developed in the partially developed ump shall be filled and consolidated with the proper

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levelling of the benches with the help of a dozer. It will help to reduce the dumped material and will minimize the infiltration of water inside the dumps. The proper gradient along the benches, top and floor of the dump shall be ensured. It will facilitate an effective seepage/flow of water retained in dumps and run-off rainwater to the drains to take the same away from the dump. The drains should be effectively maintained to divert the drained water away from the dump.

4.1.5 HAUL ROAD MAINTENANCE

For proper haul road maintenance, the following aspects have to be considered and implemented:

- i) Proper design and maintenance of the haul roads
 - a) The height of the benches in overburden, coal, or other rock formation shall not be more than the digging height of the machine deployed thereat for digging, excavation, or removal.
 - b) The width of any bench shall not be less than (i) the width of the broadest machine plying on the bench plus two meters, or (ii) three times the width of the largest dumper/truck/tipper if dumpers/trucks/tippers ply on the bench, or (ii) the height of the bench, whichever is more.
 - c) Height and width of surface miner benches :
- ii) The final sides of surface miner faces shall be kept sloped and benched, and the height of each such bench shall not exceed 10m at any place, and the width thereof shall not be less than the height.
- iii) The length and width of the operation of surface miners, loading machines, and transport vehicles shall be decided depending upon the numbers of loading machines, tippers, and other types of machinery deployed to provide sufficient space and avoid crowding of operations.
- iv) Formulation, approval, and enforcement of traffic rules regarding:
 - a) Speed limit
 - b) Parking and standing
 - c) Overtaking

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- v) One-way traffic; otherwise, the width should not be less than 3 times the width of the largest vehicle.
- vi) The gradient should not be greater than 1 in 16.
- vii) Berm should not less than 1 m in width.
- viii) Separate machines and personnel for maintenance of haul road

During the rainy season, soil erosion will occur, and it will deteriorate the haul road corridor.

- i) Proper drainage arrangement shall be made along the haul road.
- ii) Cross slopes (1 in 50 to 1 in 25) shall be provided on the haul road so that water flows into the drain.
- iii) Water barriers, cross drains, relief drains etc., should be constructed and maintained properly.
- iv) Culverts shall be designed, installed, and maintained to withstand the vertical soil pressure, the weight of the vehicles plying over the road etc.

4.1.6 **BLASTING**

SAFE USE OF EXPLOSIVES

Site Mixed Slurry (SMS) has been proposed for good fragmentation and obviate storage of bulk quantum of explosives. However, for storage of explosives meant for priming, detonating fuse, and detonators, two explosive magazines have been provided in this report.

For transportation of explosives, the explosive van of approved type is also envisaged.

For proper blasting and minimizing the adverse side effects due to blasting viz. noise, ground vibration, back-breaks, air blast and fly rocks etc., the optimal blast design parameters will be suggested during the mine operation after conducting a study for determining the blasting parameters.

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Provision has been made in the PR for qualified blasting-in-charge with a requisite number of assistants. Adherence to relevant statutory safety provisions as stipulated by DGMS, Chief Controller of Explosives and others shall be made.

Blasting danger zone of 300m for blasting has been taken in a non-forest area. In the forest area, this demarcation will be done on the ground as only 7.5m has been considered a safety zone for permissive possession in the forest area. Accordingly, the land beyond the quarry limit is envisaged to be acquired for the project from safety considerations. It is suggested to resort to controlled blasting near built-up areas and surface features, if any, within the safety zone.

4.1.7 SAFETY MANAGEMENT

Special precautions should be taken while deploying workers in the mine. Before employing any labour in the mine, proper vocational training should be imparted, and recommendations of the latest Safety Conference should be strictly followed. Management for the deployment of labours by an outside agency shall fix terms and conditions. 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 drivers' driving license shall be kept by HEMM outsourcing agency and shall be made readily available for inspection by management.
- iv) No person shall be employed unless the person holds a VTC certificate and Management is informed. A record of it shall be maintained.
- v) Qualified competent persons shall maintain adequate supervision.
- vi) Outside agency shall follow safety guidelines and safety instruction from Project Authorities.

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B) FOR MACHINERIES AS RECOMMENDED BY DGMS CIR. (TECH.) 1 OF 1999.

- i) All the machinery to be deployed in mines should be checked before deployment by the competent authority.
- ii) Regular checking of m/c deployed by an outside agency shall be done. No unfit machine shall be deployed before the defect is rectified.
- iii) A proper record of repair and maintenance and inspection done by the management and defect pointed out shall be maintained and signed by an authorized person.
- iv) The trucks deployed outside the agency shall be provided with Audio-visual alarms, proper light for use at night and a period when natural light is not sufficient. Also, audio-visual alarms for reversing on trucks shall be provided.

4.1.7.1 OTHER PRECAUTIONS FOR MACHINE

Based on the excavation requirement of the mine and the envisaged calendar programme, an adequate number of HEMM has been envisaged in the PR.

A well-equipped workshop is suggested in the PR to cater to the maintenance needs of HEMM and other equipment besides the provision of a necessary maintenance crew. A project store is provided to store slow and fast-moving spares and other critical spares of vital importance.

An adequate number of trained/skilled operators and maintenance crew are provided in the PR with due consideration of leave/sick provisions.

Properly designed haul roads are envisaged in the PR, away from the general and traffic congestion. The traffic rules as enforced by the DGMS shall be strictly followed by the operators of mobile equipment like rear dumpers, water sprinklers, tippers, and other light motor vehicles. All mobile equipment shall be provided with audio-visual alarms.

Following norms regarding machinery and its safety should be ensured:

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RTO certificate photocopies of all vehicles shall be submitted to management

- i) Daily welding, monitoring, inspection shall be done by the agency's mechanic as directed by management.
- ii) Machine manufacturers should be asked to give risk analysis details in respect to machines deployed by outside agencies.
- iii) Suitable types of the fire extinguishers shall be provided in every machine.
- iv) No person/vehicle shall be deployed at any place other than authorised place.
- v) All worker should obey lawful instruction of mine management.
- vi) Risk management Plan shall be made and implemented.
- vii) All driver shall obey systematic traffics rules prepared by management
- viii) Before deploying workers, they must be trained and briefed about safety aspects in opencast mine. However, during the course of execution of the work, if any accident occurs, whether major or minor, the matter shall have to be immediately informed to mine management i.e., Colliery Manager/Agent/GM of the area so that Notices of accidents in accordance of (Reg.9 of CMR 1957) and Section 23 of Mines Act 1952 may be given and other necessary steps may be taken in accordance with the Mines Act 1952.
- ix) The outside agency shall operate the transport system in such a way so as to minimize pollution in the mine.
- x) Safety devices like fire alarm and control, operated by sensors, should be inbuilt in the equipment/HEMM. Flashers should be fitted in relevant HEMM. The haul roads should be sufficiently wide to prevent accidents.
- xi) Inter-locking of starting with normal positioning of the dumper body should be provided, so that dumper cannot be started when the body is lifted beyond a specific limit.

4.1.7.2 PRECAUTIONS AGAINST DANGER OF INUNDATION FROM SURFACE WATER

- 1) A careful assessment is to be made against the danger from surface water before the onset of rainy seasons. The necessary precautions should be laid down and implemented. A garland drain needs to be provided to drain away from the surface rainwater from coming into the mine.

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- 2) Inspections for any accumulation of rainwater, obstruction in normal drainage and weakening in embankment.
- 3) Standing order; for withdrawal of working persons in case of apprehended danger.
- 4) During heavy rain inspection of vulnerable points is essential. In case of any danger persons are to be withdrawn to safer places.
- 5) Nallah or water inlets may be diverted or isolated by embankments/if so required.

4.1.7.3 PREVENTIONS OF FLOODING OF EQUIPMENT DEPLOYED AT BOTTOM HORIZONS

During the heavy monsoon period, the mining operation in the lower-most bench may have to be stopped. Therefore, it is proposed to draw the lowest bench, which would work as a sump. The water will be pumped out and discharged into the drain through the settling tank. For ensuring the safety of the equipment while working out horizons with no access to surface profile, the following measures should be taken:

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

4.1.7.4 PREVENTION OF ELECTRIC SHOCKS

During mining operations, all the statutory provisions of the Indian Electricity Rules 1956 and the Indian Standards for installation and maintenance of electrical equipment etc. should be observed.

- 1) For protection from electric shocks to persons, Earth Leakage Relay should be provided, which will automatically disconnect electrical circuits from electrical equipment with high voltage.

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- 2) Closed mobile substations and switchgear should be mechanically interlocked, excluding the possibility of opening the door when oil switch and air circuit breaks are in operation.
- 3) All metal parts of electrical equipment should be adequately earthed to avoid failure of insulation.
- 4) All H.T. lines and cables located within the blasting zones should be disconnected during blasting operations.

4.1.7.5 MEASURES TO BE TAKEN FOR FIRE FIGHTING AND FIRE PREVENTION

In addition to statutory provisions, the measures for firefighting and prevention of fires are as follows:

- 1) Organization of particular cell for systematic observations to examine and prevent fire.
- 2) Removal of spillage of coal on benches and cleaning of coal horizons to prevent cases of coal heating.
- 3) Storage of lubricants and cotton waste in enclosed fireproof containers in working places.
- 4) Provisions of fire extinguishers.

4.1.7.6 MEASURES TO BE TAKEN WHILE DRILLING BLASTING

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

- 1) Drilling and Blasting in quarry should be done in accordance with the provisions of the Mines Safety Act, rules, and regulations.
- 2) Adequate safety measures have to be taken during blasting operations in the quarry so that men/machines are not affected.

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4.1.8 SCIENTIFIC STUDIES

It is proposed that scientific studies respect the effects of vibration and flying fragments on surface buildings/ structures due to blasting. Studies regarding slope stability should also be carried out

4.1.9 ADDITIONAL PERMISSION/RELAXATIONS REQUIRED FROM DGMS

For usage of bulk explosive, following permission from the competent authority will be required:

- i) Approval will be needed under CMR 161 clause (1) and CMR 168(5) for the usage of explosives other than cartridge form and different types of explosives.
- ii) Permission for sleeping holes shall be obtained.

| | | |
|-------|--|-------------------------|
| 4.2.2 | A commitment from the Company Board that entire mining operation will be carried out as per the Statutory provision given under Mines Act 1952, Coal mine Regulation 2017 and wherever specific permission will be required the company will approach the concerned authorities. | Will be provided by MCL |
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Chapter – 5

INFRASTRUCTURE FACILITIES

| | <i>Particulars</i> | <i>Details</i> |
|---|---|--|
| CHAPTER 5: INFRASTRUCTURE FACILITIES | | |
| 5.1.1 | Mine infrastructure required e.g. Equipment maintenance planning, Office buildings, Workshop, Power supply arrangement, Water supply etc. | <p>In the total outsourcing variant the OB and coal both will be extracted contractually. Hence, there is no need of HEMM workshop. Only E&M workshop and store will be in the scope of MCL. Minor repair and maintenance of the HEMM provided in this variant shall be done in the E&M workshop</p> <ul style="list-style-type: none"> • E&M WORKSHOP • STORES • COLONY • PROJECT SUBSTATION • CHP SUBSTATION • PROJECT & SITE OFFICE • WATER SUPPLY ARRANGEMENT • ETP & STP PLANT <p>Equipment maintenance planning</p> <p>a) Stores Provision for a closed shed is made for the project stores. Separate provision for a store yard of adequate area is also made for loading/unloading, truck movement etc. Store racking system, weigh scale, fork lift truck have also been provided in the stores which shall be located adjacent to the workshop complex for quick issuing of materials to the workshops.</p> <p>OFFICE BUILDINGS Workshop</p> <p>a.) HEMM Workshop Outsourcing mode.</p> <p>b.) E&M Workshop E&M workshop, is envisaged for LMV and E&M equipment (components of CHP equipment and Electricals etc.) repair, lubrication, inspection and</p> |

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| | | <p>minor repairs, incidental minor repair/replacement limited to sub-assemblies. The scope also includes repair of small electric motors, switch gears and instruments including rewinding jobs.</p> <p>Inspection and scheduling will be carried out for jobs which requires major repairs and overhauling from outside agencies/Central Workshop IB Valley. A separate area is envisaged for dumper parking.</p> <ul style="list-style-type: none"> • Water Supply Arrangement • ETP & STP Plant |
| 5.1.2 | Power supply and illumination | <ul style="list-style-type: none"> • Presently existing project substation at Bhubaneswari opencast project is receiving power at 33 kV, through one number of single circuit 33 kV overhead line, drawn from 132/33 kV Nandira substation of MCL. The existing Bhubaneswari OCP project substation is having total three number of transformers (3x10 MVA, 33/6.6 kV transformer. This existing 3x10 MVA, 33/6.6 kV project substation-I has been envisaged for providing power supply to all proposed additional CHP loads. Power shall be distributed at 6.6 kV for HT loads, at 415 Volts for LT loads and at 230 (L-L) Volts for lighting loads of entire proposed and under- construction CHP from this existing 33/6.6 kV CHP main substation through 6.6 kV substations & MCC's located at suitable locations depending on the load center. • The Connected load and Maximum demand have been mentioned in Chapter-13 of this PR. The 6.6 kV Capacitor Banks have been proposed to be installed in 6.6 kV substations to improve the P.F to 0.98 for loads fed from the 6.6 kV substations. • The surface conveyors along with RLS of proposed 30 MTY CHP will receive power from existing 33/6.6 kV project substation-I through 6.6 kV overhead lines. The existing 33/6.6 kV project substation-I has sufficient number of 6.6 kV VCB feeders for supplying power to 6.6/0.415 kV substations. • The control scheme of the CHP and rapid loading system along with sequencing shall be done through dual redundant hot standby microprocessor based programmable logic controller (PLC) suitable for industrial control system. |

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5.1.2.1 DETAILS OF POWER SUPPLY SYSTEM

Presently existing project substation at Bhubaneswari opencast project is receiving power at 33 kV, through one number of single circuit 33 kV overhead line, drawn from 132/33kV Nandira substation of MCL. The existing Bhubaneswari OCP project substation is having total three number of transformers (3X 10 MVA, 33/6.6 kV transformer. This existing 3x10 MVA, 33/6.6 kV project substation-I has been envisaged for providing power supply to all proposed additional CHP loads. Power shall be distributed at 6.6 kV for HT loads, at 415 Volts for LT loads and at 230 (L-L) Volts for lighting loads of entire proposed and under-construction CHP from this existing 33/6.6 kV CHP main substation through 6.6 kV substations & MCC's located at suitable locations depending on the load center. The Connected load and Maximum demand have been mentioned in Chapter-13 of this PR. The 6.6 kV Capacitor Banks have been proposed to be installed in 6.6 kV substations to improve the P.F to 0.98 for loads fed from the 6.6 kV substations.

POWER DISTRIBUTION ARRANGEMENT

The CHP and 6.6 kV substations shall have separate power (HT & LT) cables, control cables, plant illumination system, plant earthing system, plant lightning protection system, pressurization and air conditioning system, instrumentation and telecommunication arrangement. For supplying power to different equipment at CHP as well as RLS, 6.6/0.415 kV substations have been proposed.

6.6 kV SUB-STATIONS

Seven numbers of 6.6 kV substations have been proposed for supplying power to 6.6 kV conveyors and LT loads. Two numbers of 6.6 kV have been proposed for feeding section and five number of 6.6 kV substations have been provided for evacuation section. Each 6.6 kV substation will receive power through two numbers of 6.6 kV over headlines originating from 6.6 kV switch board installed at 33/6.6 kV project substation-I. The 6.6 kV substations will be consists of 6.6kV VCB/VCP switch board panels, 415V motor control centers, 6.6/415V distribution power transformers, 6.6/.0230V (L-L) lighting transformers and main lighting distribution boards etc.

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UTILIZATION VOLTAGE

All motors above 110 kW shall get power at 6.6 kV. All motors of 110 kW & below shall get power at 415 V.

CONTROL POWER SUPPLY

In the motor control centers, the control power supply to auxiliary circuit and contactor coils shall be supplied from a Control Transformer.

PROTECTION AT 6.6 kV

All the incoming 6.6 kV panels will be provided with over load, short circuit, earth fault and earth leakage protection.

All the outgoing panels supplying power to HT motors will be provided with motor protection relay (MPR) and all the panels supplying power to transformer or to any substation or capacitor bank will be provided with over load and short circuit protection.

PROTECTION AT 415V SIDE

- (i) All the 415V incoming panels will be provided with over load, short circuit and earth leakage protection.
- (ii) All the 415 V outgoing panels supplying power to motors will have over load protection along with single phasing protection and short circuit protection.
- (iii) All the 415 V outgoing panels supplying power to motors above 45 KW in sequence control will be provided with motor protection relay.

POWER FACTOR

The power factor of the plant has to be improved to a level above 0.98 lagging at the 6600 volts switch board of 6.6/0.415 kV substations. For this purpose required capacitor bank with automatic power factor correction relay have been provided in all seven numbers of 6.6 kV substations.

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PLANT ILLUMINATION SYSTEM

The areas covered under this package will be illuminated by light fittings, which will get power from the secondary of lighting transformers located at different locations. Required number of 6.6/0.230 (L-L) kV lighting transformers have been provided at different substations for illumination of the CHP.

PLANT EARTHING SYSTEM

Proper earthing arrangement for the plant has to be provided as per I.E Rules. As per amended CMR, restricted earthed neutral system has been envisaged for the said installations. An earthing grid shall have to be developed around the periphery of main substations as well along the conveyors. In addition all the motors will be earthed through the armoring of the connecting cable.

PLANT LIGHTNING PROTECTION SYSTEM

In order to protect the CHP from direct lightning strokes, a proper lightning protection system as per relevant Indian standards shall be provided. For this purpose required numbers of spikes/interceptors of at least 2m height will be provided on the roof tops of the CHP. The spikes/interceptors provided on each building and will be interconnected by means of suitable size G.I. flats supported on saddles to form a grid.

Separate earth pits independent of the earth pits provided for equipment earthing will be provided around CHP and interconnected by means of minimum 25x6 sq.mm Galvanized steel flats. The earth pits will be constructed as per Indian Standards.

SYSTEM VOLTAGE

The supply voltage and operating voltage used in the project are as follows:

| Sl. No. | Equipment | Voltage |
|---------|------------------------------|---------|
| 1. | Incoming supply voltage | 33.0 kV |
| 2. | Surface conveyors | 6.6 kV |
| 3. | Coal Handling Plant | 6.6 kV |
| 4. | Supply voltage to Main Pumps | 6.6 kV |
| 5. | Supply voltage to workshop | 6.6 kV |

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| Sl. No. | Equipment | Voltage |
|---------|---|-------------|
| 6. | Supply Voltage to Colony & Water Supply | 415 V |
| 6. | SILo loading arrangement | 415 V |
| 8. | Quarry lighting | 230 V (L-L) |

TELECOMMUNICATION

Telecommunication system consisting of EPBAX based system and loud hailing communication system required for facilitating efficient functioning of production and administration units of the project has been proposed.

| | | | | | | | | | | | | | | | | | |
|---|---|--|------------------------|---|----|---------------------|---|-----|-------------------|---|---|--------------------|---|---|---|---|---|
| 5.1.3 | Drainage & Pumping: Assessment of volume of water for pumping, pumping capacity and pump selection | The principal drainage in the block is controlled by Bangaru jhor in the northern side of the block. The pumping and drainage system will be assessed by the outsourced agency. | | | | | | | | | | | | | | | |
| 5.1.4 | Coal Handling Arrangement: Brief detail of the CHP/ Mode of Dispatch, Coal quality and Coal staking and handling arrangement | <p>The proposed CHP of Bhubaneswari Extn. OCP (30 Mty) is planned to have a capacity to handle the production of 25 Mty by CHP under construction. Remainder 5 Mty will be dispatched through Rail by nearby wharf wall siding.</p> <p>The basic parameters considered for the planning of the coal handling plant will be as under:</p> <table> <tr> <td>Maximum Capacity (Mty)</td><td>:</td><td>25</td></tr> <tr> <td>No. of working days</td><td>:</td><td>330</td></tr> <tr> <td>No. of shifts/day</td><td>:</td><td>3</td></tr> <tr> <td>No. of hours/shift</td><td>:</td><td>8</td></tr> <tr> <td>No. of effective hours of work of CHP/shift</td><td>:</td><td>5</td></tr> </table> <ul style="list-style-type: none"> Coal from the quarry handled by private mine operators will be received at Truck Receiving Hopper complexes. From TRH's coal will transported through conveyors to 02 nos. of over ground bunker of capacity 15000Te each. The coal from the Over Ground Bunker (GB-1) will be carried with the help of conveyors C2 and C2A to TH-5. | Maximum Capacity (Mty) | : | 25 | No. of working days | : | 330 | No. of shifts/day | : | 3 | No. of hours/shift | : | 8 | No. of effective hours of work of CHP/shift | : | 5 |
| Maximum Capacity (Mty) | : | 25 | | | | | | | | | | | | | | | |
| No. of working days | : | 330 | | | | | | | | | | | | | | | |
| No. of shifts/day | : | 3 | | | | | | | | | | | | | | | |
| No. of hours/shift | : | 8 | | | | | | | | | | | | | | | |
| No. of effective hours of work of CHP/shift | : | 5 | | | | | | | | | | | | | | | |

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| | | |
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| | | <ul style="list-style-type: none"> At TH-5, coal transportation will take place by the conveyors C5 and C5A up to TH-6. From TH-6, coal will be carried through the Pipe conveyor to be delivered to Silo, located near Spur Siding-III. The Silo will have a capacity of 4000Te and shall consist of Rapid loading system along with 02 nos. of pre-weigh hopper and telescopic chute which will load the wagons. From Over Ground Bunker (GB-2) will be transported through conveyors C3 and C4 to TH-7 and TH-8 respectively. From the Transfer houses TH-7 & TH-8 the Coal will be taken by the Conventional conveyors and a Pipe conveyors to a Silo (4000 Te) located near spur siding V to dispatch a coal of around 12 Mty. The Silo will have a capacity of 4000Te and shall consist of Rapid loading system along with 02 nos. of pre-weigh hopper and telescopic chute over two separate rail lines which will load the wagons. The coal of around 5.0 Mty will be tapped from the conveyor circuit from GB-2 for mechanized truck loading system. Other facilities like Dust control (Plain water (PWDS) and Dry fog (DFDS) types), Industrial and drinking water supply, Firefighting and Plant cleaning, Belt weigher, Electrical and Mechanical hoists, Tramp iron magnet (ILMS) and Metal detector, Automatic mechanical sampling system, In motion rail weigh bridges etc. will be also envisaged. |
| 5.1.5 | Coal washing and the proposed handling/ disposal of rejects | Washing not proposed in present proposal |

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Chapter – 6

LAND REQUIREMENT

| | Particulars | Details | | | | | | | |
|--|---|---|---|---|------------|---------|---|------------|---------|
| CHAPTER 6 : LAND REQUIREMENT | | | | | | | | | |
| 6.1.1 | Total Land requirement for the mine in “Ha” | Break up of pre-mining land type (indicative)(as received from project authority as calculated from land use /revenue plan) | | | | | | | |
| | | Particulars | | | | | Area (Ha) | | |
| | | Agricultural | | | | | 445.030 | | |
| | | Forest | | | | | 132.904 | | |
| | | Waste land | | | | | | | |
| | | Surface water bodies | | | | | | | |
| | | Others (specify) settlement | | | | | 80.790 | | |
| | | Total | | | | | 658.724 | | |
| | | Items | | MP&MCP of Bhubaneswari (28 Mty), Revision-1 | | | Proposed MP&MCP of Bhubaneswari (30 Mty), Rev-2 | | |
| | | Sl. | Particulars | Total Area in ha | | | Total Area in ha | | |
| | | | (ML-mining lease) | Forest | Non-forest | Total | Forest | Non-forest | Total |
| | | 1. | Quarry Excavation area | 105.808 | 477.944 | 583.752 | 126.191* | 488.531** | 614.722 |
| | | 2. | Safety zone | | 5.747 | 5.747 | | 6.163** | 6.163 |
| | | 3. | Infrastructure (CHP, Washery, Silo point, project office, laying of railway lines for dispatch point) and Future working expansion Area** | 6.713 | 29.609 | 36.322 | 6.713 | 18.606 | 25.319 |
| | | 4. | Embankment | NIL | 12.52 | 12.52 | NIL | 12.52 | 12.52 |
| | | A. | Total ML area | 112.521 | 525.820 | 638.341 | 132.904 | 525.820 | 658.724 |
| | | Note: *20.383 Ha of Forest land is taken under Quarry Excavation area. | | | | | | | |
| **The area under Future Expansion area is annexed under the proposed quarry excavation area and safety zone. | | | | | | | | | |
| • Additional 11.003 ha of future expansion area showed in Revision-1 goes to the Quarry area (10.587 ha) and partly to the safety zone of (0.416 ha), making it to a total of 11.003 ha. This was the non-forest area adjacent to the forest area of 20.383 ha blocked because of non-clearance of this forest area. | | | | | | | | | |
| • Additionally 149.57 Ha of non-forest land may be required for residential colony, Rehabilitation & resettlement. | | | | | | | | | |

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| Type | Land use (Proposed) | Land use (End of Life) | Land Use (Post Closure) | | | | | | |
|-------------------------------------|---------------------|------------------------|-------------------------|-----------------------------|----------------|--------------------|------------------------|-------------|----------------|
| | | | Agricultural land | Plantation/ grass carpeting | Unfilled void | Pubic/ Company use | Forest land (Returned) | Undisturbed | Total |
| Excavation Area | 614.722 | | | | | | | | 614.722 |
| Backfilled Area | | 339.488 | | 339.488 | | | | | 339.488 |
| Excavated Void | | 275.234 | | | 266.628 | 8.606 | | | 275.234 |
| Without plantation | | | | | | | | | |
| Temp Top soil dump | | | | | | | | | |
| External dump | | | | | | | | | |
| Safety zone | 6.163 | 6.163 | | 4.093 | 2.07 | | | | 6.163 |
| Haul road between quarries | | | | | | | | | |
| Road diversion | | | | | | | | | |
| Diversion/ below river/ nala/ canal | | | | | | | | | |
| Settling pond | | | | | | | | | |
| Road & infrastructure area | 25.319 | 15.319 | | 6.713 | | 8.606 | | | 15.319 |
| Rationalisation area | | | | | | | | | |
| Garland drains** | 2.07 | 2.07 | | | 2.07 | | | | 2.07 |
| Embankment | 12.52 | 12.52 | | 12.52 | | | | | 12.52 |
| Green Belt | | 10.00 | | 10.00 | | | | | 10.00 |
| Water Reservoir near pit | | | | | | | | | |
| UG entry | | | | | | | | | |
| Undisturbed/ Mining right for UG | | | | | | | | | |
| Resettlement | | | | | | | | | |
| Pit head power plant | | | | | | | | | |
| Water harvesting | | | | | | | | | |
| Agricultural land | | | | | | | | | |
| Total Lease area | 658.724 | 658.724 | | 372.814 | 268.698 | 17.212 | | | 658.724 |
| colony | 32.00 | 32.00 | | 6.400 | | 25.600 | | | 32.00 |
| Resettlement outside infrastructure | 117.57 | 117.57 | | 23.520 | | 94.050 | | | 117.57 |
| Total outside area | 149.57 | 149.57 | | 29.920 | | 119.650 | | | 149.57 |
| Total Project area | 808.294 | 808.294 | | 402.734 | 268.698 | 136.862 | | | 808.294 |

*undisturbed area is for further future expansion & same may be partially planted or grass carpeted.
Area outside lease area is indicative & may vary as per actual implementation of the project.
** Garland-drain is included in the safety zone area.

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| 6.1.3 | Surface features over the block area | This is a working mine. The block has mostly agricultural land interspersed by forest plots, grazing land and habitations, scattered all over. The area is represented by a plain country with very gentle undulations at places. The southerly flowing Brahmani River on the eastern extremity of the Talcher coalfield mainly controls drainage in the area. There is one seasonal nallah, Bangaru jhor that flows in the northern and north western boundary of the block and drains into the Brahmani River. The coal evacuation arrangement is being made on the southern side of the quarry. |
| 6.1.4 | No. of villages/ Houses to be shifted | Within the existing project, nine villages are being affected (Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur). Total no PAF affected as per approved Mining Plan: 1142. Most of villagers shifted except Hensmul (Talasahi) and Hensmul (Sahasahi). Around 126 PAF of Hensmul village is yet to be shifted. |
| 6.1.5 | Population to be affected by the project | Estimated Around 4504 |
| 6.1.6 | Proposed rehabilitation programme | Land has been provided for R & R benefits including well developed rehab site and other cash compensation will be given to PAF as per R & R policy of MCL & norms of state Govt. of Odisha |
| 6.2 | DETAILS OF LEASE | |
| 6.2.1 | Status of Lease | 658.724 Ha* (*includes 20.383 ha of non-diverted forest area under process of diversion) |
| 6.2.2 | Existing Lease Area "Ha" | 638.341 |
| 6.2.3 | Period for which Mining Lease has been granted/ is to be renewed/ is to be applied for | NA |
| 6.2.4 | Date of expiry of earlier Mining Lease, if any | NA |
| 6.2.5 | Whether the lease boundary/ required boundary is same as mentioned in the allotment order | Mine excavation area along with other infrastructure are located within geological block. |

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| | | |
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| 6.2.6 | Lease Area (applied/ required) as per the Mining Plan under consideration (Ha) | 658.724 Ha* (*includes 20.383 ha of non-diverted forest area under process of diversion) |
| 6.2.7 | Whether the applied lease area falls within the allotted block | Total lease area falls within geological block, Mine excavation area, also (infrastructure/office fall within allotted block. Despatch arrangement, lies outside the block. |
| 6.2.8 | Area (Ha) of lease which falls outside the delineated block/sub-block | NIL. (Excl. land for colony, R&R) |
| 6.2.9 | Details of outside area: | |
| | <input type="checkbox"/> Whether forms part of any other coal block <input type="checkbox"/> Whether it contains any coal/lignite reserves <input type="checkbox"/> Purpose for which it is required, e.g. roads/ OB dumps/ service buildings/ colony/safety zone/ others (specify) | <ul style="list-style-type: none"> Other infrastructure are located in coal bearing area which does not belong to the same coal block. For safety zone, project office, workshops, sub-station, etc. |
| 6.2.10 | - Whether some part(s) of the allotted block has not been applied for mining lease | Eastern part of this block has been left out for future expansion. |

6.3 PROPOSED SURFACE REORGANISATION

- Infrastructural facilities have been located, as far as possible, to avoid forest land. Land use Plan and Surface & Conceptual Layout Plan is shown in **Plate No. GEN-IV and GEN-V** respectively.
- A proper resettlement and rehabilitation (R&R) plan is to be drawn up in consultation with the state govt. and project affected persons (PAPs) taking into consideration the existing norms of Government of Odisha.
- Suitable provision for compensatory afforestation, arboriculture and technical, and biological reclamation have been made per the latest EAC guidelines. Govt. land shall be chosen for compensatory afforestation and resettlement of PAPs. These shall be finalized during implementation.
- In the rainy season, mining operation may disrupt the existing drainage system. Garland drains around the periphery have therefore, been provided.

Note No. #7

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Chapter – 7

ENVIRONMENTAL MANAGEMENT

| | <i>Particulars</i> | <i>Details</i> |
|--|---|--------------------------------|
| CHAPTER 7: ENVIRONMENTAL MANAGEMENT | | |
| 7.1 | Commitment from the project proponent that the company will comply Environment and Forest Condition stipulated in the respective clearances | Will be provided by MCL |

Note No. #7

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Chapter – 8

PROGRESSIVE AND FINAL MINE CLOSURE PLAN

| 8.1 | LAND DEGRADATION AND RESTORATION SCHEDULE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------|---|-----------------------------|-----------------------------|---------------------|----------------------------|------------------------|--|----------------------|--|-------|--------------|-----------------------------|--------------------------|---------------------|----------|------------------------|--------|-------|----------------|---------|-------|--------|---------|---------|------|--|--------|---------|---------|---------|--------|---------|---------|------|--------|---------|---------|---------|---------|--------|---------|---------|------|--------|---------|---------|---------|---------|--------|---------|---------|--|--------|---------|----------------------------|--|--|--|--|--|--|--|--|------|-----------------------------------|--|--|--|--|--|--|--|
| 8.1.1 | Tentative Land Degradation and Technical Reclamation (Commutative Area “Ha”) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table><tr><th rowspan="2"></th><th colspan="4">Land Degraded</th><th colspan="4">Technically Reclaimed Area</th></tr><tr><th>Excavn. area</th><th>Dump (Extn + Top soil)</th><th>Infra/ others</th><th>Total</th><th>Backfill</th><th>Dump (Extn + Top soil)</th><th>Others</th><th>Total</th></tr><tr><td>As on 01.04.22</td><td>428.625</td><td>83.97</td><td>36.202</td><td>548.797</td><td>148.500</td><td>-</td><td></td><td>148.50</td></tr><tr><td>YR-1</td><td>494.726</td><td>53.30</td><td>37.762</td><td>585.789</td><td>172.350</td><td>-</td><td>37.762</td><td>210.112</td></tr><tr><td>YR-3</td><td>590.222</td><td>5.233</td><td>38.769</td><td>634.224</td><td>319.524</td><td></td><td>38.769</td><td>358.293</td></tr><tr><td>YR-5</td><td>614.722</td><td></td><td>44.002</td><td>658.724</td><td>339.488</td><td></td><td>44.002</td><td>383.490</td></tr><tr><td colspan="4">Post-closure* (Conceptual)</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>YR-8</td><td colspan="8">The mine to be continued further.</td></tr></table> <p><i>*mine will be continued for further expansion towards dipside</i></p> | | Land Degraded | | | | Technically Reclaimed Area | | | | Excavn. area | Dump (Extn + Top soil) | Infra/ others | Total | Backfill | Dump (Extn + Top soil) | Others | Total | As on 01.04.22 | 428.625 | 83.97 | 36.202 | 548.797 | 148.500 | - | | 148.50 | YR-1 | 494.726 | 53.30 | 37.762 | 585.789 | 172.350 | - | 37.762 | 210.112 | YR-3 | 590.222 | 5.233 | 38.769 | 634.224 | 319.524 | | 38.769 | 358.293 | YR-5 | 614.722 | | 44.002 | 658.724 | 339.488 | | 44.002 | 383.490 | Post-closure* (Conceptual) | | | | | | | | | YR-8 | The mine to be continued further. | | | | | | | |
| | Land Degraded | | | | Technically Reclaimed Area | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Excavn. area | Dump (Extn + Top soil) | Infra/ others | Total | Backfill | Dump (Extn + Top soil) | Others | Total | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| As on 01.04.22 | 428.625 | 83.97 | 36.202 | 548.797 | 148.500 | - | | 148.50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| YR-1 | 494.726 | 53.30 | 37.762 | 585.789 | 172.350 | - | 37.762 | 210.112 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| YR-3 | 590.222 | 5.233 | 38.769 | 634.224 | 319.524 | | 38.769 | 358.293 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| YR-5 | 614.722 | | 44.002 | 658.724 | 339.488 | | 44.002 | 383.490 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Post-closure* (Conceptual) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| YR-8 | The mine to be continued further. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8.1.2 | Biological Reclamation (Cumulative in “Ha”) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table><tr><th rowspan="2"></th><th colspan="5">Biologically Reclaimed Area</th><th rowspan="2">Forest land (Return)</th><th rowspan="2">Undisturbed/ to be left for Public/com use</th><th rowspan="2">Total</th></tr><tr><th>Agri-culture</th><th>Plantation/ Grass carpeting</th><th>Unfilled void/Water Body</th><th>Public/ Company Use</th><th>Total</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>YR-1</td><td></td><td>66.240</td><td>231.292</td><td>8.892</td><td>306.424</td><td></td><td></td><td></td></tr><tr><td>YR-3</td><td></td><td>265.426</td><td>233.446</td><td>13.254</td><td>512.126</td><td></td><td></td><td></td></tr><tr><td>YR-5</td><td></td><td>372.814</td><td>268.698</td><td>17.212</td><td>658.724</td><td></td><td></td><td>658.724</td></tr></table> <ul style="list-style-type: none">This mine is to further run for the whole Integrated geological block. Biological Reclamation to be done after completion of the whole mining operation. | | Biologically Reclaimed Area | | | | | Forest land (Return) | Undisturbed/ to be left for Public/com use | Total | Agri-culture | Plantation/ Grass carpeting | Unfilled void/Water Body | Public/ Company Use | Total | | | | | | | | | | YR-1 | | 66.240 | 231.292 | 8.892 | 306.424 | | | | YR-3 | | 265.426 | 233.446 | 13.254 | 512.126 | | | | YR-5 | | 372.814 | 268.698 | 17.212 | 658.724 | | | 658.724 | | | | | | | | | | | | | | | | | | | | | |
| | Biologically Reclaimed Area | | | | | Forest land (Return) | Undisturbed/ to be left for Public/com use | | | | Total | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Agri-culture | Plantation/ Grass carpeting | Unfilled void/Water Body | Public/ Company Use | Total | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| YR-1 | | 66.240 | 231.292 | 8.892 | 306.424 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| YR-3 | | 265.426 | 233.446 | 13.254 | 512.126 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| YR-5 | | 372.814 | 268.698 | 17.212 | 658.724 | | | 658.724 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8.2 | <p><u>Post-closure water quality management:</u></p> <p>Maximum effort will be made to recycle or reuse the treated effluents totally to the extent possible by keeping the make of water in different sumps or low-lying areas of the mine. The final voids of the quarries will be left as a water reservoir for water harvesting and also recharging the aquifer in the surrounding area, which will serve the following purposes:</p> <ul style="list-style-type: none">Source of supply of water for industrial and fire-fighting purposes of nearby mines.Source of supply of potable water after necessary treatment.A place of bathing and washing for the local population.Pisciculture.For recharging the aquifer in the area. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Job No.: 172202020

MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

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| | <p>In the post-mining period, the drainage pattern of the reclaimed area will be such that the run-off will be diverted to the final void of the quarry, which will be developed as a water reservoir for water harvesting and recharging aquifer in the surrounding area.</p> <p>During the operation of the mine, water samples covering surface water, groundwater, and effluent are being analysed in the core and buffer zones of the project. Out of the above, three sample points will be utilized for Water quality monitoring for three years after the closure of the mine. One number of sampling stations shall be for mine water with fortnightly frequency and two numbers of sampling stations will be for groundwater samples in the core and buffer zone with monthly frequency.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|--|--------|-------------------------|---|-------|---|--------|--|-------|--|------|-------------------------|--|-------|----------|----|-------|----------|----|----------|----|----------|----|----------|----|---------------|--|--|--------|--|-------|--|--------|--|-------|--|--|--|--------------|------|-------|-------|--|-------|--|-------|--|-------|--|------|-------|--------------|------|--------|--------|--|-------|------|--------|--|-------|------|------|--------|--------------|------|--------|--------|--|-------|------|--------|--|-------|------|------|--------|
| 8.3 | <p><u>Post-Closure Air Quality management</u></p> <p>Air quality monitoring will be continued after three years after the stoppage of mining operations. This includes the identification of major dust and gaseous sources and estimation of their levels of emission. The monitoring network will be consisting of the monitoring stations in consultation with SPCB considering various environmental impacts of air pollution. In the core zone, frequency of monitoring is fortnightly as per GSR 742 (E) Coal Mines Standard 2000 for six parameters, namely SPM, RPM, PM2.5, SOx, NOx, and CO. Five heavy metal parameters As, Ni, Pb, Hg, Cd, and Cr are being monitored once in six months at all core zone locations.</p> <p>However, for buffer zone stations, the frequency of monitoring is weekly twice as per National Ambient Air Quality Standard (NAAQS) 2009, and 12 parameters <i>PM</i>₁₀, <i>PM</i>_{2.5}, <i>SO</i>_x, <i>NO</i>_x, <i>CO</i>, Ozone, Ammonia, BaP, Benzene, As, Ni, and Pb are being monitored.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8.4 | <p><i>Waste Management (Figures in MM³)</i></p> <table><tr><th rowspan="2"></th><th colspan="3">OB Removal (Cumulative)</th><th colspan="2">Ext + Int Dump (Rehandle) / Existing External dump (Cumulative)</th><th colspan="2">Internal Backfilling (Internal Dump -1) (Cumulative)</th><th colspan="2">Internal Backfilling (Internal Dump -2) (Cumulative)</th><th colspan="2">Embankment (Cumulative)</th><th rowspan="2">Total</th></tr><tr><th>Top soil</th><th>OB</th><th>Total</th><th>Top soil</th><th>OB</th><th>Top soil</th><th>OB</th><th>Top soil</th><th>OB</th><th>Top soil</th><th>OB</th></tr><tr><td>(*01.04.2022)</td><td></td><td></td><td>157.75</td><td></td><td>54.99</td><td></td><td>109.55</td><td></td><td>11.21</td><td></td><td></td><td></td></tr><tr><td>Y-1: 2022-23</td><td>0.11</td><td>54.89</td><td>55.00</td><td></td><td>23.00</td><td></td><td>98.64</td><td></td><td>18.00</td><td></td><td>0.36</td><td>55.00</td></tr><tr><td>Y-3: 2024-25</td><td>0.26</td><td>150.73</td><td>150.99</td><td></td><td>54.99</td><td>0.13</td><td>117.37</td><td></td><td>33.00</td><td>0.13</td><td>0.36</td><td>150.99</td></tr><tr><td>Y-5: 2026-27</td><td>0.34</td><td>186.08</td><td>186.42</td><td></td><td>54.99</td><td>0.21</td><td>152.72</td><td></td><td>33.00</td><td>0.13</td><td>0.36</td><td>186.42</td></tr></table> | | OB Removal (Cumulative) | | | Ext + Int Dump (Rehandle) / Existing External dump (Cumulative) | | Internal Backfilling (Internal Dump -1) (Cumulative) | | Internal Backfilling (Internal Dump -2) (Cumulative) | | Embankment (Cumulative) | | Total | Top soil | OB | Total | Top soil | OB | Top soil | OB | Top soil | OB | Top soil | OB | (*01.04.2022) | | | 157.75 | | 54.99 | | 109.55 | | 11.21 | | | | Y-1: 2022-23 | 0.11 | 54.89 | 55.00 | | 23.00 | | 98.64 | | 18.00 | | 0.36 | 55.00 | Y-3: 2024-25 | 0.26 | 150.73 | 150.99 | | 54.99 | 0.13 | 117.37 | | 33.00 | 0.13 | 0.36 | 150.99 | Y-5: 2026-27 | 0.34 | 186.08 | 186.42 | | 54.99 | 0.21 | 152.72 | | 33.00 | 0.13 | 0.36 | 186.42 |
| | OB Removal (Cumulative) | | | Ext + Int Dump (Rehandle) / Existing External dump (Cumulative) | | Internal Backfilling (Internal Dump -1) (Cumulative) | | Internal Backfilling (Internal Dump -2) (Cumulative) | | Embankment (Cumulative) | | Total | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Top soil | OB | Total | Top soil | OB | Top soil | OB | Top soil | OB | Top soil | OB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (*01.04.2022) | | | 157.75 | | 54.99 | | 109.55 | | 11.21 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y-1: 2022-23 | 0.11 | 54.89 | 55.00 | | 23.00 | | 98.64 | | 18.00 | | 0.36 | 55.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y-3: 2024-25 | 0.26 | 150.73 | 150.99 | | 54.99 | 0.13 | 117.37 | | 33.00 | 0.13 | 0.36 | 150.99 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y-5: 2026-27 | 0.34 | 186.08 | 186.42 | | 54.99 | 0.21 | 152.72 | | 33.00 | 0.13 | 0.36 | 186.42 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| | <p>8.4.1 SOLID WASTE GENERATION DURING PROGRESSIVE CLOSURE:</p> <ul style="list-style-type: none"> ➤ All overburden from the mine will be brought to quarry's earlier generated as well as the created void forming its Internal dump, accommodating 100% of the overburden removed. ➤ Internal dumping can be started from Yr 1, and simultaneous backfilling will be continued up to the end of quarry life. Around 36.99 Mcum of overburden dumped externally over Arkhapal-A will be rehandled back to the internal dump during year one to year 3 while operating this quarry. ➤ The backfilling will be carried out in a phased manner. Once the backfilling has reached a certain predetermined reduced level, the plots will be levelled, graded and cleared of large stone pieces lying on the surface. The slope of the ground will be made very gentle as far as possible (preferably less than 2%). The graded and leveled area will be divided into small sectors and small check bunds will be constructed to retain moisture and humus in the soil. The outer slope of each bench will be kept at the natural angle of repose of the spoil material and at an overall slope angle of 26° considering all benches. ➤ Considering the proximity of the mine infrastructure, it is suggested to excavate topsoil and sub-soil up to 1m depth before commencing external dump to increase the dump stability. Further, it is recommended that a vibratory compactor may compact overburdened spoil after necessary leveling for early compaction and improved stability. ➤ Surface shall be maintained less than 2%, i.e., very gently sloping to prevent standage of water. Drainage arrangement will be provided for smooth disposal of stormwater to avoid gully formation. Garland drains shall be provided around the external dump to collect run-off sedimentation ponds one to be provided in order to avoid silt. |
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8.4.2 MANAGEMENT OF WASTES

NON-TOXIC SOLID WASTE

The solid wastes (overburden) generated from the mine during coal production are non-hazardous and non-toxic in nature. The above solid wastes are disposed of to backfill the mined-out area and then revegetate without causing any siltation problem on surface water bodies.

TOXIC WASTES

Toxic solid wastes like used oil, used batteries, oily sludge, besides filter and filter materials containing oil during maintenance of vehicles are generated from this project.

Used oil is stored in drums safely in store either for disposal through auction to authorized recyclers. Used batteries are stored safely for auction to authorized recyclers. As regards oily sludge besides filter and filter materials, the same is disposed of off in impervious layer-lined pits without causing environmental hazards.

8.4.3 ALTERNATIVE USE OF LAND

There are several options available for the land use pattern of the reclaimed land. The following factors have been considered for the selection of appropriate land-use patterns:

- Pre-mining land use pattern
- Topsoil/sub-soil quality
- Socio-economic parameters of the area
- Availability of technology for land reclamation
- Climatic conditions of the area
- Local flora.

The alternatives available for utilising the reclaimed land are :

- ❖ Agricultural use
- ❖ Afforestation

The option for using the reclaimed backfilled area for the agricultural purpose

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immediately is ruled out due to the following reasons :

- The reclaimed land is very different from its pre-mining conditions. It cannot sustain crops as the soil has poor fertility status. So the agriculture may prove an uneconomic venture compared to afforestation.
- The development of a soil regime for agriculture will take considerable time.
- Reclamation is proposed to be done progressively and concurrently with the mining operation. Carrying out agriculture within mining activity areas by releasing reclaimed areas in a phase-wise manner may not be advisable from the safety point of view.

Given the above, it is suggested to utilise the reclaimed land for afforestation purposes which will help improve the soil status, i.e., texture and nutrient levels, etc.

“Though the Bhubaneswari OCP continues for further expansion. However, in a general scenario, the mine will be closed after exhaustion of the coal reserve in the mining block. All the dumping and final quarry slopes will be grass-carpeted or covered with plantation. The final mine void in the quarry will be around 215 m, which will be kept as a water body.”

8.5

Topsoil Management – (Including Action Plan for Top Soil Management)

(All Figures are Cumulative and in mm³)

| | | Top Soil Removal Plan (in Mcum) | Top Soil Used (in Mcum) | | | |
|--------------|---------|------------------------------------|---------------------------|------------------------------|--------------------------------------|----------------|
| | | | Spreading Over Embankment | Spreading over Backfill area | Spreading over External OB Dump area | Total Utilized |
| | | | | | | |
| Yr 1 | 2022-23 | | | | - | |
| Yr 3 | 2024-25 | 0.26 | 0.13 | 0.13 | - | 0.26 |
| Yr 5 | 2026-27 | 0.34 | 0.13 | 0.21 | | 0.34 |
| Post closure | | | | | | |
| Yr 8 | 2029-30 | | | 0.34 | - | 0.34 |

Topsoil shall be progressively and concurrently utilized during physical/ technical reclamation of ext. OB dumps and backfilled area, thus preventing the necessity of the storage of topsoil separately. However, topsoil will be stored temporarily during the initial years with proper preservation measures for utilization during technical reclamation of external OB dump areas and backfilled areas.

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Depth of topsoil depends on the following:

- i) Physiography.
- ii) Climatic conditions like temperature, rainfall etc.
- iii) The uses to which the land has been put before.

In a mining block, it is necessary to have a close soil survey to determine its depth.

8.5.1 STORAGE AND PRESERVATION OF TOPSOIL

- (A) Topsoil undergo many changes during preservation. These are changes in topsoil due to storage.
 - i) Stockpiling has profound effects on physicochemical and biological properties.
 - ii) Biological activity deteriorates after 3 to 6 months of storage.
 - iii) Stockpiling reduces organic content and affects the organic compound concerned in soil aggravation.
 - iv) Aggregate stability is reduced to some extent due to storage.
 - v) Following three zones are developed in the topsoil mound during storage:
 - Aerobic zones: Soil is active in this zone
 - Transition zone: Fluctuates between predominantly aerobic and anaerobic status.
 - This zone is inactive and low in biological activity as well as organic content.
- (B) Methodology of Stripping: The stripping method should generally be by the scrappers/ small excavators only. The routing of scrappers/excavators during this operation must be planned to minimise the travel of machines to avoid compaction and damage to soil structure. Further careful control of the operation is necessary to ensure planned stripping depths of the topsoil and subsoil. These soils should be stripped and stored separately. The intermingling of these soils during stripping is not a good practice.
- (C) It is essential that topsoil stripping should be carried out when it is dry as far as possible to reduce the risk of compaction and damage to the soil structure by smearing and remolding. Prolonged rainfall is unsuitable. The best part of the year is when evapo-transportation exceeds precipitation, i.e., during March-September.

Note No. #7

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| | <p>(D) Geometry of Topsoil Heap: The heap should be constructed to facilitate the following:</p> <ul style="list-style-type: none"> To provide the maximum surface area for maintaining a greater level of Biological activity. To have slopes capable of sustaining vegetation to avoid erosion and gully formation. <p>Space constraints imposed by the site factors and soil texture would generally dictate the overall size and shape of the heap.</p> <p>As a rule of thumb, the following stack geometry may be maintained as far as possible to preserve the topsoil and increase the shelf life.</p> <p>a) Height:</p> <ol style="list-style-type: none"> 4.0m (Max) for sand soil 2.0 to 3.0 for loamy soil 1.0 for heavy clayey soil 0.5 to 1.0 for intermediate soil texture. <p>b) Slope:</p> <p>The wide slope of 1 in 3 (i.e., 18.50 to the horizontal)</p> <p>If there is a constraint in the availability of area, one or both of the following strategies can be adopted:</p> <p>ALT-I</p> <p>An acoustic barrier of topsoil may be constructed in the safety zone near the working face. When the working face advances, the embankment away from it may be reclaimed and respread over the subsoil of the technically reclaimed area. This would lessen the noise pollution besides preservation of topsoil and reduction of the demand on the land requirement.</p> <p>ALT-II</p> <p>Initial topsoil may be spread over the area to be mined. When the scope for progressive reclamation is available, the respread topsoil and the insitu one may be stripped carefully and utilised. This method would also preserve the topsoil and reduce the demand for land intake.</p> <ol style="list-style-type: none"> It is advisable to avoid topsoil storage, specifically the long-term one. However, if storage is unavoidable upon completion of the surface of the heap, the following steps are to be followed to keep the soil in good health and to increase its shelf life : Surface ripping with the suitable sub-soiling machine for aeration and |
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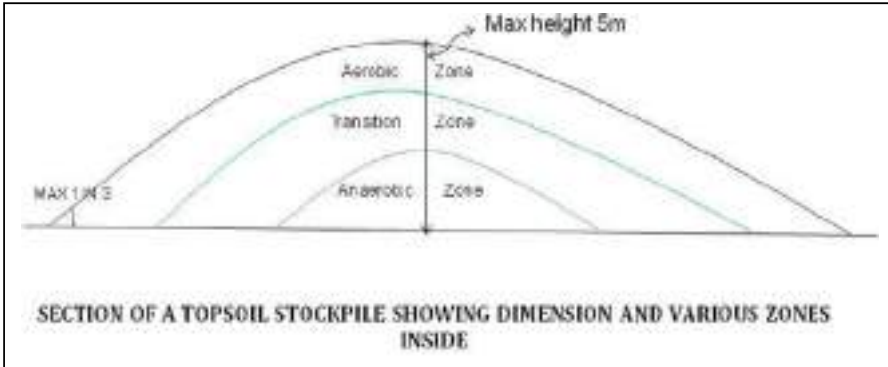
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| | <p>relieving surface compaction.</p> <p>c) Immediate cultivation of suitable low maintenance species like dwarf grasses to prevent erosion and gully formation.</p> <p><i>Maintenance of surface vegetation actively by seeding, mowing, and weed control operation.</i></p> <p>8.5.2 TOPSOIL CARPETING</p> <p>The following golden rules need to be observed:</p> <ul style="list-style-type: none"> i) Overburden, sub-soil, and topsoil should be respread to correct sequence putting the topsoil on the top of the backfilled area. ii) Topsoil should be respread over the restoration area at an even depth so as to achieve the final level and suitable configuration for drainage. iii) As far as possible progressive topsoil reclamation technique should be practiced. The topsoil from the area lying just ahead of the advancing opencast mine edge should be scrapped off by scraper and immediately placed over the technically reclaimed area. iv) Compaction of topsoil after respreading over the reclaimed area should be avoided by properly planning the movement of Earth Moving Machinery and carrying out the operation in dry period only. v) Suppose topsoil is to be reclaimed from the heap for spread in the backfilled area and OB dump area. In that case, the reclamation should be planned in such a way that materials from aerobic, transition, and anaerobic zones are taken simultaneously. The above zones should not be taken out separately. It is essential to use the active surface layer as 'inoculum' during soil respreading to recover the inactive portion of the mound as quickly as possible. vi) Revegetated topsoil dumps with legumes (<i>Stylosanthes</i>) and grasses protect the stockpiles from wind and water erosion, maintain active soil microbes population and help to restore the nutrient cycling. vii) Mulching: If possible, after topsoil application, a layer of mulch (2-3" or 5-8 cm thick) may apply to cover topsoil and provide organic matter initially. The mulch layer will prevent soil from drying out and crusted, reduce evaporation, ameliorate extreme temperature, prevent erosion, and create a congenial microhabitat for the soil biological community. |
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| |  | |
| 8.6 | Management of Coal Rejects | NA |
| 8.7 | Restoration of Land used for Infrastructure | This mine is to further run for the whole Integrated geological block. Land use to be restored after completion of the whole mining operation. |
| 8.8 | Disposal of Mining Machinery | This mine is to further run for the whole Integrated geological block. Land use to be restored after completion of the whole mining operation |
| 8.9 | Safety & Security | <p>a) DETAILS OF FENCING AROUND ABANDONED QUARRY INDICATING THE LENGTH OF THE FENCING</p> <p>Fencing around the abandoned quarry will be done as per details given in D.G.M.S Circulars.</p> <p>b) MINE ENTRY SEALING ARRANGEMENTS AND SUBSIDENCE MANAGEMENT FOR UG MINES</p> <p>Not Applicable.</p> <p>c) PROVIDING ONE TIME LIGHTING ARRANGEMENT</p> <p>Sufficient lighting as per standard will be provided at all the required places, i.e.</p> |

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| | | <p>working faces, OB dump area, haul road, coal transfer points, loading points, CHP, workshop, etc., to avoid accidents and to create efficient working conditions.</p> <p>After the closure of the mine, the lighting arrangements will be kept maintained at all locations which are not required to be demolished or dismantled like sub-stations, transformers, community services, pump-houses, water-treatment/ filtration plants, water lines, power lines, roads, etc. to be utilized for the neighboring projects and at critical places for safety point of view.</p> <p>The guidelines/instructions from DGMS will be followed in case of discontinuance of mine operation if any.</p> <p>d) SLOPE STABILITY ARRANGEMENT FOR HIGH WALL AND BACKFILLED DUMPS</p> <p>During the process, the geometrical shape of the dumps is altered to make them amenable to effective biological reclamation and provide safety. Stability and high wall will be maintained and stabilized as per norms.</p> <p>The details of the final Mine Closure plan along with the details of the updated cost estimates for various mine closure activities and the Escrow account already set up shall be submitted to the Ministry of Coal for final approval at least five years before the intended final closure of the mine.</p> |
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| 8.10 | Abandonment Cost and Financial Assurance | | |
| 8.10.1 | Abandonment Cost: Cost of Activities to be taken up for the closure of the mine | | |
| | The item-wise cost of progressive and final closure will be assessed during and before starting the mining operations and while preparing the final mine closure plan. However, a broad guideline has been detailed below: | | |
| | Sl. No. | ACTIVITY | Weighted % of Mine Closure Cost |
| | | | Progressive (%) |
| | A | Dismantling of Structures | 0 |
| | | Service Buildings | |
| | | Residential Buildings | |
| | | Industrial structures | |
| | B | Safety & Security | 6.5 |
| | | Random rubble masonry/concrete wall | |
| | | Toe wall around dump/Gabion wall | |
| | | Barbed wire fencing | |
| | | Fencing/boundary wall, fencing around water body | |
| | | Garland drains | |
| | C | OB Dump Reclamation | 60.5 |
| | CA | Technical Reclamation | |
| | | Re-handling of OB | |
| | | Levelling by Dozer | |
| | | Grading | |
| | | Levelling & grading of highwall slopes & OB dump | |
| | CB | Biological Reclamation & Plantation | 15 |
| | | Top soil Management | |
| | | Grassing of OB dump | |
| | | Plantation around virgin Area, safety zone, green belt, over external dump and internal reclaimed area | |
| | | Plantation post care (including manpower) | |
| | | Plantation over cleared area obtained after dismantling | |
| | D | Landscaping: Landscaping of the open space in leasehold area for improving its aesthetics, drain, pipelines, peripheral road, gates view point, cemented steps on bank etc | 4 |
| | | Development of Agriculture land | |
| | E | Environment mitigation & management | 12 |
| | | Air Quality (Water tanker, sprinkler & other control measures) | |
| | | Water Quality (ETP & STP etc. operating cost) | |
| | | Manpower cost and supervision | |
| | F | Post Closure Env. Monitoring | 0 |
| | | Air Quality | |
| | | Water Quality | |
| | | Power cost | |
| | | Manpower cost & supervision | |
| | G | Entrepreneurship Development (Vocational/skill development training for sustainable income of affected people) | 1 |
| | I | Miscellaneous and other mitigative measures like golden handshake, one-time financial grant, alternative jobs other service etc. | 1 |
| | | TOTAL | 100 |

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|--------|--|---------------------|----------|-------------|---------------------|-------|---|-------------|-------|---------------------------------|----|--------|-------------------|----|---------|--|----|----------|--|----|---------|---|----|----------|--|----|----|--------------------------------------|----|---|---|----|---------|---|--|----------|
| 8.10.2 | Financial Assurance: Amount to be deposited in Escrow account as a security against the mine activities to be carried out for the closure of the mine. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table><tr><td>WPI as on</td><td>March 2022* (Prov.)</td><td>148.8</td></tr><tr><td>WPI as on base data</td><td>01-04-2019*</td><td>121.1</td></tr><tr><td colspan="2">Escalation rate of closure cost</td><td>1.229</td></tr></table> | | | WPI as on | March 2022* (Prov.) | 148.8 | WPI as on base data | 01-04-2019* | 121.1 | Escalation rate of closure cost | | 1.229 | | | | | | | | | | | | | | | | | | | | | | | | |
| | WPI as on | March 2022* (Prov.) | 148.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | WPI as on base data | 01-04-2019* | 121.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Escalation rate of closure cost | | 1.229 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table><tr><td>Particulars</td><td>UG</td><td>OC</td></tr><tr><td>Base Rate of Closure Cost “Rs. (₹) Lakh/Ha”</td><td>1</td><td>9</td></tr><tr><td>Closure cost “₹ Lakh./Ha”</td><td>na</td><td>11.059</td></tr><tr><td>Project Area “Ha”</td><td>na</td><td>808.294</td></tr><tr><td>Amount to be deposited into Escrow Account “₹ in Lakh.</td><td>na</td><td>8938.624</td></tr><tr><td>Amount already deposited into Escrow Account upto 31.03.2022* ₹ in Lakh.</td><td>na</td><td>5211.32</td></tr><tr><td>Net Amount to be deposited into Escrow Account * ₹ in Lakh.</td><td>na</td><td>3727.304</td></tr><tr><td>Rate of compounding of Annual Closure Cost</td><td>na</td><td>5%</td></tr><tr><td>Balance life of the project “in yrs”</td><td>na</td><td>5</td></tr><tr><td>Annual Closure Cost (Base Year-1) (₹ in Lakh)</td><td>na</td><td>745.461</td></tr><tr><td>Amount to be deposited into Escrow Account after compounding at the rate of 5% (₹. In Lakh)</td><td></td><td>4119.142</td></tr></table> | | | Particulars | UG | OC | Base Rate of Closure Cost “Rs. (₹) Lakh/Ha” | 1 | 9 | Closure cost “₹ Lakh./Ha” | na | 11.059 | Project Area “Ha” | na | 808.294 | Amount to be deposited into Escrow Account “₹ in Lakh. | na | 8938.624 | Amount already deposited into Escrow Account upto 31.03.2022* ₹ in Lakh. | na | 5211.32 | Net Amount to be deposited into Escrow Account * ₹ in Lakh. | na | 3727.304 | Rate of compounding of Annual Closure Cost | na | 5% | Balance life of the project “in yrs” | na | 5 | Annual Closure Cost (Base Year-1) (₹ in Lakh) | na | 745.461 | Amount to be deposited into Escrow Account after compounding at the rate of 5% (₹. In Lakh) | | 4119.142 |
| | Particulars | UG | OC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Base Rate of Closure Cost “Rs. (₹) Lakh/Ha” | 1 | 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Closure cost “₹ Lakh./Ha” | na | 11.059 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Project Area “Ha” | na | 808.294 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Amount to be deposited into Escrow Account “₹ in Lakh. | na | 8938.624 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Amount already deposited into Escrow Account upto 31.03.2022* ₹ in Lakh. | na | 5211.32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Net Amount to be deposited into Escrow Account * ₹ in Lakh. | na | 3727.304 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Rate of compounding of Annual Closure Cost | na | 5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Balance life of the project “in yrs” | na | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Annual Closure Cost (Base Year-1) (₹ in Lakh) | na | 745.461 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Amount to be deposited into Escrow Account after compounding at the rate of 5% (₹. In Lakh) | | 4119.142 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <i>*Base date considered is 01.04.2022 and life of the mine considered is 5 years.</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Year | Mine closure cost (₹ in Lakhs) |
|--------|--------------------------------|
| Year-1 | 745.461 |
| Year-2 | 782.734 |
| Year-3 | 821.871 |
| Year-4 | 862.964 |
| Year-5 | 906.112 |
| Total | 4119.142 |

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| 8.11 | <p>FINANCIAL ASSURANCE</p> <ol style="list-style-type: none"> 1. MCL has already opened an Escrow Account in bank with the Coal Controller Organization (on behalf of the Central Government) as exclusive beneficiary & deposited the annual amount as per the earlier approved mine closure plan for last four years. 2. MCL shall cause payments to be deposited in the Escrow Account per year as per the table given above. The amount being deposited will be reviewed with such periodicity as deemed fit by the Coal Controller. 3. Final Mine Closure: The details of the Mining Plan (covering Final Mine Closure Plan envisaging the details of the updated cost estimates for various mine closure activities and the Escrow Account already set up, shall be submitted to the approving authority for approval at least five years before the intended final closure of the mine. 4. Final Mine Closure would be considered to be completed only after acceptance of the third party audit report by the Coal Controller on the compliance of all provisions of a Mine Closure Plan. Any Institute/ Organization/ Agency as may be notified by the government for this purpose may be engaged for Third-Party audit to create a self-sustained ecosystem. Failure of restoration within the specified period may result in forfeiture of Escrow Account created as above. The details of the Final Mine Closure Plan, along with the details of the updated cost estimate for various mine closure activities and escrow account already set up, shall be submitted at the time of approval of the final mine closure plan. 5. Mining is to be carried out in a phased manner, i.e., a continuation of mining activities from one phase to another, indicating the sequence of operations depending on the geo-mining conditions of the mine. Up to 50% of the total deposited amount, including interest accrued in the ESCROW account, may be released after every five years in line with the periodic examination of the Closure Plan as per the latest guidelines of the Ministry of Coal for preparation of Mining plan for the coal & lignite blocks vide F.No.34011/28/2019-CPAM dated 16.12.2019. The amount release should be equal to expenditure incurred on the progressive mine closure in the past five years or 50% whichever is less. The balance amount shall be released to the mine owner/leaseholder at the end of |
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| | <p>the final Mine Closure in compliance with all closure plan provisions. This compliance report should be duly signed by the lessee and certify that said closure of mine complied with all statutory rules, regulations, orders made by the Central or State Government, statutory organisations, court, etc., and certified by the Coal controller.</p> <p>6. An Agreement outlining detailed terms and conditions of operating the Escrow Account shall be executed amongst MCL, Coal Controller, and the concerned bank to give effect to this.</p> |
| 8.12 | <p>RESPONSIBILITIES OF THE MINE OWNERS</p> <ol style="list-style-type: none"> 1. It is the responsibility of MCL to ensure that the protective measures contained in the mine closure plan, including reclamation and rehabilitation works, have been carried out in accordance with the approved mine closure plan and final mine closure plan. 2. MCL shall submit to the Coal Controller a yearly report before 1st July of every year setting forth the extent of protective and rehabilitative works carried out as envisaged in the mine closure plans. 3. The details of the final Mine Closure plan along with the details of the updated cost estimates for various mine closure activities and the Escrow account already set up shall be submitted to the Ministry of Coal for final approval at least five years before the intended final closure of the mine. |
| 8.13 | <p>PROVISIONS OF MINE CLOSURE</p> <ol style="list-style-type: none"> 1. MCL shall be required to obtain a mine closure certificate from Coal Controller to the effect that the protective, reclamation, and rehabilitation works in accordance with the approved mine closure plan/final mine closure plan have been carried out by the mine owner for surrendering the reclaimed land to the State Government concerned. 2. The balance amount at the end of the final Mine Closure may be released to MCL in compliance of all provisions of the Closure Plan duly signed by MCL to the effect that said the closure of mine complied with all statutory rules, regulations, orders made by the Central or State Government, statutory organizations, court, etc. and duly certified by the |

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| | <p>Coal Controller. This will also indicate the estimated extractable coal reserves and actual coal mined out.</p> <p>3. If the Coal Controller has reasonable grounds for believing that the protective, reclamation and rehabilitation measures as envisaged in the approved mine closure plan regarding which financial assurance was given has not been or will not be carried out under the mine closure plan, either fully or partially. The Coal Controller shall give MCL a written notice of his intention to issue the orders for forfeiting the sum assured at least thirty days before the date of the order to be issued after allowing being heard.</p> |
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ANNEXURES

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Mandatory Document Board approval must specify:

- Approvals of Mining Plan form the Board of the company giving undertaking for correctness of data used in preparation of Mining Plan:
- Details of the **Qualified Person (QP)/Accredited Mining Plan Preparing Agency (MPPA)** with certification that the eligibility of Qualified person/Accredited Mining Plan preparing agency has been verified.
- Acceptance of the Mining Plan by the company board with recommendation for approval:
- Undertaking that the mine will be developed as per the approval of the Mining Plan from Ministry of Coal and all other approvals, as required will be obtained from relevant authorities.
- Commitment that entire mining operation will be carried out as per the Statutory provision given under Mines Act 1952, Coal Mine Regulation 2017, EP Act 1986 and FC Act 1980 and wherever specific permission will be required the company will approach the concerned authorities.
- Financial Assurance for implementation.
- Undertaking that the reclamation & rehabilitation work shall be carried out in accordance with the approved Mine Closure Plan and any modification/amendments which may be made in the Mine Closure Plan by Ministry of Coal, from time to time.
- Undertaking that the protective measures contained in the mine closure plan including reclamation and rehabilitation works will be carried out in accordance with the approved mine closure plan and final mine closure plan and undertake to submit a yearly report before 1st July of every year to the Coal Controller setting forth the extent of protective and rehabilitative works carried out as envisaged in the approved mine closure plans (Progressive and Final Closure);
- Undertaking that they will obtain a mine closure certificate from Coal Controller to the effect that the protective, reclamation and rehabilitation works carried out in accordance with the approved mine closure plan/final mine closure plan and will surrender the reclaimed land to the State Government concerned.

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ANNEXURE-II


Mahanadi Coalfields Limited
 A Subsidiary of Coal India Limited
 OFFICE OF THE CHIEF GENERAL MANAGER (C&P)
 AT P.O. JAGANNATHPUR, BURLA
 DIST. KANDHAMAL DIST. - 751001 (ORISSA)
 Phone - 06643 2543888 (C&P) Fax - 2543767

Ref No: MCLHQ/MP&MCP/2022-23

Date: 22.04.2022

SANCTION ORDER

Sub : Approval of Project Report of Bhubaneswar OC (30.0 Mty) at total capital investment of Rs.490.10 crores including Rs 335.68 crores approved by Govt. of India for Bhubaneswar OC (10.0 Mty) to be implemented in both coal & CB (subsidized) variant.

The Project Report of Bhubaneswar OC for an annual coal production of 20.0 Mty with a total capital investment of Rs.490.10 crores including Rs 335.68 crores approved by Govt. of India for Bhubaneswar OC (10.0 Mty) to be implemented in both coal & CB (subsidized) variant has been approved by MCL Board in its 93rd meeting held on 22.12.2021 at Bhubaneswar.

However the above approval is subject to amendment of Articles of Association (AOA) and Enhancement of Delegation of Powers of Board to approve PRs up to Rs 500.00 crores or equal to Net worth of the Company whichever is lower as required on gaining Miniratna status by MCL.

The start date of monitoring of the project will be from the date of issue of the letter. The monthly monitoring report should be sent to this office by 10th of every month for onward submission to C&P, A. Ministry. This is for kind information & necessary action.


 (Sd/-) General Manager (C&P)

Distribution

1. CMD, MCL
2. DGM (C&P), DGP, MCL
3. CVO, MCL
4. Advisor (Project), Govt. of India - With a copy of MCL Board Resolution
5. CGM (PHD) OCL, Kolkata
6. Company Secretary, MCL
7. CGM (C&P) - Extension/Finance/Coal/General Manager, L&R, Paradip, SRF, T.O.
8. CGM, Jagannathpur - With a copy of MCL Board Resolution & PP
9. MD, UMPSIL, Burla, Bhubaneswar
10. Sd/- N. Saha, Sd/- GPRD (Genl), MCL Hqs
11. Sd/- G. K. Mishra, Sd/- Geology, MCL Hqs
12. Bhubaneswar C&P file - Project Sanction file

Sd/- General Manager

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| No. 34Q12/(4)/2011-CPAM Government of India Ministry of Coal <small>(CPAM Section)</small> | |
| New Delhi, the 16 th July, 2013 | |
| To | Shri B.N. Shukla, General Manager (CP&P), Mahanadi Coalfields Limited, P.O. Jagriti Vihar, Burla, Distt.Sambalpur - 768020 (ODISHA). |
| Subject | Approval of Mining Plan for Bhubaneswari Open Cast Project [Normative Capacity 20 MTY [Peak capacity 25 MTY] MCL dated July, 2013. |
| <p>Sir,</p> <p>I am directed to refer to MCL's letter No. MCL/HQRS/GM[CP&P]/13/377 dated 12.07.2013 on the subject mentioned above and to forward herewith 4 copies of Mining Plans for Bhubaneswari Open Cast Project [Normative Capacity 20 MTY [Peak capacity 25 MTY] of MCL dated July, 2013 duly approved and signed by Adviser [Projects], Ministry of Coal.</p> | |
|  [V.S. Bhatnagar] Under Secretary to the Govt. of India. | |
| Encl: As above. | |

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Job No.172202020
MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

Note No. #7

Attachment:Final MP&MCP BBSRI 30MTY.pdf

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**ANNEXURE-III (Cont...)**

No.34012/4/2011-CPAM
Government of India
Ministry of Coal
(CPAM Section)

New Delhi, the 3rd February, 2014.

To
Shri B N Shukla,
General Manager (CP&P)
Mahanadi Coalfields Limited (MCL)
P.O. Jagriti Vihar, Bura,
Distt. Sambalpur - 758020 (Odisha)

| | |
|-----------|--|
| Subject : | Approval of Addendum to Mining Plan of Bhubaneswari Open Cast Project (25 Mty Peak Capacity) of Mahanadi Coalfields Limited. |
|-----------|--|

Sir,

I am directed to refer to MCL's letter No.MCL/HQRS/GM/CP&P/14/1190 dated 01-02-2014 on the subject Mentioned above and to forward herewith 4 copies of Addendum to Mining Plan (Revised Production Schedule - One Page) of Bhubaneswari Open Cast Project (25 Mty Peak Capacity) of Mahanadi Coalfields Limited duly approved and signed by Adviser (Projects), Ministry of Coal.

Encls : as above.


(Sanjit Bhattacharya)
Under Secretary (CPAM)
Tele: 011 2307 3934
Fax: 011 2338 7738

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Job No.172202020
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Note No. #7

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ANNEXURE-III (Cont..)

File No.CPAM-34011/36/2017-CPAM

No.34011/36/2017-CPAM
Government of India
Ministry of CoalShastri Bhawan, New Delhi
Dated: 20th November, 2017

To,

Chairman-Cum-Managing Director
Mahanadi Coalfields Limited,
AT/P.O Jagrui Vihar,
Burla Distt. Sambalpur
Odisha
E-mail: cmd.mcl.cil@coalindia.in

Subject: Approval of Mine Plans and Mine Closure Plans for the following projects of MCL, namely: Basundhara West, Samleswar OCP Expansion, Bhubaneswari OCP, Lakhanpur OC Expansion -reg.

Sir,

I am directed to refer to your letter no. MCL/HQ/MC(P&P)17/972 Dated 12.11.2017 regarding above mentioned subject for approval of the following projects of MCL:

1. Basundhara (West) Expansion OCP (7.00 Mty)(Revision-1), duly approved by MCL Board in its 194th meeting held on 08.09.2017
2. Samleswar OCP Expansion (Phase-IV)(Revision-1) (15.00 Mty), duly approved by MCL Board in its 194th meeting held on 08.09.2017
3. Bhubaneswari OCP (28.00 Mty), duly approved by MCL Board in its 195th meeting held on 07.11.2017
4. Lakhanpur OC Expansion, Ph-II (21.00 Mty), duly approved by MCL Board in its 195th meeting held on 07.11.2017.

The above mentioned projects duly signed and stamped by the competent authority are hereby approved.

Four copies of approved plans of each project are returned herewith this letter.

Enclosures: As above.

Yours Faithfully

Signature valid

Digitally signed by ANANDA

KUMAR MANDAL

Date: 2017.11.20 14:22:59

Reason: Approved

A.K. Mandal
Under Secretary to the Govt. of India
CPAM Section

Copy to: CCO, Kolkata, West Bengal

"PR Approval File"

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ANNEXURE-IV

No.J-11015/280/2013-IA-II(M)pt.
Government of India
Ministry of Environment, Forest and Climate Change
IA-II (Coal Mining) Division

Indira Paryavaran Bhawan,
Jorbagh Road, N Delhi-3
Dated: 16th February, 2018

To,

The Chief General Manager (CP&P)
M/s Mahanadi Coalfields Limited
PO - Jagruti Vihar, Burla,
Sambalpur - 768 020 (Odisha)

E-mail: cgmenvt2014@gmail.com; gmenvt_mcl@yahoo.co.in

Sub: Bhubaneswari Opencast Expansion from 25 MTPA to 28 MTPA in existing ML area of 638.341 ha of M/s Mahanadi Coalfields Ltd. Tehsil Talcher, District Angul (Odisha) - Environmental Clearance - reg.

Sir,

This refers to your letter No.MCL/HQ/Environment/Bhuneswary OCP Expn. Project/17-18/2755 dated 17.11.2017 along with online proposal No. IA/OR/CMIN/71006/2017, dated 23.11.2017 and subsequent letters/email dated 24.11.2017, 27.11.2017, 18.01.2018 and 19.01.2018 on the above-mentioned subject.

2. The proposal is for grant of environmental clearance to the Bhubaneswari Opencast expansion Project from 25 MTPA to 28 MTPA in Mining lease area of 638.341 ha of M/s Mahanadi Coalfield Limited at district Angul (Odisha).

3. The proposal was considered by the Expert Appraisal Committee (EAC) in the Ministry for Thermal & Coal Mining sector in its 22nd meeting held on 27th November, 2017. The details of the project, as per the documents submitted by the project proponent, and also as informed during the meeting, are reported to be as under:-

(i) Earlier, the Environmental Clearance of Bhubaneswari Opencast was accorded by the Ministry vide letter dated 30th November, 2012 for production capacity of 20 MTPA in an area of 808.294 ha. Public Hearing for same was held on 10th February, 2009.

(ii) Further, the project was accorded EC from 20 MTPA to 25 MTPA on 19th February, 2014 under clause 7(ii) of EIA Notification, 2006 in accordance with OM J-11015/30/2004.IA.II(M) dated 19th December, 2012 exempting from fresh public hearing.

(iii) Meanwhile, OM No.J-11015/224/2015-IA.II, dated 15/09/2017, was issued for production capacity expansion up to 40% of PH capacity without Public Hearing with certain conditions. On the basis of the above said OM this proposal has been submitted for grant of EC for expansion of Bhubaneswari opencast coal mine from 25 MTPA to 28 MTPA without public hearing in the existing mine lease area of 638.341 ha.

(iv) To verify the status of compliance of EC conditions for Bhubaneswari opencast expansion project 25 MTPA, the Regional Office of MoEF&CC, Bhubaneswar has carried out Bhubaneswari OCP 25-28 MTPA of MCL280_2013_EC

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ANNEXURE-IV (Cont..)

the site inspection on 31.10.2017. The monitoring report has been forwarded to this Ministry vide their letter No. 101-980/VEPE dated 24.11.2017, which was deliberated in the EAC meeting. The project proponent presented the action taken on each of the observations made by Regional Office during the site visit.

(v) The latitude and longitude of the project are 22° 19' 00" to 22° 19' 30" North and 82° 42' 30" to 82° 44' 30" East respectively.

(vi) Joint Venture: No

(vii) Coal Linkage : Thermal Power Plant & Basket Linkage

(viii) Employment generated / to be generated: Direct employment already provided to 1002 persons further 51 employment are in process.

(ix) Benefits of the project: (a) Improvement in Physical Infrastructure (b) Improvement in Social Infrastructure (c) Increase in employment potential (d) Contribution to the Exchequer (both State and Central Govt.) (v) Post mining enhancement of Green Cover (e) Improvement of Electrical Power Generation and availability of electricity for 24x7 in rural areas (f) Overall economic growth of the country.

(x) The land usage of the project will be as follows:

Pre-Mining:

| | Type of Land | Area (Ha) |
|----|----------------------|----------------|
| a. | Agriculture | 445.030 |
| b. | Forest | 112.521 |
| c. | Waste land | --- |
| d. | Grazing | --- |
| e. | Surface water bodies | --- |
| f. | Others (specify) | 80.790 |
| | Total | 638.341 |

Post- Mining:

| Sl. No. | Category | Land use (In Ha) | | | | | |
|---------|--------------------------|------------------|---------------|------------------------------|--------------|----------------|----------------|
| | | Plant-ation | Water body | Dip side slope and haul road | Undisturbed | Built-up area | Total |
| 1 | Excavation (backfill) | 355.517 | 31.000 | 55.741 | -- | -- | 442.258 |
| 2 | Danger zone for blasting | 83.150 | -- | -- | -- | -- | 83.150 |
| 3 | External OB dumps | 94.000 | -- | -- | -- | -- | 94.000 |
| 4 | Railway siding | 1.600 | -- | -- | -- | 6.400 | 8.000 |
| 5 | Infrastructure | 0.850 | -- | -- | -- | 10.083 | 10.933 |
| 6 | Residential colony | 6.400 | -- | -- | -- | 25.600 | 32.000 |
| 7 | Rehabilitation site | 23.520 | 0.00 | 0.00 | 0.00 | 94.050 | 117.570 |
| | Total | 565.037 | 31.000 | 55.741 | 0.000 | 136.133 | 787.911 |

Bhubaneswari OCP 25-26 MTPA of MCL280_2013_EC

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ANNEXURE-IV (Cont..)

Core area:

| Particulars | Existing | | |
|---|----------------|----------------|-----------------|
| | Forest | Non-Forest | Total |
| Quarry excavation | 105.808 | 336.450 | 442.258 |
| Blasting danger zone (excluding the part of OB dump) | -- | 83.150 | 83.150 |
| OB dumps (external) | -- | 94.000 | 94.000 |
| Railway siding | -- | 8.000 | 8.000 |
| Infrastructure | 6.713 | 4.220 | 10.933 |
| Mine Lease Area | 112.521 | 525.820 | 638.341* |
| Residential Colony | -- | 32.000 | 32.000 |
| Rehabilitation site | -- | 117.570 | 117.570 |
| Outside lease area | -- | 149.57 | 149.57 |
| Total | 112.521 | 675.39 | 787.911 |

*Out of the total Area of the project mining lease area of 658.724 ha, the project was granted EC for 638.341 Ha. Remainder forest land of 20.383 ha, falling in the excavation area, is non-diverted and the diversion proposal for the same is under progress. This Mining Plan is for the mining lease area of 638.341 Ha inclusive of the forest land 112.51 ha for which EC and FC is already granted. The total land area is 787.911 ha, initially.

(xi) The total geological reserve of the block is 741.09 MT. The minable reserve for the proposed project is 233.39 MT (in 638.314 Ha ML Area in Phase-I) & 259.45 MT (in 658.724 Ha ML Area in Phase-I+II) and extractable reserve is 233.39 MT (in 638.314 Ha ML Area in Phase-I) & 259.45 MT (in 658.724 Ha ML Area in Phase-I+II) (As on 01.04.2017). The percentage extraction would be 100 %.

(xii) The coal grade is G-12 TO G-16. The stripping ratio is 0.71 Cum/tonne. The average Gradient is 4.5°. There will be 15 seams with thickness ranging (0.2 m to 40.90 m).

(xiii) The total estimated water requirement is 2423 m³/day.

(xiv) The level of ground water ranges (0.80 m to 10.90 m bgl).

(xv) The Method of mining would be Open cast mining.

(xvi) There is three external OB dump with Quantity of 35.82 Mcum in an area of 94.00 ha with height of 52 meters above the surface level and one internal dump with Quantity of 212.87 Mcum in an area of 355.517 ha with height Up to ground level in major part, 10 m above ground level at some parts

(xvii) The final mine void would be in 31.00 Ha with depth 187.5 m and the total quarry area is 442.258. Backfilled quarry area of 355.517 Ha shall be reclaimed with plantation. A void of 31.00 ha with depth upto 187.5 m which is proposed to be converted into a water body.

(xviii) The life of mine is 9 Years as on 01.04.2017(Phase-I)

(xix) Transportation: Coal transportation from face to pit top: by trucks. surface to siding: by conveyor to silo ; siding to consumer : rail.

(xx) There is R & R involved. There are 1111 PAFs.

(xxi) Total capital cost of the project is Rs. 490.10 Crores. CSR Cost According to New CSR policy, the fund for the CSR should be allocated based on 2% of the average net profit of the Company for the three immediate preceding financial years or Rs. 2.00 per tonne of coal production of previous year whichever is higher. R&R Cost Rs. 31.22 Crores. Environmental Management Cost Rs. 71.41 Cr.

Bhubaneswari OCP 25-28 MTPA of MCL280_2013_EC

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- (xdi) Bangaru Jhor is flowing adjacent (North), Brahmani River is about 6.0 km (East); Nandira Jhor is located at 9.0 km (South), Singada Jhor is about 12.0 km (West).
- (xdi) Ground water clearance : Not applicable.
- (xdi) Mining plan for the 28 MTPA was approved by MCL Board on 07.11.2017 & by MoC vide letter no. 34011/36/2017-CPAM dated 20-11-2017. Mine closure plan is an integral part of mining plan.
- (xdi) There are no national Parks, wildlife sanctuary, biosphere reserves found in the 10 km buffer zone.
- (xdi) Total forest land 112.521 ha in ML area of 638.341 Ha, Status of Forest clearance: Stage-II available vide letter no.8-18/2002-FC dt: 06-12-2004.
- (xdi) Total afforestation plan shall be implemented covering an area of 355.517 ha at the end of mining including green Belt over an area of 83.15 ha. Density of tree plantation 2500 trees/ha of plants.
- (xdi) There are no court cases/violation pending with the project proponent.

4. The Expert Appraisal Committee in its 22nd meeting held on 27th November, 2017, has recommended the proposal for grant of Environmental Clearance. Based on recommendations of the EAC, the Ministry of Environment, Forest and Climate Change hereby accords environmental clearance to Bhubaneswari Opencast Expansion from 25 MTPA to 28 MTPA in existing ML area of 638.341 ha of M/s Mahanadi Coalfields Ltd, Tehsil Talcher, District Angul (Odisha), under the provisions of the Environment Impact Assessment Notification, 2006, read with subsequent amendments/circulars thereto, and subject to compliance of the terms and conditions and environmental safeguards as below:

- (i) Adequate ambient air quality monitoring stations shall be established in consultation with the State Pollution Control Board, and regular monitoring shall be carried out for particulate emissions (both PM₁₀ & PM_{2.5}), SO₂ & NO_x. The monitoring results for the period during summer season (April - June, 2018) shall be submitted to the SPCB and the Regional Office of the Ministry.
- (ii) The EAC shall review the compliance of the action taken on the observations of the Regional Office, before December, 2018 and make its recommendations for continuance of the project thereafter. Also, based on the monitoring results, the Committee shall examine efficacy and adequacy of the proposed control measures and its impact on the ambient air quality.
- (iii) To control the of dust generation at source, the crusher and in-pit belt conveyors shall be provided with mist type sprinklers.
- (iv) Mitigative measures shall be undertaken to control dust and other fugitive emissions all along the roads by providing sufficient numbers of water sprinklers. Adequate corrective measures shall be undertaken to control dust emissions as presented before the Committee, 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 railway siding, etc.
- (v) Thick green belt of 50 m width at the final boundary in the down wind direction of the project site shall be developed to mitigate/check the dust pollution.
- (vi) Persons of nearby villages shall be given training for their livelihood and skill development.
- (vii) To ensure health and welfare of nearby villages, regular medical camps shall be organized at least once in six months.
- (viii) In view of the mining potential of the area and the prevailing environmental concerns, carrying capacity of the eco-system shall be studied through some expert agencies to assess

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ANNEXURE-IV (Cont..)

optimal mining operations in the area with minimal impact on the environmental components.

(ix) The mine is surrounded by large opencast mines operated by M/s MCL and shall have a cascading impact on air pollution. Therefore, a stage wise response plan vis-a-vis varying level of air pollution level be prepared and implemented in the mine during its operation.

(x) A mechanism of inter- project environmental audit shall be devised and implemented with reporting to this ministry along-with half yearly reports.

4.1 The grant of EC is further subject to compliance of the generic conditions as under:

(a) Mining

(i) No change in mining technology and scope of work shall be made without prior approval of the Ministry of Environment, Forest and Climate Change. No change in the calendar plan including excavation, quantum of coal and waste should be made.

(ii) Mining shall be carried out as per the approved mining plan, and also abiding by the relevant laws related to coal mining and the circulars issued by Directorate General Mines Safety (DGMS). An approved progressive Mine Closure Plan shall strictly be complied with and submitted.

(b) Land reclamation

(i) Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment, Forest and Climate Change its Regional Office.

(ii) Final mine void depth should not be more than 40 m. The void area should be converted into water body. The remaining area should be back filled up to the ground level and covered with thick top soil. The land after mining should be restored for agriculture or forestry purpose.

(iii) The top soil, if any, shall temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long. The topsoil shall be used for land reclamation and plantation. The overburden dumps should be vegetated with suitable native species to prevent erosion and surface run off. The entire excavated area shall be backfilled and afforested in line with the approved Mine Closure Plan. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office on six monthly basis.

(iv) Greenbelt shall be developed all along the mine lease area in a phased manner. The width of the green belt along forest area should not be less than 7.5 m, and the total area covered by 3 tier green belt shall not be less than 100 ha. A 3-tier green belt comprising of a mix of native species shall be developed all along the major approach roads.

(c) Emissions, Effluents, and Waste Disposal

(i) Transportation of coal by road should be carried out by covered trucks only. Effective measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of PM₁₀ and PM_{2.5} such as haul road, loading and unloading point and transfer points. Fugitive dust emissions from all the 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 in this regard.

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ANNEXURE-IV (Cont..)

- (ii) Vehicular emissions shall be kept under control and regularly monitored. Project should obtain 'PUC' certificate for all the vehicles from authorized pollution testing centres.
- (iii) Adequate ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for monitoring of pollutants, namely PM₁₀, PM_{2.5}, SO₂ 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 the State Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months.
- (iv) Crusher/feeder and breaker material transfer points should invariably be provided with dust suppression system. Belt-conveyors should be fully covered to avoid air borne dust. Drills shall be wet operated or fitted with dust extractors.
- (v) The project proponent shall not alter the major channels around the site. Appropriate embankment should be provided along the side of the river/nallah flowing near or adjacent to the mine. The embankment constructed along the river/nallah boundary should be of suitable dimensions and critical patches should be strengthened by stone pitching on the river front side and stabilised with plantation so as to withstand the peak water flow and prevent mine inundation.
- (vi) Rainwater harvesting shall be implemented for conservation and augmentation of ground water resources in the area in consultation with Central Ground Water Board.
- (vii) Catch drains and siltation ponds of appropriate size shall be constructed around the mine working, coal heaps and OB dumps to prevent run off of water and flow of sediments directly into the river and other water bodies. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly. Sump capacity should provide adequate retention period to allow proper settling of silt material. Dimension of the retaining wall to be constructed at the toe of the dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data.
- (viii) Industrial waste water (CHP, workshop and waste water from the mine) should be properly collected and treated so as to conform to the standards prescribed under the Environment (Protection) Act, 1986 and the Rules made there under, and as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.
- (d) Noise & Vibration Control
- (i) Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs/muffs.
- (ii) Controlled blasting techniques should be practiced with use of delay detonators to mitigate ground vibrations and fly rocks.
- (e) Occupational Health & Safety
- (i) Besides carrying out regular periodic health check-up of their workers, 20% of the workers identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, through an specialised agency /institution within the District/State and the results reported to this Ministry and to DGMS.

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**ANNEXURE-IV (Cont..)**

- (ii) Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects. Supervisory staff shall be held responsible for ensuring compulsory wearing of dust mask.
- (iii) In case of outsourcing of work through MDO, the project proponent shall ensure the strict enforcement of the above conditions.

(f) Biodiversity

- (i) 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.

(g) Implementation of Action Plan as per Public Hearing and CSR Activities

- (i) Implementation of Action Plan on the issues raised during the Public Hearing shall be ensured. The Project Proponent shall complete all the tasks as per the Action Plan submitted with budgetary provisions during the Public Hearing. Land oustees should be compensated as per the norms laid out R&R Policy of the Company or the National R&R Policy or R&R Policy of the State Government, whichever is higher.
- (ii) The Board of every company, shall ensure that the company spends, in every financial year, at least two per cent. of the average net profits of the company made during the three immediately preceding financial years, in pursuance of its Corporate Social Responsibility Policy under Section 135 of the Companies Act, 2013, for the socio economic development of the neighbourhood.

(h) Corporate Environment Responsibility

- (i) The Company should have a well laid down Environment Policy approved by the Board of Directors.
- (ii) To have proper checks and balances, the Company should have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large.
- (iii) A separate environmental management cell with suitable qualified personnel should be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization.
- (iv) The funds earmarked for environmental protection measures should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office.

(i) Statutory Obligations

- (i) Environmental clearance is granted subject to final outcome of Hon'ble Supreme Court of India, Hon'ble High Court, NGT and any other Court of Law, if any, as applicable to the project.
- (ii) This Environmental Clearance is subject to obtaining requisite NBWL Clearance from the Standing Committee of National Board for Wildlife, if any, as applicable to the project.
- (iii) The project proponent shall obtain Consent to Establish and Consent to Operate from the concerned State Pollution Control Board prior to increase in capacity of washery and effectively implement all the conditions stipulated therein.

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ANNEXURE-IV (Cont..)

(iv) Project Proponent shall obtain the necessary prior permission from the Central Ground Water Authority (CGWA) for drawl of water (surface and ground water).

(j) Monitoring of Project

(i) Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring shall be carried out four times in a year pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the data thus collected may be sent regularly to Ministry of Environment, Forest and Climate Change and its Regional Office, Central Ground Water Authority and Regional Director, Central Ground Water Board.

(ii) The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment, Forest and Climate Change, its Regional Office, Central Pollution Control Board and State Pollution Control Board.

(iii) 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.

(iv) The activities pertaining to development of green belt/horticulture shall be reported to concerned Regional Office of MoEF&CC on six monthly basis from the date of commencement of mining operations.

(v) For half yearly monitoring reports, the data should be monitored for the period of April to September and October to March of the financial years and submitted to the concerned authorities within 2 months of the completion of periodicity of monitoring.

(k) Miscellaneous

(i) A copy of clearance letter will be marked to concerned Panchayat/local NGO, if any, from whom suggestion / representation has been received while processing the proposal.

(ii) An electronic copy of the EC letter shall be marked to the concerned State Pollution Control Board, Regional Office, District Industry Sector and Collector's Office/Tehsildar Office for information in public domain within 30 days.

(iii) The EC letter shall be uploaded on the company's website. The compliance status of the stipulated EC conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same in public domain. The monitoring data of environmental quality parameter (air, water, noise and soil) and critical pollutant such as PM_{10} , $PM_{2.5}$, SO_2 and NO_x (ambient) and critical sectoral parameters shall also be displayed at the entrance of the project premises and mine office and in corporate office and on company's website.

(iv) The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment, Forest and Climate Change at www.environmentclearance.nic.in and a copy of the same should be forwarded to the Regional Office.

(v) The Environmental Statement for each financial year ending 31 March in Form-V is mandated to be submitted by the PP for the concerned State Pollution Control Board as

Bhubaneswari OCP 25-28 MTPA of MCL200_2013_EC

Page 8 of 9

AN -IV, page - 8

Job No.172202020

MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

Note No. #7

Attachment:Final MP&MCP BBSRI 30MTY.pdf

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ANNEXURE-IV (Cont..)

prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on the Company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MoEF&CC by e-mail.

5. The proponent shall abide by all the commitments and recommendations made in the EIA/EMP report and also that during presentation to the EAC. All the commitments made on the issues raised during public hearing shall also be implemented in letter and spirit.

6. The proponent shall obtain all necessary clearances/approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection. The Ministry or any other competent authority may stipulate any further condition for environmental protection.

7. Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

8. The above conditions will 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 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.

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

10. This EC supersedes the earlier EC granted vide letter No. J-11015/280/2013-IA.II (M) dated 19.02.2014 with a capacity 25 MTPA.

(S. K. Srivastava)
Scientist E

Copy to:

1. The Secretary, Ministry of Coal, Shastri Bhawan, New Delhi
2. The APPCF, Regional office (EZ), MoEF&CC, A-31, Chandrasekarpur, Bhubaneswar. 751023 (Odisha)
3. The Secretary, Department of Environment & Forest, Government of Odisha, Secretariat, Bhubaneswar (Odisha)
4. The Member Secretary, Central Ground Water Authority, Ministry of Water Resources, Curzon Road Barracks, A-2, W-3 Kasturba Gandhi Marg, New Delhi
5. The Member Secretary, CPCB, CBD-cum-Office Complex, East Arjun Nagar, Delhi - 32
6. The Member Secretary, Odisha SPCB, Neelakanth Nagar, Unit-VIII, Bhubaneswar
7. The District Collector, Angul, Government of Odisha
8. Monitoring File 9. Guard File 10. Record File 11. Notice Board

(S. K. Srivastava)
Scientist E

Bhubaneswar OCP 25-28 MTPA of MCL280_2013_EC

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Job No.172202020

MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

Note No. #7

Attachment:Final MP&MCP BBSRI 30MTY.pdf

CONSULTANT
cmpdi**ANNEXURE-V**

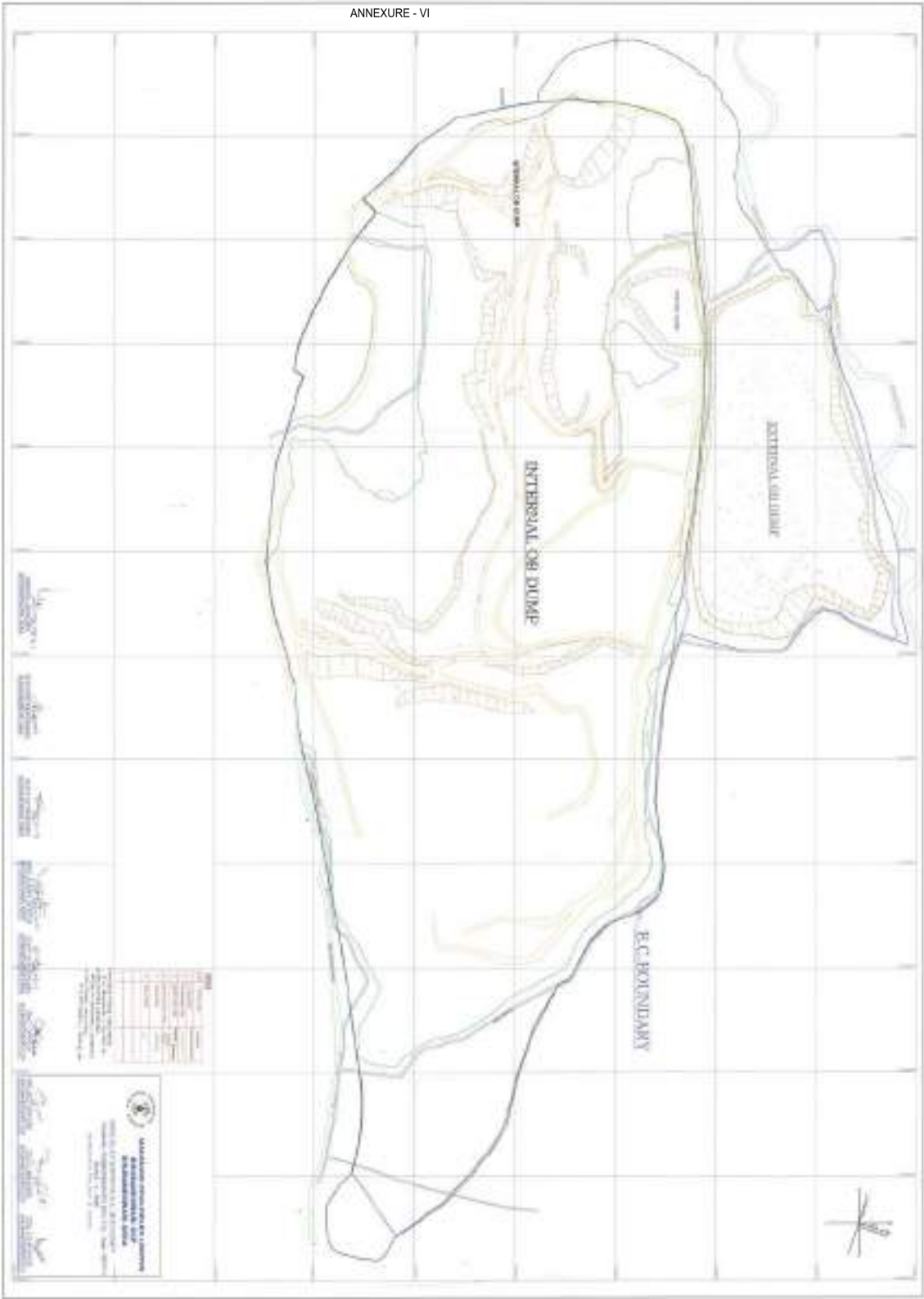
AN-V, Page - 1

Job No.172202020

MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

Note No. #7

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Note No. #7

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BY REGD POST


OFFICE OF THE
STATE POLLUTION CONTROL BOARD, ODISHA
Parivesh Bhawan, A/118, Nilakantha Nagar, Unit-VIII,
Bhubaneswar - 751 012
Ind-II-NOC-5837
Date 24.02.19

No. 2637

OFFICE MEMORANDUM

In consideration of the application for obtaining Consent to Establish for Bhubaneswar OCP of M/s. Mahanadi Coal Fields Ltd., the State Pollution Control Board has been pleased to convey its Consent to Establish under section 25 of Water (Prevention & Control of Pollution) Act, 1974 and section 21 of Air (Prevention & Control of Pollution) Act, 1986 for enhancement of production capacity of Coal from 20.0MTPA to 25.0MTPA, over mine lease hold area of 638.724 ha. (652.724 ha. - 20.383 ha = 638.341 ha.), At-Jagannath Area, Talcher, P.O:- Dera Colliery of Angul District with the following conditions:

GENERAL CONDITIONS:

1. This Consent to establish is valid for the product, method of mining and capacity mentioned in the application form. This order is valid for five years, which means the proponent shall commence mining activities for the proposal within a period of five years from the date of issue of this consent to establish order. If the proponent fails to commence mining activities for the proposal within five years then a renewal of this consent to establish shall be sought by the proponent.
2. Adequate effluent treatment facilities are to be provided such that the quality of sewage and trade effluent satisfies the standards as prescribed under Environment Protection Rule, 1986 or as prescribed by the Central Pollution Control Board and/or State Pollution Control Board or otherwise stipulated in the special conditions.
3. All emission from the mining activities as well as the ambient air quality and noise shall conform to the standards as laid down under Environment (Protection) Act, 1986 or as prescribed by Central Pollution Control Board/State Pollution Control Board or otherwise stipulated in the special conditions.
4. Appropriate method of disposal of solid waste is to be adopted to avoid environmental pollution.
5. The mine shall comply to the provisions of Environment Protection Act, 1986 and the rules made there under with their amendments from time to time such as the Hazardous Waste (Management, Handling & Transboundary Movement) Rules, 2008, Hazardous Chemical Rules (Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 etc. and amendments there under. The mine shall also comply to the provisions of Public Liability Insurance Act, 1991, if applicable.

[1]

(21)

Note No. #7

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ANNEXURE – VII (Cont..)

6. The mine shall apply for grant of Consent to operate under section 25/26 of Water(Prevention & Control of Pollution)Act, 1974 & Air (Prevention & Control of Pollution)Act, 1981 at least 3 (three) months before the commencement of production and obtain Consent to Operate from this Board.
7. This consent to establish is subject to statutory and other clearances from Govt. of Odisha and/or Govt. of India, as and when applicable.

SPECIAL CONDITIONS :

1. The proponent shall comply to the conditions imposed in environmental clearance issued by MoEF. Govt. of India vide letter No. J-11015/280/2013-IA.II (M), dtd. 19.02.2014.
2. The proponent shall carry out mining activity within the existing mining lease area of 638.341 ha. (i.e. total ML area 658.724ha - 20.383ha, for which the proponent has not obtained forest clearance) as per environmental clearance granted by the MoEF, Govt of India vide letter no. J-11015/280/2013-IA.II (M), dtd. 19.02.2014.
3. The mine shall use surface miner instead of sovel dumper for mining activity.
4. Mining operations for the expansion project shall not involve drilling and blasting operations and surface miner shall be used for the mining operation.
5. The roads should be developed with a 3-tier avenue plantation preferably of 20-30m width using native species. The road transportation should be by mechanically covered trucks and not tarpaulin covered trucks, which should be introduced within 9-12 months from the date of issue of this order.
6. The mine shall explore the possibility for back filling of mine voids by fly ash generation from nearby thermal power plant.
7. No change in mining technology and scope of working shall be made without prior approval of the Board.
8. Top soil should be stacked separately with proper slope at earmarked site(s) with adequate measures and shall be used for reclamation and rehabilitation of mined out areas.
9. Back filling of abandoned pit shall be carried out as per approved mining plan. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status in this regard shall be submitted to the Ministry of Environment & Forests with a copy to the Board on yearly basis.
10. Garland drains (size, gradient and length) and sump capacity shall be designed keeping 50% safety margin over and above the peak sudden rain fall and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material.
11. Dimension of the retaining wall at the toe of dumps and OB benches within the mine to check run-off and siltation shall be based on the rainfall data. The detail specification shall be worked out and submitted to the Board.
12. Catch drains of appropriate size should be constructed to divert the run off from the OB dump to the siltation pond of appropriate size to arrest silt and sediment flows from soil, OB and

[2]

Note No. #7

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mineral dumps. Similar arrangement shall be done around the coal stack pile area. The drains should be regularly desilted and maintained properly. Surface run-off from OB dump area, coal pile area, top soil storage area shall be routed through adequate settling pond (designed maximum hourly rain fall basis) to meet prescribed standard of **SS-50 mg/l and Oil & Grease-10 mg/l** before discharge into natural stream/water courses during monsoon.

13. Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells. The monitoring should be done four times a year in pre-monsoon (April/May), monsoon (August), Post – monsoon (November) and winter (January) seasons. Data thus collected should be submitted to the Board quarterly.
14. Sewage Treatment Plant should be installed for the treatment of domestic effluent generated from the colony and mines so as to meet the prescribed standard such as **pH=5.5-9.0, SS=100mg/l, BOD=30mg/l & O&G=10mg/l** and shall be reused for green belt development
15. Wastewater (workshop) shall be properly collected, treated in ETP consists of primary settling tank, O&G trap, flash mixer with chemical dosing and secondary settling tank so as to conform the prescribed standard **pH = 5.5-9.0, SS = 100mg/l, O&G = 10mg/l** or as amended from time to time and reused for washing with make-up water.
16. Mine drainage water, shall be treated properly in adequate size of settling tanks with coagulation and chemical dosing facilities. The mine shall explore to reuse it for dust suppression, green belt and vehicle washing. Balance treated mine drainage water shall be discharged to sewer or land or stream then the effluent shall confirm to standard prescribed by the Board i.e. **pH =5.5 to 9.0, total SS = 100mg/l, O&G = 10mg/l**. and other parameters conforming to standards for discharge to inland surface water as prescribed under EP Act, 1986.
17. Rain water harvesting practice shall be followed by utilizing the rain water collected from the roof of the buildings for recharging of ground water within the premises and other large structures as per the concept and practices prescribed by CPCB, New Delhi and details of which is available in the web site.
18. The mine shall take adequate preventive measures for spontaneous fire in the coal seam as well as stock yard and an action plan regarding this shall be submitted at the time of consent to operate application.
19. **Crushers at the CHP** of adequate capacity for the expansion project shall be operated with high efficiency bag filters. Water sprinkling systems shall be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points etc.
20. **Provision of movable chutes shall be made during loading at CHP to avoid free fall of coal.**
21. Water sprinkling shall be carried out on unplanted surface of OB dump to control fugitive emission.
22. Drilling shall be avoided to the maximum possible extent. However, drill should be wet operated or with dust extractors and controlled blasting should be practiced.
23. The mine shall provide water or water mixed chemicals for dust suppression at all strategic points such as coal stack yards, loading and unloading points, all transfer points, conveyors etc. to suppress dust fine atomizer nozzles arrangement shall be provided on the coal heaps

[3]

Note No. #7

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ANNEXURE – VII (Cont..)

and on land around the crusher / pulverizes. As far as possible conveyors and transfer points etc. shall be provided with enclosures.

24. **Four ambient air quality monitoring stations** for 24 hours operation should be established in the core zone as well as in the buffer zone for PM₁₀, PM_{2.5}, SO₂, NO_x, and CO monitoring. Location of the stations should be decided based on the metrological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board.
25. Data on ambient air quality (PM₁₀, PM_{2.5}, SO₂, NO_x and CO) shall be regularly submitted to the State Pollution Control Board once in six months.
26. The mine has to comply the following standard at the loading or unloading, haul road, coal transportation road, coal handling plant(CHP), overburden dumps or any other dust generating external sources as per the Rule2(1) of the Environmental Amendment Rules, 2000 notified vide notification G.S.R. 742(E), dated 25.09.2000.

| Pollutant | Time weighted average | Concentration in Ambient Air | Method of Measurement |
|---------------------------|-----------------------|------------------------------|---|
| 1 | 2 | 3 | 4 |
| SPM | Annual Average* | 360µg/m ³ | High volume sampling (Average flow rate not less than 1.1m ³ /min) |
| | 24 hours** | 500µg/m ³ | |
| RPM(size less than 10 µm) | Annual Average* | 180µg/m ³ | Respirable Particulate matter sampling and analysis |
| | 24 hours** | 250µg/m ³ | |
| SO ₂ | Annual Average* | 80µg/m ³ | Improved west and Gaeke method Ultraviolet fluorescence |
| | 24 hours** | 120µg/m ³ | |
| NO ₂ | Annual Average* | 80µg/m ³ | Jacob & Hochheiser Modified (Na-Arsenic) Method Gas phase Chemiluminescence |
| | 24 hours** | 120µg/m ³ | |

* Annual Arithmetic mean for the measurements taken in a year, following the guidelines for frequency of sampling laid down in clause2.

**24 hourly/ 8 hourly values shall be met 92% of the time in a year. However, 80% of the time may exceed but not on two consecutive days.

27. The haul roads and arterial roads shall be made black topped / concrete with avenue plantation.
28. A green belt of adequate width and density preferably with local species along the periphery of the mine, inactive dumps, backfilled area, vacant area, colony and any other vacant area shall be raised so as to provide protection against particulates and noise to ameliorate the environment. A detailed plantation programme in this regard shall be prepared and submitted at the time of making application for consent to operate for assessment.


[4]

Note No. #7

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CONSULTANT
cmpdi**ANNEXURE – VII (Cont..)**

29. Adequate measures shall be taken for control of noise levels below 85 dB (A) in the work environment.
30. Environmental laboratory should be established with adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board.
31. A separate environmental management cell with suitable qualified personnel should be set up under the control of a Senior Executive, who will report directly to the Head of the organization.
32. All efforts shall be taken to protect the existing water bodies in the surrounding. A definite plan in this regard shall be submitted to the Board within 06 months from the date of issue of this order.
33. The Board may impose further condition or modify the conditions stipulated in this order during installation, and / or at the time of obtaining consent to operate and may revoke this clearance in case the stipulated conditions are not implemented and / or any information suppressed in the application form.
34. The above conditions will 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 and the Public Liability Insurance Act, 1991 along with their amendments and rules.


MEMBER SECRETARY

To,

Mr. Sahab Singh, Project Officer,
Bhubaneswari OCP of M/s. Mahanadi Coal Fields Ltd.,
At/Po- Dera, Tahasil- Talcher,
Dist- Angul-759103,
Odisha.

Memo No. _____/Dt. _____/

Copy forwarded to:

1. The Secretary Steels & Mines, Govt. of Odisha, Bhubaneswar.
2. The District Magistrate & Collector, Angul.
3. The Director, Directorate of Mines, Govt. of Odisha, Bhubaneswar.
4. The Deputy Director of Mines, Talcher.
5. The Regional Officer, SPC Board, Angul.
6. The DFO, Angul.
7. Copy to HSM Cell, SPC Board, Bhubaneswar.
8. Consent to operate section, SPC Board, Bhubaneswar.
9. Copy to Guard file.


SR. ENV. ENGINEER (N)



[5]

Note No. #7

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ANNEXURE-VII (A)

OFFICE OF THE
STATE POLLUTION CONTROL BOARD, ODISHA
 Parivesh Bhawan, A/118, Nilakantha Nagar, Unit-VIII,
 Bhubaneswar - 751 012

FAX: 2551821/2550955
 TEL: 2554831/2541828
 BPARS: 2551804/2543847
 E-mail: bsbbsri@odisha.nic.in
 Web site: www.spcbboard.org

No. 2585 / IND-B-NOC - 6139 Date 06-03-2018

OFFICE MEMORANDUM

In consideration of the online application no. 1894816 for obtaining Consent to Establish for Bhubaneswari OCP of M/s Mahanadi Coalfields Ltd., the State Pollution Control Board is pleased to convey its Consent to Establish under section 25 of Water (Prevention & Control of Pollution) Act, 1974 and section 21 of Air (Prevention & Control of Pollution) Act, 1981 for enhancement of production of coal from 25.00 MTPA to 28.00 MTPA over existing mining lease hold area of 638.341 ha. (as per land requirement breakup enclosed as Annexure-I), At-Jagannath Ama, Talcher, P.O:- Dara Colliery in the district of Angul with the following conditions.

GENERAL CONDITIONS:

1. This Consent to establish is valid for the product, method of mining and capacity mentioned in the application form. This order is valid for five years. The proponent shall commence mining activities for the proposal within a period of five years from the date of issue of this consent to establish order. If the proponent fails to commence mining activities for the proposal within five years then a renewal of this consent to establish shall be sought by the proponent.
2. The mine shall apply for grant of Consent to operate under section 25/26 of Water(Prevention & Control of Pollution) Act, 1974 & Air (Prevention & Control of Pollution) Act, 1981 at least 3 (three) months before the commencement of production and obtain Consent to Operate from this Board.
3. This consent to establish is subject to statutory and other clearances from Govt. of Odisha and/or Govt. of India, as and when applicable.

SPECIAL CONDITIONS:

A. GENERAL CONDITIONS:

1. The proponent shall comply to the conditions imposed in environmental clearance issued vide letter no. J-11015/200/2013-3A, B/M/pt. dated 16.02.2018.
4. The mine should not store for more than seven days of coal production to avoid coal fire in stock yard as well as coal seam. The mine shall take adequate preventive measures for spontaneous fire in the coal seam as well as stock yard and an action plan regarding this shall be submitted at the time of consent to operate application.
5. The method of mining shall be opencast mining by shovel-dumper in overburden and surface miner, loader and tipper in coal. No change in mining technology and scope of working shall be made without prior approval of the Board.

Page 1 of 1

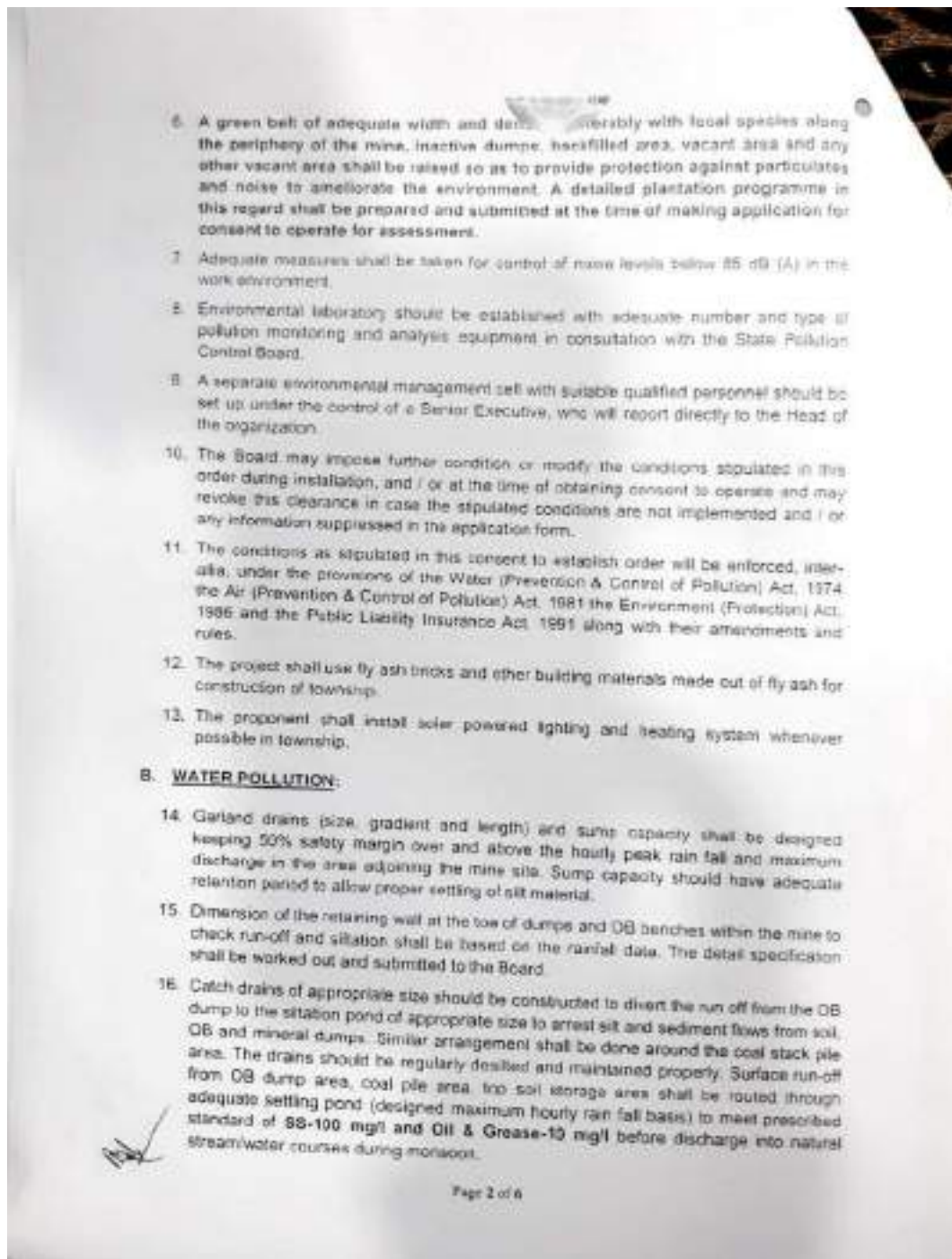
AN-VII(A), page - 1

Job No.172202020

MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

Note No. #7

Attachment:Final MP&MCP BBSRI 30MTY.pdf

CONSULTANT
cmpdi**ANNEXURE-VII (A) (Cont..)**

AN-VII(A), page - 2

Job No.172202020

MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

Note No. #7

Attachment:Final MP&MCP BBSRI 30MTY.pdf

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ANNEXURE-VII (A) (Cont..)

17. Regular monitoring of ground water quality should be carried out by establishing a network of existing wells. The monitoring should be done four times a year in pre-monsoon (April/May), monsoon (August), Post-monsoon (November) and winter (January) seasons. Data thus collected should be submitted to the Board quarterly.

18. The domestic wastewater generated from the township will be treated in sewage treatment plant. The treated water shall be reused for gardening and plantation and the surplus water if any shall be discharged to outside after meeting the following prescribed standards as notified by the MoEF&CC, Govt. of India vide G.S.R. 1265 (E), dated 13.10.2017.

| Sl. No. | Parameters | Standards |
|---------|----------------------------|-----------|
| 1. | pH | 6.5-9.0 |
| 2. | BOD(mg/l) | 30 |
| 3. | TSS(mg/l) | <100 |
| 4. | Fecal Coliform (MPN/100ml) | <1000 |

19. Oil and grease trap shall be installed before discharge of effluent from workshop. Wastewater from the mine pit, check dams or any other discharge leaving lease boundary of the mine should be properly collected, treated so as to conform the following standard i.e. pH = 5.5 - 9.0, SS = 100 mg/l, COD = 250 mg/l & Oil & Grease = 10 mg/l.

20. Rain water harvesting practice shall be followed by utilizing the rain water collected from the roof of the buildings for recharging of ground water within the premises and other large structures as per the concept and practices prescribed by CPCB, New Delhi and details of which is available in the web site.

C. AIR POLLUTION:

21. High efficiency bag filters shall be installed at crushers of the Coal Handling Plant. Water sprinkling systems shall be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points etc. Provision of movable chutes shall be made during loading at CHP to avoid free fall of coal.

22. Water sprinkling shall be carried out on unplanted surface of OB dump to control fugitive emission.

23. Drilling shall be avoided to the maximum possible extent. However, drill should be well operated or with dust extractors and controlled blasting should be practiced.

24. The mine shall provide water or water mixed chemicals for dust suppression at all strategic points such as coal stock yards, loading and unloading points, all transfer points, conveyors etc. to suppress dust fine atomizer nozzles arrangement shall be provided on the coal heaps and on land around the crusher / pulverizers. As far as possible conveyors and transfer points etc. shall be provided with enclosures.

25. Four (4) ambient air quality monitoring stations for 24 hours operation should be established in the core zone as well as in the buffer zone for PM₁₀, PM_{2.5}, SO₂, NO_x and CO monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board.

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Job No.172202020

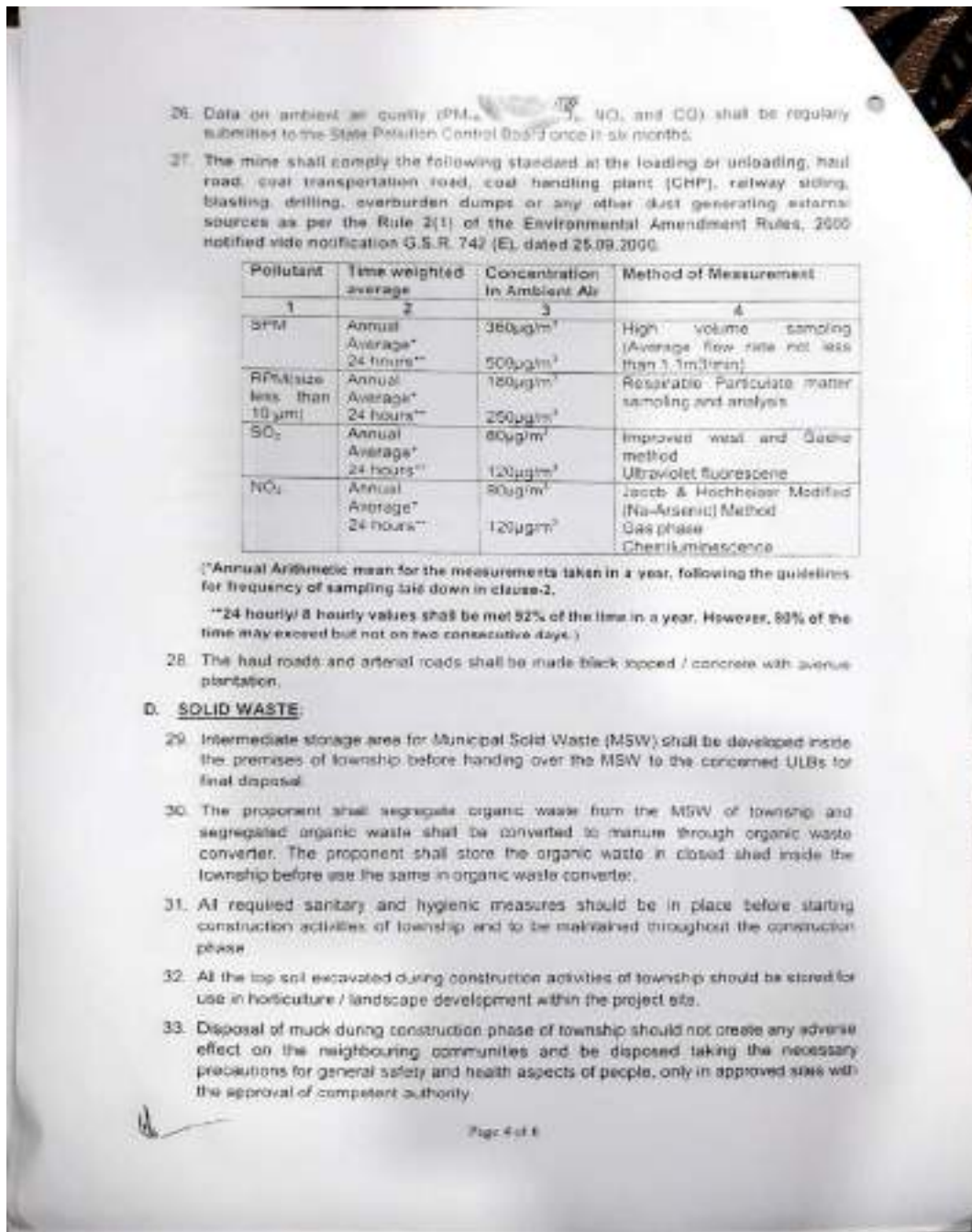
MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

Note No. #7

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ANNEXURE-VII (A) (Cont..)



AN-VII(A), page - 4

Job No.172202020

MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

Note No. #7

Attachment:Final MP&MCP BBSRI 30MTY.pdf

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ANNEXURE-VII (A) (Cont..)

34. The proponent shall comply the provisions of Construction & Demolition Waste Management Rules, 2016.

35. Construction spoils of township, including bituminous material and other hazardous materials, must not be allowed to contaminate watercourses and the dump sites for such material must be secured so that they should not leach into the ground water.

36. The Project proponent shall dispose off hazardous waste materials such as tarry products, lead containing products, paints & pigments residues, broken fluorescent and mercury lamps during construction and operational phase as per Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016 as amended from time to time.

37. Municipal solid waste generated from the township shall be disposed off as per Solid Waste Management Rules, 2016.

38. Top soil of mining area shall be stacked separately with proper slope at earmarked site (s) with adequate measures and shall be used for reclamation and rehabilitation of mined out areas.

39. Back filling of abandoned pit shall be carried out as per approved mining plan. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status in this regard shall be submitted to the Board on yearly basis. The mine shall explore the possibility for back filling of mine voids by fly ash generation from nearby thermal power plant.

To, **MEMBER SECRETARY**

Mr. P. B. Reddy, Project Officer,
Bhubaneswari OCP of M/s Mahanadi Coal Fields Ltd.,
Jagannath Area, Talcher, P.O. Dera Colliery,
Dist- Angul, Odisha.

Memo No. 2396 Dt. 06.03.2018

Copy forwarded to:

1. The Secretary Steels & Mines, Govt. of Odisha, Bhubaneswar
2. The Collector & District Magistrate, Angul
3. The Director, Directorate of Mines, Govt. of Odisha, Bhubaneswar
4. The Regional Officer, SPC Board, Angul
5. The DFO, Angul
6. Copy to HSM Cell, SPC Board, Bhubaneswar
7. Consent to Operate Section, SPC Board, Bhubaneswar
8. Copy to Guard file

Sr. ENV. SCIENTIST, L-1 (N)

AN-VII(A), page - 5

Job No.172202020

MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

Note No. #7

Attachment:Final MP&MCP BBSRI 30MTY.pdf

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cmpdi



ANNEXURE-VII (A) (Cont..)

Annexure-I

Land Requirement Break-up (In Ha.) for Bhubaneswari OCP of M/s Mahanadi Coalfields Ltd.

| Particulars | Forest | Non- Forest | Total |
|--|----------------|----------------|-----------------|
| Quarry excavation | 105.808 | 335.450 | 441.258 |
| Blasting danger zone (excluding the part of OS dump) | --- | 83.150 | 83.150 |
| OS dumps (external) | --- | 94.000 | 94.000 |
| Railway siding | --- | 8.000 | 8.000 |
| Infrastructure | 6.713 | 4.226 | 10.933 |
| Mine Lease Area | 112.521 | 525.820 | 638.341* |
| Residential Colony | --- | 32.000 | 32.000 |
| Rehabilitation site | --- | 117.670 | 117.670 |
| Outside lease area | --- | 149.57 | 149.57 |
| Total | 112.521 | 875.39 | 787.911 |

AN-VII(A), page - 6

Job No.172202020

MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

Note No. #7

Attachment: Final MP&MCP BBSRI 30MTY.pdf

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cmpdi

ANNEXURE-VIII

F.No.8-18/2002-FC
Government of India
Ministry of Environment & Forests
(FC Division)

Paryavaran Bhawan, UGO Complex,
Laxmi Road, New Delhi-110003
Dated the 16th October, 2002

To
The Secretary (Forests),
Government of Orissa,
Bhubaneswar.

Sub: Diversion of 132.904 ha. of forest land in Talcher Coalfields of Angul District in favour of Bhubaneswari OCP of Mahanadi Coalfields Ltd., Orissa.

Sir,

I am directed to refer your letter No.10F(Cons)-128/01/2347/F&E dated: 5-2-2002 on the above-mentioned subject seeking prior approval of the Central Government under Section-2 of the Forest (Conservation) Act, 1980.

After careful examination of the proposal of the State Government, the Central Government hereby agrees in-principle for diversion of 112.521 ha. of forest land in Talcher Coalfields of Angul District in favour of Bhubaneswari OCP of Mahanadi Coalfields Ltd., Orissa, subject to fulfillment of following conditions:

1. The User Agency shall transfer the cost of raising and maintaining the compensatory afforestation over degraded forest land area double in extent i.e.225.042 ha., to the State Forest Department.
2. The cost of biological reclamation and afforestation shall be deposited with the State Forest Department by the User Agency.
3. The User Agency shall prepare a plan for habitat improvement of the surrounding areas for next 5(five) years at the project cost in consultation with the State Forest Department.
4. The rehabilitation plan shall be immediately implemented under the supervision of the State Government and the Regional Office, Bhubaneswar.

After receipt of compliance report on the fulfillment of the conditions (1), (2) & (3) and progress report on condition (4) from the State Government, formal approval will be issued in this regard under Section 2 of the Forest (Conservation) Act, 1980.

Yours faithfully,

(Anurag Bajpai)
Asstt. Inspector General of Forests (FC)

Copy to:

1. The Principal Chief Conservator of Forests, Government of Orissa, Bhubaneswar.
2. The Nodal Officer, Forest Department, Government of Orissa, Bhubaneswar.
3. The Chief Conservator of Forests (Central), Regional Office, Bhubaneswar.
- ✓ 4. User Agency.
5. Guard File.

(Anurag Bajpai)
Asstt. Inspector General of Forests (FC)

AN-VIII, page - 1

Job No.172202020

MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

Note No. #7

Attachment:Final MP&MCP BBSRI 30MTY.pdf

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ANNEXURE-VIII (Cont..)

AVPO, Jagati Vihar, 1
Sagarbalpur-768020, Orissa

Conversion of 132,904 ha of forest land in Talcher Coalfields of Angul District in
of Bhubaneswar OCP of Mahanadi Coalfields Ltd., Orissa.

Kindly refer to your A.O. letter no. MCL/HQ/SBP/CF/04/03 dated 4th January
on the above mentioned subject. In this regard, I am directed to inform you that
request for modification of condition No.2 has been examined by the Central
Committee and it does not stand merit for consideration.

It is, therefore, requested that the user agency may be asked to deposit the whole
amount with the State Government at the earliest and the State Government will deposit
the same with Compensatory Afforestation Management and Planning Agency
(CAMP).

Yours faithfully,

(Anurag Bajpai)
Asstt. Inspector General of Forests

10:

1. The Principal Secretary (Forests), Government of Orissa, Bhubaneswar.
2. The Principal Chief Conservator of Forests, Government of Orissa,
Bhubaneswar.
3. The Nodal Officer, Forest Department, Government of Orissa,
Bhubaneswar.
4. The Chief Conservator of Forests (Central), Regional Office,
Bhubaneswar.
5. User Agency.
6. Guard File.

(Anurag Bajpai)
Asstt. Inspector General of Forests

AN-VIII, page - 2

Job No.172202020

MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

Note No. #7

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F.No.8-18/2002-FC

Government of India

Ministry of Environment & Forests
(FC Division)Paryavaran Bhawan, CGO Complex,
Lodi Road, New Delhi-110003
Dated the 6th December 2004To
The Secretary (Forests),
Government of Orissa,
Bhubaneswar.Sub: Diversion of 132.904 ha. (approved area 112.521 ha). of forest land in
Talcher Coalfields of Angul District in favour of Bhubaneswari OCP of
Mahanadi Coalfields Ltd., Orissa.

Sir,

I am directed to refer to your letter No. 10F(Cons)-128/01/2347/F&E dated: 5-2-2002 on the above mentioned subject seeking prior approval of the Central Govt. under Section-2 of Forest (Conservation) Act, 1980 and to say that the proposal has been examined by the Advisory Committee constituted by the Central Government under Section 3 of the aforesaid Act.

After careful consideration of the proposal of the State Government and on the basis of the recommendation of the above mentioned Advisory Committee, the Central Government hereby, conveys its approval under Section-2 of Forest (Conservation) Act, 1980 for diversion of 112.521 ha. of forest land in Talcher Coalfields of Angul District in favour of Bhubaneswari OCP of Mahanadi Coalfields Ltd., Orissa, subject to the fulfilment of the following conditions:

1. Legal status of forest land shall remain unchanged.
2. Compensatory afforestation shall be raised and maintained by the State Forest Department over degraded forest area double in extent, at the project cost.
3. Safety zone shall be regenerated and protected and plantations shall be raised and maintained over degraded forest lands elsewhere, over an area one and half times of the extent of the safety zone, by the State Forest Department, at the project cost.
4. Biological reclamation and afforestation shall be done by the State Forest Department at the project cost.
5. Habitat improvement plan for the surrounding areas shall be implemented by the State Forest Department at the project cost.
6. The State Government shall maintain the above-mentioned funds in the form of Fixed Deposits in the name of concerned DFO/ Nodal Officer of the State, in a nationalized bank, till such time the Compensatory Afforestation Fund

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Job No.172202020

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**ANNEXURE-VIII (Cont..)**

Management and Planning Authority (CAMP) intimates the head of account for transfer/deposition of funds.

7. Demarcation of the area will be done on ground at project cost using four feet high RCC pillars. The pillars shall indicate serial numbers, forward and back bearings and distance between adjacent pillars.
8. The user agency shall protect the top soil at the project cost.
9. Concurrent Reclamation plan shall be executed by the user agency from the very first year and an annual report shall be sent to the Nodal Officer and the Regional CCF, Bhubaneswar. If it is found from the Annual report that the annual programme mentioned in Concurrent Reclamation Plan is not being adhered to by the user agency, the mining activities shall remain suspended till such time the annual programme is completed for that year.
10. Trees shall be felled only when it becomes necessary and under strict supervision of State Forest Department.
11. The user agency shall protect the top soil at the project cost.
12. No labour camps shall be established on the forest land.
13. Sufficient firewood shall be provided by the User Agency to the labourers at the project cost after purchase from the State Forest Department/Forest Development Corporation.
14. Mining shall be done as per the approved mining plan.
15. The User Agency shall ensure that there is no damage to the available wildlife.
16. The forest land shall not be used for any purpose other than that specified in the proposal.
17. The lease period shall be co-terminus with the current lease granted under MMRD Act, 1957.
18. Rehabilitation Plan shall be adhered to by the user agency/State Government.
19. Any other condition that the State Government as well as CCF (Central) Regional Office, Bhubaneswar, may impose from time to time for the protection and improvement of flora and fauna in the forest area.

Yours faithfully

(Anurag Bajpai)
Asstt. Inspector General of Forest

Copy to:

1. The Principal Chief Conservator of Forests, Government of Orissa, Bhubaneswar.
2. The Nodal Officer, Forest Department, Government of Orissa, Bhubaneswar.
3. The Chief Conservator of Forests (Central), Regional Office, Bhubaneswar.
4. User Agency.
5. Monitoring Cell of FC Division
6. Guard File.

(Anurag Bajpai)
Asstt. Inspector General of Forest

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Job No.172202020

MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

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ANNEXURE-IX

No. G-11015/45/96-IA 11(M)
Government of India
Ministry of Environment & Forests

Paryavaran Bhawan,
C.G.O. Complex, Lodi Road,
New Delhi-110 003

Dated the 6th June 2022.

To
Director (Technical),
Mahanadi Coalfields Ltd.,
At P.O.-Jagati Vihar, Borda,
District Sundergarh,
ORISSA- 768 020.

Subject: Bhubaneswari opencast coal mine (30.0 Mty) of M/s Mahanadi Coalfields Ltd. located at Village(s) Nakulbaspur, Ambaininca, Balugaon-Khamar, Kandhar, Anadour, Hamsamul, Jinda, Narahapur, Longjoda, Madanmohanpur, Alhadnagar (Uninhabited), Bira, Ramchandrapur, and Khandulbahi, Tehsil Talcher, District Angul of Orissa - Environmental Clearance - req.

Sir,

This has reference to the Ministry of Coal's letters No. 43011/45/91-CPL dated 24.12.1993, 25.03.1996, and 17.11.1990 and MCL's letters dated 27.02.1996, 28.10.1998, 07.09.1999, 27.10.1999, 10.03.2000, 05.09.2000, 28.02.2001, 01.09.2001, 09.04.2002, 04.05.2002, 13.07.2002, 21.08.2002, 24.08.2002, 28.01.2003, 04.03.2003 and 25.04.2003 on the subject mentioned above. The Ministry of Environment & Forests has examined the application. It has been noted that the total land requirement for the project is 998.294 ha, out of which 675.390 ha is non-forestland and 322.904 ha is forestland. After deducting 32.0 ha area for residential colony and 117.37 ha residential site, the total lease area comes 663.724 ha of which 525.62 ha is non-forestland and 132.504 ha forestland. Out of the 132.904 ha forestland, stage-I forestry clearance had been accorded for 112.521 ha (up to 25th years of mine operation), therefore environmental clearance is restricted to 635.341 ha area only. Township is outside the mine lease area, about 5-km from the mine site comprising an area of 32 ha. Annual production capacity of the mine is 30.0 million tonnes. Working will be opencast by mechanised, loaded using shovel dumper combination. The project involves displacement of 1072 families comprising population of 4657 people from three villages namely Hamsamul, Jinda. The R&R will be followed as per the norms of the State Government of Orissa and LIL. It has been mentioned that about 19045 m³/day of OB will be generated. Backfilling of OB will start from the 5th year of the production and continue till the end of mine life. Total water requirement for the project on-avg is 2770 m³/day out of which 970 m³/day will be met from Bramhani River through integrated Water Supply Scheme and the

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Annexure-IX (Contd.)

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remaining 1800 m³/day will be met from accumulated water in the huge mine voids from different underground mines of Talcher Coalfield. Consent to Establish from the Orissa State Pollution Control Board has been obtained on 22.04.2000. The Ministry of Coal has given its approval to the project report on 21.04.2002. Capital cost of the project is Rs. 762.61 crores.

2. The Ministry of Environment and Forests hereby accords environmental clearance to the above mentioned mechanised opencast coal mine of M/s Mahanadi Coalfields Limited for 10.0 million TPA production involving lease area of 638.341 ha only under the provisions of the Environment Impact Assessment Notification, 1984 as amended on 04.05.1997 and 10.04.1997 subject to the compliance of the terms and conditions mentioned below:

A. Specific conditions

- (i) Top soil should be stacked with proper slope at earmarked site(s) and adequate measures should be used for reclamation and rehabilitation of mined out area.
- (ii) OB dumps should be stacked at earmarked dump site(s) only and should not be kept active for long period. The total height of the dumps should not exceed 90m, each stage should preferably be of 15m but should not exceed 20m. Overall slope of the dump should not exceed 28°. Concurrent back-filling should be started from the fifth year of operation. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forests on yearly basis.
- (iii) Catch drains, and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected should be utilised for watering the mine area roads, green belt development etc. The drains should be regularly desludged and maintained properly.

Garland drains (size, gradient and length) and sump capacity should be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material.

- (iv) Dimension of the retaining wall at the toe of dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data.

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Annexure-IX (Contd.)

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- (v) A detailed mine decommissioning plan should be submitted to the Ministry of Environment and forests 5 years in advance of closure for approval.
- (vi) A green belt of adequate width should be raised by planting the native species around the ML area, coal handling plant, roads, OB dump sites, etc., in consultation with the local DFO/Agriculture Department. The density of the tree should be around 2500 plants per ha.
- (vii) Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new piezometers. The monitoring should be done four times a year in pre-monsoon (April/May), monsoon (August), post-monsoon (November) and winter (January) seasons. Data thus collected should be submitted to the Ministry of Environment & Forests and Central Ground water Board quarterly.
- (viii) Coal handling plant (CHP) should be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.
- (ix) Drill should be wet operated or with dust extractors and Controlled blasting should be practiced.
- (x) Project authority should undertake sample survey to generate data on pre-project community health status within a radius of 1 km from proposed mine.
- (xi) Coal Drills should be operated with dust extracted or should be wet operated.
- (xii) A comprehensive R&R plan should be submitted to the Ministry as per the final package finalized in consultation with the State Government for rehabilitation of project effected families within 3 months.
- (xiii) Digital processing of the entire lease area using remote sensing technique should be done regularly once in three years for monitoring land use pattern and report submitted to MOEF and its Regional Office.
- (xiv) Before commencing the work, the proponent should obtain the sanction of the power and water from the concerned authorities and submit the same to the Ministry.
- (xv) Sewage Treatment Plant should be installed for the colony. ETP should also be provided for workshop and CHP waste water.

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Annexure-IX (Contd.)

B. General Conditions

- (i) No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment and Forests.
- (ii) No change in the calendar plan including excavation, quantum of mineral coal and waste should be made.
- (iii) Five ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for R_{PM}, SPM, SO₂, NO_x and CO monitoring. Location of the stations should be decided based on the meteorological data, geographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board.

Data on ambient air quality (R_{PM}, SPM, SO₂, NO_x and CO) should be regularly submitted to the Ministry including its Regional Office at Bhubaneswar and to the State Pollution Control Board/Central Pollution Control Board once in six months.
- (iv) Fugitive dust emissions from all the sources should be controlled regularly monitored and data recorded properly. Water spraying arrangements on haul roads, wagon loading, dump trucks (loading & unloading) should be provided and properly maintained.
- (v) Adequate measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operations of HEMM, etc., should be provided with ear plugs/muffs.
- (vi) Industrial waste water (workshop and waste water from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422(F) dated 19th May 1993 and 31st December 1993 or-as amended from time to time. Oil and grease trap should be installed before discharge of effluents from workshop.
- (vii) Acid mine water, if any has to be treated and disposed of after conforming to the standard prescribed by the competent authority.
- (viii) Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.

Occupational health surveillance programme of the workers should be undertaken periodically to observe any contractions due to exposure to coal dust and take corrective measures, if needed.

Note No. #7

Attachment:Final MP&MCP BBSRI 30MTY.pdf

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Annexure-IX (Contd.)

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- (ix) Environmental laboratory should be established with adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board.
 - (xi) A separate environmental management cell with suitable qualified personnel should be set up under the control of a person or Board/Committee who will report directly to the Head of the Organisation.
 - (xii) The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year-wise expenditure should be reported to the Ministry and its Regional Office located at Bhubaneswar.
 - (xiii) The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The Project authorities should extend full cooperation to the officer(s) of the Regional Office by furnishing requisite data/information/monitoring reports.
 - (xiii) A copy of the clearance letter will be marked to the concerned Panchayat /local NGO, if any, from whom any suggestions/representation has been received while processing the proposal.
 - (xiv) The project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.
 - (xv) State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Centre and Collector's/Tehsildar's Office for 30 days.
 - (xvi) The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and may also be seen at web site of the Ministry of Environment and Forests at <http://envfor.mca.gov> and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubaneswar.
3. The Ministry or any other competent authority may stipulate any further condition for environmental protection.
4. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance.

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**ANNEXURE - X**

No. J-11015/280/2013-IA.II (M)
Government of India
Ministry of Environment & Forests

Paryavans Bhawan,
CGO Complex, Lodi Road,
New Delhi-110003
Dated: 19th February, 2014

To,

Sri B.C. Tripathy,
General Manager (Env.)
M/s Mahanadi Coal Fields Ltd.,
Bhubaneswar OCP,
P.O. Jagrili Vihar, Bhuba,
Dist. Sambalpur-768020,
Orissa.

Sub. : Expansion [under 7(ii) of EIA Notification 2006] of Bhubaneswar Opencast project from 20 MTPA to 25 MTPA in ML area 638.341 ha (658.724 ha – 20.383 ha = 638.341 ha); Latitude 20° 57' 59" to 20° 58' 43" & Longitude 85° 09' 10" to 85° 11' 37" of M/s Mahanadi Coalfields Ltd. Village: Hensamal, Dist. Anugul, Orissa – Environment Clearance - reg.

Sir,

This is with reference to letter no. CIL/DEL/EMP/2813/29 dated 24.07.2013 with the application and subsequent letter no. dated 25.12.2013 for Environmental Clearance for Expansion under 7(ii) of EIA Notification 2006 for the above-mentioned project.

2. The Ministry of Environment & Forests has considered the application. It is noted that the proposal is for grant of Environmental Clearance for expansion [under 7(ii) of EIA Notification 2006] of Bhubaneswar Opencast project from 20 MTPA to 25 MTPA in ML area 638.341 ha (658.724 ha – 20.383 ha = 638.341 ha); Latitude 20° 57' 59" to 20° 58' 43" & Longitude 85° 09' 10" to 85° 11' 37" of M/s Mahanadi Coalfields Ltd. Village: Hensamal, Dist. Anugul, Orissa. The proposal was considered in the 2nd EAC held on 3-4th October, 2013 and reconsidered in the 5th EAC meeting held on 20th - 21st January, 2014. The proponent has informed that:

- i. It was noted that EC was granted for Bhubaneswar Opencast vide letter no. J-11015/45/96-IA.II (M) dated 06.06.2003 for 10 MTPA. The project was again granted EC vide letter no. J-11015/128/2007-IA.II (M) dated 30.11.2012 for an expansion in production from 10 MTPA to 20 MTPA in a Mining lease area of 808.294 ha.
- ii. M/s MCL is seeking expansion in production capacity from 20 MTPA to 25 MTPA in ML area 658.724 ha under 7(ii) of EIA Notification 2006 with 25 % expansion.
- iii. The land usage of the project will be as follows:

Bhubaneswar EC, Expansion 7(ii)

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ANNEXURE – X (Cont..)

Post Mining

| Sl. | Item | Post Mining Land Use (in ha) | | | | | |
|-----|--|------------------------------|---------------|------------------------------|--------------|----------------|----------------|
| | | Plantation | Water body | Dip side slope and haul road | Undisturbed | Build-up area | Total |
| 1 | Quarry excavation | 375.900 | 31.000 | 55.741 | 0.000 | 0.000 | 462.641 |
| 2 | Blasting danger zone (excluding the part of OB dump) | 83.150 | 0.000 | 0.000 | 0.000 | 0.000 | 83.150 |
| 3 | OB Dumps (external) | 94.000 | 0.000 | 0.000 | 0.000 | 0.000 | 94.000 |
| 4 | Infrastructure including CHP, magazine, etc. | 0.850 | 0.000 | 0.000 | 0.000 | 10.083 | 10.933 |
| 5 | Railway siding | 1.000 | 0.000 | 0.000 | 0.000 | 6.400 | 8.000 |
| | Mining lease area (1 to 5) | 555.500 | 31.000 | 55.741 | 0.000 | 16.483 | 658.724 |
| 6 | Residential colony | 6.400 | 0.000 | 0.000 | 0.000 | 25.600 | 32.000 |
| 7 | Rehabilitation Site | 23.520 | 0.000 | 0.000 | 0.000 | 94.050 | 117.570 |
| | Outside Lease area (6 to 7) | 29.920 | 0.000 | 0.000 | 0.000 | 119.650 | 149.570 |
| | Total : | 585.420 | 31.000 | 55.741 | 0.000 | 136.133 | 808.294 |

Pre-Mining

| Sl. | Item | Pre-Mining Land Requirement (in ha) | | |
|-----|--|-------------------------------------|------------------------------|----------------|
| | | Forest | Non-Forest (Govt. & Tenancy) | Total |
| 1 | Quarry excavation | 126.191 | 336.450 | 462.641 |
| 2 | Blasting danger zone (excluding the part of OB dump) | — | 83.150 | 83.150 |
| 3 | OB Dumps (external) | — | 94.000 | 94.000 |
| 4 | Infrastructure including CHP, magazine, etc. | 6.713 | 4.220 | 10.933 |
| 5 | Railway siding | — | 8.000 | 8.000 |
| | Mining lease area (1 to 5) | 132.904 | 525.82 | 658.724 |
| 6 | Residential colony | — | 32.000 | 32.000 |
| 7 | Rehabilitation Site | — | 117.570 | 117.570 |
| | Outside Lease area (6 to 7) | 0 | 149.570 | 149.570 |
| | Total : | 132.904 | 675.39 | 808.294 |

- iv. The total geological reserve is 741.09 MT. The mineable reserve is 374.12 MT. The extractable reserve is 374.12 MT. The per cent of extraction would be 100 %.
- v. The coal grades are D to G having stripping ratio of 0.67 m³/t. The average Gradient is 4.5 degree. There will be total ten seams with thickness ranging from 0.42 to 44.90 m.
- vi. The total estimated water requirement is 4.36 MLD. The level of ground water ranges from 80 to 134 m.
- vii. The Method of mining would be opencast mining with shovel- dumper.
- viii. There are one external OB dump covering an area of 62.40 ha having a height upto 32 m

Bhubaneswar, Odisha, India

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ANNEXURE – X (Cont..)

- with the quantity of 26658480 m³. The final mine voids will have an area of 31 Ha with 187.5 m depth. There is one internal dump having an area of 23.25 ha and height 54 m. Out of total quarry area 462.641 Ha, backfilled quarry area will be 375.90 Ha which shall be reclaimed with plantation. A void of 31 ha with depth of about 180 m, which is proposed to be converted into water body.
- ix. The seasonal data for ambient air quality has been documented and all results at all stations are within prescribed limits.
 - x. The life of mine is 15 Years.
 - xi. **Transportation:** Transportation of coal in pit by dumper. Surface to siding by tipper/conveyor, and rakes loading by pay loaders. Provisional wasby belt to washery and from washery to siding by tube conveyor and rakes loading through silo but the same is delayed.
 - xii. There is R & R involved. There are 1012 PAFs.
 - xiii. **Cost:** Total capital cost of the project is Rs. 490 Crore. The cost of production would be Rs. 153 /tonnes. C&R Cost (Capital cost: Rs.296 lakhs / tonne of Coal production, R&R Cost Rs. 31.22 crore. Environmental Management Cost is Rs. 71.41 Crore.
 - xiv. **Approvals:** Ground water clearance obtained on 09.01.2000. The Mine Closure approval obtained on 28.09.2013. Date of approval of mine plan is 23.06.2011. Board's approval obtained on 22.12.2007.
 - xv. **Wildlife issues:** There are no national Parks, wildlife sanctuary, biosphere reserves found in the 10 km buffer zone.
 - xvi. **Forestry issues:** Total forest area involved for mining 133.904 ha. PC was granted vide letter no. 8-18/2002-PC dated 6.12.2004 for diversion of 112.521 ha of forest land.
 - xvii. **Total afforestation plan** shall be implemented covering an area of 585.42 ha at the end of mining where reclaimed external OB dump is 94 Ha and Internal OB Dump 375.90 ha. Green Belt over an area of 83.13 ha. Density of tree plantation 2500 trees/ha of plants.
 - xviii. There are no court cases/violation pending with the project proponent.
 - xx. Earlier EC was obtained on 30.11.2012 for which the Public Hearing was held on 10.02.2009 at Jagannath Kala Kendra, Tulchar, Angul district of Orissa.
 - xx. Certificate of compliance of earlier EC from MoEF, Regional office, Bhubaneswar has been issued vide their letter no. 106-102/EPE dtd, 16.09.2013.
3. The project proponent further informed on the Report of the RO, MOEF vis-a-vis the commitments made by the proponent which are as follows:
- i. The Source Apportionment Study for which the works order has been placed to ARAL, Pune, The Report will be submitted within 4 months i.e., 27/03/2014.
 - ii. Tender for construction of Washery-Conveyor-Silo is under process and award of work and completion of construction will take at least 3 years' time. Completion of the above work is not possible within 18 months. It is committed to implement the Action Plan by 01/01/2017. Land has been acquired and fencing is under construction, NIT ready and to be floated.
 - iii. Planning, Design & Engineering, erection/ installation along with all associated civil and structural works, testing, successful commissioning of coal washing plant including PGT with two years critical spares, operation and maintenance for supply of washed coal of requisite quality at the designated delivery places and disposal of washery rejects on BOM is ready. There will not be any tipper for feeding of coal to washery. Coal will come through belt conveyor from the receiving pit.
 - iv. EC has been granted for 20 MTPA in Nov.2012 and production achieved during 2013-13 was 17.93 MT. 20 MT will be achieved this year and since there is further scope for additional production from this mine and EC has been sought for 25 MTPA.

Bhubaneswar, Odisha, 27/03/2014

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Note No. #7

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ANNEXURE – X (Cont..)

- v. The additional 3 MTPA of coal production in Bhubaneswari OCP will be transported to the power plant consumers only through Rail Mode.
- vi. MCL will establish conveyor system from mine to siding, without considering the intermediate washery arrangement, within 24 months' time, and thus our earlier commitment in this regard stands revised.
- vii. MCL will ensure that only native species are planted by the Forest Department in the plantation programme of this project.

4. Reference is invited to the e-mail dated 07 February, 2014 stating that "Stage -I Forest Clearance for 112.521 ha was granted by MoEF vide letter dttd. 6th December, 2004, against total forest diversion proposal of 132.904 ha. Total Forest land involved for the entire life of the Project is 132.904 ha. Forest land involved for 25 years was assessed as per MOEF directive and it was 112.521 ha and this area was approved by MoEF and it was directed to approach MoEF after 25 years for balance 20.383 ha of forest land" and hence will not be diverted. In this regard, you are required to follow the guidelines issued by the FC Division of the Ministry of Environment & Forests vide no. 11-362/2012-FC dated 01-02-2013 "Guidelines for diversion of forest land for non-forest purposes under the Forest (Conservation) Act 1980, Submission of proposals to obtain forest land located within the mining lease and grant of environment clearance to mining projects" addressed to the Principal Secretary (Forests), Principal Secretary (Environment) of all the States/UT Govts. and copy to concerned Government Departments/Organisations which prescribes, inter-alia, the following:

" (iii) As regards Environment Clearance (EC) cases of existing mining operations, where approval under the FC Act for the full forest area in the mining lease area is not available, granting of EC may be considered and the following process will be adopted for processing such cases:

- a) Grant of EC may be considered only for the non-forest area plus the forest area within the mining lease for which FC is available. No mining activities will be allowed in forest area for which the FC is not available; and
- b) The project proponent will seek and obtain approval under the FC Act for diversion of the entire forest land located within the mining lease within a period of two years from the date of issue of these guidelines, failing which the mining lease area will be reduced to the non-forest area plus the forest area for which the project proponent has been able to obtain the FC at the end of this time period. In the case of reduction in mine lease area, the project proponent will need to get a revised mining plan approved from the competent authority for reduced area and enter into a new mining lease as per reduced lease area. The EC will be construed to be available for the mining lease area as per the revised mining lease deed."

5. The proposal was reconsidered in the Expert Appraisal Committee (EAC) (Thermal & Coal Mining) and recommended in its 5th meeting held on 26th - 25th November, 2013 for granting Environmental Clearance. The Ministry of Environment & Forests hereby accords environmental clearance for the above-mentioned expansion (under 7(ii) of EIA Notification 2006) of Bhubaneswari Opencast project from 20 MTPA to 25 MTPA in ML area 638.341 ha (658.724 ha - 20.383 ha = 638.341 ha); Latitude 20° 57' 59" to 20° 58' 43" & Longitude 85° 09' 10" to 85° 11' 37" of M/s Mahanadi Coalfields Ltd, Village: Hensamal, Dist. Anugol, Orissa under the provisions of the Environment Impact Assessment Notification, 2006 and subsequent amendments thereto subject to the compliance of the terms and conditions mentioned below. You will need to seek and obtain approval under the FC Act for diversion of the entire

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cmpdi**ANNEXURE – X (Cont..)**

forest land located within the mining lease within a period of two years from the date of issue of these guidelines (i.e. 01 February, 2013), failing which the mining lease area will be reduced to the non-forest area plus the forest area for which you have been able to obtain the FC at the end of this time period. In the case of reduction in mine lease area, you will need to get a revised mining plan approved from the competent authority for reduced area and enter into a new mining lease as per reduced lease area. The EC will be construed to be available for the mining lease area as per the revised mining lease deed.

A. Specific Conditions:

- i. No mining operations shall be undertaken in the forestland until clearance has been obtained under the provisions of FC Act, 1980.
- ii. The maximum production from the mine at any given time shall not exceed the limit as prescribed in the EC.
- iii. The report of ARAI, Pune on Source Apportionment Study be submitted in the concerned State Pollution Control Board and the Regional office of the MoEF submitted within 4 months i.e. 27/03/2014.
- iv. There will not be any tippers for loading of coal to washery. Coal will come through belt conveyor from the receiving pit.
- v. The conveyor system from Mine to Siding, without considering the intermediate washery arrangement, shall be established within 24 months i.e. by January, 2016. This has already been highly delayed.
- vi. Only native species to be planted by the Forest Department in the plantation programme of this project.
- vii. Proponent should expeditiously take up the matter with the Coal India to create an Environment Cadre for future employment in Coal India and its subsidiaries.
- viii. MCL has committed to implement the Action Plan by 01/01/2017.
- ix. The coal production in Bhubaneswari OCP will be transported to the power plant and other consumers only through Rail Mode.
- x. Transportation of coal in pit by dumper. Surface to siding by tipper/conveyor, and rakes loading by pay loaders. Provision washy belt to washery and from washery to siding by tube conveyor and rakes loading through silo but the same is delayed. Roads shall be metal topped and mechanical sweepers shall be regularly deployed to clear the dust off the main approach and mineral transportation roads. Water sprinkling (fixed and mist type, mobile) shall be regularly done along the main haul roads.
- xi. Mining operations for the expansion project shall not involve drilling, blasting and rishing operations as a result of use of surface miner.
- xii. The production shall be within the same Mining Lease area.
- xiii. The OB shall be completely re-handled at the end of the mining.
- xiv. Final mine void depth will not be more than 40 m. The void area will be converted into waterbody. The rest of the area will be back filled upto the ground level and covered with about a meter thick top soil and put to use.
- xv. Galled drains be provided.
- xvi. Appropriate embankment shall be provided along the side of the river/ nullah flowing near or adjacent to the mine.
- xvii. The land after mining shall be brought back for agriculture purpose.
- xviii. Mine water should be treated for discharge into the lagoon. The quality of lagoon water shall be regularly monitored and mitigation measures taken.

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ANNEXURE – X (Cont..)

- xxix. The CSR cost should be Rs 5 per Tonnes of Coal produced which should be adjusted as per the annual inflation. Annual social audit should be got carried out and details furnished as part of compliance report and also uploaded on the company website.
- xxx. Everybody in the core area should be provided with mask for protection against fugitive dust emissions.
- xxxi. Dust mask to be provided to everyone working in the mining area. The supervisory staff should be held personally responsible for ensuring compulsory regarding wearing of dust mask in the core area.
- xxxii. People working in the core area should be periodically tested for the lung diseases and the burden of cost on account of working in the coal mine area. The lung burden analysis report of workers working in coal mining area should be provided and uploaded on the company website.
- xxxiii. R&R for the 1185 PAFs of Hemaamal, Jilinda and Nanduripuri which are yet to be resettled, shall be implemented within a specified time-frame. R&R norms shall be not less than of the National R&R Policy.
- xxxiv. The topsoil, if any, should be stacked properly with proper slope at earmarked site(s) and should not be kept active and shall be used for reclamation and development of green belt. The time schedule for development of green cover should be provided.
- xxxv. The OB shall be simultaneously backfilled in the occupied area. No new OB dumps shall be created for the OB to be generated in the balance life of mine. sequential operation of mines should be done so that the voids of adjoining mines can be used for dumping OB.
- xxxvi. No external OB dump should be left at the Final Mine Closure stage and the mined out area and void should be backfilled up to ground level to the extent possible and the void if left, should be no more than 30-40m depth. Fly ash should not be dumped in mine void.
- xxxvii. Water from River Beahmal should not be drawn for these purposes and an awareness campaign should be launched by MCL for proper use of water from various sources. The Committee desired that a trend analysis of the water quality (surface and ground water) including heavy metals, should be carried out and data uploaded on the company website. Mine water be used for irrigation of nearby agricultural land and also for green belt and other uses.
- xxxviii. Long-term monitoring on the impacts of simultaneous operation of large opencast mines should be carried out on the confined and unconfined aquifers.
- xxxix. The roads should be developed with a 3-tier avenue plantation preferably of 20-30m width using native species. The Committee also desired that road transportation should be by mechanically covered trucks and not tarpaulin covered trucks, which should be introduced within 9-12 months. An 'Action Plan' for the transportation of coal by road to major consumers (during the initial years) should be submitted to ministry for record and the FSA entered with the major linkages should stipulate a condition to the effect that only mechanically covered trucks are used for coal transportation.
- xl. The mining area should be grounded by green belt having thick closed thick canopy of the tree cover.
- xli. The embankment constructed along the river boundary shall be of suitable dimensions and critical patches shall be strengthened by stone pitching on the river front side and stabilised with plantation so as to withstand the peak water flow and prevent mine inundation.
- xlii. There shall be no overflow of OB into the river and into the agricultural fields and massive plantation of native species shall be taken up in the area between the river and the project.
- xliii. OB shall be stacked at two earmarked external OB dumpsite(s) only. The ultimate slope of the dump shall not exceed 28°. Monitoring and management of existing reclaimed dumpsites shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests and its concerned Regional office on yearly basis.

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- xxxi. Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flows from sell, OB and mineral dumps. The water so collected shall be utilized for watering the mine area, roads, green belt development, etc. The drains shall be regularly desilted and maintained properly. Garland drains (size, gradient and length) and sump capacity shall be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity shall also provide adequate retention period to allow proper settling of silt material.
- xxxii. Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation shall be based on the rainfall data.
- xxxiii. Crushers at the CHP of adequate capacity for the expansion project shall be operated with high efficiency bag filters, water sprinkling system shall be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc.
- xxxiv. Drills shall be wet operated.
- xxxv. The project authorities shall undertake regular repairing and tarring of roads used for mineral transportation. A 3-tier green belt comprising of a mix of native species shall be developed all along the major approach roads.
- xxxvi. Controlled blasting shall be practiced with use of delay detonators and only during daytime. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders shall be implemented.
- xl. A Progressive afforestation plan shall be implemented covering an area of 585.420 ha at the end of mining, which includes reclaimed External OB dump area (94 ha), Internal OB dump area (375.90 ha), along roads and infrastructure (32.37 ha), and Green belt (83.150 ha) and in township located outside the lease by planting native species in consultation with the local DFO/Agriculture Department. The density of the trees shall be around 2500 plants per ha. Massive plantation shall be carried out in open spaces in and around the mine and a 3-tier avenue plantation along the main approach roads to the mine.
- xli. An estimated total 251.39 Mm³ of OB will be generated during the entire life of the mine. Out of which 52.37 Mm³ of OB will be dumped in two external OB Dumps in earmarked area covering 94 ha of land. 199.02 Mm³ will be one internal OB dump in covering an area of 279.65 ha. The maximum height of external OB dump for hard OB will not exceed 90 m and that for soft OB shall not exceed 60 m. The maximum slope of the dump shall not exceed 28 degrees. Monitoring and management of reclaimed dump sites shall continue till the vegetation becomes self-sustaining and compliance status shall be submitted to MOEF and its Regional Office on yearly basis.
- xlii. The proponent should prepare restoration and reclamation plan for the degraded area. The land be used in a productive and sustainable manner.
- xliii. Compensatory Ecological & Restoration of water land, other degraded land and OB dumps in lieu of breaking open the land be carried out.
- xliv. The mining should be phased out in sustainable manner. No extra over burden dumps are permitted.
- xlv. No groundwater shall be used for mining operations.
- xlvi. Of the total quarry area of 462.641 ha, the backfilled quarry area of 279.65 ha shall be reclaimed with plantation and a void of 182.991 ha at a depth of 30-40 m which is proposed to be converted into a water body shall be gently sloped and the upper benches shall be terraced and stabilised with plantation/afforestation by planting native plant species in consultation with the local DFO/Agriculture Department. The density of the trees shall be around 2500 plants per ha.
- xlvii. Regular monitoring of groundwater level and quality shall be carried out by establishing a network of existing wells and construction of new piezometers. The monitoring for quantity shall be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for quality in May. Data thus collected shall be

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ANNEXURE – X (Cont..)

- submitted to the Ministry of Environment & Forests and to the Central Pollution Control Board quarterly within one month of monitoring.
- xlviii. The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource in case monitoring indicates a decline in water table. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.
- xlix. Sewage treatment plant shall be installed in the existing colony. ETP shall also be provided for workshop and CHP wastewater.
- i. Besides carrying out regular periodic health check-up of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, through an specialised agency /institution within the District/State and the results reported to this Ministry and to DGMS.
 - ii. Land owners shall be compensated as per the norms laid out R&R Policy of CIL or the National R&R Policy or R&R Policy of the State Government whichever is higher.
 - iii. For monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery (on a scale of 1: 5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in 3 years (for any one particular season which is consistent in the time series), and the report submitted to MOEF and its concerned Regional office.
 - liii. A detailed Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests within 6 months of grant of Environmental Clearance.
 - liii. The project authorities shall in consultation with the Panchayats of the local villages and administration identify socio-economic and welfare measures under CSR to be carried out over the balance life of the mine.
 - lv. The commitment made by the Proponent in the issue raised during Public Hearing shall be implemented by the Proponent.
 - lvi. Corporate Environment Responsibility:
 - a) The Company shall have a well laid down Environment Policy approved by the Board of Directors.
 - b) The Environment Policy shall prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.
 - c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished.
 - d) To have proper checks and balances, the company shall have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.

B. General Conditions

- i. No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.
- ii. No change in the calendar plan of production for quantum of mineral coal shall be made.
- iii. Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM₁₀, PM_{2.5}, SO₂ and NO_x monitoring. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board.

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- Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months.
- iv. Data on ambient air quality (PM₁₀, PM_{2.5}, SO₂ and NO₂) and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly submitted to the Ministry including its concerned Regional Office and to the State Pollution Control Board and the Central Pollution Control Board once in six months. Random verification of samples through analysis from independent laboratories recognised under the EPA rules, 1986 shall be furnished as part of compliance report.
 - v. Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs/muffs.
 - vi. Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May 1997 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.
 - vii. Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpulins and optimally loaded.
 - viii. Monitoring of environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board and data get analysed through a laboratory recognised under EPA Rules, 1986.
 - ix. Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects.
 - x. Occupational health surveillance programme of the workers shall be undertaken periodically to observe any contraindications due to exposure to dust and to take corrective measures, if needed and records maintained thereof. The quality of environment due to outsourcing and the health and safety issues of the outsourced manpower should be addressed by the company while outsourcing.
 - xi. A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the company.
 - xii. The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this Ministry and its concerned Regional Office.
 - xiii. The Project authorities shall advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution control Board and may also be seen at the website of the ministry of Environment & Forests at <http://envfor.nic.in>.
 - xiv. A copy of the environmental clearance letter shall be marked to concerned Panchayat/Zila Parishad, Municipal Corporation or Urban local body and local NGO, if any, from whom any suggestion/representation has been received while processing the proposal. A copy of the clearance letter shall also be displayed on company's website.
 - xv. A copy of the environmental clearance letter shall be shall also be displayed on the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the Regional Office, District Industry Sector and Collector's Office/Tehsildar's Office for 30 days.
 - xvi. The clearance letter shall be uploaded on the company's website. The compliance status of the stipulated environmental clearance conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same in public domain. The monitoring data of environmental quality parameter (air, water, noise and soil)

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cmpdi**ANNEXURE – X (Cont..)**

- and critical pollutant such as PM₁₀, PM_{2.5}, SO₂ and NO₂ (ambient) and critical sectoral parameters shall also be displayed at the entrance of the project premises and mine office and in corporate office and on company's website.
- xvii. The project proponent shall submit six monthly compliance reports in status of compliance of the stipulated environmental clearance conditions (both in hard copy and in e-mail) to the respective Regional Office of the Ministry, respective Zonal Office s of CPCB and the SPCB.
- xviii. The Regional Office of this Ministry located in the Region shall monitor compliance of the stipulated conditions. The Project authorities shall extend full cooperation to the office(s) of the Regional Office by furnishing the requisite data/ information/monitoring reports.
- xix. The Environmental statement for each financial year ending 31 March in Form-V is mandated to be submitted by the project proponent for the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on the company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MoEF by e-mail.
6. This EC supersedes the earlier EC, vide letter no. J-11615/128/2007-IA.II (M) dated 34.11.2012, for an expansion in production from 10 MTPA to 20 MTPA in a Mining lease area of 808.294 ha.
7. The proponent shall abide by all the commitments and recommendations made in the EIA/EMP report so also during their presentation to the EAC.
8. The proponent is required to obtain all necessary clearances/approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection.
9. The Ministry or any other competent authority may stipulate any further condition for environmental protection.
10. The Proponent shall setup an Environment Audit cell with responsibility and accountability to ensure implementation of all the EC Conditions.
11. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract the provisions of the Environment (Protection) Act, 1986.
12. The above conditions will 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 and the Public Liability Insurance Act, 1991 along with their amendments and Rules. The proponent shall ensure to undertake and provide for the costs incurred for taking up remedial measures in case of soil contamination, contamination of groundwater and surface water, and occupational and other diseases due to the mining operations.


(Dr. Manoj Kumar Das)
Director

Copy to:

1. Secretary, Ministry of Coal, New Delhi.
2. Secretary, Department of Environment & Forests, Government of Orissa, Secretariat, Bhubaneswar, Orissa.

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3. Chief Conservator of Forests, Regional office (EZ), Ministry of Environment & Forests, A-31, Chandrasekharpur, Bhubaneswar – 751023, Orissa.
4. Member Secretary, Orissa State Pollution Control Board, Pariveshi Bhawan, A/118, Nilkanthanagar, Unit VIII, Bhubaneswar – 751012, Orissa.
5. Member Secretary, Central Pollution Control Board, CBD-cum-Office Complex, East Arjun Nagar, New Delhi-110032.
6. Member Secretary, Central Ground Water Authority, Ministry of Water Resources, Conzon Road Baranaka, A-2, W-3 Kasturba Gandhi Marg, New Delhi.
7. Dr. R.K. Garg, Advisor, Coal India Limited, SCOPE Minar, Cor-1, 81 Floor, Vikas Marg, Laxmi Nagar, New Delhi.
8. District Collector, Angul, Government of Odisha.
9. Monitoring File: 10. Closed File: 11. Record File: 12. Notice Board

(Signature)
(Dr. Manoranjan Das)
Director

Mahanadi Coalfields Ltd. (Registration No.)

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ANNEXURE-XI

F. No.J-11015/224/2015-IA.II
Government of India
Ministry of Environment, Forest and Climate Change
(IA-II Section)

Indira Paryavaran Bhawan,
Jorbagh Road, N Delhi - 3
Dated: 15th September, 2017

Office Memorandum

**Sub: Environmental Clearance for expansion of Coal Mining Projects -
Exemption from Public hearing - reg.**

In order to facilitate grant of Environmental Clearance (EC) to the expansion projects of coal mines, Office Memorandums have been issued by this Ministry from time to time providing exemption from public hearing.

2. Ministry of Coal in order to allow rapid expansion in coal production has made request for further dispensation in public hearing to expedite Environmental Clearances.

3. The request of Ministry of Coal was considered by the Expert Appraisal Committee (EAC) in the Ministry constituted for appraisal of projects relating to Thermal and Coal sectors. The Committee has recommended for exemption from public hearing while considering grant of environmental clearances to the expansion projects of coal mines, involving increase in production capacity up to 40% in 2-3 phases after the due diligence and subject to fulfilment of certain requirements as under:-

- (i) Predicted air quality parameters are within the prescribed norms.
- (ii) Coal transportation is through conveyor system up to the silo and then loading to railway wagons, involving no transportation through roads.
- (iii) Coal mining is done through deployment of surface miners, replacing three dust generating operations of the conventional mining system namely drilling, blasting and crushing in one go.
- (iv) Public hearing already conducted for the total mine lease area involved and no more area is required for the proposed expansion.
- (v) Compliance status of EC conditions monitored by the concerned Regional Office of this Ministry is found to be satisfactory.
- (vi) Other statutory requirements like Consent to Establish/Operate, Clearance from CGWA, approval of Mining Plan and the Mine Closure Plan, Mine Closure Status Report as applicable, Forest Clearance, etc are satisfactorily fulfilled.



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ANNEXURE-XI (Cont..)

4. In view of the aforesaid recommendations by EAC, the Ministry has decided to consider the proposals for grant of EC to the expansion of coal mining projects providing exemption from public hearing, in the manner and/or subject to the conditions as under:-

- (a) The proposed expansion can go up to a maximum of 40% of capacity, wherein the last public hearing was conducted.
- (b) There is no increase in area for the proposed expansion vis-a-vis the area in EC, wherein last public hearing was conducted.
- (c) Coal transport is through conveyor system up to the silo and loading to railway wagons, and not by road.
- (d) The EAC shall carry out the due diligence on all the parameters mentioned in para 3 above, and make its recommendations accordingly.
- (e) EAC may consider the need for a third party study through an expert agency in a time bound manner, after grant of EC.

5. This OM shall be in supersession of the earlier OMs issued by the Ministry as under:

- (i) OM No. J-11015/30/2004-IA.II (M) dated 19th December, 2012
- (ii) OM No. J-11015/30/2004-IA.II (M) dated 7th January, 2014
- (iii) OM No. J-11015/30/2004-IA.II (M) dated 30th May, 2014
- (iv) OM No. J-11015/30/2004-IA.II (M) dated 28th July, 2014
- (v) OM No. J-11015/30/2004-IA.II (M) dated 2nd September, 2014

6. This issues with approval of the competent authority.


15/9/2017
(S.K. Srivastava)
Scientist E

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ANNEXURE-XII

APPROVAL OF MP&MCP OF BHUBANESWARI OCP, REV-1

ମହାନଦୀ କୋଲ୍ ଫିଲ୍ଡ୍‌ସ୍ ଲିମିଟେଡ୍
महानदी कोलफील्ड्स लिमिटेड
Mahanadi Coalfields Limited
(A subsidiary of Coal India Limited)

Office of the Company Secretary
At/Po. Jagruti Vihar, Burla, MCL
Dist. Sambalpur – 768020 (Odisha)
CIN: U10102OR1992GOI003038
TeleFax No. 06632542977
Email id: cosecymcl@gmail.com
Website: www.mahanadicoal.in



Ref. No. MCL/SBP/CS/BD-243/Exct/2022/ 12291

Date: 01.02.2022

गोपनीय/CONFIDENTIAL

सेवा में,
The GM(P&P)
एम सी एल मुख्यालय, सम्बलपुर ।

Sub: Extract from the minutes of the 243rd meeting of Board of Directors of MCL held at 11.00 AM on Thursday, the 20th January, 2022 at Registered Office of the Company, Jagruti Vihar, Burla, Sambalpur, Odisha-768020.

प्रिय महोदय,

आप के सूचनार्थ एवं उचित कार्यवाही हेतु एम.सी.एल. निदेशक मण्डल की 243 वी बैठक का उद्धृत दिया जा रहा है।

243.C/4 Approval of Mining Plan for Bhubaneswari OCP (28 MTY) Rev-1 with estimated mine closure cost of Rs.3853.253 Lakhs compounded @ 5% annually for 05 years.

4.1 The Board deliberated on the proposal in detail and based on the clarifications offered by GM(P&P) & RD CMPDIL, approved the Mining Plan and Mine Closure Plan Bhubaneswari OCP (28 MTY) Rev-1 with total mine closure cost of Rs.3744.28 lakhs compounded @5% annually for 05 years as per the details brought out in the agenda note.

भवदीय,

कंपनी सचिव

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Job No.172202020

MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

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ANNEXURE – XIII

| | | |
|--|--|---|
| <p>ମହାନଦୀ କୋଇଲ୍ୟ ମିନିଙ୍ଗ୍ Mahanadi Coalfields Limited (A subsidiary of Coal India Limited)</p> | | <p>ମହାପ୍ରबंधक(परियोजना एवं योजना)का कार्यालय Office of the General Manager (P&P) At/Pat Jagruti Vihar, Birta, Dist. Sambalpur-768020 (Odisha) Phone: (0663) 2958562. E-mail: gpm-cmpdi@mahadi.co.in / gpm@mahadi.co.in Web site: www.mahanadi.co.in CN No.: U10142081992GO0003038</p> |
| <p>संदर्भ संख्या: एमसीएल/मुख्यालय/महाप्रबंधक(परियोजना एवं योजना)/22/ 04-H</p> | | <p>दिनांक: 19/04/2022</p> |
| <p align="center">REVISED WORK ORDER</p> <p>In partial modification to the earlier Work Order issued vide no. 839-H dated 14.03.2022, the revised Work Order is as below.</p> <p>ମିତା ମି, କ୍ଷେତ୍ର ନିର୍ଦ୍ଦେଶ, କେନ୍ଦ୍ରୀୟ ସଂସ୍ଥା - ୨, ସେଣ୍ଟ୍ରାଲ ମ୍ୟାନିଞ୍ଜିଂ ଓଡ଼ିଶା ଡିଭିଜନ୍ (ସି.ମି.ଜି.ଏସ୍.ଏସ୍.), ସାମଲପୁରୀ (ସାମଲ ପାର୍କ କମ୍ପ୍ଲେକ୍ସ), ଭାର. ଭବ. ୩୩, ବୁର୍ସିଂ - 751 013 (ଓଡ଼ିଶା) ବିଷୟ: Work Order for "Preparation of Mining Plan & Mine Closure Plan for ML area of 658.724 Ha including Forest Area of 20.383 Ha in respect of Bhubaneswari OCP (30 MTY)" beyond approved Annual Work Programme 2021-22 for CMPDI. ସଂଖ୍ୟା: Computer No: 689754 File No: 191, dt: 21.03.2022 ସଂକ୍ଷେପ, With reference to the above, this is to inform you that the Competent Authority of MCL has accorded the financial approval for the work "Preparation of Mining Plan & Mine Closure Plan for ML area of 658.724 Ha including Forest Area of 20.383 Ha in respect of Bhubaneswari OCP (30 MTY)" beyond approved Annual Work Programme 2021-22 for CMPDI for an amount of Rs. 41,08,170 /- (Rupees Forty-One Lakh Eight Thousand One Hundred Seventy only). Details of value of job: (Total EDs assigned for the job: 150) i. Total amount for EDs - Rs. 34,81,500.00 (150 ED @ 23,200/-, ED rate of 2021-22) ii. GST - Rs. 6,26,670.00 (@ 18% of Rs. 34,81,500.00) iv. Grand Total: Rs. 41,08,170 /- (Rupees Forty-One Lakh Eight Thousand One Hundred Seventy only). FC Details: FC No:- FC/MCL/SBP/2021-22/CAP/C-982/TCR/OTHER MINING INFRASTRUCTURE(MINE DEVELOPMENT)/BHUBANESWARI OCP, BHUBANESWARI AREA/Rs.41,08,170/- Dt.14.03.2022. Note: Work must be completed within this financial year and subsequently submitting the bills within current Financial Year i.e. 2021-22 Please acknowledge and arrange to complete the job at the earliest.</p> | | |
| <p>सूचनाएं:</p> <ul style="list-style-type: none"> निदेश (सचरीकी / संस्थागत) निदेश (वित्त) निदेश (सचरीकी / परियोजना एवं योजना) <p>प्रतिपत्ति:</p> <ol style="list-style-type: none"> GM (HD), CMPDI, Ranchi TS to CMD, MCL GM (Finance - Commercial Accounts) / HOD, MCL HQ GM (Finance - Corporate Accounts) / HOD, MCL HQ GM (Finance - C & B) / HOD, MCL HQ | | <p>महप्रबंधक (परियोजना एवं योजना)</p> <p align="right">[Signature]</p> |
| <p align="center">Corporate Office: Jagruti Vihar, Birta, Sambalpur, Odisha - 768020, Phone: (0663) 2958562, Website: www.mahanadi.co.in</p> | | |

Job No.172202020

AN-XIII, Page - 1

MP & MCP of Bhubaneswari OCP (30.0 Mty) (Revision-2)

Note No. #7

Attachment:Final MP&MCP BBSRI 30MTY.pdf

Central Mine Planning and Design Institute Limited

(A Subsidiary of Coal India Limited)

Regional Institute – VII

Plot No. E-4, Near Gandhi Park, Samantapuri, P.O.: RRL,

Bhubaneswar – 751013, Odisha, India

Phone: **0674-2974271 (O)**, Fax: **0674-2301762 (O)**

E-Mail: rdri7.cmpdi@coalindia.in



Government of Odisha
Offline Challan Deposit Form
Depositor's Copy

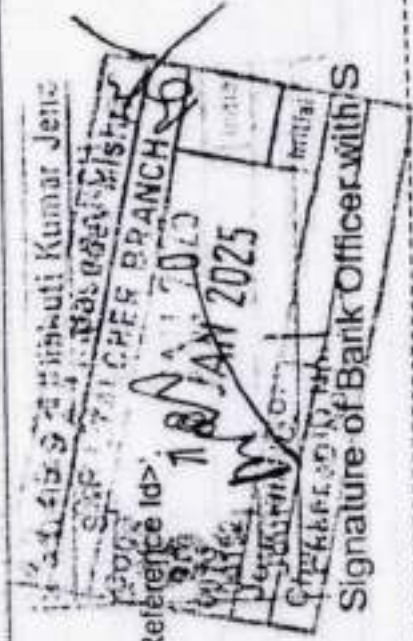


Challan of Cash/Cheque/DD paid through STATE BANK OF INDIA at Cyber Treasury, Odisha, Bhubaneswar

| | | | |
|--|--------------------------|------------------------|-------------|
| 1. Name of the Depositor | : Tahasildar, Talcher | | |
| 2. Mobile No. | : 8018127772 | | |
| 3. Department Identification ID | : | | |
| 4. Challan Generation Date & Time | : 16/01/2025 03:47:47 PM | | |
| 5. Head of Account | Purpose | Head Of Account | Amount |
| Land Revenue Cess | | 0029-00-103-0062-01028 | Rs. 4117575 |
| | | Total Amount | Rs. 4117575 |
| Total Amount (In words) - Forty One Crore Seventeen Lakh Fifty Seven Thousand Five Hundred C | | | |
| 6. Treasury Reference ID | : 3A3C18E046 | | |
| 7. Bank Transaction Date & Time | : | | |

1. This challan is valid for 7 days from the date of online entry.
2. In case of Cheque, bank transaction id will be available after realization of the cheque.
3. In case of Cheque/DD, it should be payable to 'State Government Receipts- <Challan Reference Id>

Tahasildar
Tahasildar
Signature of the Depositor



ରସିଦ୍ ପୁସ୍ତକ
RECEIPT BOOK

ନଂ. 0289860

[ଓଡ଼ିଶା ନିଜାଗତ ପ୍ରକରଣ ପୁସ୍ତକ, 1963 ନିୟମ 31(ii) ଦ୍ଵାରା]

ପୁସ୍ତକ ନଂ. 04/2024-25 ମସିହା 20

କାର୍ଯ୍ୟାଳୟ ପ୍ରାପ୍ତ ହେଲା G.M. Bhubaneswari Area (MCL)

towards Land Premium through
RTGS transfer to DDO C/A No -
ବେଞ୍ଚ ନମ୍ବର 11094460682 dt. 09.01.2025

ପରିମାଣ

ନଗଦ ଆକାରରେ Land Premium = 41,17,57,500/-

ଆମ ଆକାରରେ

Total = 41,17,57,500.00

ଟଙ୍କା

(Rupees Forty-One Crore seventeen Lakh.
- ~~Fifty Seven Thousand Five Hundred~~ only)

ତା. 18/01/2025

OGP (FORMS) DTP-207-10,000 Bks.-24-07-2012

ଗ୍ରହଣ କରାଯାଇ ପ୍ରମାଣିତ
18/01/25
Nail
Tahsil Office, Talcher



OFFICE OF THE TAHASILDAR, TALCHER

ତହସିଲଦାରଙ୍କ କାର୍ଯ୍ୟାଳୟ, ତାଳଚେର



Telephone: 06744-241224/3 4 - mail: tah.talcher.od@gmail.in

Letter No. 361 / File No. Date: 24.01.2025

To

The Divisional Forest Officer,
Angul.

Sub : Submission of RoR in Alienation Case No.103/2024 and 102/2024 in
favour of Environment, Forest & Climate Change Department, Govt.
of Odisha.

Sir,

With reference to the subject cited above, I am to submit herewith
the RoRs in Alienation Case No.103/2024 and 102/2024 in the name of
Environment, Forest & Climate Change Department, Govt. of Odisha.

This is for favour of your kind information and necessary action.

End: Two(02) Nos. of RoR.

Yours faithfully,


Tahsildar, Talcher

Memo No. 362 /Dt. 24.01.2025

Copy submitted to the Additional Dist. Magistrate, (Revenue), Angul for
favour of kind information.


Tahsildar, Talcher

Memo No. 363 /Dt. 24.01.2025

Copy submitted to the General Manager, Bhubaneswari Area, Dera,
Talcher for favour of kind information.


Tahsildar, Talcher

Schedule I Form No.39-A

ଖତିୟାନ

ମୌଜା : କର୍ଣ୍ଣପୁର

ତହସିଲ : ଡାକଡେର

ଥାନା : କହିୟାବା

ତହସିଲ ନମ୍ବର : 315

ଥାନା ନମ୍ବର : 39

ଫିଲ୍ଡା : ଅନୁଗୋଳ

| | |
|---|---|
| ଜମିଦାରଙ୍କ ନାମ ଓ ଖେତ୍ରାଳ ବା ଖତିୟାନର କ୍ରମିକ ନମ୍ବର | ଓଡ଼ିଶା ସରକାର ଖେତ୍ରାଳ ନମ୍ବର 1 |
| ୧) ଖତିୟାନର କ୍ରମିକ ନଂ | 498/1 |
| ୨) ପ୍ରଜାର ନାମ, ପିତାର ନାମ, ଜାତି ଓ ବାସସ୍ଥାନ | ରାଜ୍ୟ ହଜାର ପରିବେଶ ଓ ଜଳବାୟୁ ପରିଚର୍ଚ୍ଚନ ବିଭାଗ, ଓଡ଼ିଶା |

| କାମ୍ପୁସ୍ | | | | | |
|----------|-----------|-----------|--|------------|-------------------------------|
| ୪) ଦେର | କିଲୋଗ୍ରାମ | ଫିଟ୍ | ବେସ ଓ ଅନ୍ୟାନ୍ୟ ବେସ ପରି କିଛି ଥାଏ | ମୋଟ | ୫) କ୍ରମବର୍ଦ୍ଧନଶୀଳ ଗଠନର ବିବରଣୀ |
| | 982905.00 | 737179.00 | 98290.00 | 1818374.00 | |

| | |
|----------------------------------|---|
| ୬) ବିଶେଷ ଅନୁସଙ୍ଗ ଯଦି କିଛି ଥାଏ | Alienation Case No. 103/2024, RCCMS Case No. 182/2025, LRMS କେଶ ନଂ 182/2025 ହୁକୁମ ନୁତାବକ ପୁର ନଂ 8/6005 ଉକ୍ତା ଏ 37.0000 ହି ପ୍ରଜାରନ ଖାତା ନଂ 498 ରୁ |
|----------------------------------|---|

BLANK SPACE FOR STAMPING

ଅଭିନ ପ୍ରକାଶନ ତାରିଖ : 28/08/1985

ଉକ୍ତା ଥାନା ତାରିଖ :



[Signature]
Addl. Tahasildar

| ଅନୁପଞ୍ଜନ କ୍ରମିକ ନଂ : 498/1 | | ମୌଜା : ଉର୍ବପୁର | | | ବିଭା : ଅନୁଗୋଳ | |
|----------------------------|--------------------|-------------------------------------|-------|----|---------------|-----|
| ପୁର ନମ୍ବର ଓ ଚକର ନାମ | ଭିସମ ଓ ପୁରର ଉଚ୍ଚତା | ଭିସମର ବିକାଶିତ ବିବରଣୀ ଓ ଚୌକିର ବିବରଣୀ | ମୂଲ୍ୟ | | | ମୋଟ |
| | | | ଫଲ୍ଡ | ଫି | ସହସ୍ର | |
| ୨ | ୮ | ୯ | ୧୦ | ୧୧ | ୧୨ | |
| 8.6005 | ଭରଦ | ଭ୍ରାମ୍ୟ ଭରଦ | 37000 | | 14,9734 | |
| 1.୧୨୫ | | | 37000 | | 14,9734 | |

କାର୍ଯ୍ୟାଳୟ ସ୍ୱତନ୍ତ୍ର ସିଲ୍ ସହ, ଓଡ଼ିଶା

22/01/2025


R.K.
 Tahasil Office, Talcher


D.E.O.
 Tahasil Office, Talcher


Addl. Tahasildar
 Talcher

Schedule I Form No.39-A

ଖତିୟାନ

ମୌଜା : କର୍ଣ୍ଣପୁର

ଚନ୍ଦ୍ରସିଦ୍ଧ : ଚାନ୍ଦିନୀ

ଆନା : କବିନ୍ଦ୍ରା

ଚନ୍ଦ୍ରସିଦ୍ଧ ନମ୍ବର : 315

ଆନା ନମ୍ବର : 39

ବିଭା : ଅନୁଗୋଳ

| | | | | | | |
|--|---|------------|------------|---|------------|--------------------------------|
| କମିସନର ନାମ ଓ ଖେତ୍ର ବା ଖତିୟାନର କ୍ରମିକ ନମ୍ବର | ଓଡ଼ିଶା ସରକାର ଖେତ୍ରୀ ନମ୍ବର 1 | | | | | |
| ୧) ଖତିୟାନର କ୍ରମିକ ନଂ | 498/2 | | | | | |
| ୨) ପ୍ରକାର ନାମ, ପିତାଙ୍କ ନାମ, ବାପା ଓ ବାସସ୍ଥାନ | ରାଜ୍ୟ ଜଙ୍ଗଲ ପରିବେଶ ଓ ଜଳବାୟୁ ପରିଚର୍ଚ୍ଚନ ବିଭାଗ, ଓଡ଼ିଶା | | | | | |
| ୩) ସ୍ୱତ୍ୱ | | | | | | |
| ୪) ସେୟା | କଳକର | ଖଜଣା | ସେୟା | ନିଷ୍କାର ସେୟା ଓ ଅନ୍ୟାନ୍ୟ ସେୟା ଯଦି କିଛି ଥାଏ | ମୋଟ | ୫) କ୍ରମବର୍ଦ୍ଧନଶୀଳ ଖଜଣାର ବିବରଣୀ |
| | | 3134670.00 | 2351002.00 | 313467.00 | 5799139.00 | |
| ୬) ବିଶେଷ ଅନୁରୋଧ ଯଦି କିଛି ଥାଏ | Alienation Case No. 102/2024, RCCMS Case No. 26-1/2025, LRMS ଦେଶ ନଂ 182/2025 ବୁକୁନ ମୁତାବକ ପୁର ନଂ 1,2 ଉଦ୍ଦେଶ୍ୟ 70.000, 48.000 ଟି ପ୍ରକାଶନ ଖାତା ନଂ 498 ରୁ | | | | | |

ଅଗ୍ନି ପ୍ରକାଶନ ତାରିଖ : 28/08/1985

ଖଜଣା ଧାର୍ଯ୍ୟ ତାରିଖ :



BLANK SPACE FOR STAMPING

(Signature)
Addl. Tahasildar
Talcher
22/01/2025

| ମାପିଯାମ୍ୟ କ୍ରମିକ ନଂ : 498/2 | | ମନିଷା : ବର୍ଣ୍ଣପୁର | | | କିସା : ଅନୁସନ୍ଧାନ |
|-----------------------------|---------------------|--------------------------------|--------|---------|------------------|
| ପୁର ନମ୍ବର ଓ ବର୍ଷର ନାମ | ଭିତ୍ତିକ ଓ ପୁରର ଖରାଦ | ଭିତ୍ତିକର ବିକାଶିତ ବିବରଣୀ ଓ ମୋଟର | ଓଡ଼ିଆ | | |
| | | | ପ୍ରକାର | ଫି | ମୋଟର |
| ୫ | ୮ | ୯ | ୧୦ | ୧୧ | ୧୨ |
| 1 | ବିତ୍ତିକ ପୁର | ମୋଟର | 70000 | 28.3280 | |
| 2 | ବିତ୍ତିକ ପୁର | ମୋଟର | 48000 | 19.4249 | |
| 3 ପୁର | | | 118000 | 47.7529 | |

କାର୍ଯ୍ୟକାରୀ ଦସ୍ତଖତ ଦେଇ, ଉପରୋକ୍ତ

22/01/2025


R.K.
Tahasil Office, Talcher


D.E.O.
Tahasil Office, Talcher


Addl. Tahasilidar
Talcher

GOVERNMENT OF ODISHA
FOREST, ENVIRONMENT AND CLIMATE CHANGE DEPARTMENT

Annexure-5B

NOTIFICATION

Bhubaneswar, Dated the **27 MAR 2025**

No.FE-DIV-FLD-0020-2022 (10F-(Cons)-66/2017)- 7514 /FE&CC, In exercise of the powers conferred under Section-33 of the Odisha Forest Act, 1972 (Odisha Act 14 of 1972), the State Government do hereby declare that the following land situated in Village-Karnapur under Talcher Tahasil of Angul District mutated and transferred in favour of Forest, Environment & Climate Change Department for raising Compensatory Afforestation thereon against the proposed diversion of 26.416 ha (originally proposed area is 20.383 ha) of forest land in favour of the Mahanadi Coalfield Ltd. for continuation of mining operation at Bhubaneswari Expansion OCP within Mining Lease area over 658.724 ha under Angul Forest Division in Angul District, Odisha vide in-principle approval of Government of India, MoEF&CC, FC Division, New Delhi communicated in letter dated 24.09.2024 under Section-2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980, the limits of which are specified below and the area of which is 62.7263 ha (155.00 Ac) shall be a Protected Forest with effect from the date of issue of the Notification and shall be known as "Karnapur Protected Forest".

Forest Block:

| | | |
|--------------------------------|---|--------------------|
| Name of the Protected Forest | : | Karnapur |
| Area of Protected Forest in Ha | : | 62.7263 |
| Area in Acres | : | 155.00 |
| Name of the Village | : | Karnapur |
| Name of the Police Station | : | Colliery PS |
| Name of the Tahasil | : | Talcher |
| Name of the Sub-Division | : | Talcher |
| Name of the District | : | Angul |

Land Schedule:

| SL No. | Village | Khata No. | Plot No. | Kissam | Area in Ac. | Boundary description | | | |
|--------|----------|-----------|----------|--------|-------------|--|---|--|------------------------------|
| | | | | | | North | South | East | West |
| 1 | Karnapur | 498/1 | 8/6005 | Jungle | 37.00 | Plot No. 5366/5447, 5366/584, 5366/5861, 8/5621/5777, 8/5979, 8/5366, 8/5626, 8/5621/5977, 9, 5242 of Mouza Karnapur and 450, 449, 440, 441, 435/712, 435 of Mouza | Plot No. 588, 5398, 589/5648, 589/5648/6001 of Mouza Karnapur | Plot No. 8/5625, 146, 5368 of Mouza Karnapur | Plot No. 8 of Mouza Karnapur |

Memo No. 7518/FE&CC, Date 27 MAR 2025

Copy forwarded to the Principal Chief Conservator of Forests & HoFF, Odisha/ Principal Chief Conservator of Forests (WL) & CWLW, Odisha/ Addl. Principal Chief Conservator of Forests (FD&NO, FC Act), O/o the PCCF & HoFF, Odisha w.r.t. his letter No.5640, dt.11.03.2025/ Regional Chief Conservator of Forests, Angul Circle/ Divisional Forest Officer, Angul Forest Division for information and necessary action.

27/3/2025
OSD-cum-Special Secretary to Government

Memo No. 7519/FE&CC, Date 27 MAR 2025

Copy forwarded to the Head State Portal, IT Centre, Odisha Secretariat, Bhubaneswar/ OE (IT) Section, FE&CC Department w.r.t. this Department letter No.21646/F&E dtd.22.11.2016/ 5 spare copies for G.F. for information and necessary action.

27/3/2025
OSD-cum-Special Secretary to Government

Memo No. 7520/FE&CC, Date 27 MAR 2025

Copy forwarded to the General Manager, Mahanadi Coal Fields Ltd., Bhubaneswar Area, Deracolliery, Talcher, Angul, Odisha-759103 for information and necessary action.

27/3/2025
OSD-cum-Special Secretary to Government



**GOVERNMENT OF ODISHA
FOREST, ENVIRONMENT AND CLIMATE CHANGE DEPARTMENT**

Annexure- 6

NOTIFICATION

Bhubaneswar, Dated the **27 MAR 2025**

No.FE-DIV-FLD-0020-2022 (10F-(Cons)-66/2017)- **7514** /FE&CC, In exercise of the powers conferred under Section-33 of the Odisha Forest Act, 1972 (Odisha Act 14 of 1972), the State Government do hereby declare that the following land situated in Village-Karnapur under Talcher Tahasil of Angul District mutated and transferred in favour of Forest, Environment & Climate Change Department for raising Compensatory Afforestation thereon against the proposed diversion of 26.416 ha (originally proposed area is 20.383 ha) of forest land in favour of the Mahanadi Coalfield Ltd. for continuation of mining operation at Bhubaneswari Expansion OCP within Mining Lease area over 658.724 ha under Angul Forest Division in Angul District, Odisha vide in-principle approval of Government of India, MoEF&CC, FC Division, New Delhi communicated in letter dated 24.09.2024 under Section-2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980, the limits of which are specified below and the area of which is 62.7263 ha (155.00 Ac) shall be a Protected Forest with effect from the date of issue of the Notification and shall be known as "**Karnapur Protected Forest**".

Forest Block:

| | | |
|--------------------------------|---|-----------------|
| Name of the Protected Forest | : | Karnapur |
| Area of Protected Forest in Ha | : | 62.7263 |
| Area in Acres | : | 155.00 |
| Name of the Village | : | Karnapur |
| Name of the Police Station | : | Colliery PS |
| Name of the Tahasil | : | Talcher |
| Name of the Sub-Division | : | Talcher |
| Name of the District | : | Angul |

Land Schedule:

| SL No. | Village | Khata No. | Plot No. | Kissam | Area in Ac. | Boundary description | | | |
|--------|----------|-----------|----------|--------|-------------|--|---|--|------------------------------|
| | | | | | | North | South | East | West |
| 1 | Karnapur | 498/1 | 8/6005 | Jungle | 37.00 | Plot No. 5366/5447, 5366/584, 5366/5861, 8/5621/5777, 8/5979, 8/5366, 8/5626, 8/5621/5977, 9, 5242 of Mouza Karnapur and 450, 449, 440, 441, 435/712, 435 of Mouza | Plot No. 588, 5398, 589/5648, 589/5648/6001 of Mouza Karnapur | Plot No. 8/5625, 146, 5368 of Mouza Karnapur | Plot No. 8 of Mouza Karnapur |

| | | | | | | | | | |
|---------------|--|-------|---|-----------|--------------------------|---|------------------------------|------------------------------|--------|
| | | | | | | Baulpur | | | |
| 2 | | 498/2 | 1 | Jungle-II | 70.00 | Plot No. 36, 44, 45, 444 of Mouza Baulpur | Plot No. 2 of Mouza Karnapur | Plot No. 8 of Mouza Karnapur | Forest |
| 3 | | | 2 | | 48.00 | Plot No. 1 of Mouza Karnapur | Plot No. 3 of Mouza Karnapur | Plot No. 8 of Mouza Karnapur | Forest |
| Total 3 plots | | | | | 155.00 Ac or 62.7263 Ha. | | | | |

By order of the Governor

(Satyabrata Sahu)

Additional Chief Secretary to Government

By e-Mail: deputydirectorppp@rediffmail.com

Memo No. 7515 /FE&CC, Date 27 MAR 2025

Copy with soft copy forwarded to the Director of Printing, Stationery and Publication, Odisha Cuttack for publication in an extra-ordinary issue of the Odisha Gazette and supply 10 copies of printed notification each to Forest, Environment & Climate Change Department/ Director of Land Records and Surveys, Odisha, Cuttack/ Collector, Angul/ Divisional Forest Officer, Angul Forest Division/ Tahasildar, Talcher Tahasil, Dist.-Angul.

2. The Notification is statutory and may be assigned SRO number.

OSD-cum-Special Secretary to Government

Memo No. 7516 /FE&CC, Date 27 MAR 2025

Copy forwarded to the Assistant Inspector General of Forests, Govt. of India, Ministry of Environment, Forest and Climate Change, (F.C. Division), Indira Paryavaran Bhawan, Jor Bagh Road, Aliganj, New Delhi-110003/ Deputy Director General of Forests (Central), Govt. of India, MoEF&CC, Regional Office, A/3, Chandrasekharapur, Bhubaneswar-23 for information and necessary action.

OSD-cum-Special Secretary to Government

Memo No. 7517 /FE&CC, Date 27 MAR 2025

Copy forwarded to the Revenue & Disaster Management Department/ Steel & Mines Department/ Director, Environment-cum-Special Secretary to Government, FE&CC Department/ Member Secretary, SPCB, Odisha/ Director of Land Records and Surveys, Odisha, Cuttack/ RDC (ND), Sambalpur/ Collector, Angul/ Tahasildar, Talcher Tahasil, Dist.-Angul for information and necessary action.

OSD-cum-Special Secretary to Government

Memo No. 7518/FE&CC, Date 27 MAR 2025

Copy forwarded to the Principal Chief Conservator of Forests & HoFF, Odisha/ Principal Chief Conservator of Forests (WL) & CWLW, Odisha/ Addl. Principal Chief Conservator of Forests (FD&NO, FC Act), O/o the PCCF & HoFF, Odisha w.r.t. his letter No.5640, dt.11.03.2025/ Regional Chief Conservator of Forests, Angul Circle/ Divisional Forest Officer, Angul Forest Division for information and necessary action.

du 27/3/2025

OSD-cum-Special Secretary to Government

Memo No. 7519/FE&CC, Date 27 MAR 2025

Copy forwarded to the Head State Portal, IT Centre, Odisha Secretariat, Bhubaneswar/ OE (IT) Section, FE&CC Department w.r.t. this Department letter No.21646/F&E dtd.22.11.2016/ 5 spare copies for G.F. for information and necessary action.

du 27/3/2025

OSD-cum-Special Secretary to Government

Memo No. 7520/FE&CC, Date 27 MAR 2025

Copy forwarded to the General Manager, Mahanadi Coal Fields Ltd., Bhubaneswari Area, Deracolliery, Talcher, Angul, Odisha-759103 for information and necessary action.

du 27/3/2025

OSD-cum-Special Secretary to Government



OFFICE OF THE DIVISIONAL FOREST OFFICER, ANGUL DIVISION: ANGUL 21.10.24

Tc
Subj:-

Letter No. 8043 DRP/Dated. 21.10.2024

The General Manager,
Bhubaneswari Area, Mahanadi Coalfields Limited
At./P. O- Dera Colliery, Talcher, Angul-759103.

Proposal for seeking prior approval of the Central Government under Section-2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 26.416 ha (originally proposed area is 20.383 ha) of forest land in favour of the Mahanadi Coalfields Ltd. for continuation of mining operation at Bhubaneswari expansion OCP within Mining Lease area over 658.724 ha under Angul Forest Division in Angul District, Odisha - Regarding.
(Online proposal no. FP/OR/MIN/155017/2022).

: - Demand of Net Present Value (NPV).

- Ref: -
1. Stage-I/in-principle approval letter No. 8-18/2002-FC(Vol) Dtd. 24.09.2024 of the AIGF, FC Division, Government of India MoEF&CC, New Delhi.
 2. Memo No 18586 Dtd. 27.09.2024 of OSD-cum-SS to Government.
 3. Memo No 20116 Dtd. 05.10.2024 of PCCF(Nodal), Bhubaneswar.

Sir,

With reference to the above-cited subject, it is to inform you that the Ministry of Environment, Forest, and Climate Change (MOEF&CC), Government of India, New Delhi has conveyed its approval for the Stage-I/ In-principle forest clearance vide Order No. 8-18/2002-FC (Vol) dated 24.09.2024 under section 2(1)(ii) of Forest (Conservation) Act, 1980 in favour of the Mahanadi Coalfields Ltd. for non-forestry 26.416 Ha of forest land for the use of continuation of mining operation at Bhubaneswari expansion OCP within Mining Lease area over 658.724 ha under Angul Forest Division in Angul District, Odisha

In this connection, the user agency, Bhubaneswari OCP of M/s Mahanadi Coalfields Limited has already deposited the cost of NPV for the Safety Zone Forest land of 6.033 Ha amounting to Rs. 56,64,987.00 vide UTR/DD No 8684633 Dtd 26.07.2010 and deposited in CAMPA Account (CAF A/c No. CA-1585 (Copy of proforma pertaining to transfer of funds by the user agency is enclosed for reference).

Further, you are requested to deposit an amount of Rs. 2,92,83,645.00 (Rupees Two Crores Ninety-Two Lakhs Eighty-Three Thousand Six Hundred And Forty Five Only) towards the cost of the NPV for the balance forest land of 20.383 Ha through the online e-payment module on PARIVESH portal, in to the account of CAMPA of the Odisha State immediately and inform this office for further action as per the Stage-I approval condition No. 3. The user agency is required to transfer the funds towards cost of the NPV of the forest land being diverted under this proposal, as per the orders of the Hon'ble Supreme Court of India dated 28.03.2008, 24.04.2008, and 09.05.2008 in Writ Petition (Civil) No. 202/1995, and the guidelines given under para 3 of the Chapter-3 of the

Consolidated Guidelines and Clarifications issued under the Van (Sanrakshan Evam Samvardhan) Rules, 2023 published by the Ministry 29.12.2023. The detailed calculation is given below:

| | |
|-------------------------|--|
| Forest land involved: | 20.383 ha |
| Density of forest land: | 0.4 - 0.5 |
| Eco value class: | I |
| Rate of NPV applicable: | Rs. 14,36,670.00/- per ha x 20.383 ha = Rs. 2,92,83,645.00 |

Additionally, as per the condition No. 3(ii) of the Stage-I/ In-principle approval, you are requested to submit an undertaking to pay additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India. An undertaking from the user agency in this regard is required.

This is for information and necessary action.


Encl :- As above.

Yours faithfully,


Divisional Forest Officer
Angul Division


Memo No. 8044 / Dated. 21.10.2024

Copy forwarded to the Regional Chief Conservator of Forests, Angul Circle, Angul for favour of kind information and necessary action with reference to memo No. 18584 dt. 27.09.2024 of OSD-cum-SS to Govt.


Divisional Forest Officer
Angul Division

Memo No. 8045 / Dated. 21.10.2024

Copy forwarded to the Principal Chief Conservator of Forests, Forest Diversion & Nodal Officer, F.C. Act, O/o the Principal Chief Conservator of Forests, Odisha for favour of kind information and necessary action with reference to memo No. 18581 dt. 27.09.2024 of OSD-cum-SS to Govt.


Divisional Forest Officer
Angul Division

Online payment history made by User Agency under CAMPA

Help



| Sno. | Proposal Detail | Application_No | Application No (New) | Date of IN-PRINCIPLE | Amount to be Paid/Amount Paid (in Rs.) | Payment Status | Payment Detail | Demand Letter |
|------|---|------------------|----------------------|----------------------|--|----------------|---|---|
| 1 | FP/OR/MIN/155017/2022 (../viewreport.aspx?pid=FP/OR/MIN/155017/2022) BHUBANESWARI OCP | MIN1550172022490 | 58155017490 | 24 Sep 2024 | CA: 27534400/- Addl CA : 0/- PCA: 0/- , CAT : 0/- Safety Zone: 0/- , Addl PA : 0/- NPV: 29283645/- Other Charges : 0/- Other Charges1 0/- : Other Charges2 0/- : Other Charges3 0/- : Total : 56818045/- | Paid | Fund Demand Verified by :24 Oct 2024 Nodal Officer On Bank Name : Union Bank Of India Mode of : NEFT/RTGS Payment : (Challan) Challan Generated On :30 Oct 2024 Transaction :06 Nov 2024 Date | Demand Letter (../writereaddata/Fundpdf/231020241947030010_FPORMIN1550172022_User_Fund_Demanded_87471.p Generated Challan (../UserAccount/Neft_Challan.aspx?pid=MIN1550172022490) |



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For any Technical support, Please Contact EFCCID, NIC, New Delhi, monitoring-fc(at)nic(dot)in

OFFICE OF THE DIVISIONAL FOREST OFFICER, ANGUL DIVISION, ANGUL

Memo No. 5961 / Dated. 10-10-12

The Chief Conservator of Forests
(Forest Diversion & Nodal Officer) F.C. Act.
O/o the Principal CCF, Odisha.

Sub:- Diversion of 132.904 ha (approved area 112.521 ha) of forest land in Talcher Coalfields of Angul District in favour of Bhubaneswari OCP of Mahanadi Coal Fields Ltd. Odisha- Compliance relating to deposit of funds in connected CAMPA account-regarding.

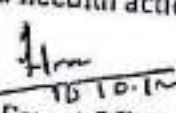
Ref:- Memo No. 17796 dt. 17.09.2012 of Govt. of Odisha, F&E Department.


With reference to the above subject, it is to inform that on the stipulation of the Final Approval Order of MCL vide letter E.No.8-18/2007 dt. 06.12.2004, the User Agency i.e. General Manager, Bhubaneswari OCP (MCL) has deposited the following funds for compliance of the stipulations.


| Sl. No. | Description of Funds deposited by the User Agency | DD/ Check No. | Amount deposited (in Rs) | D.D. sent to CCF (Nodal) vide memo No. & Date |
|---------|---|----------------------------|--------------------------|---|
| 1 | Cost of Bio-Logical Reclamation & Afforestation. | 333204 dt. 12.06.2004 | 17076000 | Deposited in Forest Deposit |
| 2 | Cost of Habitat Improvement Plan for surrounding area | 422052 dt. 04.09.2004 | 5424896 | Deposited in Forest Deposit |
| 3 | Cost of Compensatory Afforestation Scheme | 417707 dt. 09.05.2003 | 3253159 | Deposited in Forest Deposit |
| 4 | Cost of NPV | 5054-260 dt. 07.07.2007 | 84390750 | Memo No. 3734 dt. 19.07.2007 |
| 5 | Cost of Addl. NPV | 868463 dt. 26.07.2010 | 5664987 | Memo No. 5172 dt. 03.08.2010 |
| 6 | Cost of Safety Zone Scheme | 007304 dt. 08.09.2008 | 2588100 | Memo No. 6286 dt. 26.09.2008 |
| | Cost of 1.5 time Safety Zone | | 240200 | |

In this connection connected documents in support of the Deposition of the above funds are sent herewith for favour of information and needful action as desired.

As above.


Divisional Forest Officer
Angul Division.


Staff Officer (Env.)
Bhadrachal Area, MCL


General Manager
Bhadrachal Area, MCL.

Memo No. 5903 / Dated 10-10-12

Copy forwarded to the Regional Chief Conservator of Forests, Angul for information and necessary action with reference to the memo No.17797 dt. 17.09.2012 of Govt. of Odisha Forest & Environment Department.

11-10-12
Divisional Forest Officer
Angul Division.

Memo No. 5903 / Dated 10-10-12

Copy forwarded to the Addl. Secretary to Government of Odisha, Forest & Environment Department for favour of kind information and necessary action with reference to his memo No. 17797 dt. 17.09.2012.

11-10-12
Divisional Forest Officer
Angul Division

15/10/2012
महा प्रबंधक
जगन्नाथ जी
Gene Jagannath
CL



Office of the General Manager
(Bhubaneswari Area)
At/Po :Dera Colliery
Dist: Angul – 759103 (Odisha)
Website :www.mcl.gov.in
Email Id: cgm-bhubaneswari.mcl@coalindia.in



MCL

Annexure- 08

UNDERTAKING

PROPOSAL NO.:- FP/OR/MIN/155017/2022

(In compliance to Condition No. 3 (ii) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "At the time of payment of the Net Present Value (NPV) at the present rate, the user agency shall furnish an undertaking to pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India".

General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एन सी एल, भुवनेश्वर क्षेत्र
MCL, Bhubaneswar Area

Divisional Forest Officer
Angul, Division

Assesment-9

PARIVESH
परिवेश

Ministry of Environment, Forest and Climate Change
Government of India

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[Home](#)

[Online payment facility made by User Agency under JARPA](#)

| Sl. No. | Request No. | Request Title | Request Status | Request Type | Request Category | Request Sub-Category | Request Description | Request Date | Request Status | Request Date | Request Status |
|---------|----------------------|-----------------------|----------------|--------------|------------------|----------------------|-----------------------|--------------|----------------|--------------|----------------|
| 1 | 10000000000000000000 | Request for Clearance | Pending | Request | Request | Request | Request for Clearance | 10/01/2020 | Pending | 10/01/2020 | Pending |
| 2 | 10000000000000000000 | Request for Clearance | Pending | Request | Request | Request | Request for Clearance | 10/01/2020 | Pending | 10/01/2020 | Pending |

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Government of India

Divisional Forest Officer
Angul, Division



Assets Management System

Home Assets/Other work sites Summary/Reports

Asset/Site-specific Work-sites List

Help

State of Odisha

Asset major category: Other

Asset Ownership Type: Departmental

Circle: Angul

Range: Talcher

Asset sub-category: Others

Asset Nature: Proposed

Division: Angul

Asset Location: Forest Land

New List of Assets

| S.No. | Asset / Site | Work-Site/Asset Code | Area | State | Division | Range | Asset Year | Asset Ownership | Asset Nature | Range Asset Yr. Bu | Forest Land Type | District | Forestry Details | Major Categories | GPS | Asset Category | GPS |
|-------|--|----------------------|-------------------|--------|----------|---------|------------|-----------------|--------------|--------------------|------------------|----------|--|------------------|-----------|----------------|-----|
| 251 | WL-SSCP-Bharapuri Fire line Tracing at Kantejerna EF APC-2019-20 | 26A2220134020B | 14.000 Hectare | Odisha | Angul | Talcher | 2019 | Departmental | Proposed | | Forest Land | | Beats-Kantejerna, Coupes - 0, Comp - 0 | Other | lat, long | Others | |
| 252 | Interest-18 Months old Seedlings at Talcher Range-APC-2020-21 | 26A2220177304 | 1.000 Hectare | Odisha | Angul | Talcher | 2020 | Departmental | Proposed | | Forest Land | | Beats-Seedling, Coupes - 0, Comp - 0 | Other | lat, long | Others | |
| 253 | Interest-6 Months Free Distribution Seedlings at Talcher Range-APC-2020-21 | 26A2220177372 | 30000.000 Hectare | Odisha | Angul | Talcher | 2020 | Departmental | Proposed | | Forest Land | | Beats-Talcher, Coupes - 0, Comp - 0 | Other | lat, long | Others | |
| 254 | Proposed Site Specific Wildlife Management Plan for Bhubaneswar | 26A22201260948 | 1.000 Hectare | Odisha | Angul | Talcher | 2025 | Departmental | Proposed | | Forest Land | | Beats-Talcher, Coupes - 0, Comp - 0 | Other | lat, long | Others | |

| | | | | | | | | | | | | | | |
|-----|--|-----------------------|------------------|--------|-------|---------|------|--------------|----------|-------------|-------------------------------------|-------|-------------|--------|
| 255 | CCP under of Angul Division WPP-18 Montha old Seedlings 10000 nos at Talcher APO-2020-21 | <u>26A22201542948</u> | 1,000 Number | Odisha | Angul | Talcher | 2020 | Departmental | Proposed | Forest Land | Beats- Talcher, Coupes - 0, Comp- 0 | Other | lat., long. | Others |
| 256 | Forest Protection- Para Forest Staff at Talcher Range APO-2020-21 | <u>26A2220154305</u> | 4,000 Number | Odisha | Angul | Talcher | 2020 | Departmental | Proposed | Forest Land | Beats- Talcher, Coupes - 0, Comp- 0 | Other | lat., long. | Others |
| 257 | Control & Prevention of Forest fire- Fire Fighting Squad at Talcher Range APO-2020-21 | <u>26A2220154314</u> | 10,000 Number | Odisha | Angul | Talcher | 2020 | Departmental | Proposed | Forest Land | Beats- Talcher, Coupes - 0, Comp- 0 | Other | lat., long. | Others |
| 258 | Control & Prevention of Forest Fire- Fire Vehicle at Talcher Range APO-2020-21 | <u>26A2220154327</u> | 1,000 Number | Odisha | Angul | Talcher | 2020 | Departmental | Proposed | Forest Land | Beats- Talcher, Coupes - 0, Comp- 0 | Other | lat., long. | Others |
| 259 | WL-SSCP- Bhadrakpur Fire line Tracing at Raibhuan SF APO-2019-20 | <u>26A2220154444</u> | 3,000 Kilometres | Odisha | Angul | Talcher | 2019 | Departmental | Proposed | Forest Land | Beats- Seepur, Coupes - 0, Comp- 0 | Other | lat., long. | Others |
| 260 | Inter- Forest Protection- Patrolling PCL at Talcher Range APO-2020-21 | <u>26A2220167484</u> | 1,000 Number | Odisha | Angul | Talcher | 2020 | Departmental | Proposed | Forest Land | Beats- Talcher, Coupes - 0, Comp- 0 | Other | lat., long. | Others |
| | | | | | | | | | | 1 2 3 4 5 6 | | | | |



Verification of GPS

Home GPS Verification GPS Verification Status

View Remarks on Polygons Uploaded by States

State : Odisha Circle : Angul

Division : Angul Range : Talcher

Site Type : Asset Sites Status of polygons : Remarks not given

View Sites for which polygons uploaded Export To: Excel

--GPS Uploaded/Updated On--

☐ Today ☐ This Week ☐ This Month ☐ This Year ☒ All



| S.No | FCA Project No | GPS ID | Division | Range | Project Name | Project Year | Site/Work/Asset Name | Area(In Ha.) | Updated | View Remarks | Download |
|------|----------------|--------|----------|---------|--------------|--------------|---|--------------|------------|--------------|----------|
| 1 | -- | 113396 | Angul | Talcher | -- | -- | Proposed Sanu Specific Wildlife Management Plan for (Bhathinagar) OCP under of Angul Division | 0.000 | 30/03/2025 | | |

| S.No. | PCA Project File No. | Proj. Name | State | Proj. Year | Ref. No. | Ref. Date | Receipts Date | NPV | CA | ACA | PCA | PAF | CAT | SZ | Others | Total Recovered |
|-------|----------------------------|--|-------|------------|-----------------------|------------|------------------|----------|----------|-----|-----|-----|-----|----|-----------|--------------------|
| 1 | 18/2002- FC No. | Diversion of 26.416 ha originally proposed area is 20.383 ha) of forest operation at Bhubaneswar expansion OCP within Mining Lease area over 658.724 | OR | 2024 | ICR22024110605082518 | 06/11/2024 | 06/11/2024 | 0 | 27534400 | 0 | 0 | 0 | 0 | 0 | 0 | 27534400 |
| 2 | 18/2002- FC No. | Diversion of 26.416 ha originally proposed area is 20.383 ha) of forest operation at Bhubaneswar expansion OCP within Mining Lease area over 658.724 | OR | 2024 | ICR22024110605082519 | 06/11/2024 | 06/11/2024 | 29280645 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29280645 |
| 3 | 18/2002- FC No. | Diversion of 26.416 ha originally proposed area is 20.383 ha) of forest operation at Bhubaneswar expansion OCP within Mining Lease area over 658.724 | OR | 2024 | ICR220250332408450385 | 24/03/2025 | 24/03/2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7625700 | 7625700 |
| 4 | 18/2002- FC No. | Diversion of 26.416 ha originally proposed area is 20.383 ha) of forest operation at Bhubaneswar expansion OCP within Mining Lease area over 658.724 | OR | 2024 | ICR220250332408450389 | 26/03/2025 | 26/03/2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 152514000 | 152514000 |
| Total | | | | | | | | 29280645 | 27534400 | 0 | 0 | 0 | 0 | 0 | 160139700 | 216957745 |

Look and Print Details Go Back

महेश प्रवीण
General Manager
एम.सी.एल. पुणेरेखरी मंत्र

Divisional Forest Officer
Angul, Division

| | | |
|--|--|---|
|  | <p>Office of the General Manager (Bhubaneswari Area) At/Po :Dera Colliery Dist: Angul – 759103 (Odisha) Website :www.mcl.gov.in Email Id: cgm-bhubaneswari.mcl@coalindia.in</p> |  |
|--|--|---|

Annexure-11

UNDERTAKING

PROPOSAL NO.:- FP/OR/MIN/155017/2022

(In compliance to Condition No. 6 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "Following activities, as per approved plan / schemes, shall be undertaken in the lease area by the User Agency under the supervision of the State Forest Department. Approved scheme/plan shall be submitted to the Ministry along with compliance of 'in-principle' approval".



General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एम.सी.एल, भुवनेश्वर क्षेत्र
MCL, Bhubaneswari Area



Divisional Forest Officer
Angul, Division

OFFICE OF THE DIVISIONAL FOREST OFFICER; ANGUL DIVISION: ANGUL

Memo No. 10028 /DRP/2024/Dated 12.12.2024

To

The General Manager, Bhubaneswari Area,
At /PO/Dist.- Angul, Odisha, Pin- 759122

Sub: -

Proposal for Seeking prior approval of Central Government under section 2 (ii) of the forest (Conservation) Act, 1980 in favour of M/s Mahanadi Coal filed Ltd. for non-forestry use of 26.416 ha (Originally proposed area is 20.383 ha) of forest land for Bhubaneswari OCP Coal mining under Angul Forest Division and District Angul of Odisha State-Reg. Projects of Bhubaneswari Area.

:- Approval of Schemes.

Ref: -

Memo No. 4930 dt. 10.12.2024 of RCCF, Angul.

Sir,

With reference to the above-cited subject, this is to inform that the Regional Chief Conservator of Forests, Angul Circle, Angul, has approved the following scheme, as per conditions No. 6(i), 6(ii), 6(iii), 6(iv), 6(v), 7, and 8 of the Stage-I approval, vide their memo No. 4920 dated 10.12.2024 (copy enclosed for your reference). The details are given below.

| Cond . No. | Name of the Scheme | Financial outlay (Rs.) |
|------------|---|------------------------|
| 6.1 | Mitigative Measures to Minimize Soil Erosion and Choking of Streams and its implementations. | 3,48,88,000/- |
| 6.2 | Planting of Adequate Drought Hardy Plant Species and Sowing of Seeds, in the Appropriate Area within the Mining Lease to Arrest Soil Erosion | 1,26,87,000/- |
| 6.3 | Construction of Check Dams, Retention/ Toe Walls to Arrest Sliding Down of the Excavated Material Along the Contour | 6,44,97,100/- |
| 6.4 | Stabilize the Overburden Dumps by Appropriate Grading/ Benching, in Accordance with the Approved Scheme, so as to Ensure that Angles of Repose at any Given Place is Less than 28° | 1,08,00,000/- |
| 6.5 | Management of top soil | 45,20,200/- |
| 7 | Gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located in the area within 100 meters from outer perimeter of the mining lease through the State Forest Department. | 1,86,83,500/- |
| 8 | De-silting of Village Tanks and Other Water Bodies Located Within 05 km from the Mine Lease Boundary so as to Mitigate the Impact of Siltation of such Tanks/ Water bodies | - |

Hence, the above-approved schemes received from the Regional Chief Conservator of Forests, Angul Circle, Angul, are enclosed herewith for necessary action as per the Stage-I condition of MoEF&CC. Further, you are requested to submit the point-wise Stage-I compliance report along with all relevant documents to this office immediately for onward transmission to the higher authority in due time.

This is for information and necessary action.

Encl: - As above.


Divisional Forest Officer
Angul Division

Memo No. 10029 / Dated. 12-12-2024



Copy forwarded to the Principal Chief Conservator of Forests, Forest Diversion & Nodal Officer, FC Act O/o the Principal Chief Conservator of Forests, Odisha, Bhubaneswar for kind information and necessary action with reference to memo No. 4931 dt. 10.12.2024 of RCCF, Angul.


Divisional Forest Officer
Angul Division

Memo No. 10030 / Dated. 12-12-2024

Copy forwarded to the Regional Chief Conservator of Forests, Angul Circle, Angul for information and necessary action with reference to your memo No. 4930 dt. 10.12.2024.


Divisional Forest Officer
Angul Division

| | | |
|--|--|---|
|  | <p>Office of the General Manager (Bhubaneswari Area) At/Po :Dera Colliery Dist: Angul – 759103 (Odisha) Website :www.mcl.gov.in Email Id: cgm-bhubaneswari.mcl@coalindia.in</p> |  |
|--|--|---|

Annexure-19

UNDERTAKING

PROPOSAL NO.:- FP/OR/MIN/155017/2022

(In compliance to Condition No. 6 (i) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "Mitigation measures, to minimize soil erosion and choking of stream, shall be implemented within a period of two years with effect from the date of issue of order of diversion of forest land, in accordance with the approved Plan in consultation with the State Forest Department".



General Manager
Bhubaneswari Area, MCL

सहा प्रबंधक
General Manager
एम.डी.एल, भुवनेश्वरी क्षेत्र
MCL, Bhubaneswari Area



Divisional Forest Officer
Angul, Division



BHUBANESWARI OPEN CAST COAL PROJECT

***Scheme
for***

**MITIGATIVE MEASURES TO MINIMIZE SOIL EROSION AND
CHOKING OF STREAMS**

***in compliance
with***

**Condition No.6 (i) of
Stage-I approval granted vide
Letter No.8-18/2002-FC, Dated.24.09.2024
of Govt. of India, Ministry of Environment, Forests
& Climate Change, New Delhi.**

for

**Diversion of 26.416 Ha. (Originally proposed area is 20.383 ha)
of Forest Land within 658.724 Ha. of ML area of Bhubaneswari OCP
for Non forestry use U/s-2 (ii) of FC Act-1980
in villages Jilinda, Hensmul (Sharasahi), Hensmul
(Talasahi), Naraharipur, Khandualbhal, Kandhal,
Madanmohanpur, Langijoda and Anadipur of
Angul District, Odisha.**

M/s. Mahanadi Coalfields Limited

SCHEME FOR MITIGATIVE MEASURES TO MINIMIZE SOIL EROSION AND CHOKING OF STREAM SHALL BE IMPLEMENTED WITHIN A PERIOD OF TWO YEARS WITH EFFECT FROM DATE THE ISSUE OF STAGE-II CLEARANCE IN ACCORDANCE WITH THE APPROVED PLAN IN CONSULTATION WITH THE STATE FOREST DEPARTMENT.

1. INTRODUCTION

Bhubaneswari Open Cast Project is a mega coal mining project spread over a mining lease area of 658.724 ha. in Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur of Angul District, Odisha.

Mahanadi Coalfields Limited has named Bhubaneswari and combined Bhubaneswari, Sakhigopal-A, Arkhapal-A coal blocks as Bhubaneswari Open Cast Project.

As per approved Mining Plan and Mine Closure Plan, the mine life is 5 years. Out of total 658.72 Ha. of Mining Lease area, total forest land involved is 132.904 Ha out of which 112.521 Ha has got Stage 2 Forest clearance vide F.no:8-18/2002-FC, Dated 06/12/2004

The Stage-I Forest Clearance approval over 26.416 ha of Forest Land Under Section- 2 (ii) (including 6.033 ha. of Safety Zone) of the Forest (Conservation) Act, 1980 has been granted by MoEF & CC, Government of India vide their Letter No. 8-18/2002-FC, dated 24.09.2024, where in it has been stipulated as per **Condition No. 6 (i) for undertaking Mitigative measures to minimize soil erosion and choking of stream shall be implemented within a period of two years with effect from the issue of Stage-II clearance in accordance with the approved plan in consultation with the State Forest Department.**

2. LOCATION

The mining lease area is covered in the Survey of India Topo sheet No. F45T1 and Special Topo sheet Nos. D1, D2, E1& E2 and situated between the latitude 20°57'53.53"N to 20°59'16.83"N, and longitude 85°08'27.17"E to 85°11'6.29"E. The above ML area covering villages are in Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur of Angul District, Odisha.

LOCATION MAP

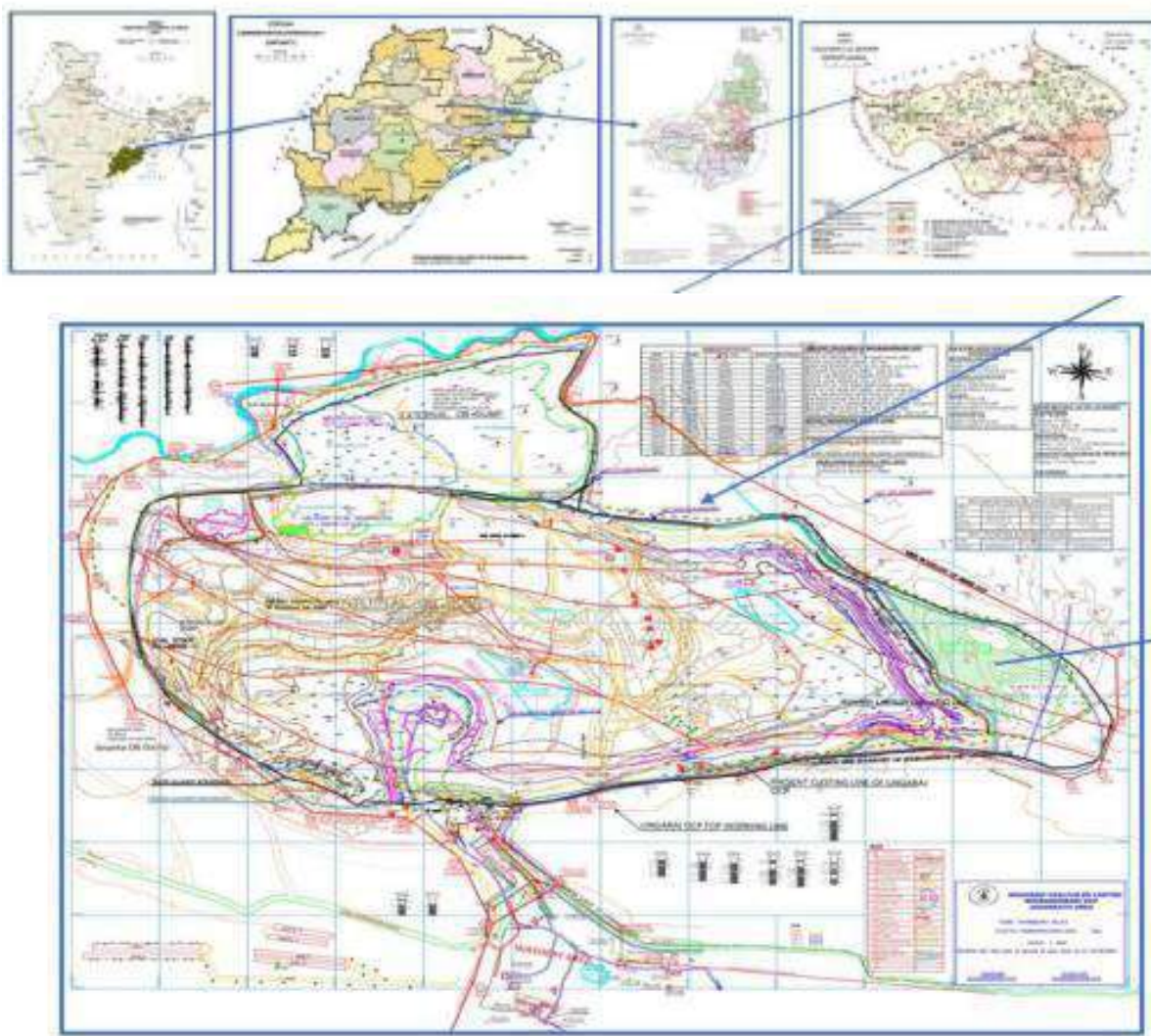


Fig-1. Location Map of Bhubaneswari OCP, MCL

3. TOPOGRAPHY

The surface topography is (majorly) predominantly soil covered and gently undulating with paddy fields and is used for agricultural purpose and some patches of barren lands. Around south western part, the surface topography is mildly undulating and slopes towards north. The ground level rises towards south-eastern corner of the block with highest elevation above Mean Sea Level of about 167.50 meter. A small seasonal stream (part of Bangaru stream) is flowing along the northern boundary of the project. Elevations of the area vary between 92 m to 137 m above mean sea level.

4. LAND USE PATTERN

The proposed land use pattern of 658.724 Ha. of mining lease area as per approved Mining Plan and Mine Closure Plan is given below:

Table 1: Purpose wise break up forest and non-forest land

| Sl. No. | Type of Land Use | Forest Land in Ha | Non-Forest Land in Ha | Total Land in Ha |
|--------------|---|-------------------|-----------------------|------------------|
| 1 | Mining Excavation Area | 126.191 | 488.531 | 614.722 |
| 2 | Safety Zone | | 6.163 | 6.163 |
| 3 | Infrastructure (CHP, Washery, Silo point, project office, laying of railway lines for dispatch point) and Future working expansion Area | 6.713 | 18.606 | 25.319 |
| 4 | Embankment | NIL | 12.52 | 12.52 |
| Total | | 132.904* | 525.820 | 658.724 |

Note: Out of total 658.72 Ha. of Mining Lease area, total forest land involved is 132.904 Ha out of which 112.521 Ha has got Stage 2 Forest clearance vide F.no:8-18/2002-FC, Dated 06/12/2004

5. DETAILS OF FOREST LAND WITHIN THE ML AREA

| | |
|---|-----------------|
| Forest land to be worked for mining and allied purpose- | 20.383 Ha |
| Area set aside for Safety Zone | <u>6.033 Ha</u> |
| | 26.416 Ha |

6. SOIL TYPE

The areas primarily consist of sandy and lateritic soil, with an additional presence of clay. In most of the area the soil is moderately coarse in nature whereas it is loamy in the cultivated land. The area nearby has a nala Bangaru stream - one seasonal stream (flows in the northern boundary). There were two periods of glacial advance and retreat during the deposition of Talcher sediments.

7. CLIMATE

The area experiences a sub-tropical warm temperature. Monsoon is from mid of June and continues till end of September. The average annual rainfall as recorded at IMD observatory at Angul is 1277 mm. and the highest rainfall occurs in the month of August (84.0 mm with a mean rainfall of 4.4 mm for the year 2020). Around 78% of rainfall occurs during the monsoon season. The temperature varies from 5.6oC to 43.7oC. Maximum temperature is being observed in the month of May and minimum in the month of December.

8. DRAINAGE

Brahmani River, flowing approximately north to south along the eastern boundary of the Talcher coalfield, provides the main drainage of the region. This river is fed by seasonal nalas, viz. Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor and a few small nalas. From the eastern boundary of the block, the Brahmani River lies eastward at a distance of about 20 km.

Bangaru stream River drains this entire block. Bangaru Stream River emerges as seasonal third order streams in Ambapal, Natara and Kalamchhuin village areas and flows into Brahmani River. The general slope is towards north. The local drainage is mainly dendritic in nature. Entire Mining area in north is drained by Bangaru Stream, in south by Nandira Stream and east by seasonal streams. These streams are ultimately joining in the North West –South East flowing Brahmini River east of the Mining area. Small ponds are common in this block and are utilized for drinking purpose.

9. EXISTING VEGETATION

The forest growth available in the area resembles Northern Tropical Dry Deciduous Forest similar to other regions in Talcher coalfield. Dominant tree species include Sal (*Shorea robusta*), Mahua (*Madhuca indica*), Neem (*Azadirachta indica*), Teak (*Tectona grandis*), Jamun (*Syzygium cumini*), and Mango (*Mangifera indica*)

The vegetation of the applied area is composed of Sal (*Shorea robusta*), Mahua (*Madhuca indica*), Neem (*Azadirachta indica*), Teak (*Tectona grandis*), Jamun (*Syzygium cumini*), Mango (*Mangifera indica*), Pipal (*Ficus religiosa*), Khajur (*Phoenix dactylifera*), Kusum (*Schleichera oleosa*), Tendu (*Diospyros melanoxylon*), Haldu (*Adina cordifolia*), Ber (*Ziziphus mauritiana*), and Saj (*Terminalia tomentosa*). **Sal (*Shorea robusta*)** is noted as the predominant species within the area

10. FACTORS RESPONSIBLE FOR SOIL EROSION & CHOKING OF STREAMS

The mining activities and overburden dumps are the major source of drainage of soil and other substances for choking of any drainage system existing down below. The forms of erosion observed in this region include mainly rill and gully. The storm water runoffs from the uplands, mine faces and OB dump slope areas carry substantial quantity of solids in the lower order streamlets and choke the higher order streams. These lower order streamlets and gullies have high erosion capacity due to steep gradient and transportation of rock fragments with high velocity of the stream and deposition of same in the connecting high order streams due to velocity drop. Streams can also erode by undercutting their banks resulting in mass-wasting processes like slumps or slides. When the undercut material falls into the stream, the fragments are transported and deposited down below in the stream bed. The other mode of sediment transportation is very negligible

11. OBJECTIVES OF THE SCHEME

The objectives are as follows: -

- i. To fulfil Condition No.6 (i) of the Stage-I approval granted vide Letter No.8-18/2002- FC, Dated.24.09.2024 of Govt. of India a to undertake **“Mitigative measure to minimize soil erosion & choking of stream shall be implemented within a period of 2 years with effect from the issue of Stage-II clearance in accordance with the approved plan in consultation with State Forest Department”**.
- ii. To prevent erosion of top soil.
- iii. To prevent obstruction of existing natural water course.
- iv. Proper Management of overburden deposited so as to prevent siltation in the down below streams.
- v. To prevent overflow of eroded soils from the mining areas to the natural streams

12. PROPOSED METHODOLOGY

To achieve the above objectives, it has been proposed to take up both biological and structural measures for effective erosion control and water conservation. The biological measures primarily include vegetative cover around overburden (OB) dump sites and along the diversions of nearby nalas. Structural measures are planned in the lower reaches of OB dump areas to reinforce the stability and manage run-off effectively. This comprehensive approach aims to minimize soil erosion while protecting the natural water courses in the vicinity

13. MEASURES ALREADY ADOPTED

It is an expansion project rather than a new mining lease, has already undertaken some preparatory measures for soil erosion control. These measures include ongoing efforts to reinforce existing structures and stabilize the environment in compliance with environmental guidelines. The mitigation strategy involves implementing both biological and structural measures around active areas, with particular emphasis on areas previously subject to disturbances. Following the approval of Stage-II forest clearance, these practices will be scaled up in coordination with the Forest Department, continuing throughout the mining operations.

14. MEASURES PROPOSED

The details of proposed mitigative measures to minimize soil erosion and choking of streams in Mining Lease of Bhubaneswari OCP in favour of M/s Mahanadi Coalfield Limited over an area of 658.724 hectare in villages Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur of Angul District, Odisha are given below:

a) Biological Measures

i) Plantation

In order to minimise soil erosion in the mining lease area of Bhubaneswari OCP. Two (2) types of measures are proposed i.e., i) plantation & ii) structural measures. In this connection it is proposed to take up plantation on 44.002 Ha at Three (3) different locations as per the map given as **Annexure-I** as per Mine Plan & Mine Closure Plan. The location-wise area details are given below:

Proposed Plantation Area

| Sl.No | Location | Area (in Ha.) |
|------------|---|---------------|
| 1 | Safety Zone | 6.163 |
| 2 | Infrastructure (CHP, Washery, Silo point, project office, laying of railway lines for dispatch point) and Future working expansion Area | 25.319 |
| 3 | Embankment | 12.52 |
| Total Area | | 44.002 |

The list of species proposed for plantation is as follows:

| Sl. No. | Local Name | Botanical Name | Family |
|---------|------------|---------------------|------------------|
| 1 | Jamun | Syzygium cumini | Myrtaceae |
| 2 | Mango | Mangifera indica | Anacardiaceae |
| 3 | Neem | Azadirachta indica | Meliaceae |
| 4 | Pipal | Ficus religiosa | Moraceae |
| 5 | Mahua | Madhuca latifolia | Sapotaceae |
| 6 | Teak | Tectona grandis | Lamiaceae |
| 7 | Ber | Ziziphus mauritiana | Rhamnaceae |
| 8 | Kachnar | Bauhinia racemosa | Fabaceae |
| 9 | Sal | Shorea robusta | Dipterocarpaceae |
| 10 | Khajur | Phoenix dactylifera | Arecaceae |
| 11 | Haldu | Adina cordifolia | Rubiaceae |

| | | | |
|----|----------|----------------------|--------------|
| 12 | Kusum | Schleichera oleosa | Sapindaceae |
| 13 | Jam Tree | Acacia acuminata | Fabaceae |
| 14 | Saj | Terminalia tomentosa | Combretaceae |
| 15 | Babul | Acacia arabica | Fabaceae |

It is proposed to go for block plantation @ 1000 plants per Hectare. Planting shall be done during July in pre-dug pits of size 45 cm X 45 cm X 45 cm. A basal dose of N.P.K fertiliser shall be applied at the time of planting, besides mixing with insecticides to prevent termites & insects. Fruit bearing trees and bamboo rhizomes shall not be planted in close proximity. A minimum distance of 2.5 mt X 2.5 mt shall be maintained on every fourth plants in planting either of the species. Care should be taken to complete the planting during July while rains are still on during first or second week of July

ii) Weeding

For establishment and better growth of the planted seedlings, timely weeding, soil working and manuring are necessary. It is proposed to carry out two weeding's, soil working and manuring during the first year and second year of plantation and one weeding and soil working during third year. During first year and second year, first weeding and manuring shall be carried out during August-September and the second one during September-October along with soil working after rains. First weeding shall be around the plants and the second one will be done in strip. In the third year the weeding will be done around the plants, which will be carried out during August.

After each weeding, intensive soil working will be done around each plant at a radius of 0.5mtr, followed by manuring of @ 50 grams NPK per plant in ring form.

iii) Application of Insecticides

The plantation site, after planting with good and healthy seedlings, may cause influx of insects, which usually eat and damage the tender leaves and shoots of the plants. To get rid of such insect attack, application of insecticides will be taken up in required doses at desired intervals. Spraying of insecticides shall be done preferably in a sunny day in the forenoon as per requirement.

The approved base cost norm for Block Plantation (Core Plantation) @ 1000 seedling per hectare with 10 years maintenance is given at Annexure-I

b) Structural Measures:

Vegetative means of erosion control are the most feasible and economic measures. However, as the pressure on land is increasing, it is necessary to bring even highly eroded land for

utilization. In this type of land, vegetative measures only are not adequate to keep down the erosion. Some structural measures are required to be undertaken along with vegetative measures. Structural measures, therefore, serve as supplementary to vegetative measures. The approved Mining Plan and Mine Closure Plan has prescribed some structural measures to be undertaken to minimise soil erosion which are enlisted below:

i) Construction of Retaining wall

As the bhubaneswari ocp is a running mine nearly 2000 meters retaining wall has already been constructed and the remaining wall i.e 7500 meters wall will be constructed as proposed.

ii) Construction of Garland drain

From the outer side of the retaining wall a shallow trench (1.0 m wide x 1.50 m deep) will be dug around the temporary external OB Dump area for storage of run-off accumulated for draining surface water before it is flown to the natural water course. The proposed Garland drain will be having a for length of 7200 meter

iii) Terracing of OB Dump Slope

It is proposed to construct berm & terraces over a length of 18100 m. on the proposed Dumps considering the volume of OB materials & the area earmarked for dumping. The slope of individual terrace should be within the permissible range considering the angle of repose of the soil and space available, thereby maintaining the angle of repose at less than 28 degrees. The terracing will be done through the internal resources by deploying the operating mining equipment. All these operations will be carried out after sufficient deposition of OB. When OB dump will partially mature, the work will be executed.

iv) Construction of Settling Tanks

It is proposed to construct 1 no. of settling tank at North - West corner (Settling tank no-1) for sedimentation of run-off water that will come out of garland drain.

v) De-siltation of Settling Tank

The de-silting works of the settling tank will be taken up at regular intervals to prevent sedimentation and choking of streams. This de-silting of settling tank will provide space and base to hold the sediment laden runoff thereby allowing settling and clear water to flow down. This de-silting work will be preferably undertaken once in a year before & after monsoon. The implementation of the plans will be site specific in nature depending upon the severity of the sedimentation and choking of stream.

The location of different structural measures proposed above from sl.no i) to sl.no iv) are shown in a map which is attached as Annexure-II. Further the structural measures that are proposed to be undertaken in order to minimize soil erosion and choking of streams are dealt in detail including the financial forecasts for the corresponding structural measures and do form part of other schemes e.g.

- a) In compliance to Condition No. 6 (3) - "Construction of Check Dams, Retention / Toe-walls to arrest sliding down of the excavated material along the contour in accordance with the approved scheme."
- b) In compliance to Condition No. 6 (4) – "Stabilize the Overburden Dumps by appropriate grading/ benching in accordance with the approved schemes so as to ensure that angels of repose at any given place is less than 28 degrees.

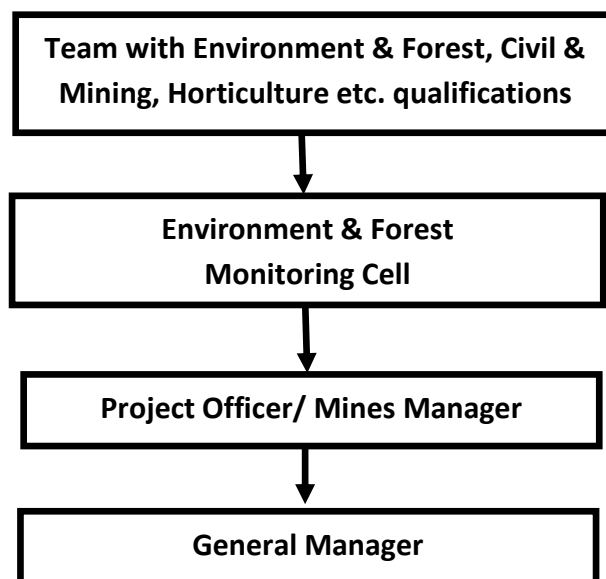
15. MOTIVATION OF PEOPLE

The villagers / VSS Committee members of the adjoining villages are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the adjoining villages and resolution will be passed to support plantation activities. For motivation of the villagers/ VSS Committee members, they will be provided incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure for this purpose.

16. EXECUTING AGENCY

The work will be executed by the User Agency i.e. M/s Mahanadi Coalfields Limited through dedicated departments manned by technically qualified persons with outsourced man and machinery as and when required. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department

EXECUTING AGENCY



17. INSPECTION, MONITORING AND EVALUATION

Proper inspection, monitoring and evaluation will be done in-house by designated authorities of MCL under supervision of Forest Department

18. REQUIREMENT OF FUNDS

The total cost for implementation of the proposed interventions will be Rs 3,48,88,000.00 (Rupees (Rupees Three Crores Forty-Eight Lakhs Eighty-Eight Thousand only).

It is to mention that the total cost required for the implementation of the scheme is based on approved cost norm /approved matrices of State Forest Dept. given as Annexure -III as per below details.

- a) Core Plantation Base Cost Norm for Compensatory Afforestation @1000 seedlings /Ha with 10-year Maintenance, Wage Rate @ Rs. 452.00 per Manday and Matrix for Core Plantation for Compensatory Afforestation @1000 seedlings /Ha with 10-year maintenance.
- b) Add on Model -Watering Provision Watering Model W-I: Borewell fitted with Solar & Drip system and Matrix for Watering Model W-I: (Solar Borewell) fitted with Drip system. (Per Ha)
- c) Cost Norm for Soil & Moisture Conservation (SMC) Works Wage rate @ 452/- per Manday and Matrix for Soil & Moisture Conservation (SMC) Works.

This budget will be subject to increase in amount considering the increase in cost of materials and labour charges. However, escalation factor @ 20% has been considered over and above the estimate.

FINANCIAL FORECAST

(Wage Rate @ Rs. 452.00 according to Base Cost Norm and Rate/ Ha. for the year 2025-26 as per approved Matrix)

| Sl. No. | Description of the Work | Fund Required |
|---------|---|--------------------|
| | | (in Rs.) |
| 1 | Biological Measures | |
| A | Block Plantation (@1000 nos of seedlings/ha.) over 44.002 ha. @ Rs 2,85,302.00/- per ha. (Rate / Ha. as per approved matrix for 2025-2026) | 12553858.6 |
| B | Watering (Solar Bore well) fitted with Drip System @ Rs 2,45,933.00 per ha. (Rate / Ha. as per approved matrix for the year 2025-26) × 44.002 Ha. | 10821543.87 |
| C | SMC @ Rs 43,310.00 per ha. (Rate / Ha. as per approved matrix for the year 2025-26) × 44.002 ha | 1905726.62 |
| | Sub Total (1) | 25281129.09 |
| 2 | 15% of the total cost for motivation of VSS / People involved | 3792169.36 |
| | Sub Total (2) | 29073298.45 |
| 3 | Price escalation @ 20% | 5814659.69 |
| | Grand Total | 34887958.14 |
| | Say Or | 34888000.00 |

(Rupees Three Crores Forty-Eight Lakhs Eighty-Eight Thousand only)

Note: The above-mentioned expenditure has already been included in the budget of Environment Management Plan (EMP) as well as approved Mining Plan and Mine Closure Plan.

M/s Mahanadi Coalfields Ltd. do hereby undertake to execute the item of works mentioned in this scheme and incur the approved amount in a phased manner as per approved Mining Plan and Mine Closure Plan/Environment Management Plan (EMP).

Countersigned


05/12/2024
M/s Mahanadi Coalfields Ltd

मह प्रबंधक
General Manager
एम.सी.एल. भुवनेश्वर क्षेत्र
MCL Bhuteswar Area


Divisional Forest Officer
Divisional Forest Officer
Angul Division

Approved for Rs. 348.88 cr/-


10/12/24
Regional Chief Conservator
of Forests, Angul Circle.

UNDERTAKING FOR MITIGATIVE MEASURES TO MINIMIZE SOIL EROSION AND CHOKING OF STREAMS SHALL BE IMPLEMENTED WITHIN A PERIOD OF TWO YEARS WITH EFFECT FROM ISSUE OF STAGE - II CLEARANCE IN ACCORDANCE WITH THE APPROVED PLAN IN CONSULTATION WITH THE STATE FOREST DEPT.

I hereby undertake for the mitigative measures to minimize soil erosion and choking of streams which shall be implemented within a period of two years with effect from issue of stage - ii clearance in accordance with the approved plan in consultation with the state forest dept.

Countersigned

Nitish

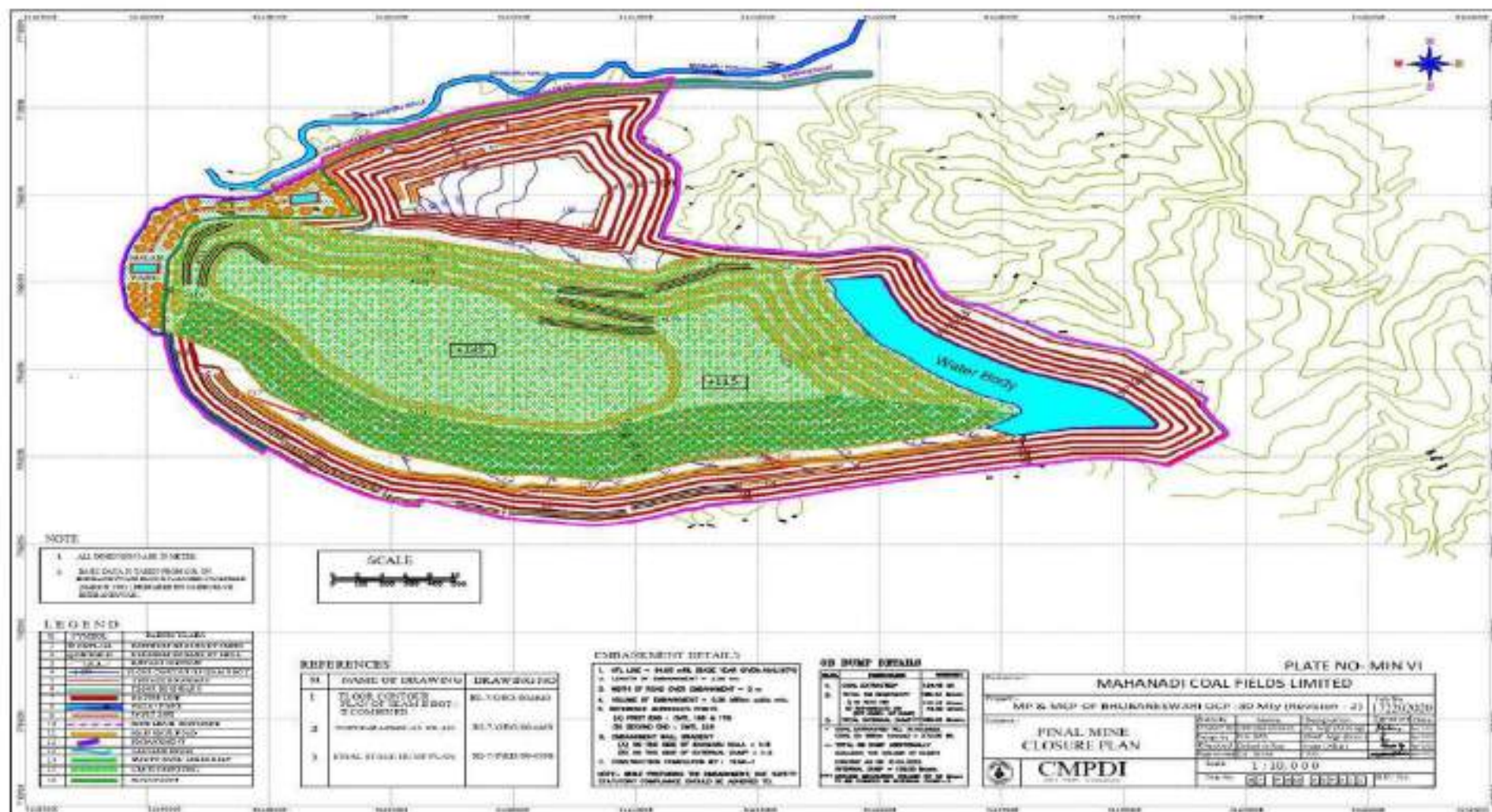
Divisional Forest Officer
Divisional Forest Officer
Angul Division

General Manager
Bhubaneswari Area

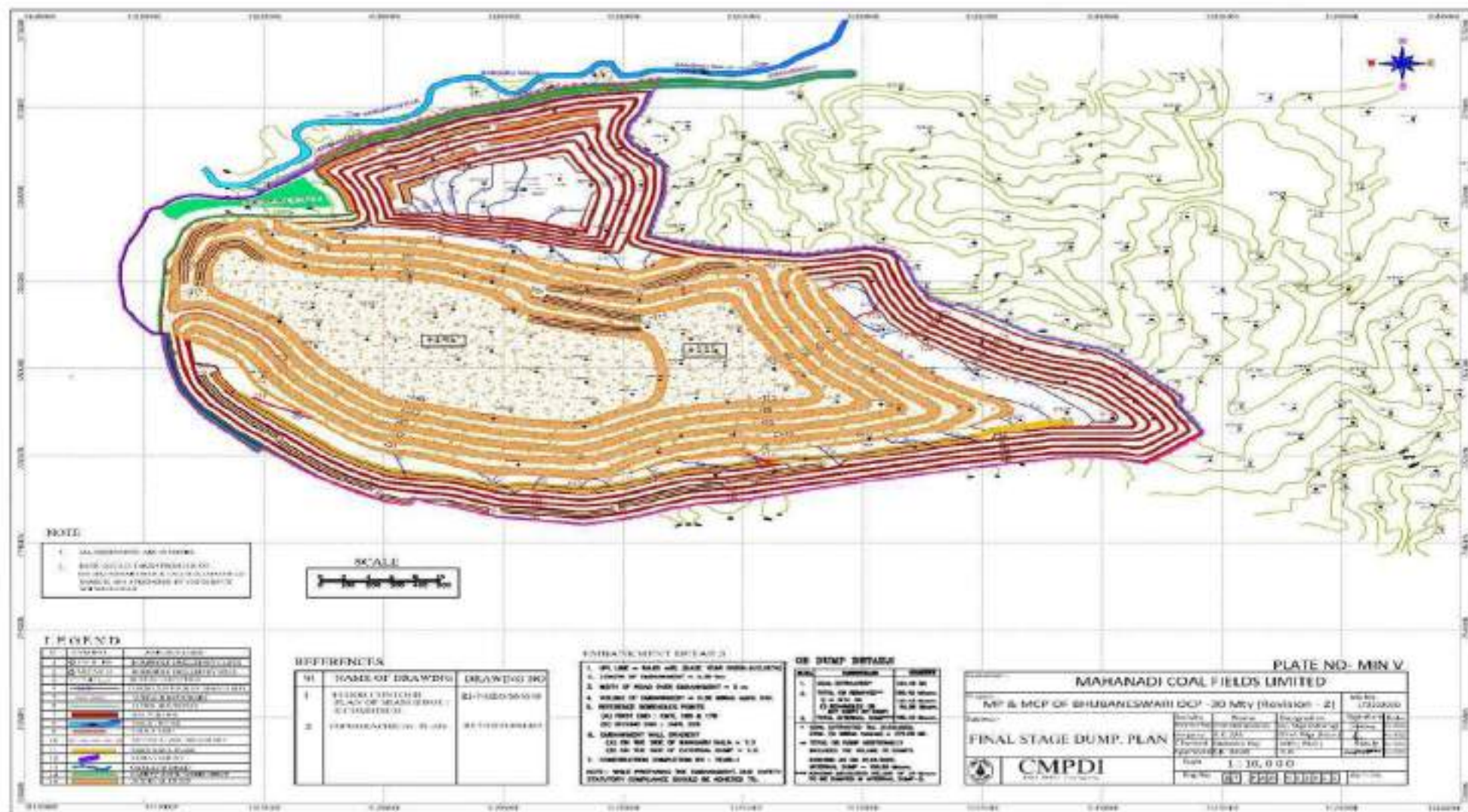
महान प्रबंधक

General Manager
एम.सी.एल, भुवनेश्वर क्षेत्र
MCL, Bhubaneswari Area

Proposed Plantation Area To Minimize Soil Erosion



Structural Measures To Minimize Soil Erosion



**Core Plantation Base Cost Norm for Compensatory Afforestation
@ 1000 Seedlings / Ha. with 10 Year Maintenance**

Wage rate @ ₹311/- per Manday

| Sl. No. | Items of Work | Preferable Period of Execution | No. of Mandays | Labour Cost (₹) | Material Cost (₹) | Total Cost (₹) |
|---|--|--------------------------------|----------------|-----------------|-------------------|----------------|
| 0th Year (Advance work) Pre-Planting Operation | | | | | | |
| 1 | Survey, Demarcation and Pillar posting | Nov/Dec | 2 | 622 | 0 | 622 |
| 2 | Preparation of Treatment Map (Digital Map) | Nov/Dec | 1 | 311 | 100 | 411 |
| 3 | Site preparation (Cleaning & removal of debris) | Nov/Dec | 12 | 3732 | 0 | 3732 |
| 4 | Creation of 4.00 mt wide Inspection Path | Feb/Mar | 1 | 311 | 0 | 311 |
| 5 | Alignment and stacking of pits | Feb/Mar | 1 | 311 | 0 | 311 |
| 6 | Digging of pits (45cm x 45cm x 45cm) in hard & gravelly soil | Feb/Mar | 40 | 12440 | 0 | 12440 |
| 7 | Construction of Temporary Labour Shed, Drinking water facility and First Aid etc. | Jan/Mar | 0 | 0 | 3500 | 3500 |
| | Total | | 57 | 17727 | 3600 | 21327 |
| 1st Year/Planting Year | | | | | | |
| 1 | Refilling of pits by altering the dugout soil of the pits, application of organic compounds / CDM/ FYM & mixing the same properly | Jun/Jul | 7.5 | 2332.50 | 5000 | 7332.50 |
| 2 | Transportation of 18 months old polythene bag seedlings in hired truck /tractor from the Permanent/Mega nursery to planting site including loading & unloading. (Average lead of 10 Rkm) & stacking the seedlings @ Rs.6/- per seedling. (1100 nos.) | Jul/Aug | 0 | 0 | 6600 | 6600 |
| 3 | Watering polypot seedlings at planting site | Jul/Aug | 2 | 622 | 0 | 622 |
| 4 | Conveyance of polypot seedlings on head load from the stacking site to individual dugout pits within the planting site, applying insecticide, fertilizers & planting after scooping the soil with other applied materials & pressing the soil properly around the planted seedlings. | Jul/Aug | 22.5 | 6997.50 | 0 | 6997.50 |
| 5 | Cost of Fertilizer & Insecticide | Jul/Aug | 0 | 0 | 3000 | 3000 |
| | (a) NPK/Bio-fertilizer @ 50 gms/plant as basal dose = 50kg @ Rs.30/- per kg = Rs.1500/- | | | | | |

| Sl. No. | Items of Work | Preferable Period of Execution | No. of Mandays | Labour Cost (₹) | Material Cost (₹) | Total Cost (₹) |
|-----------------------------|---|--------------------------------|----------------|-----------------|-------------------|----------------|
| | (b) Urea/Vermicompost/Mo Khata/any other fertilizer in two subsequent doses @ Rs. 750/- | | | | | |
| | (c) Insecticide/ Bio-pesticide @ 5 gms/plant = 5 kg @ Rs.150/- per kg = Rs. 750/- | | | | | |
| 6 | Casualty Replacement @ 10% (100 nos.) | Jul/Aug | 2.5 | 777.5 | 0 | 777.5 |
| 7 | 1st Weeding & Manuring | Aug/Sep | 12 | 3732 | 0 | 3732 |
| 8 | 2nd Weeding, Soil working (1mt. diameter around the plants) & Manuring | Oct/Nov | 15 | 4665 | 0 | 4665 |
| 9 | Fire line tracing (2 m. wide fire line over 400 m. long) including maintenance of inspection path | Feb/Mar | 3 | 933 | 0 | 933 |
| 10 | Watch & Ward including watering as per requirement | Aug-Mar | 12 | 3732 | 0 | 3732 |
| | Total | | 76.50 | 23791.50 | 14600.00 | 38391.5 |
| 2nd Year Maintenance | | | | | | |
| 1 | Transportation of 100 seedlings from Nursery to plantation site including loading, unloading & conveyance by Tractor @Rs.6/- per seedling | Jul | 0 | 0 | 600 | 600 |
| 2 | Casualty replacement- 10% | Jul | 2.5 | 777.5 | 0 | 777.5 |
| 3 | Cost of Fertilizer & Insecticide- | Jul/Aug | 0 | 0 | 2875 | 2875 |
| | A) Cost of Insecticide/Bio-pesticide@5gms/plant = 0.5 Kg @ Rs.150/- per kg = Rs.75/- | | | | | |
| | B) Urea/NPK/Bio-fertilizer/Vermicompost/Mo Khata/any other fertilizer @Rs.2800/- | | | | | |
| 4 | Complete Weeding, Manuring & Soil working, (1mt. diameter around the plants) | Sep/Oct | 15 | 4665 | 0 | 4665 |
| 5 | Fire line tracing (2 m. wide fire line over 400 m long) including maintenance of inspection path | Feb/Mar | 3 | 933 | 0 | 933 |
| 6 | Watch & Ward including watering as per requirement | Apr-Mar | 18 | 5598 | 0 | 5598 |
| 7 | Maintenance of Temporary Labour Shed, Drinking water facility and First Aid etc. | Apr-Mar | | 0 | 1000 | 1000 |
| | Total | | 38.5 | 11973.5 | 4475 | 16448.5 |

| Sl. No. | Items of Work | Preferable Period of Execution | No. of Mandays | Labour Cost (₹) | Material Cost (₹) | Total Cost (₹) |
|-----------------------------|--|--------------------------------|----------------|-----------------|-------------------|----------------|
| 3rd Year Maintenance | | | | | | |
| 1 | Cost of fertilizer (Urea/NPK/Bio-fertilizer/Vermicompost/Mo Khata/any other fertilizer) | Jul/Aug | 0 | 0 | 2800 | 2800 |
| 2 | Complete Weeding, Manuring & Soil working, (1mt. diameter around the plants) | Sep/Oct | 15 | 4665 | 0 | 4665 |
| 3 | Fire line tracing(2m. wide fire line over 400m long)including maintenance of inspection path | Feb/Mar | 3 | 933 | 0 | 933 |
| 4 | Watch & Ward including watering as per requirement | Apr-Mar | 18 | 5598 | 0 | 5598 |
| 5 | Maintenance of Temporary Labour Shed, Drinking water facility and First Aid etc. | Apr-Mar | 0 | 0 | 1000 | 1000 |
| | Total | | 36 | 11196 | 3800 | 14996 |
| 4th Year Maintenance | | | | | | |
| 1 | Fire line tracing (2m. wide fire line over 400m long)including maintenance of inspection path | Feb/Mar | 3 | 933 | 0 | 933 |
| 2 | Watch & Ward including maintenance of vegetative fencing | Apr-Mar | 18 | 5598 | 0 | 5598 |
| | Total | | 21 | 6531 | 0 | 6531 |
| 5th Year Maintenance | | | | | | |
| 1 | Fire line tracing (2 m. wide fire line over 400 m long) including maintenance of inspection path | Feb/Mar | 3 | 933 | 0 | 933 |
| 2 | Watch & Ward | Apr-Mar | 18 | 5598 | 0 | 5598 |
| | Total | | 21 | 6531 | 0 | 6531 |
| 6th Year Maintenance | | | | | | |
| 1 | Fire line tracing (2 m. wide fire line over 400 m length) | Feb/Mar | 3 | 933 | 0 | 933 |
| 2 | Pruning of branches, Singling out of multiple shoots | Jan-Mar | 3 | 933 | 0 | 933 |
| 3 | Watch & Ward | Apr-Mar | 18 | 5598 | 0 | 5598 |
| | Total | | 24 | 7464 | 0 | 7464 |
| 7th Year Maintenance | | | | | | |
| 1 | Fire line tracing (2 m. wide fire line over 400 m length) | Feb/Mar | 3 | 933 | 0 | 933 |
| 2 | Watch & Ward | Apr-Mar | 18 | 5598 | 0 | 5598 |
| | Total | | 21 | 6531 | 0 | 6531 |

| Sl. No. | Items of Work | Preferable Period of Execution | No. of Mandays | Labour Cost (₹) | Material Cost (₹) | Total Cost (₹) |
|------------------------------|---|--------------------------------|----------------|-----------------|-------------------|----------------|
| 8th Year Maintenance | | | | | | |
| 1 | Fire line tracing (2 m. wide fire line over 400 m length) | Feb/Mar | 3 | 933 | 0 | 933 |
| 2 | Watch & Ward | Apr-Mar | 18 | 5598 | 0 | 5598 |
| | Total | | 21 | 6531 | 0 | 6531 |
| 9th Year Maintenance | | | | | | |
| 1 | Fire line tracing (2 m. wide fire line over 400 m length) | Feb/Mar | 3 | 933 | 0 | 933 |
| 2 | Watch & Ward | Apr-Mar | 18 | 5598 | 0 | 5598 |
| | Total | | 21 | 6531 | 0 | 6531 |
| 10th Year Maintenance | | | | | | |
| 1 | Fire line tracing (2 m. wide fire line over 400 m length) | Feb/Mar | 3 | 933 | 0 | 933 |
| 2 | Watch & Ward | Apr-Mar | 18 | 5598 | 0 | 5598 |
| | Total | | 21 | 6531 | 0 | 6531 |

Year wise Abstract of Cost Norm (Showing Seedling Cost separately)

| Sl. No. | Year | No. of Mandays | Labour Cost (₹) | Material Cost (₹) | MELD and other contingency (5%) of (4+5) | Cost of Seedling @₹50.31 per Seedlings | Total Cost (₹) |
|---------|---------------|----------------|-----------------|-------------------|--|--|-----------------|
| 1 | 0th year | 57 | 17727.0 | 3600.0 | 973.0 | 0.0 | 22300.0 |
| 2 | 1st year | 76.5 | 23791.5 | 14600.0 | 1918.50 | 55341.00 | 95651.00 |
| 3 | 2nd year | 38.5 | 11973.5 | 4475.0 | 821.50 | 5031.00 | 22301.00 |
| 4 | 3rd year | 36.0 | 11196.0 | 3800.0 | 749.00 | 0.00 | 15745.00 |
| 5 | 4th year | 21.0 | 6531.0 | 0.0 | 326.00 | 0.00 | 6857.00 |
| 6 | 5th year | 21.0 | 6531.0 | 0.0 | 326.00 | 0.00 | 6857.00 |
| 7 | 6th year | 24.0 | 7464.0 | 0.0 | 373.00 | 0.00 | 7837.00 |
| 8 | 7th year | 21.0 | 6531.0 | 0.0 | 326.00 | 0.00 | 6857.00 |
| 9 | 8th year | 21.0 | 6531.0 | 0.0 | 326.00 | 0.00 | 6857.00 |
| 10 | 9th year | 21.0 | 6531.0 | 0.0 | 326.00 | 0.00 | 6857.00 |
| 11 | 10th year | 21.0 | 6531.0 | 0.0 | 326.00 | 0.00 | 6857.00 |
| | Total: | 358.0 | 111338.0 | 26475.0 | 6791.0 | 60372.0 | 204976.0 |

Matrix for Core Plantation for Compensatory Afforestation @ 1000 Seedlings/ Ha. with 10 year maintenance

| Sl. No | Commencement Year | I | II | III | IV | V | VI | VII | VIII | IX | X | XI | XII | XIII | XIV | XV | XVI | XVII | XVIII | XIX | XX | Total Cnt (10796) |
|--------|-------------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------|
| | Base Norm | 22300 | 99551 | 22301 | 15745 | 6837 | 6857 | 7637 | 6857 | 6857 | 6857 | | | | | | | | | | | 20493 |
| 01 | 2021-22 | 22300 | 103434 | 24326 | 16226 | 8335 | 8751 | 9350 | 9648 | 10131 | 10637 | 11169 | | | | | | | | | | 234710 |
| 02 | 2022-23 | | 25475 | 116456 | 25814 | 9137 | 8752 | 9189 | 10027 | 10130 | 10638 | 11169 | 11727 | | | | | | | | | 243454 |
| 03 | 2023-24 | | | 24686 | 119729 | 27105 | 20364 | 9190 | 9648 | 11578 | 10637 | 11170 | 11727 | 12313 | | | | | | | | 259777 |
| 04 | 2024-25 | | | | 25815 | 116255 | 29460 | 21029 | 9500 | 10130 | 12157 | 11169 | 11729 | 12313 | 12829 | | | | | | | 271716 |
| 05 | 2025-26 | | | | | 27106 | 122178 | 29820 | 22154 | 10130 | 10637 | 12166 | 11727 | 12316 | 12829 | 13575 | | | | | | 285300 |
| 06 | 2026-27 | | | | | | 28481 | 139182 | 31377 | 22362 | 10645 | 11169 | 13403 | 12313 | 12831 | 13575 | 14254 | | | | | 296667 |
| 07 | 2027-28 | | | | | | | 28684 | 134591 | 32946 | 34425 | 11172 | 11727 | 14073 | 13505 | 13576 | 14254 | 14867 | | | | 310546 |
| 08 | 2028-29 | | | | | | | | 31378 | 141321 | 34983 | 25646 | 11731 | 12313 | 14777 | 13575 | 14227 | 14967 | 15715 | | | 320273 |
| 09 | 2029-30 | | | | | | | | | 32547 | 140387 | 30320 | 26838 | 12316 | 13239 | 15546 | 14254 | 14870 | 15715 | 16501 | | 346788 |
| 10 | 2030-31 | | | | | | | | | | 34594 | 102806 | 30339 | 28274 | 12894 | 13575 | 16202 | 14967 | 15715 | 16501 | 17326 | 364127 |

Add on Model - Watering Provision

Watering Model W-I: Bore well fitted with Solar & Drip System

| Solar system with Bore well (1 system for 5 Ha Plantation) fitted with Drip system, Wage rate @ Rs.311/- | | | |
|--|--|-----------------|--------------|
| Year of Installation (0th Year) | | | |
| 1 | Cost of Bore well | 1,50,000 | |
| 2 | Installation of Solar panel & other System | 3,00,000 | |
| 3 | Cost of 0.5 HP submersible motor with accessories | 50,000 | |
| 4 | Water Storage Tanks/ Flexible pipes | 15,000 | |
| 5 | Cost of laying Drip system including all accessories, fittings etc. with 12% GST | 3,02,431 | |
| | Total | 8,17,431 | |
| 6 | Cost of Water & watering per Ha. (8,17,431/ 5)= Rs. 1,63,486/- | | 1,63,486 |
| 1st Year Watering | | | |
| 7 | No maintenance required | 0 | |
| | Total | | 0 |
| 2nd Year Watering | | | |
| 8 | Maintenance of system @ 5% of initial cost of installation | | 8,174 |
| | Total | | 8,174 |
| 3rd Year Watering | | | |
| 9 | Maintenance of system @ 5% of initial cost of installation | | 8,174 |
| | Total | | 8,174 |
| 4th Year Watering | | | |
| 10 | Maintenance of system @ 5% of initial cost of installation | | 8,174 |
| | Total | | 8,174 |
| 5th Year Watering | | | |
| 11 | Maintenance of system @ 5% of initial cost of installation | | 8,174 |
| | Total | | 8,174 |

Abstract



| Sl. No | Year | No. person days | Labour cost @ Rs. 311/-per day | Material Cost | Total cost (Rs.) |
|--------|--------------|-----------------|--------------------------------|---------------|------------------|
| 1 | 0th year | 0 | 0.0 | 163486.0 | 163486.0 |
| 2 | 1st year | 0 | 0.0 | 0.0 | 0.0 |
| 3 | 2nd year | 0 | 0.0 | 8174.0 | 8174.0 |
| 4 | 3rd year | 0 | 0.0 | 8174.0 | 8174.0 |
| 5 | 4th year | 0 | 0.0 | 8174.0 | 8174.0 |
| 6 | 5th year | 0 | 0.0 | 8174.0 | 8174.0 |
| | Total | 0 | 0 | 196182 | 1,96,182 |

Matrix for Watering Model-W-1 (Solar bore well) fitted with Drip System (per Ha)

| Sl. No. | Commencement Year | I | II | III | IV | V | VI | VII | VIII | IX | X | XI | XII | XIII | XIV | XV | XVI | Total Cost |
|---------|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-----|------------|
| | Base Norm | 163486 | 0 | 8174 | 8174 | 8174 | 8174 | | | | | | | | | | | |
| 1 | 2021-22 | 163486 | 0 | 9011 | 9453 | 9935 | 10432 | | | | | | | | | | | 202327 |
| 2 | 2022-23 | | 171660 | 0 | 9462 | 9936 | 10432 | 10954 | | | | | | | | | | 212444 |
| 3 | 2023-24 | | | 180243 | 0 | 9935 | 10433 | 10954 | 11502 | | | | | | | | | 223067 |
| 4 | 2024-25 | | | | 188255 | 0 | 10432 | 10955 | 11502 | 12077 | | | | | | | | 234221 |
| 5 | 2025-26 | | | | | 198718 | 0 | 10954 | 11503 | 12077 | 12681 | | | | | | | 245933 |
| 6 | 2026-27 | | | | | | 208854 | 0 | 11502 | 12078 | 12681 | 13315 | | | | | | 258230 |
| 7 | 2027-28 | | | | | | | 219087 | 0 | 12077 | 12682 | 13315 | 13981 | | | | | 271142 |
| 8 | 2028-29 | | | | | | | | 230041 | 0 | 12681 | 13316 | 13981 | 14680 | | | | 284659 |
| 9 | 2029-30 | | | | | | | | | 241543 | 0 | 13315 | 13982 | 14680 | 15414 | | | 298034 |
| 10 | 2030-31 | | | | | | | | | | 253820 | 0 | 13981 | 14681 | 15414 | 16185 | | 313861 |

Matrix for Soil & Moisture Conservation (SMC) works

| Sl. No. | Commencement Year | I | II | III | IV | V | VI | VII | VIII | IX | X | XI | XII | XIII | XIV | XV | XVI | Total Cost |
|---------|-------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|-----|------------|
| | Base Norm | 0 | 20215 | 3032 | 3032 | 3032 | 3032 | | | | | | | | | | | |
| 1 | 2021-22 | 0 | 21226 | 3342 | 3510 | 3685 | 3870 | | | | | | | | | | | 35633 |
| 2 | 2022-23 | | 0 | 22287 | 3509 | 3686 | 3869 | 4064 | | | | | | | | | | 37415 |
| 3 | 2023-24 | | | 0 | 23401 | 3684 | 3870 | 4062 | 4267 | | | | | | | | | 39284 |
| 4 | 2024-25 | | | | 0 | 24571 | 3868 | 4064 | 4265 | 4480 | | | | | | | | 41248 |
| 5 | 2025-26 | | | | | 0 | 25800 | 4061 | 4267 | 4478 | 4704 | | | | | | | 43310 |
| 6 | 2026-27 | | | | | | 0 | 27090 | 4264 | 4480 | 4702 | 4939 | | | | | | 45475 |
| 7 | 2027-28 | | | | | | | 0 | 28445 | 4477 | 4704 | 4937 | 5186 | | | | | 47749 |
| 8 | 2028-29 | | | | | | | | 0 | 29867 | 4701 | 4939 | 5184 | 5445 | | | | 50136 |
| 9 | 2029-30 | | | | | | | | | 0 | 31360 | 4936 | 5186 | 5443 | 5717 | | | 52642 |
| 10 | 2030-31 | | | | | | | | | | 0 | 32928 | 5183 | 5445 | 5715 | 6003 | | 55274 |

| | | |
|--|--|---|
|  | <p>Office of the General Manager (Bhubaneswari Area) At/Po :Dera Colliery Dist: Angul – 759103 (Odisha) Website :www.mcl.gov.in Email Id: cgm-bhubaneswari.mcl@coalindia.in</p> |  |
|--|--|---|

Annexure- 13

UNDERTAKING

PROPOSAL NO.:- FP/OR/MIN/155017/2022

(In compliance to Condition No. 6 (ii) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "Planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion in accordance with the approved scheme".


 General Manager
 Bhubaneswari Area, MCL
 महा प्रबंधक
 General Manager
 एच.पी.एच. भुवनेश्वरी क्षेत्र
 MCL, Bhubaneswari Area


 Divisional Forest Officer
 Angul, Odisha



BHUBANESWARI OPEN CAST COAL PROJECT

Scheme for

**PLANTING OF ADEQUATE DROUGHT HARDY PLANT
SPECIES AND SOWING OF SEEDS, IN THE APPROPRIATE
AREA WITHIN THE MINING LEASE TO ARREST SOIL
EROSION**

***in compliance
with***

***Condition No.6 (ii) of
Stage-I approval granted vide
Letter No.8-18/2002-FC, Dated.24.09.2024
of Govt. of India, Ministry of Environment, Forests
& Climate Change, New Delhi.***

for

***Diversion of 26.416 Ha. (Originally proposed area is 20.383 ha)
of Forest Land within 658.724 Ha. of ML area of Bhubaneswari OCP
for Non forestry use U/s-2 (ii) of FC Act-1980
in villages Jilinda, Hensmul (Sharasahi), Hensmul
(Talasahi), Naraharipur, Khandualbhal, Kandhal,
Madanmohanpur, Langijoda and Anadipur of
Angul District, Odisha.***

M/s. Mahanadi Coalfields Limited

SCHEME FOR PLANTING OF ADEQUATE DROUGHT HARDY PLANT SPECIES AND SOWING OF SEEDS, IN THE APPROPRIATE AREA WITHIN THE MINING LEASE TO ARREST SOIL EROSION

1. INTRODUCTION

Bhubaneswari Open Cast Project is a mega coal mining project spread over a mining lease area of 658.724 ha. in Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur of Angul District, Odisha.

Mahanadi Coalfields Limited has named Bhubaneswari and combined Bhubaneswari, Sakthigopal-A, Arkhapal-A coal blocks as Bhubaneswari Open Cast Project.

As per approved Mining Plan and Mine Closure Plan, the mine life is 5 years. Out of total 658.72 Ha. of Mining Lease area, total forest land involved is 132.904 Ha out of which 112.521 Ha has got Stage 2 Forest clearance vide F.no:8-18/2002-FC, Dated 06/12/2004

The Stage-I Forest Clearance approval over 26.416 ha of Forest Land Under Section- 2 (ii) (including 6.033 ha. of Safety Zone) of the Forest (Conservation) Act, 1980 has been granted by MoEF & CC, Government of India vide their Letter No. 8-18/2002-FC, dated 24.09.2024, where in it has been stipulated as per **Condition No. 6 (ii) for planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion in accordance with the approved scheme.**

2. LOCATION

The mining lease area is covered in the Survey of India Topo sheet No. F45T1 and Special Topo sheet Nos. D1, D2, E1& E2 and situated between the latitude 20°57'53.53"N to 20°59'16.83"N, and longitude 85°08'27.17"E to 85°11'6.29"E. The above ML area covering villages are in Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur of Angul District, Odisha.

LOCATION MAP

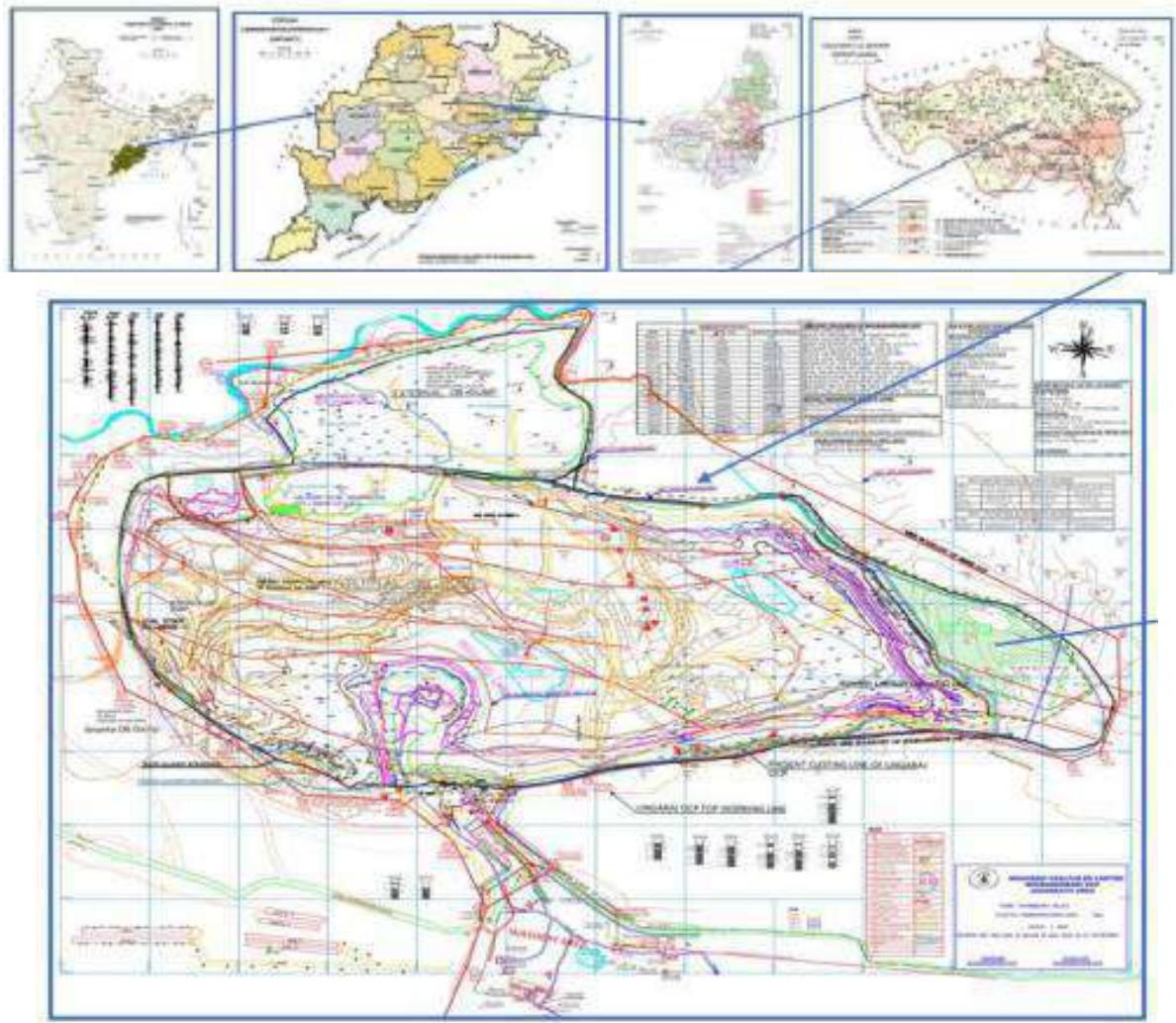


Fig-1. Location Map of Bhubaneswari OCP, MCL

3. TOPOGRAPHY

The surface topography is (majorly) predominantly soil covered and gently undulating with paddy fields and is used for agricultural purpose and some patches of barren lands. Around south western part, the surface topography is mildly undulating and slopes towards north. The ground level rises towards south-eastern corner of the block with highest elevation above Mean Sea Level of about 167.50 meter. A small seasonal stream (part of Bangaru stream) is flowing along the northern boundary of the project. Elevations of the area vary between 92 m to 137 m above mean sea level.

4. LAND USE PATTERN

The proposed land use pattern of 658.724 Ha. of mining lease area as per approved Mining Plan and Mine Closure Plan is given below:

Table 1: Purpose wise break up forest and non-forest land

| Sl. No. | Type of Land Use | Forest Land in Ha | Non-Forest Land in Ha | Total Land in Ha |
|--------------|---|-------------------|-----------------------|------------------|
| 1 | Mining Excavation Area | 126.191 | 488.531 | 614.722 |
| 2 | Safety Zone | | 6.163 | 6.163 |
| 3 | Infrastructure (CHP, Washery, Silo point, project office, laying of railway lines for dispatch point) and Future working expansion Area | 6.713 | 18.606 | 25.319 |
| 4 | Embankment | NIL | 12.52 | 12.52 |
| Total | | 132.904* | 525.820 | 658.724 |

Note: Out of total 658.72 Ha. of Mining Lease area, total forest land involved is 132.904 Ha out of which 112.521 Ha has got Stage 2 Forest clearance vide F.no:8-18/2002-FC, Dated 06/12/2004

5. DETAILS OF FOREST LAND WITHIN THE ML AREA

| | |
|---|-----------------|
| Forest land to be worked for mining and allied purpose- | 20.383 Ha |
| Area set aside for Safety Zone | <u>6.033 Ha</u> |
| | 26.416 Ha |

6. SOIL TYPE

The areas primarily consist of sandy and lateritic soil, with an additional presence of clay. In most of the area the soil is moderately coarse in nature whereas it is loamy in the cultivated land. The area nearby has a nala Bangaru stream - one seasonal stream (flows in the northern boundary). There were two periods of glacial advance and retreat during the deposition of Talcher sediments.

7. CLIMATE

The area experiences a sub-tropical warm temperature. Monsoon is from mid of June and continues till end of September. The average annual rainfall as recorded at IMD observatory at Angul is 1277 mm. and the highest rainfall occurs in the month of August (84.0 mm with a mean rainfall of 4.4 mm for the year 2020). Around 78% of rainfall occurs during the monsoon season. The temperature varies from 5.6oC to 43.7oC. Maximum temperature is being observed in the month of May and minimum in the month of December.

8. DRAINAGE

Brahmani River, flowing approximately north to south along the eastern boundary of the Talcher coalfield, provides the main drainage of the region. This river is fed by seasonal nalas, viz. Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor and a few small nalas. From the eastern boundary of the block, the Brahmani River lies eastward at a distance of about 20 km.

Bangaru stream River drains this entire block. Bangaru Stream River emerges as seasonal third order streams in Ambapal, Natara and Kalamchhuin village areas and flows into Brahmani River. The general slope is towards north. The local drainage is mainly dendritic in nature. Entire Mining area in north is drained by Bangaru Stream, in south by Nandira Stream and east by seasonal streams. These streams are ultimately joining in the North West –South East flowing Brahmini River east of the Mining area. Small ponds are common in this block and are utilized for drinking purpose.

9. EXISTING VEGETATION

The forest growth available in the area resembles Northern Tropical Dry Deciduous Forest similar to other regions in Talcher coalfield. Dominant tree species include Sal (*Shorea robusta*), Mahua (*Madhuca indica*), Neem (*Azadirachta indica*), Teak (*Tectona grandis*), Jamun (*Syzygium cumini*), and Mango (*Mangifera indica*)

The vegetation of the applied area is composed of Sal (*Shorea robusta*), Mahua (*Madhuca indica*), Neem (*Azadirachta indica*), Teak (*Tectona grandis*), Jamun (*Syzygium cumini*), Mango (*Mangifera indica*), Pipal (*Ficus religiosa*), Khajur (*Phoenix dactylifera*), Kusum (*Schleichera oleosa*), Tendu (*Diospyros melanoxylon*), Haldu (*Adina cordifolia*), Ber (*Ziziphus mauritiana*), and Saj (*Terminalia tomentosa*). **Sal (*Shorea robusta*)** is noted as the predominant species within the area

10. OBJECTIVES OF THE SCHEME

Planning for plantation & grass seed sowing will be done with the following objectives:

- a. To meet the stipulation No 6(ii) of Stage-I Forest clearance accorded vide Letter 8-18/2002-FC, dated 24.09.2024 of MoEF & CC, Government of India, New Delhi, i.e., **“planting of adequate drought hardy plant species & sowing of seeds, in appropriate area within mining lease to arrest soil erosion in accordance with the approved scheme.”**
- b. To compensate the loss to vegetation due to operation of the mine.
- c. To prevent spread of fugitive dust generated due to mining and allied activities.
- d. To attenuate noise generated by the mine.
- e. To reduce soil erosion.
- f. To stabilize the slope of external over-burden dumps.

- g. To increase the green cover and to improve aesthetics.
- h. To attract the birds, which are addressed as litmus of nature.
- i. To provide recreational value to colony inhabitants.
- j. Attract Animals to re-colonize the area where the Mine is abandoned.

11. PLANTATION

In order to fulfil the above objective, it is proposed to go for plantation in an area measuring 339.488 Ha. within the Mining Lease area. Saplings would be planted at the rate of 1600 trees/ha in Block plantation mode. Post planting care would be taken to replace casualties, remove dead, dying, diseased and top broken trees etc. In this connection it is proposed to take up plantation at three (3) different locations as per the map given as Annexure-I. The location-wise area details are given below.

Proposed Plantation Area

| Sl.No | Location | Area (in Ha.) |
|-------------------|-----------------|----------------------|
| 1 | Backfilled Area | 239.488 |
| 2 | Grass Carpeting | 100 |
| Total Area | | 339.488 |

The list of species proposed for plantation is as follows:

| Sl. No. | Local Name | Botanical Name | Family |
|----------------|-------------------|-----------------------|------------------|
| 1 | Jamun | Syzygium cumini | Myrtaceae |
| 2 | Mango | Mangifera indica | Anacardiaceae |
| 3 | Neem | Azadirachta indica | Meliaceae |
| 4 | Pipal | Ficus religiosa | Moraceae |
| 5 | Mahua | Madhuca latifolia | Sapotaceae |
| 6 | Teak | Tectona grandis | Lamiaceae |
| 7 | Ber | Ziziphus mauritiana | Rhamnaceae |
| 8 | Kachnar | Bauhinia racemosa | Fabaceae |
| 9 | Sal | Shorea robusta | Dipterocarpaceae |
| 10 | Khajur | Phoenix dactylifera | Arecaceae |

| | | | |
|----|----------|-----------------------------|--------------|
| 11 | Haldu | <i>Adina cordifolia</i> | Rubiaceae |
| 12 | Kusum | <i>Schleichera oleosa</i> | Sapindaceae |
| 13 | Jam Tree | <i>Acacia acuminata</i> | Fabaceae |
| 14 | Saj | <i>Terminalia tomentosa</i> | Combretaceae |
| 15 | Babul | <i>Acacia arabica</i> | Fabaceae |

The choice of species is based on the following parameters: (i) Drought hardy and (ii) it should prevent soil erosion. Selection of the plant species is based on the inventory of the local forest species. like **Neem (*Azadirachta indica*)**, **Pipal (*Ficus religiosa*)**, **Mahua (*Madhuca indica*)**, **Teak (*Tectona grandis*)**, **Kusum (*Schleichera oleosa*)**, **Babul (*Acacia nilotica*)**. etc

It is proposed to go for block plantation @ 1600 plants per Hectare. Planting shall be done during July in pre-dug pits of size 45 cm X 45 cm X 45 cm. A basal dose of N.P.K fertiliser shall be applied at the time of planting, besides mixing with insecticides to prevent termites & insects. Fruit bearing trees and bamboo rhizomes shall not be planted in close proximity. A minimum distance of 2.5 mt X 2.5 mt shall be maintained on every fourth plants in planting either of the species. Care should be taken to complete the planting during July while rains are still on during first or second week of July

a. Pre-Planting and Planting Operation

Different operations that will be taken up for plantation are as follows:

i) Raising of nursery

Seedlings required for plantation shall be raised in a temporary nursery nearer to the planting site and water sources. Bhubaneswari OCP is a running project, it already has a running SAL Nursery of 2.5 Ha in Mines. 20% extra seedlings shall be raised besides the actual requirement to compensate the casualties. Seedlings will be raised in polythene bags of 10" x 6" size following standard nursery practice.

ii) Alignment and pitting

Alignment and pitting will be taken up in the month of March-April, Pits of size 45cm X 45cm X 45cm will be dug maintaining a spacing of 2.5mtr X 2.5mtr.

iii) Actual Planting

The seedling would be planted in the dugout pits of size 45cm x 45cm x 45cm with a spacing of 2.5mtr x 2.5mtr. Plantation will be taken up after first regular

shower of monsoon and will be completed by the end of July. Species will be planted as per suitability of the soil condition. NPK fertilizer @50gms per plant will be applied as basal dosage 5 gm of anti-termite insecticide will also be applied to each pit while planting. Casualties, if any noticed, shall be replaced with the extra seedlings raised for the purpose. During second year also, casualty replacement will be done for which seedlings shall be raised.

iv) Weeding, Soil working & Manuring

For establishment and better growth of the planted seedlings, timely weeding, soil working and manuring are necessary. It is proposed to carry out two weeding's, soil working and manuring during the first year and second year of plantation and one weeding and soil working during third year. During first year and second year, first weeding and manuring shall be carried out during August-September and the second one during October- November along with soil working after rains. First weeding shall be around the plants and the second one will be done in strip. In the third year the weeding will be done around the plants, which will be carried out during August.

After each weeding, intensive soil working will be done around each plant at a radius of 0.5mtr, followed by manuring of @50grms NPK per plant in ring form.

v) Application of insecticides

The plantation site, after planting with good and healthy seedlings, may cause influx of insects, which usually eat and damage the tender leaves and shoots of the plants. To get rid of such insect attack, application of insecticides will be taken up in required doses at desired intervals. Spraying of insecticides shall be done preferably in a sunny day in the forenoon as per requirement.

b. Post Plantation Care

Post Plantation care shall be adopted to ensure maximum survival of the plants. Funds would be provided for maintenance of the plants for ten years (i.e. nine years) after the year of plantation. In the present Scheme, provision of fund would be made immediately after planting the seedlings. Watering would be done at regular interval during the dry spell. In the dry season, watering would be regularly done especially during February to June. Watering in one year planted saplings would be more frequent (10 days in a month). Manuring would be done by using organic manure (cow dung, agricultural waste, kitchen waste, etc.). Diseased and dead plants would be uprooted, destroyed and replaced by fresh saplings. Growth and survival of saplings would be regularly monitored and remedial actions would be undertaken as required.

12. GRASS SEED SOWING:

In order to minimize soil erosion in the mining lease area of Bhubaneswari OCP it is proposed to go for sowing of grass seeds in a phased manner over an area of 100 Ha. in the back- filled area as per the Table given below.

| Phase Wise Grass Seeding and plantation in Back Filled Area | | |
|---|---------------------------|--------------------------|
| Production Year | Back Filled Area (in Ha.) | Cumulative Area (in Ha.) |
| As on 31.03.22 | 32.50 | 32.50 |
| Year 1 | 38.46 | 70.96 |
| Year 3 | 164.30 | 235.26 |
| Year 4 | 104.728 | 339.488 |
| Final Reclamation (End of Mine life) | 339.488 | 339.488 |

Some soil binding grasses species like *Vetiveria zizanioides*, *Bothriochloa odorata*, *Themeda triandra*, *Andropogon monticola*, *Apluda mutica* will be introduced .The Grass seeding shall be done after spreading of Top soil in the back-filled area with adequate mixing of good earth & farm grade manure.

The location map for proposed area where drought hardy species shall be planted & the grass seeds shall be shown is furnished as **Annexure-I**.

The proposed plantation activity shall be taken up as per approved Cost Norm for Block Plantation @ 1600 Saplings /Ha & corresponding approved matrix of State Forest Dept. It is to mention that the financial forecast for grassing of 339.488 Ha has been taken up in the Scheme namely Mitigative measure to minimize soil erosion in compliance to Condition no 6(ii) of Stage - I Forest Clearance granted by MoEF & CC, Govt of India.

Besides the Cost Norm for Grass seeding is provided as Annexure-II

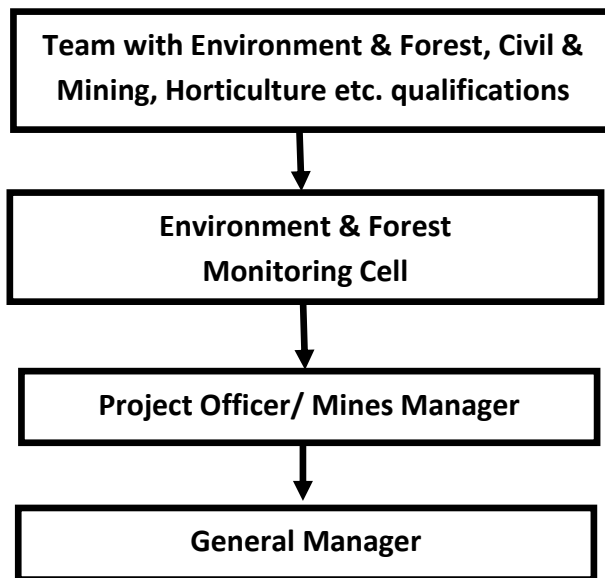
13. MOTIVATION OF PEOPLE

The villagers / VSS Committee members of the adjoining villages are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the adjoining villages and resolution will be passed to support plantation activities. For motivation of the villagers/ VSS Committee members, they will be provided incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure for this purpose.

14. EXECUTING AGENCY

The work will be executed by the User Agency i.e. M/s Mahanadi Coalfields Limited through dedicated departments manned by technically qualified persons with outsourced man and machinery as and when required. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department

EXECUTING AGENCY



15. INSPECTION, MONITORING AND EVALUATION

Proper inspection, monitoring and evaluation will be done in-house by designated authorities of MCL under supervision of Forest Department.

16. REQUIREMENT OF FUNDS

The total cost for implementation of the proposed interventions will be Rs 1,26,87,000.00 (Rupees One Crore Twenty-Six Lakh Eighty-Seven Thousand only) excluding the cost of Plantation for droughty hardy species which has been considered in the Scheme namely Mitigative measure to minimize soil erosion in compliance to Condition no 6(ii) of Stage -I Forest Clearance granted by MoEF & CC, Govt of India. The expenditure will be made during the course of mine life and post reclamation as per approved Mining Plan and Mine Closure Plan.

This budget will be subject to increase in amount considering the increase in cost of materials and labour charges. However, escalation factor @ 20% has been considered over and above the tentative estimate.

The tentative expenditure based on approved base norm and corresponding matrix's approved by State Forest Department.

Regional Director
Forest Department
Jammu & Kashmir

FINANCIAL FORECAST

(Wage Rate @ Rs. 452.00 according to Base Cost Norm and Rate/ Ha. for the year 2025-26 as per approved Matrix)

| Sl. No. | Description of the Work | Fund Required (in Rs.) |
|-------------|---|--|
| 1 | Block Plantation (@1000 nos of seedlings/ha.) over 44.002 ha. @ Rs 2,85,302.00/- per ha. (Rate / Ha. as per approved matrix for 2025-2026) | The Cost for the plantation is already included in the Scheme – 6(i) |
| 2 | Watering (Solar Bore well) fitted with Drip System @ Rs 2,45,933.00 per ha. (Rate / Ha. as per approved matrix for the year 2025-26) × 44.002 Ha. | |
| 3 | SMC @ Rs 43,310.00 per ha. (Rate / Ha. as per approved matrix for the year 2025-26) × 44.002 ha | |
| 4 | Grass seeding over 339.488 Ha @27,080 per Ha | 9193335.04 |
| Sub Total | | 9193335.04 |
| 2 | 15% of the total cost for motivation of VSS / People involved | 1379000.26 |
| Sub Total | | 10572335.30 |
| 3 | Price escalation @ 20% | 2114467.06 |
| Grand Total | | 12686802.36 |
| Say Or | | 12687000.00 |

(Rupees One Crore Twenty-Six Lakh Eighty-Seven Thousand only)

Note: The above-mentioned expenditure has already been included in the budget of Environment Management Plan (EMP) as well as approved Mining Plan and Mine Closure Plan.

M/s Mahanadi Coalfields Ltd. do hereby undertake to execute the item of works mentioned in this scheme and incur the approved amount in a phased manner as per approved Mining Plan and Mine Closure Plan/Environment Management Plan (EMP).

Countersigned

05/12/2024

M/s Mahanadi Coalfields Ltd

महानदी प्रबंधक

General Manager

एम.सी.एल., भुवनेश्वर क्षेत्र

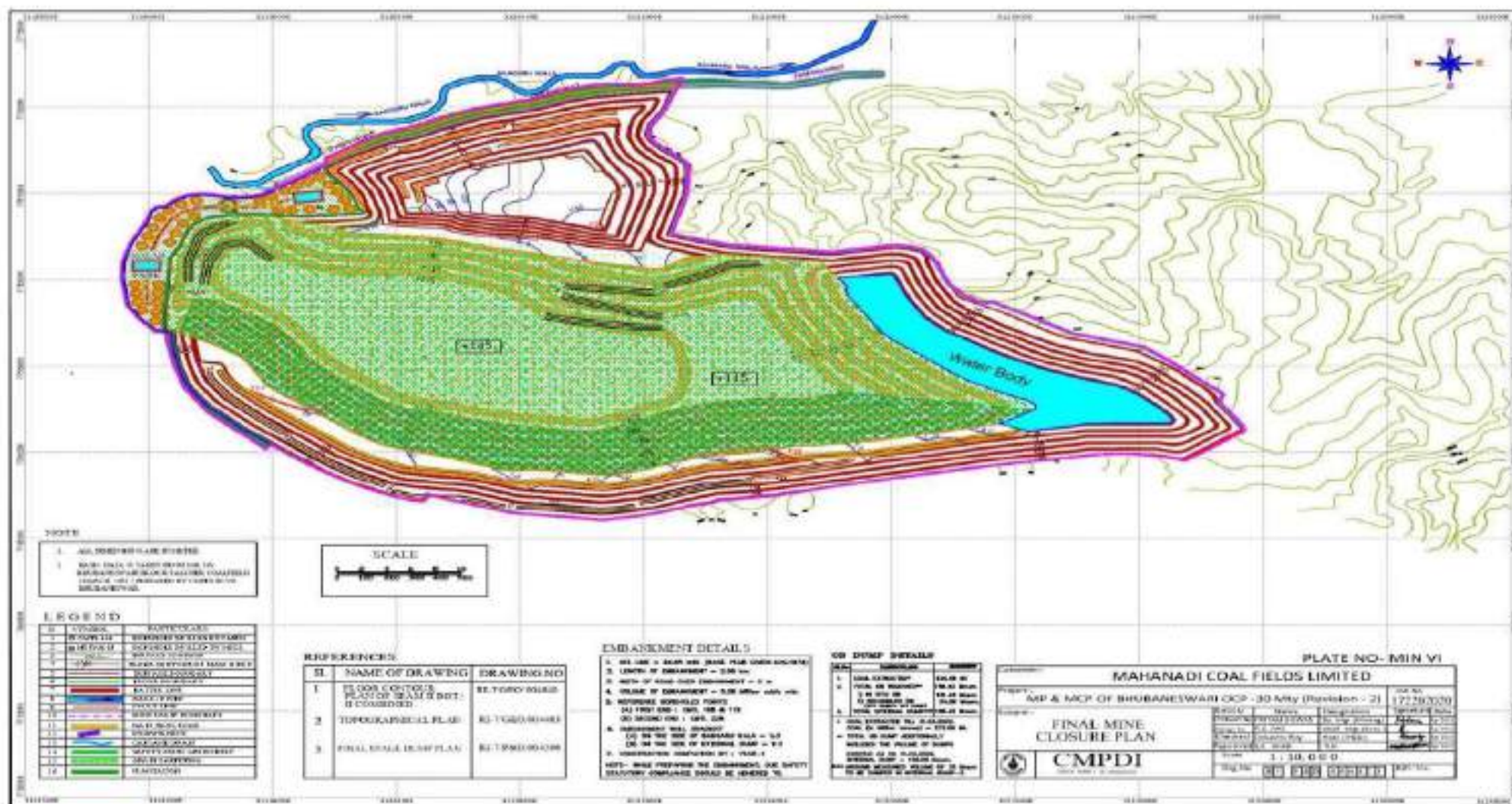
MCL, Bhubaneswar Area

Approved for Rs. 12687000/-

10/12/24
Regional Chief Conservator
of Forests, Angul Circle.

10/12/24
Divisional Forest Officer
Divisional Forest Officer
Angul Division

Drought Hardy Species Plantation & Grass Seeding Map



COST OF GRASS SEEDING SOWING PER HECTARE**Wage rate RS.452/-**

| Sl. No | Purpose | No of Labour/ Quantity of materials | Rate (Rs.) | Amount (Rs.) |
|---------------|--|--|---------------------|-------------------------|
| 1 | Spreading of good earth and FYM including carriage | 20 Nos | 452.00 | 9040.00 |
| 2 | Adding FYM and good earth | 2 TL FYM | 1,000/ TL FYM | 4000.00 |
| | | 2 TL good earth | 1,000/TL Good earth | |
| 3 | Cost of grass seed 50 kg/Ha. | | 100/kg | 5000.00 |
| 4 | Broadcast sowing | 20 nos. | 452.00 | 9040.00 |
| Total | | | | 27080.00 |



Office of the General Manager
(Bhubaneswari Area)
At/Po :Dera Colliery
Dist: Angul – 759103 (Odisha)
Website :www.mcl.gov.in
Email Id: cgm-bhubaneswari.mcl@coalindia.in



Annexure- 14

UNDERTAKING

PROPOSAL NO.:- FP/OR/MIN/155017/2022

(In compliance to Condition No. 6 (iii) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "Construction of check dams, retention /toe walls to arrest sliding down of the excavated material along the contour in accordance with the approved scheme".

General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एच.पी.ए., भुवनेश्वर क्षेत्र
MCL, Bhubaneswari Area

Divisional Forest Officer
Angul, Division



BHUBANESWARI OPEN CAST COAL PROJECT

*Scheme
for*

**CONSTRUCTION OF CHECK DAMS, RETENTION/TOE
WALLS TO ARREST SLIDING DOWN OF THE
EXCAVATED MATERIAL ALONG THE CONTOUR**

in compliance

with

Condition No.6 (iii) of

Stage-I approval granted vide

Letter No.8-18/2002-FC, Dated.24.09.2024

of Govt. of India, Ministry of Environment, Forests

& Climate Change, New Delhi.

for

**Diversion of 26.416 Ha. (Originally proposed area is 20.383 ha)
of Forest Land within 658.724 Ha. of ML area of Bhubaneswari OCP**

for Non forestry use U/s-2 (ii) of FC Act-1980

in villages Jilinda, Hensmul (Sharasahi), Hensmul

(Talasahi), Naraharipur, Khandualbhal, Kandhal,

Madanmohanpur, Langijoda and Anadipur of

Angul District, Odisha.

M/s. Mahanadi Coalfields Limited

SCHEME FOR CONSTRUCTION OF CHECK DAMS, RETENTION/TOE WALLS TO ARREST SLIDING DOWN OF THE EXCAVATED MATERIAL ALONG THE CONTOUR IN ACCORDANCE WITH THE APPROVED SCHEME.

1. INTRODUCTION

Bhubaneswari Open Cast Project is a mega coal mining project spread over a mining lease area of 658.724 ha. in Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur of Angul District, Odisha.

Mahanadi Coalfields Limited has named Bhubaneswari and combined Bhubaneswari, Sakhigopal-A, Arkhapal-A coal blocks as Bhubaneswari Open Cast Project.

As per approved Mining Plan and Mine Closure Plan, the mine life is 5 years. Out of total 658.72 Ha. of Mining Lease area, total forest land involved is 132.904 Ha out of which 112.521 Ha has got Stage 2 Forest clearance vide F.no:8-18/2002-FC, Dated 06/12/2004

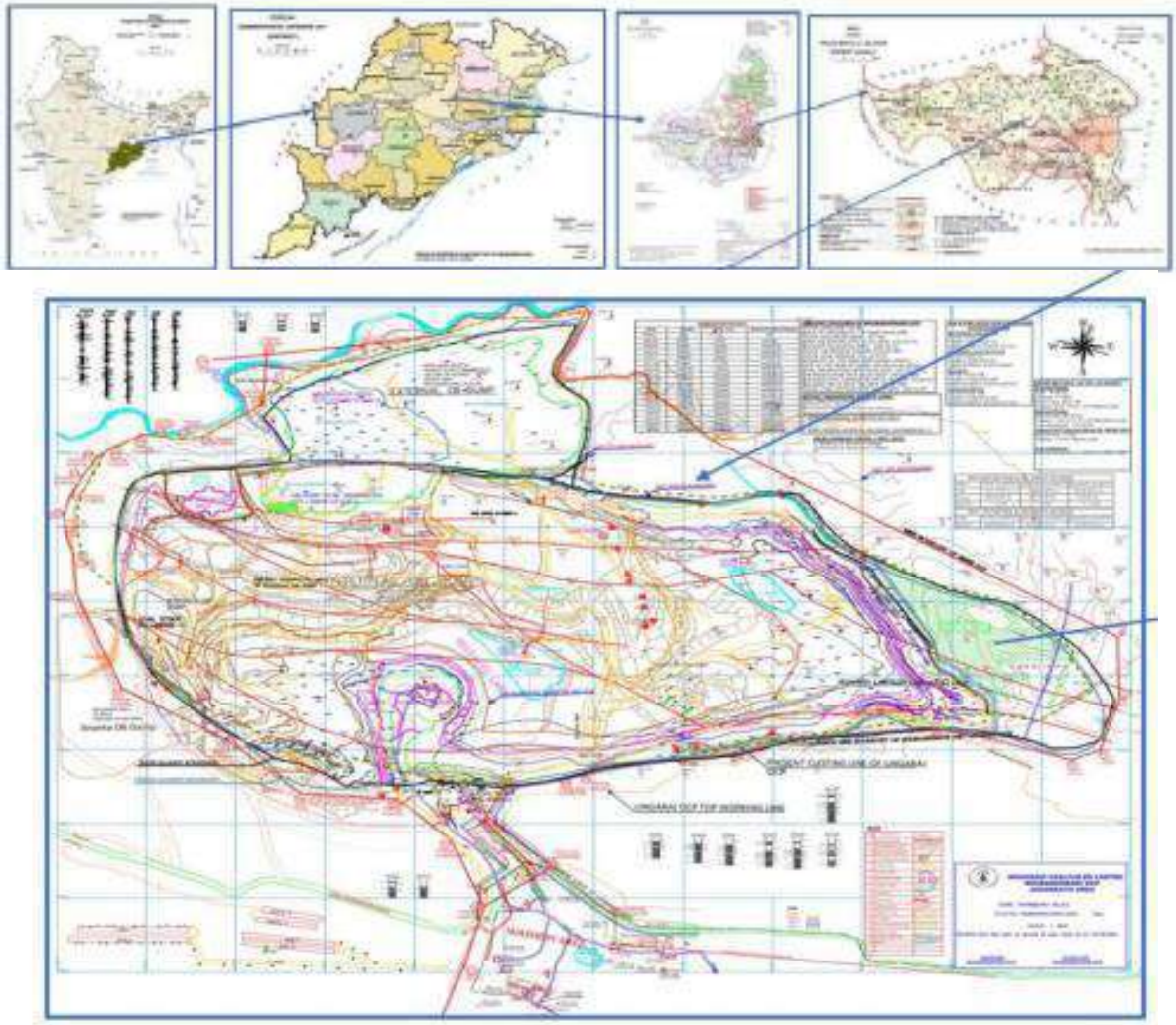
The Stage-I Forest Clearance approval over 26.416 ha of Forest Land Under Section- 2 (ii) (including 6.033 ha. of Safety Zone) of the Forest (Conservation) Act, 1980 has been granted by MoEF & CC, Government of India vide their Letter No. 8-18/2002-FC, dated 24.09.2024, where in it has been stipulated as per **Condition No. 6 (iii) for construction of check dams, retention/toe walls to arrest sliding down of the excavated material along the contour in accordance with the approved scheme.**

2. LOCATION

The mining lease area is covered in the Survey of India Topo sheet No. F45T1 and Special Topo sheet Nos. D1, D2, E1& E2 and situated between the latitude 20°57'53.53"N to 20°59'16.83"N, and longitude 85°08'27.17"E to 85°11'6.29"E. The above ML area covering villages are in Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur of Angul District, Odisha.

LOCATION MAP

Fig-1. Location Map of Bhubaneswari OCP, MCL



3. TOPOGRAPHY

The surface topography is (majorly) predominantly soil covered and gently undulating with paddy fields and is used for agricultural purpose and some patches of barren lands. Around south western part, the surface topography is mildly undulating and slopes towards north. The ground level rises towards south-eastern corner of the block with highest elevation above Mean Sea Level of about 167.50 meter. A small seasonal stream (part of Bangaru stream) is flowing along the northern boundary of the project. Elevations of the area vary between 92 m to 137 m above mean sea level.

4. LAND USE PATTERN

The proposed land use pattern of 658.724 Ha. of mining lease area as per approved Mining Plan and Mine Closure Plan is given below:

Table 1: Purpose wise break up forest and non-forest land

| Sl. No. | Type of Land Use | Forest Land in Ha | Non-Forest Land in Ha | Total Land in Ha |
|--------------|---|-------------------|-----------------------|------------------|
| 1 | Mining Excavation Area | 126.191 | 488.531 | 614.722 |
| 2 | Safety Zone | | 6.163 | 6.163 |
| 3 | Infrastructure (CHP, Washery, Silo point, project office, laying of railway lines for dispatch point) and Future working expansion Area | 6.713 | 18.606 | 25.319 |
| 4 | Embankment | NIL | 12.52 | 12.52 |
| Total | | 132.904* | 525.820 | 658.724 |

Note: Out of total 658.72 Ha. of Mining Lease area, total forest land involved is 132.904 Ha out of which 112.521 Ha has got Stage 2 Forest clearance vide F.no:8-18/2002-FC, Dated 06/12/2004

5. DETAILS OF FOREST LAND WITHIN THE ML AREA

| | |
|---|-----------------|
| Forest land to be worked for mining and allied purpose- | 20.383 Ha |
| Area set aside for Safety Zone | <u>6.033 Ha</u> |
| | 26.416 Ha |

6. SOIL TYPE

The areas primarily consist of sandy and lateritic soil, with an additional presence of clay. In most of the area the soil is moderately coarse in nature whereas it is loamy in the cultivated land. The area nearby has a nala Bangaru stream - one seasonal stream (flows in the northern boundary). There were two periods of glacial advance and retreat during the deposition of Talcher sediments.

7. CLIMATE

The area experiences a sub-tropical warm temperature. Monsoon is from mid of June and continues till end of September. The average annual rainfall as recorded at IMD observatory at Angul is 1277 mm. and the highest rainfall occurs in the month of August (84.0 mm with a mean rainfall of 4.4 mm for the year 2020). Around 78% of rainfall occurs during the monsoon season. The temperature varies from 5.6oC to 43.7oC. Maximum temperature is being observed in the month of May and minimum in the month of December.

8. DRAINAGE

Brahmani River, flowing approximately north to south along the eastern boundary of the Talcher coalfield, provides the main drainage of the region. This river is fed by seasonal nalas, viz. Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor and a few small nalas. From the eastern boundary of the block, the Brahmani River lies eastward at a distance of about 20 km.

Bangaru stream River drains this entire block. Bangaru Stream River emerges as seasonal third order streams in Ambapal, Natara and Kalamchhuin village areas and flows into Brahmani River. The general slope is towards north. The local drainage is mainly dendritic in nature. Entire Mining area in north is drained by Bangaru Stream, in south by Nandira Stream and east by seasonal streams. These streams are ultimately joining in the North West –South East flowing Brahmini River east of the Mining area. Small ponds are common in this block and are utilized for drinking purpose.

9. OBJECTIVES OF THE SCHEME

The main objective of the present scheme is to fulfil the Condition No. 6(iii) of the Stage-I approval granted vide Letter No.8-18/2002-FC, Dated.24.09.2024 of MoEF & CC, Government of India to undertake **“Construction of Check dams, Retention /Toe walls to arrest sliding down of the excavated material along the contour in accordance with the approved scheme”**.

The different steps proposed to be adopted are as under:

- a) To prevent erosion of sediment due to surface runoff.
- b) To prevent of obstruction of natural water sources.
- c) To complete construction activities efficiently before surface soil is exposed.
- d) To prevent overflow of eroded soil from the mining areas to the natural streams and habitations.

10. PROPOSED METHODOLOGY

To achieve the above objectives, it has been proposed to take up both biological and structural measures for effective erosion control and water conservation. The biological measures primarily include vegetative cover around overburden (OB) dump sites and along the diversions of nearby nalas. Structural measures are planned in the lower reaches of OB dump areas to reinforce the stability and manage run-off effectively.

a) Structural Measures

Vegetative means of erosion control are the most feasible and economic measures. However, as the pressure on land is increasing, it is necessary to bring even highly eroded land for utilization. In this type of land, vegetative measures only are not adequate to keep down the erosion. Some structural measures are required to be undertaken along with vegetative measures. Structural measures, therefore, serve as supplementary to vegetative measures. The approved Mining Plan and Mine

Closure Plan has prescribed some structural measures to be undertaken to minimise soil erosion which are enlisted below:

i) Construction of Retaining wall

As the Bhubaneswari OCP is a running mine nearly 2000 meters retaining wall has already been constructed and the remaining wall i.e 5500 meters wall will be constructed as proposed.

ii) Construction of Garland drain

From the outer side of the retaining wall a shallow trench (1.0 m wide x 1.50 m deep) will be dug around the temporary external OB Dump area for storage of run-off accumulated for draining surface water before it is flown to the natural water course. The proposed Garland drain will be having a for length of 7200 meter

iii) Terracing of OB Dump Slope

It is proposed to construct berm & terraces over a length of 18100 m. on the proposed Dumps considering the volume of OB materials & the area earmarked for dumping. The slope of individual terrace should be within the permissible range considering the angle of repose of the soil and space available, thereby maintaining the angle of repose at less than 28 degrees. The terracing will be done through the internal resources by deploying the operating mining equipment. All these operations will be carried out after sufficient deposition of OB. When OB dump will partially mature, the work will be executed.

iv) Construction of Settling Tanks

It is proposed to construct 1 no. of settling tank North - West corner (Settling tank no-2) for sedimentation of run-off water that will come out of garland drain.

v) De-siltation of Settling Tank

The de-silting works of the settling tank will be taken up at regular intervals to prevent sedimentation and choking of streams. This de-silting of settling tank will provide space and base to hold the sediment laden runoff thereby allowing settling and clear water to flow down. This de-silting work will be preferably undertaken once in a year before & after monsoon. The implementation of the plans will be site specific in nature depending upon the severity of the sedimentation and choking of stream.

The location of different structural measures proposed above from sl.no i) to sl.no iv) are shown in a map which is attached as Annexure-II. Further the structural measures that are proposed to be undertaken in order to minimise soil erosion and choking of streams are dealt in detail including the financial forecasts for the corresponding structural measures and do form part of other schemes e.g.

b) Slope of the proposed Dump

In the quarry, the overburden removed completely from the first year is to be dumped over the existing quarry void created by the mine advancement. The total volume of insitu overburden removed corresponding to the total production of 124.46 Mt is 131.43 Mcum. The external dump lying over the northern part of the quarry excavation area is of 36.99 Mm³ and the internal dump is of 18.00 Mcum. So, the overburden of 54.99 Mm³ is to be rehandled back into the proposed internal dump of the extended quarry. The internal Dump of 109.55 Mm³ is already lying on the existing void of the quarry as on 01.04.2022. The total volume of OB programmed for the proposed excavation area is of 186.42 Mm³. Overall slope of internal dump is 26 degrees, The dumped material shall be allowed to settle at the natural angle of repose of the material as prescribed in Reg. 108(2) of CMR, 2017. The spoil bank face shall not be retained by artificial means at an angle in excess of its natural angle of repose.

c) Management

Re-treating fashion will be adopted to dump the total waste material generated during planned period. Three (3) terraces will be formed during planned period of 5 years in the entire proposed dump. Each terrace will have inward slope with catch drain at inward side of the terrace. The catch drain of the individual terrace will be connected to the garland drain outside the periphery of the dump. These catch drain will preferably have half concrete open pipe followed by settling tank to avoid wash offs. Each terrace will have a provision of berms at the outer end to reduce gully formation due to rain water wash offs.

To control erosion in the proposed waste dumps, regular compaction, development of terraces and vegetation are proposed to be done. Also, the retaining wall and garland drain for the proposed waste dump will be constructed to arrest wash-offs from the dump. It is proposed to construct both the retaining wall and garland drain at the end of 1st year plan period. No proposal has been given for the rehabilitation of the dump during planned period of five (5) years

11. INSPECTION, MONITORING AND EVALUATION

Proper inspection, monitoring and evaluation will be done in-house by designated authorities of MCL under supervision of Forest Department.

12. MOTIVATION OF PEOPLE

The villagers / VSS Committee members of the adjoining villages are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the adjoining villages and resolution will be passed to support plantation activities. For motivation of the villagers/ VSS Committee members, they will be provided incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure for this purpose.

13. EXECUTING AGENCY

The work will be executed by the User Agency i.e. M/s Mahanadi Coalfields Limited through dedicated departments manned by technically qualified persons with outsourced man and machinery as and when required. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department

EXECUTING AGENCY



14. REQUIREMENT OF FUNDS

The financial forecast for construction of Retention wall, Garland drain & Setting Tank to arrest sliding down of the excavated material will be **₹6,44,97,100.00** (Rupees Six Crore Forty Four Lakh Ninety-Seven Thousand One Hundred Ninety only)

Regional Chief Commissioner
of Tourism, Nagpur Circle

FINANCIAL FORECAST

(Wage Rate @ Rs. 452.00 according to Base Cost Norm and Rate/ Ha. for the year 2025-26 as per approved Matrix)

| Sl. No. | Description of the Work | Fund Required (in Rs.) |
|-------------|---|------------------------|
| 1 | Retaining Wall 7500m @2707 per Mtr. | 20302500.00 |
| 2 | Garland Drain 7200m @3478 per Mtr. | 25041600.00 |
| 3 | Construction of Settling Tank No-1 | 392927.00 |
| 5 | De-Siltation work for garland drains intermittently and settling ponds on L.S | 500000.00 |
| 6 | Repair of Retaining walls of L.S | 500000.00 |
| Sub Total | | 46737027.00 |
| 7 | 15% of the total cost for motivation of VSS / People involved | 7010554.05 |
| Sub Total | | 53747581.05 |
| 8 | Price escalation @ 20% | 10749516.21 |
| Grand Total | | 64497097.26 |
| Say Or | | 64497100.00 |

(Rupees Six Crore Forty-Four Lakh Ninety-Seven Thousand One Hundred Ninety only)

Note: The above-mentioned expenditure has already been included in the budget of Environment Management Plan (EMP) as well as approved Mining Plan and Mine Closure Plan.

M/s Mahanadi Coalfields Ltd. do hereby undertake to execute the item of works mentioned in this scheme and incur the approved amount in a phased manner as per approved Mining Plan and Mine Closure Plan/Environment Management Plan (EMP).

M/s Mahanadi Coalfields Ltd

महानदी कोयला
General Manager
एम.सी.एल., भुवनेश्वर क्षेत्र
MCL, Bhubaneswar Area

Countersigned

Divisional Forest Officer
Divisional Forest Officer
Angul Division

Approved by Rs. 644,97,100/-

Regional Chief Conservator
of Forests, Angul Circle.

ESTIMATE FOR CONSTRUCTION OF RETAINING WALL

Wage rate Rs.452/Day

| Sl.No | Job Description | No | Length (In mtr.) | Width (in mtr.) | Height (in mtr.) | Unit | Quantity | Rate | Amount |
|-------|---|----|------------------|-----------------|------------------|------|----------|---------------|-----------------------|
| 1 | Earth work is hard soil or gravelly soil within 50 mtr initial lead & 1.50 mtr initial lift including rough dressing & breaking clods to maximum 5.00cm to 7.00 cm & laying layers not exceeding 0.30mtr in depth and as per the direction of the engineer -in charge. | 1 | 1000 | 0.7 | 0.7 | CUM | 490 | 269.70 | 132153.00 |
| 2 | Filling in foundation and plinth with sand watered and rammed | 1 | 1000 | 0.7 | 0.075 | CUM | 52.50 | 593.80 | 31174.50 |
| 3 | Cement concrete M-10 grade (PCC 1:4:8 for foundation) with crushed broken granite coarse aggregate of size 40 mm downgraded mixed in concrete mixture including cost conveyance and royalty of all materials, machineries and labour and laying in head works and canal structures with required lifts and de-lifts as per direction of Engineer-in-charge. | 1 | 1000 | 0.6 | 0.075 | CUM | 45.00 | 5644.80 | 254016.00 |
| 4 | BRICK WORK for foundation having crushing strength not less than 75 kg/cm ² with dimensional tolerance ± 8 percent in cement mortar (1:6) in foundation and plinth per cum | 1 | 1000 | 0.5 | 0.3 | CUM | 150 | 5244.30 | 786645.00 |
| 5 | BRICK WORK for S/S, having crushing strength not less than 75 kg/cm ² with dimensional tolerance ± 8 percent in cement mortar (1:6) in foundation and plinth per cum | 1 | 1000 | 0.25 | 1 | CUM | 250 | 5277.60 | 1319400.00 |
| 6 | Concrete for plinth M-20 grade with crushed broken granite coarse aggregate of size 20mm downgraded mixed plant including cost of all materials, machineries and labour and transportation of mixed concrete | 1 | 1000 | 0.25 | 0.1 | CUM | 25 | 5426.80 | 135670.00 |
| 7 | Concrete for coping M-20 grade with crushed broken granite coarse aggregate of size 20mm downgraded mixed plant including cost of all materials, machineries and labour and transportation of mixed concrete | 1 | 1000 | 0.35 | 0.025 | CUM | 8.75 | 5426.80 | 47485.00 |
| | | | | | | | | Total: | ₹ 27,06,543.00 |

(Rupees Twenty-Seven Lakhs Six Thousand Five Hundred Forty-Three only)

The cost for construction of Retaining Wall for 1000m is **27,06,543/-** at Wages@452.00The cost for construction of Retaining Wall for 1m is **27,06,543÷1000=2706.543** say 2707/-**The cost of Retaining Wall for 7500 m is 2707 X 7500 = 20302500/-**

ESTIMATE FOR CONSTRUCTION OF GARLAND DRAIN**Wage rate Rs.452/Day**

| Sl.No | Job Description | No | Length (In mtr.) | Width (in mtr.) | Height (in mtr.) | Unit | Quantity | Rate | Amount |
|---------------|--|----|------------------|-----------------|------------------|------|----------|---------|-----------------------|
| 1 | Cleaning of Jungles & bushes | 1 | 1000 | 7 | 1 | Sqm | 7000 | 1.7 | ₹ 11,900.00 |
| 2 | Earth work is hard soil or gravelly soil within 50 mtr initial lead & 1.50 mtr initial lift including rough dressing & breaking clods to maximum 5.00cm to 7.00 cm & laying layers not exceeding 0.30mtr in depth and as per the direction of the engineer -in charge. | 1 | 1000 | 3 | 0.75 | CUM | 2250 | 269.70 | ₹ 6,06,825.00 |
| 3 | Ramming and rolling earth work with light H.R.R. in embankments in layers not exceeding 0.30 m in depth as directed by the Engineer-in-charge. | 1 | 1000 | 3 | 0.075 | CUM | 225.00 | 5.10 | ₹ 1,148.00 |
| 4 | Rough Stone Dry Packing with local boulder only labour charges(Local boulder will be supplied by the Company through contractual manner) | 1 | 2000 | 3 | 0.3 | CUM | 1800 | 1588.00 | ₹ 28,58,400.00 |
| Total: | | | | | | | | | ₹ 34,78,272.50 |

The cost for construction of Garland Drain for 1000m is 34,78,272.5/- at Wages@ Rs.452.00

The cost for construction of Garland Drain for 1m is $34,78,273 \div 1000 = 3,478.27$ say **3,478/-**

The cost for construction of Garland Drain for 7200 m is $3,478 \times 7200 =$ **2,50,41,600/-**

ESTIMATE FOR CONSTRUCTION OF SETTLING TANK**Wage rate Rs.452.00/day**

| Sl.No | Job Description | No | Length (In mtr.) | Width (in mtr.) | Height (in mtr.) | Unit | Quantity | Rate | Amount |
|-------|--|----|---|-----------------|------------------|------|----------|---------|----------------------|
| 1 | Earth work is hard soil or gravely soil by M/c means within 5 Km. Lead by truck & 1.50 mtr initial lift including rough dressing & breaking clods to maximum 5.00cm to 7.00 cm & laying layers not exceeding 0.30mtr in depth and as per the direction of the engineer -in charge. | 1 | $\frac{(60 \times 50) + (57 \times 47)}{2} \times 1.50$ | | | CUM | 4,259.25 | 72.10 | ₹ 3,07,092.00 |
| 2 | Specification approved by department along with proper compaction with H.R.R.Excavation | 1 | 60 | 50 | 1.5 | CUM | 4500 | 5.10 | ₹ 22,950.00 |
| 3 | Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be supplied by our Company) | 1 | 220 | 0.60 | 0.30 | CUM | 39.60 | 1588.00 | ₹ 62,885.00 |
| | Rate per one no.Settling Tank | | | | | | | | ₹ 3,92,927.00 |

Cost for construction of one no. of Settling Tank = **Rs. 3,92,927.00**



Office of the General Manager
(Bhubaneswari Area)
At/Po :Dera Colliery
Dist: Angul – 759103 (Odisha)
Website :www.mcl.gov.in
Email Id: cgm-bhubaneswari.mcl@coalindia.in



Annexure- 15

UNDERTAKING

PROPOSAL NO.:- FP/OR/MIN/155017/2022

(In compliance to Condition No. 6 (iv) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "Stabilize the overburden dumps by appropriate grading/benching, in accordance with the approved scheme, so as to ensure that angles of repose at any given place is less than 28°".

General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एच.पी.एल. भुवनेश्वर क्षेत्र
MCL, Bhubaneswari Area

Divisional Forest Officer
Angul, Division



BHUBANESWARI OPEN CAST COAL PROJECT

**Scheme
for**

**STABILIZE THE OVERBURDEN DUMPS BY APPROPRIATE
GRADING/BENCHING, SO AS TO ENSURE THAT ANGLES OF
REPOSE AT ANY GIVEN PLACE IS LESS THAN 28°**

**in compliance
with**

**Condition No.6 (iv) of
Stage-I approval granted vide
Letter No.8-18/2002-FC, Dated.24.09.2024
of Govt. of India, Ministry of Environment, Forests
& Climate Change, New Delhi.**

for

**Diversion of 26.416 Ha. (Originally proposed area is 20.383 ha)
of Forest Land within 658.724 Ha. of ML area of Bhubaneswari OCP
for Non forestry use U/s-2 (ii) of FC Act-1980
in villages Jilinda, Hensmul (Sharasahi), Hensmul
(Talasahi), Naraharipur, Khandualbhal, Kandhal,
Madanmohanpur, Langijoda and Anadipur of
Angul District, Odisha.**

M/s. Mahanadi Coalfields Limited

SCHEME FOR STABILIZE THE OVERBURDEN DUMPS BY APPROPRIATE GRADING/BENCHING, IN ACCORDANCE WITH THE APPROVED SCHEME,SO AS TO ENSURE THAT ANGLES OF REPOSE AT ANY GIVEN PLACE IS LESS THAN 28°

1. INTRODUCTION

Bhubaneswari Open Cast Project is a mega coal mining project spread over a mining lease area of 658.724 ha. in Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur of Angul District, Odisha.

Mahanadi Coalfields Limited has named Bhubaneswari and combined Bhubaneswari, Sakhigopal-A, Arkhapal-A coal blocks as Bhubaneswari Open Cast Project.

As per approved Mining Plan and Mine Closure Plan, the mine life is 5 years. Out of total 658.72 Ha. of Mining Lease area, total forest land involved is 132.904 Ha out of which 112.521 Ha has got Stage 2 Forest clearance wide F.no:8-18/2002-FC, Dated 06/12/2004

The Stage-I Forest Clearance approval over 26.416 ha of Forest Land Under Section- 2 (ii) (including 6.033 ha. of Safety Zone) of the Forest (Conservation) Act, 1980 has been granted by MoEF & CC, Government of India vide their Letter No. 8-18/2002-FC, dated 24.09.2024, where in it has been stipulated as per **Condition No. 6 (iv) for stabilize the overburden dumps by appropriate grading/benching, in accordance with the approved scheme,so as to ensure that angles of repose at any given place is less than 28°**

2. LOCATION

The mining lease area is covered in the Survey of India Topo sheet No. F45T1 and Special Topo sheet Nos. D1, D2, E1& E2 and situated between the latitude 20°57'53.53"N to 20°59'16.83"N, and longitude 85°08'27.17"E to 85°11'6.29"E. The above ML area covering villages are in Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur of Angul District, Odisha.

LOCATION MAP

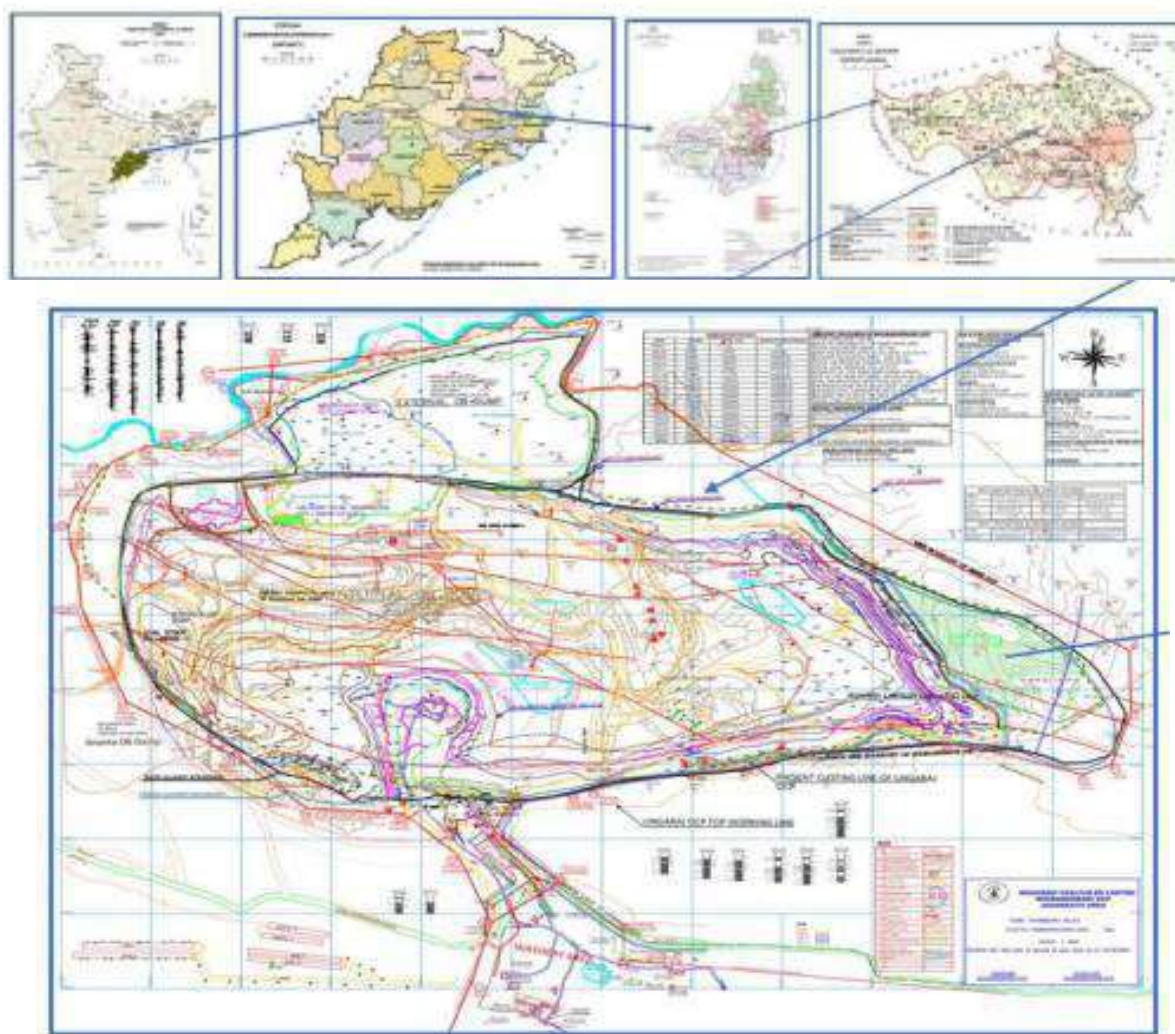


Fig-1. Location Map of Bhubaneswari OCP, MCL

3. TOPOGRAPHY

The surface topography is (majorly) predominantly soil covered and gently undulating with paddy fields and is used for agricultural purpose and some patches of barren lands. Around south western part, the surface topography is mildly undulating and slopes towards north. The ground level rises towards south-eastern corner of the block with highest elevation above Mean Sea Level of about 167.50 meter. A small seasonal stream (part of Bangaru stream) is flowing along the northern boundary of the project. Elevations of the area vary between 92 m to 137 m above mean sea level.

4. LAND USE PATTERN

The proposed land use pattern of 658.724 Ha. of mining lease area as per approved Mining Plan and Mine Closure Plan is given below:

Table 1: Purpose wise break up forest and non-forest land

| Sl. No. | Type of Land Use | Forest Land in Ha | Non-Forest Land in Ha | Total Land in Ha |
|--------------|---|-------------------|-----------------------|------------------|
| 1 | Mining Excavation Area | 126.191 | 488.531 | 614.722 |
| 2 | Safety Zone | | 6.163 | 6.163 |
| 3 | Infrastructure (CHP, Washery, Silo point, project office, laying of railway lines for dispatch point) and Future working expansion Area | 6.713 | 18.606 | 25.319 |
| 4 | Embankment | NIL | 12.52 | 12.52 |
| Total | | 132.904* | 525.820 | 658.724 |

Note: Out of total 658.72 Ha. of Mining Lease area, total forest land involved is 132.904 Ha out of which 112.521 Ha has got Stage 2 Forest clearance wide F.no:8-18/2002-FC, Dated 06/12/2004

5. DETAILS OF FOREST LAND WITHIN THE ML AREA

| | |
|---|-----------------|
| Forest land to be worked for mining and allied purpose- | 20.383 Ha |
| Area set aside for Safety Zone | <u>6.033 Ha</u> |
| | 26.416 Ha |

6. SOIL TYPE

The areas primarily consist of sandy and lateritic soil, with an additional presence of clay. In most of the area the soil is moderately coarse in nature whereas it is loamy in the cultivated land. The area nearby has a nala Bangaru stream - one seasonal stream (flows in the northern boundary). There were two periods of glacial advance and retreat during the deposition of Talcher sediments.

7. CLIMATE

The area experiences a sub-tropical warm temperature. Monsoon is from mid of June and continues till end of September. The average annual rainfall as recorded at IMD observatory at Angul is 1277 mm. and the highest rainfall occurs in the month of August (84.0 mm with a mean rainfall of 4.4 mm for the year 2020). Around 78% of rainfall occurs during the monsoon season. The temperature varies from 5.6oC to 43.7oC. Maximum temperature is being observed in the month of May and minimum in the month of December.

8. DRAINAGE

Brahmani River, flowing approximately north to south along the eastern boundary of the Talcher coalfield, provides the main drainage of the region. This river is fed by seasonal nalas, viz. Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor and a few small nalas. From the eastern boundary of the block, the Brahmani River lies eastward at a distance of about 20 km.

Bangaru stream River drains this entire block. Bangaru Stream River emerges as seasonal third order streams in Ambapal, Natara and Kalamchhuin village areas and flows into Brahmani River. The general slope is towards north. The local drainage is mainly dendritic in nature. Entire Mining area in north is drained by Bangaru Stream, in south by Nandira Stream and east by seasonal streams. These streams are ultimately joining in the North West –South East flowing Brahmini River east of the Mining area. Small ponds are common in this block and are utilized for drinking purpose.

9. EXISTING VEGETATION

The forest growth available in the area resembles Northern Tropical Dry Deciduous Forest similar to other regions in Talcher coalfield. Dominant tree species include Sal (*Shorea robusta*), Mahua (*Madhuca indica*), Neem (*Azadirachta indica*), Teak (*Tectona grandis*), Jamun (*Syzygium cumini*), and Mango (*Mangifera indica*)

The vegetation of the applied area is composed of Sal (*Shorea robusta*), Mahua (*Madhuca indica*), Neem (*Azadirachta indica*), Teak (*Tectona grandis*), Jamun (*Syzygium cumini*), Mango (*Mangifera indica*), Pipal (*Ficus religiosa*), Khajur (*Phoenix dactylifera*), Kusum (*Schleichera oleosa*), Tendu (*Diospyros melanoxylon*), Haldu (*Adina cordifolia*), Ber (*Ziziphus mauritiana*), and Saj (*Terminalia tomentosa*). **Sal (*Shorea robusta*)** is noted as the predominant species within the area

10. PHASE WISE MINING ACTIVITY AND MANAGEMENT OF OVERBURDEN DUMP

Taking into consideration the topography of the deposit, estimated reserve and grade, disposition of coal body, nature of intercalated waste, incidence of coal, and production requirement, the deposits will be mined by fully mechanised method with the deployment of Surface miner, hydraulic shovel, dumpers, dozers etc. on three shift bases.

a. OB Generation

The overburden removed completely from the first year is to be dumped over the existing quarry void created by the mine advancement. The total volume of insitu overburden removed corresponding to the total production of 124.46 Mt is 131.43 Mcum. The external dump lying over the northern part of the quarry excavation area is of 36.99 Mm³ and the internal dump is of 18.00 Mcum. So, the overburden of 54.99 Mm³ is to be rehandled back into the proposed internal

dump of the extended quarry. The internal Dump of 109.55 Mm³ is already lying on the existing void of the quarry as on 01.04.2022. The total volume of OB programmed for the proposed excavation area is of 186.42 Mm³. Overall slope of internal dump is 26 degrees.

b. The salient features of OB Dump Management practices

Retaining wall and garland drain would be provided around the proposed dumps with settling tanks.

Precautionary measures to be adopted during waste disposal are as follows:

- i. The ultimate dump slope to be maintained around 26°.
- ii. For better stability of internal dumps, it is suggested to rip the mine floor in strips before backfilling. It is suggested to level the dumps and grade them outward properly to obviate water accumulation and will be followed by garland drains all along the periphery of the dump
- iii. The discontinuous dumping shall be avoided to check water accumulation between heaps as far as practicable. The open cracks developed in the partially developed dump shall be filled and consolidated with the proper levelling of the benches with the help of a dozer. It will help to reduce the dumped material and will minimize the infiltration of water inside the dumps. The proper gradient along the benches, top and floor of the dump shall be ensured. It will facilitate an effective seepage/flow of water retained in dumps and run-off rainwater to the drains to take the same away from the dump. The drains should be effectively maintained to divert the drained water away from the dump

11. OBJECTIVES OF THE PROPOSED PLAN

The objectives are as follows: -

- i) To fulfil Condition No.6 (iv) of the Stage-I approval granted vide Letter No.8-18/2002- FC, Dated.24.09.2024 of Govt. of India to prepare a plan **of Stabilize the overburden dumps by appropriate grading/benching so as to ensure that angles of repose at any given place is less than 28 °**
- ii) To adopt proper Management and scheduling of overburden materials so as to minimize external dumping.
- iii) To provide methodologies and implement the proposed works in time bound manner to prevent slope failures there by providing stable OB dump slopes.
- iv) To stabilize the over burden dumps by plantation.
- v) To prevent overflow of eroded soil from the fines, OB dump areas which lead to siltation in the streams.

12. PROPOSED METHODOLOGY

Due to the geological feature of the mining lease area, the dumps would be higher than the adjoining ground level. Top soils from the slopes of the dump are likely to flow during heavy rains and disturb the topography of its adjoining land, till the dump surface is completely stabilized by biological means. In order to curb this situation, retaining walls of minimum one & half meter height have been planned all along the peripheral contour of the dumps to arrest the possibility material running down on the slopes. Waste dumping has been planned in such a manner that backfilling can be done with a view to reclaim the degraded land. The methods to be adopted for stabilization of OB dumps are as follows:

a. Vegetative methods (Biological Measures)

As the waste material is kept temporarily and utilised for back filling of the mine void area, no need of plantation over the temporary dump area.

b. Bio-engineering Measures

- Terraces as a soil conservation measures.

c. Structural measures

- Terracing of slopes, plugging of gullies by construction of catch drain
- Construction of Garland drains, Settling Tank.

To give an ideal shape to the dump, appropriate slope has to be maintained for which terraces to be made in dumps to maintain the slope. The angle of repose of the terrace would be around 28 degrees. Backfilled areas would be biologically reclaimed. Terraces would be developed having maximum height of 10m in dumps keeping in view the gradual progress of dump and area available for minimum utilisation of virgin land. The details of dumps and terraces to be made have been summarized as follows:

i. Terracing of OB Dump Slope

It is proposed to construct berm & terraces over a length of 18100 m. on the proposed dumps considering the volume of OB materials & the area earmarked for dumping. The slope of individual terrace should be within the permissible range considering the angle of

repose of the soil and space available, thereby maintaining the angle of repose at less than 28°. The terracing will be done through the internal resources by deploying the operating mining equipment. All these operations will be carried out after sufficient deposition of OB has been made. Map showing OB terracing and provision of other structural measures is attached as **Annexure-I**. Further to be in clarity the cross section of proposed Temporary External OB dump, (a not to scale) map is provided as **Annexure -II**.

13. INSPECTION, MONITORING AND EVALUATION

Proper inspection, monitoring and evaluation will be done in-house by designated authorities of MCL under supervision of Forest Department.

14. MOTIVATION OF PEOPLE

The villagers / VSS Committee members of the adjoining villages are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the adjoining villages and resolution will be passed to support plantation activities. For motivation of the villagers/ VSS Committee members, they will be provided incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure for this purpose.

15. EXECUTING AGENCY

The work will be executed by the User Agency i.e. M/s Mahanadi Coalfields Limited through dedicated departments manned by technically qualified persons with outsourced man and machinery as and when required. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department

EXECUTING AGENCY



16. TERRACING OF THE DUMP SLOPE

For terracing of OB Dump in a planned manner, internal resources shall be deployed utilizing HEMM vehicles etc. However, an estimated cost calculation is provided below to calculate the amount of cost to be incurred for the said job.

Engagement of HEMM on the O/B dump slope for terracing

| | |
|--|--|
| Location | - Over Burden Dump |
| Work efficiency per hour | - 3.38 running meter on the dump |
| Width & height of the terrace | - 30 m. & 30 m. |
| Rate for engagement of HEMM/hr - Rs. 2000.00 | - Rs. 2000.00 |
| Rate for engagement of HEMM/hr/m- Rs.2000.00 / 3.38 m = Rs. 591.71 or say Rs.592/- | - Rs.2000.00 / 3.38 m = Rs. 591.71 or say Rs.592/- |
| Total Cost | = Rs. 592.00 X 18100 m = Rs. 1,07,15,200.00 or say Rs. <u>1,08,00,000</u> |

Therefore, cost of terracing to be done at OB Dump for a length of 18,100 Running Metre is Rs. 1,08,00,000.00 (Rupees One Crore Eight Lakhs Only)

17. REQUIREMENT OF FUNDS


The financial forecast for terracing of OB Dump will be Rs. 1,08,00,000.00 (Rupees One Crore Eight Lakhs Only)

Note: The above-mentioned expenditure has already been included in the budget of Environment Management Plan (EMP) as well as approved Mining Plan and Mine Closure Plan.

M/s Mahanadi Coalfields Ltd. do hereby undertake to execute the item of works mentioned in this scheme and incur the approved amount in a phased manner as per approved Mining Plan and Mine Closure Plan/Environment Management Plan (EMP).

Countersigned


05/12/2024
M/s Mahanadi Coalfields Ltd
महानदी कोयला
General Manager
एम.सी.एल, भुवनेश्वर क्षेत्र
MCL, Bhubaneswar Area


Divisional Forest Officer
Angul Division

Approved for Rs 1,08,00,000/-


10/12/24
Regional Chief Conservator
of Forests, Angul Circle.

Stabilize the overburden dumps by appropriate grading/benching

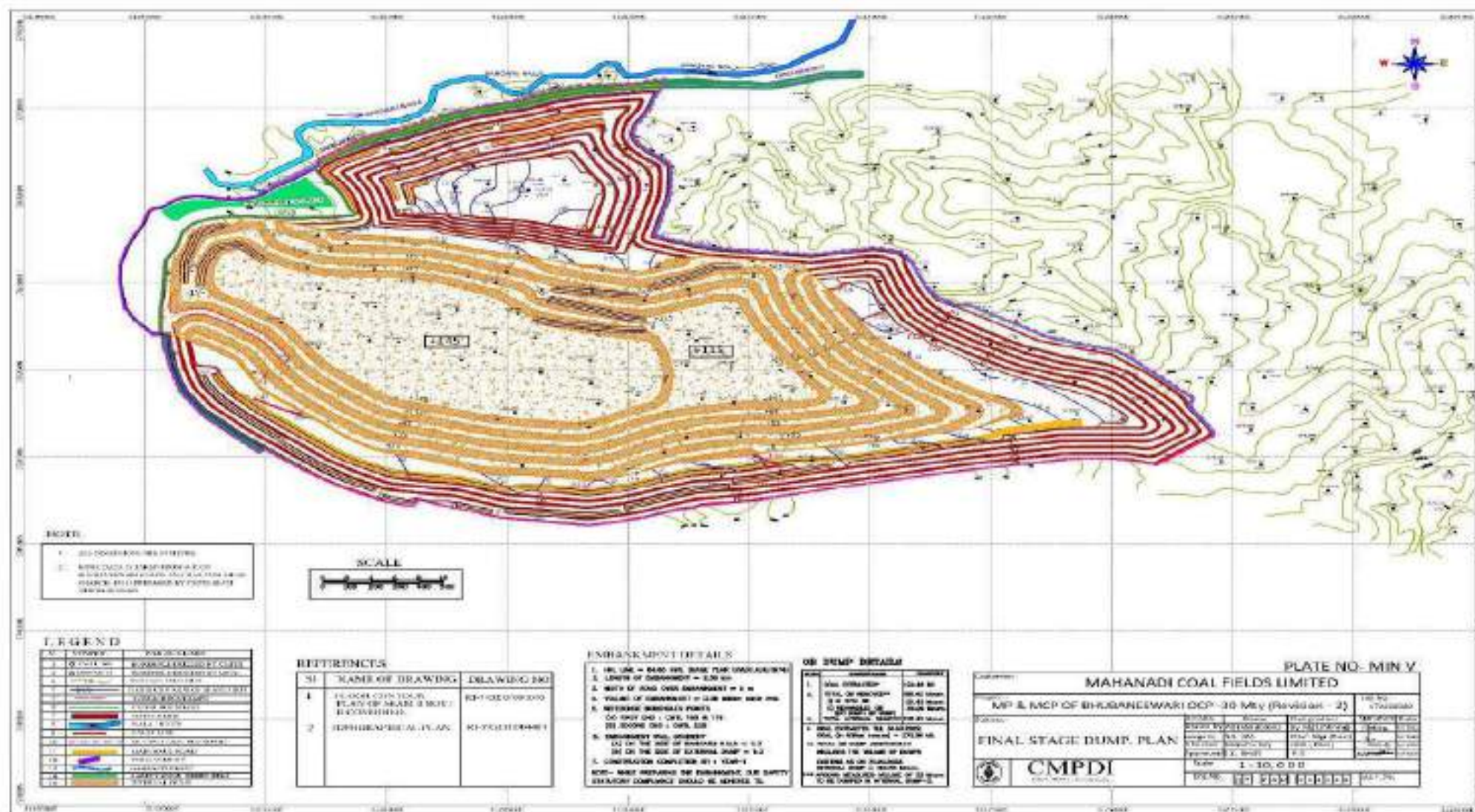


Fig 5.1.12 and 5.1.13 shows the model of OB dumps along FF' and its simulation results under multiple constraints of water and seismicity.

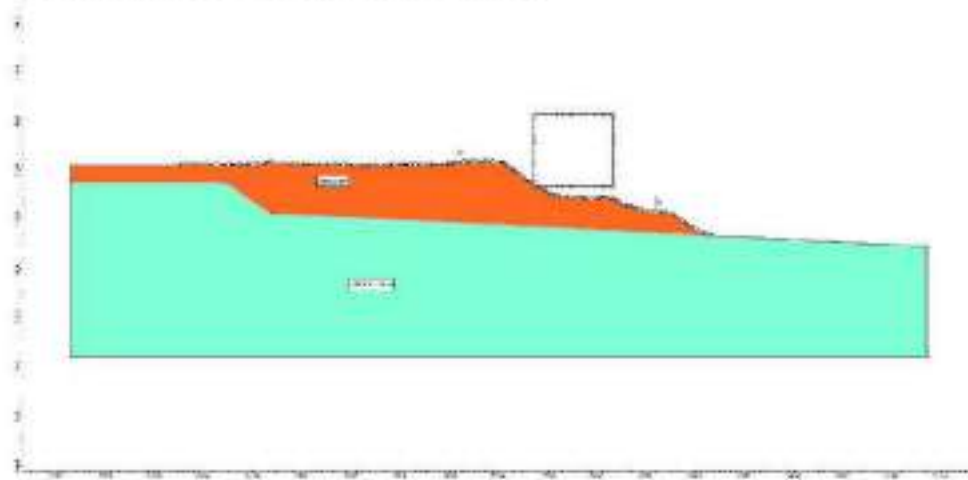


Fig 5.1.12 Model of OB Dumps along Profile FF'

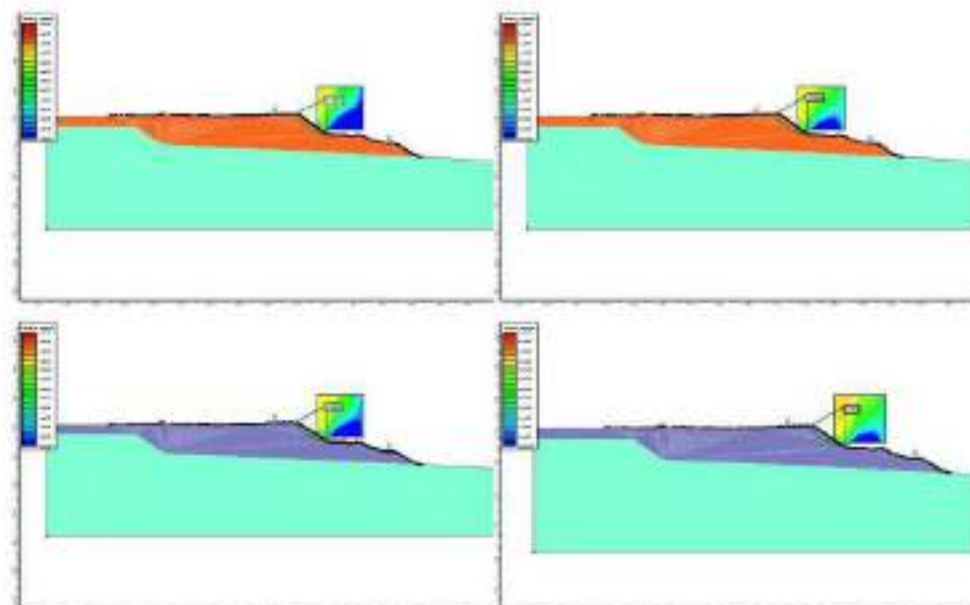


Fig 5.1.13 Simulation of OB dump slope of profile FF' under various constraints

Fig 5.1.14 and 5.1.15 shows the model of OB dumps along FF' and its simulation results under multiple constrains of water and seismicity.

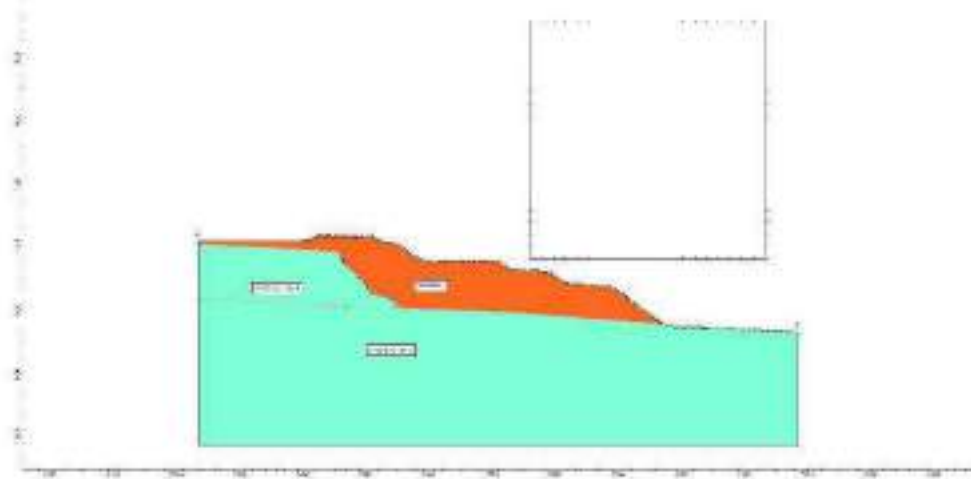


Fig 5.1.14 Model of OB Dumps along Profile HH'

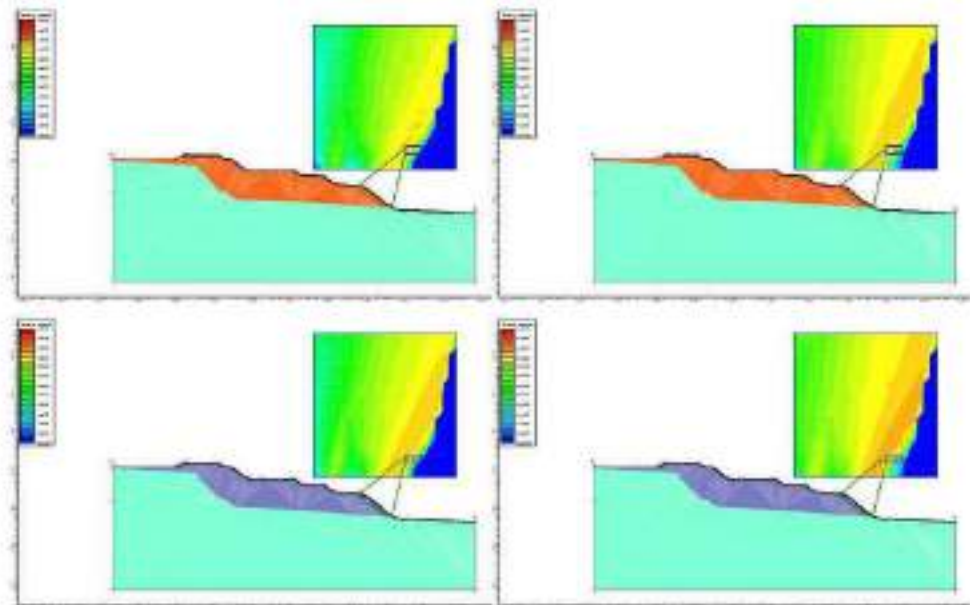
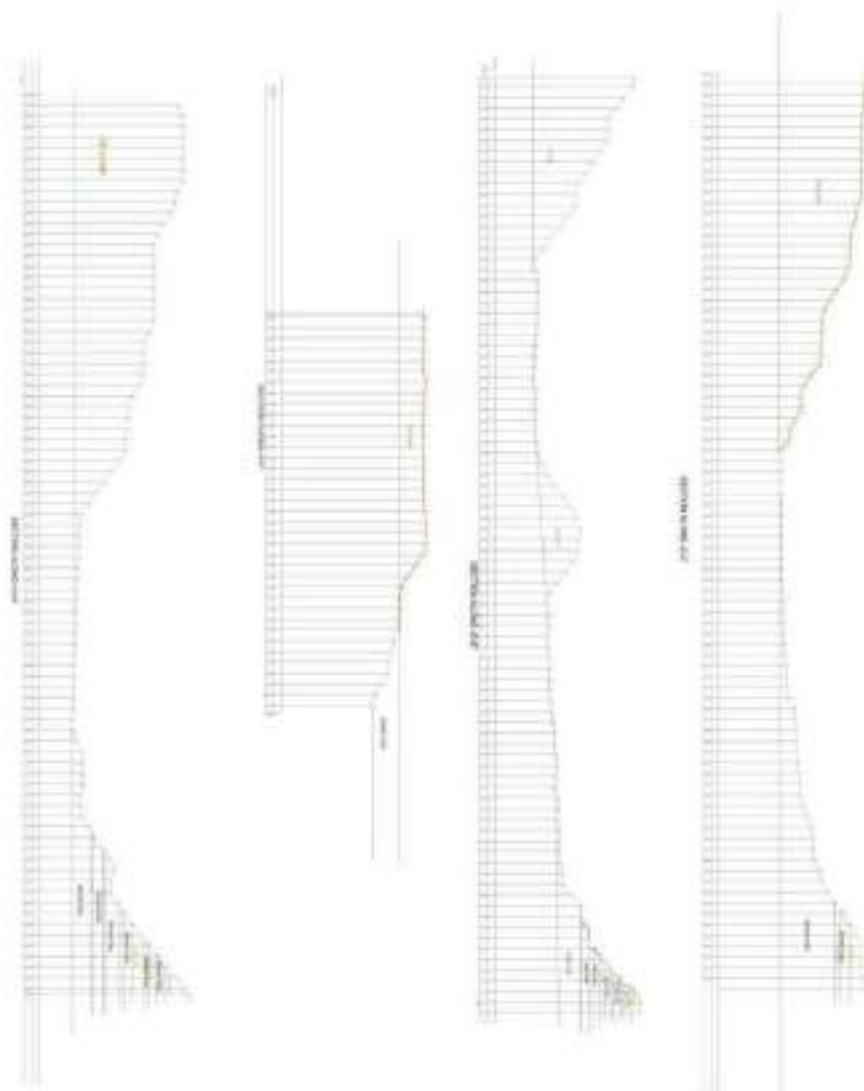


Fig 5.1.15 Simulation of OB dump slope of profile HH' under various constraints



Working plan with Profile Sections across Quarry and Dump





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(Bhubaneswari Area)
At/Po : Dera Colliery
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MCL

Annexure- 16

UNDERTAKING

PROPOSAL NO.:- FP/OR/MIN/155017/2022

(In compliance to Condition No. 6 (v) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "No damage shall be caused to the top-soil and the user agency will follow the top soil management plan".

General Manager
Bhubaneswari Area, MCL

महानदी प्रबंधक
General Manager
एच.के.एल. भुवनेश्वरी क्षेत्र
MCL, Bhubaneswari Area

Divisional Forest Officer
Angul, Division



BHUBANESWARI OPEN CAST COAL PROJECT

**Scheme
for**

TOP SOIL MANAGEMENT PLAN

**in compliance
with**

**Condition No.6 (v) of
Stage-I approval granted vide
Letter No.8-18/2002-FC, Dated.24.09.2024
of Govt. of India, Ministry of Environment, Forests
& Climate Change, New Delhi.**

for

**Diversion of 26.416 Ha. (Originally proposed area is 20.383 ha)
of Forest Land within 658.724 Ha. of ML area of Bhubaneswari OCP
for Non forestry use U/s-2 (ii) of FC Act-1980
in villages Jilinda, Hensmul (Sharasahi), Hensmul
(Talasahi), Naraharipur, Khandualbhal, Kandhal,
Madanmohanpur, Langijoda and Anadipur of
Angul District, Odisha.**

M/s. Mahanadi Coalfields Limited

SCHEME FOR NO DAMAGE SHALL BE CAUSED TO THE TOP SOIL AND THE USER AGENCY WILL FOLLOW THE TOP SOIL MANAGEMENT PLAN.

1. INTRODUCTION

Bhubaneswari Open Cast Project is a mega coal mining project spread over a mining lease area of 658.724 ha. in Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur of Angul District, Odisha.

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2. LOCATION

The mining lease area is covered in the Survey of India Topo sheet No. F45T1 and Special Topo sheet Nos. D1, D2, E1& E2 and situated between the latitude 20°57'53.53"N to 20°59'16.83"N, and longitude 85°08'27.17"E to 85°11'6.29"E. The above ML area covering villages are in Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur of Angul District, Odisha.

LOCATION MAP

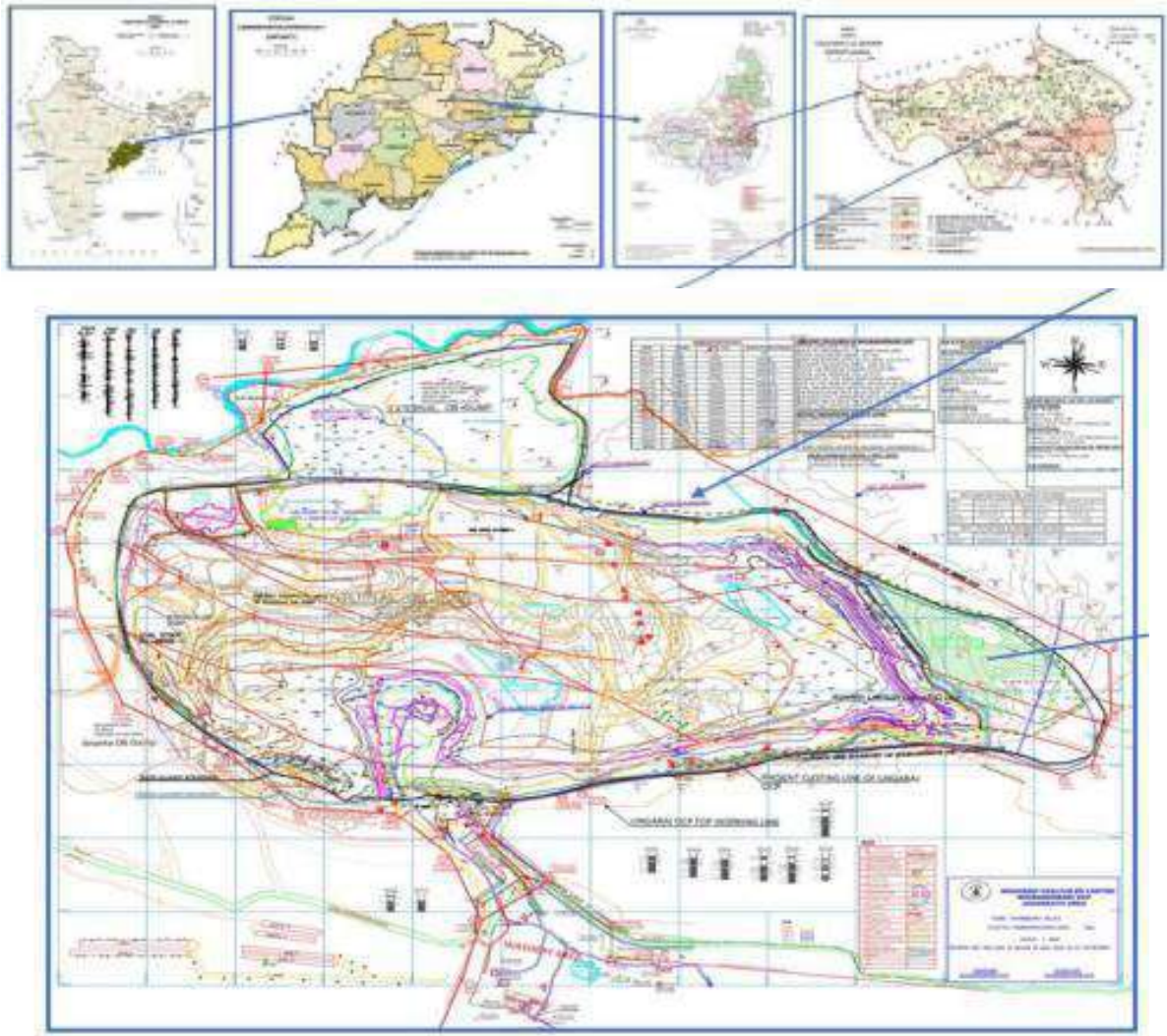


Fig-1. Location Map of Bhubaneswari OCP, MCL

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The surface topography is (majorly) predominantly soil covered and gently undulating with paddy fields and is used for agricultural purpose and some patches of barren lands. Around south western part, the surface topography is mildly undulating and slopes towards north. The ground level rises towards south-eastern corner of the block with highest elevation above Mean Sea Level of about 167.50 meter. A small seasonal stream (part of Bangaru stream) is flowing along the northern boundary of the project. Elevations of the area vary between 92 m to 137 m above mean sea level.

4. LAND USE PATTERN

The proposed land use pattern of 658.724 Ha. of mining lease area as per approved Mining Plan and Mine Closure Plan is given below:

Table 1: Purpose wise break up forest and non-forest land

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Note: Out of total 658.72 Ha. of Mining Lease area, total forest land involved is 132.904 Ha out of which 112.521 Ha has got Stage 2 Forest clearance wide F.no:8-18/2002-FC, Dated 06/12/2004

5. DETAILS OF FOREST LAND WITHIN THE ML AREA

| | |
|---|-----------------|
| Forest land to be worked for mining and allied purpose- | 20.383 Ha |
| Area set aside for Safety Zone | <u>6.033 Ha</u> |
| | 26.416 Ha |

6. SOIL TYPE

The areas primarily consist of sandy and lateritic soil, with an additional presence of clay. In most of the area the soil is moderately coarse in nature whereas it is loamy in the cultivated land. The area nearby has a nala Bangaru stream - one seasonal stream (flows in the northern boundary). There were two periods of glacial advance and retreat during the deposition of Talcher sediments.

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The area experiences a sub-tropical warm temperature. Monsoon is from mid of June and continues till end of September. The average annual rainfall as recorded at IMD observatory at Angul is 1277 mm. and the highest rainfall occurs in the month of August (84.0 mm with a mean rainfall of 4.4 mm for the year 2020). Around 78% of rainfall occurs during the monsoon season. The temperature varies from 5.6oC to 43.7oC. Maximum temperature is being observed in the month of May and minimum in the month of December.

8. DRAINAGE

Brahmani River, flowing approximately north to south along the eastern boundary of the Talcher coalfield, provides the main drainage of the region. This river is fed by seasonal nalas, viz. Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor and a few small nalas. From the eastern boundary of the block, the Brahmani River lies eastward at a distance of about 20 km.

Bangaru stream River drains this entire block. Bangaru Stream River emerges as seasonal third order streams in Ambapal, Natara and Kalamchhuin village areas and flows into Brahmani River. The general slope is towards north. The local drainage is mainly dendritic in nature. Entire Mining area in north is drained by Bangaru Stream, in south by Nandira Stream and east by seasonal streams. These streams are ultimately joining in the North West –South East flowing Brahmini River east of the Mining area. Small ponds are common in this block and are utilized for drinking purpose.

9. PLAN FOR TOP SOIL MANAGEMENT

The top soil of Mining Lease area is present in three layers i.e. on an average of 0.35 m thickness. The excavated top soil over mining area shall be stored separately before commencement of mining activities in that proposed area and stacked separately at the earmarked area with a height of four metre. Top soil will be preserved by planting sewing grass seeds on slopes of top soil dump. Top soil dumps will have a maximum height of 04 metres and slope of 280. Top soil will be preserved as per top soil management method detailed below.

10. OBJECTIVES

The objectives of Top soil management to be executed are as follows:

- i) To fulfil Condition No.6 (v) of the Stage-I approval granted vide Letter No.8-18/2002- FC, Dated.24.09.2024 of Govt. of India i.e., **“No damage shall be caused to the top soil and the User Agency will follow the Top soil management Plan”**.
- ii) To identify top soil resources and to follow correct procedure for optimum recovery.
- iii) To manage and conserve the top soil reserves by implementing biological measures.
- iv) To provide sufficient stable top soil for reclamation work of dumps, back filled areas and degraded lands.

11. MANAGEMENT OF TOP SOIL TO BE GENERATED FROM MINING

This Topsoil Management Plan has provision for soil stripping and stockpiling procedures to minimize top soil degradation and maximize availability of suitable soil for future reclamation.

The top soil in Mining area is scanty which is present in extremely thin layers. Whatever top soil is available will be excavated during the development of unbroken patches within the mining lease. Precautionary measures will be taken so that this valuable resource is not wasted. This excavated top-soil will be utilized for concurrent reclamation works in the mine as per this plan. The top soil will be stored temporarily until it is being used for reclamation. The total top soil generated and remained from the total excavation area of 614.722 ha. is approx. 0.05 Mcum.

Prior to stripping, the area will be cleared by removing the weed growth. The proposed procedure for soil handling is given below which includes soil handling measures in order to optimize retention of soil characteristics (in terms of nutrients and micro-organisms) conducive to growth of plant.

12. METHODOLOGY

In accordance with the above objectives of providing sufficient stable soil for reclamation and to optimize soil recovery, the following strategies have to be followed:

- i) Top soil stockpile is identified outside quarry area but within mining lease area.
- ii) Stripping off the topsoil by dozer or by small shovel dumper combination rather than scrappers to minimize structural degradation;
- iii) Improvement of drainage and promotion of re-vegetation.
- iv) Stabilization of Top soil surface by biological measures i.e. by sowing seeds of grass with other Leguminosae (Fabaceae) species.
- v) To utilize stripped top soil as soon as possible for reclamation in a phased manner in accordance with the reclamation plan as prescribed in the approved Mine Plan & Mine Closure Plan.

13. TOP SOIL MANAGEMENT AND CONSERVATION PLAN

This is a running mine, top soil generated is being concurrently spread over backfilled area. The top soil generated will be temporarily stored for a period of 6 months to 18 months and the top soil dump is grassed during storage. Subsequently, top soil is spread over the backfilled area before taking up plantation with native species of plants. Phase wise quantities of top soil extracted, stored and re-used are given in table below.

Table-2. Top soil generation, storage & reuse

| | Top Soil Removal Plan (in Mcum) | Top Soil Used (in Mcum) | | | |
|---------------------|---------------------------------|---------------------------|------------------------------|--------------------------------------|----------------|
| | | Spreading Over Embankment | Spreading over Backfill area | Spreading over External OB Dump area | Total Utilized |
| Yr 1 | 0.26 | 0.13 | 0.13 | - | 0.26 |
| Yr 3 | 0.34 | 0.13 | 0.21 | - | 0.34 |
| Post Closure | | | | | |
| Yr 5 | | | 0.34 | - | 0.34 |

As mentioned above, the top soil shall be collected in a phased manner as per working of mine based on approved Mining Plan and shall be spread over the backfilled areas progressively according to approved Mine closure plan. These operations shall be done utilising internal resources like deployment of HEMM vehicles etc. for which the cost likely to be incurred is included in approved Mine Plan and Mine Closure Plan

14. INSPECTION, MONITORING AND EVALUATION:

Proper inspection, monitoring and evaluation will be done in-house by designated authorities of MCL under supervision of Forest Department

15. MOTIVATION OF PEOPLE

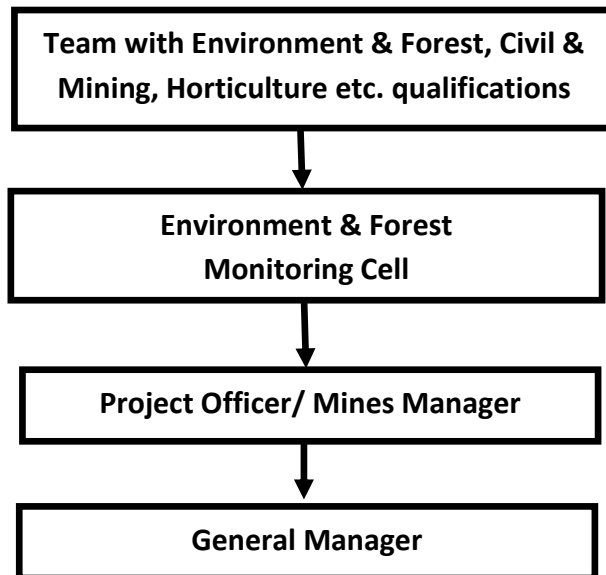
The villagers / VSS Committee members of the adjoining villages are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the adjoining villages and resolution will be passed to support plantation activities. For motivation of the villagers/ VSS Committee members, they will be provided incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure for this purpose.

16. EXECUTING AGENCY

The work will be executed by the User Agency i.e. M/s Mahanadi Coalfields Limited through dedicated departments manned by technically qualified persons with outsourced man and machinery as and when required. To facilitate this, the user agency

shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department

EXECUTING AGENCY



17. REQUIREMENT OF FUNDS

The total cost of implementation of measures for Top Soil Management will be Rs.45,20,200.00 (Rupees Forty-Five Lakh Twenty Thousand Two Hundred Rupees only).

This budget will be subject to increase in amount considering the increase in cost of materials and labour charges.

Regional Chief Engineer
Water Supply, Ahmednagar

FINANCIAL FORECAST

Wage Rate Rs.452/-

| Sl. No. | Description of the Work | Fund Required (in Rs.) |
|--------------|---|------------------------|
| 1 | Cost of sowing of grass seeds on the slope of top soil storage area 0.5 Ha @Rs.27,080/- per Ha per annum for 2 nd Production year and After Mine closure year (0.5 Ha x Rs.27,080/- x 2 times = Rs. 27,080.00) | 27,080.00 |
| 2 | Cost of erection of 1200m Dry toe wall around top soil stock pile @2707 per Mtr. | 3,248,400.00 |
| Sub Total(1) | | 3,275,480.00 |
| 2 | 15% of the total cost for motivation of VSS / People involved | 491,322.00 |
| Sub Total(2) | | 3,766,802.00 |
| 3 | Price escalation @ 20% | 753,360.40 |
| Grand Total | | 4520162.40 |
| Say Or | | 4520200.00 |

(Rupees Forty-Five Lakh Twenty Thousand Two Hundred Rupees only)

Note: The above-mentioned expenditure has already been included in the budget of Environment Management Plan (EMP) as well as approved Mining Plan and Mine Closure Plan.

M/s Mahanadi Coalfields Ltd. do hereby undertake to execute the item of works mentioned in this scheme and incur the approved amount in a phased manner as per approved Mining Plan and Mine Closure Plan/Environment Management Plan (EMP).

Countersigned

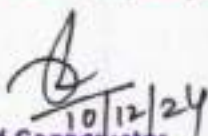

05/12/2024

M/s Mahanadi Coalfields Ltd

महा प्रबंधक
General Manager
एम.सी.एल., पुणेवरी क्षेत्र
MCL, Bhutanewari Area


Divisional Forest Officer
Divisional Forest Officer
Angul Division

Approved on 18.12.2024


10/12/24
Regional Chief Conservator
of Forests, Angul Circle.

Top Soil Management Plan

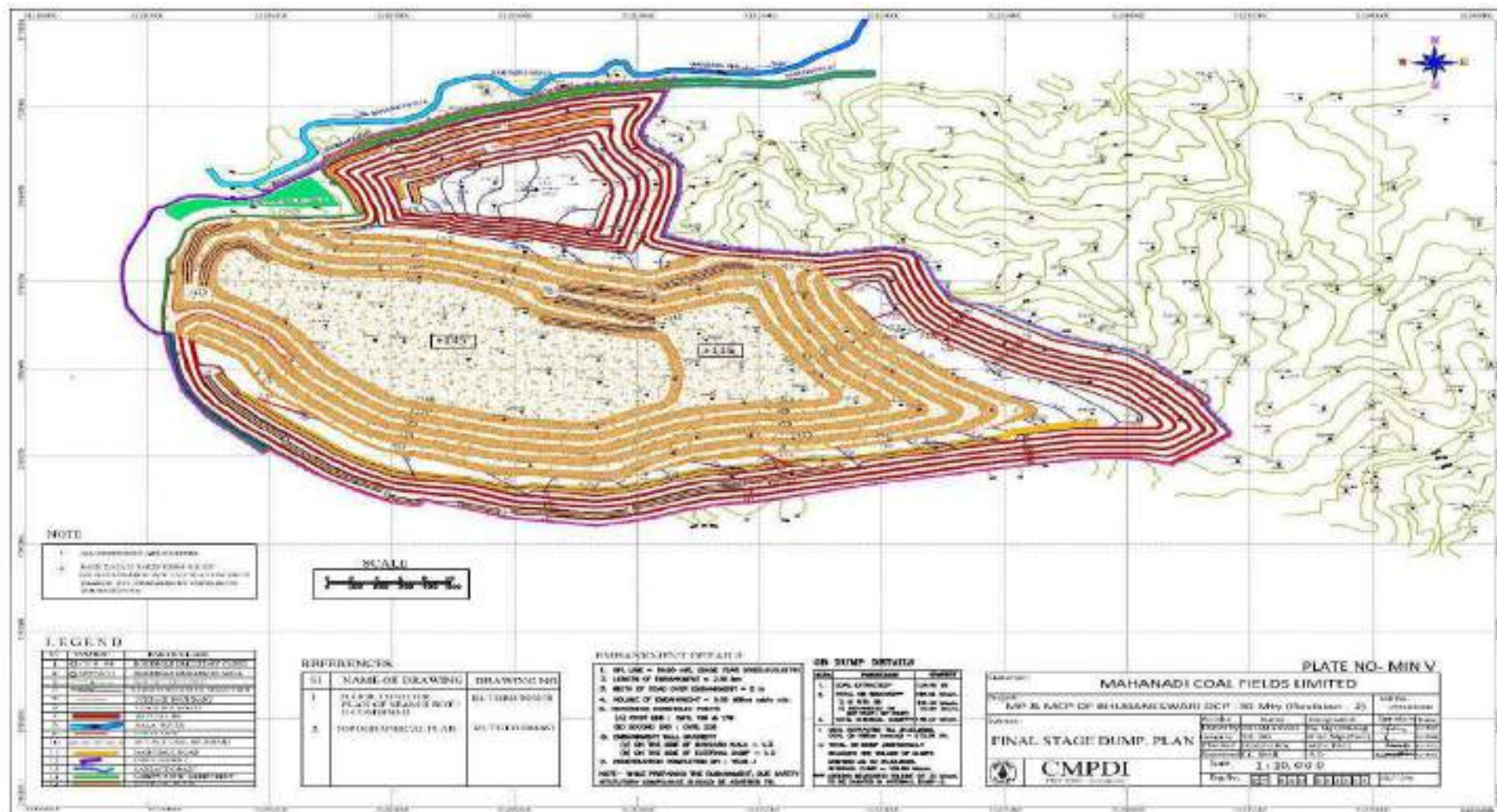


Fig 5.1.12 and 5.1.13 shows the model of OB dumps along FF' and its simulation results under multiple constraints of water and seismicity.

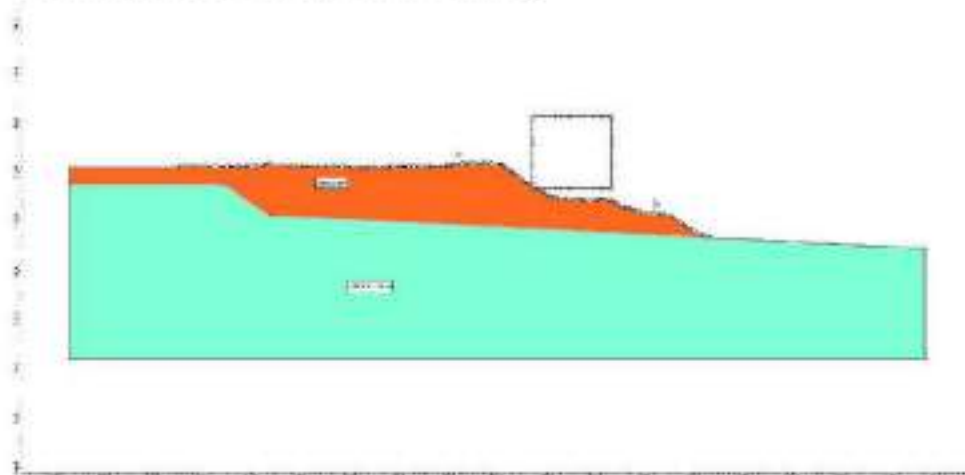


Fig 5.1.12 Model of OB Dumps along Profile FF'

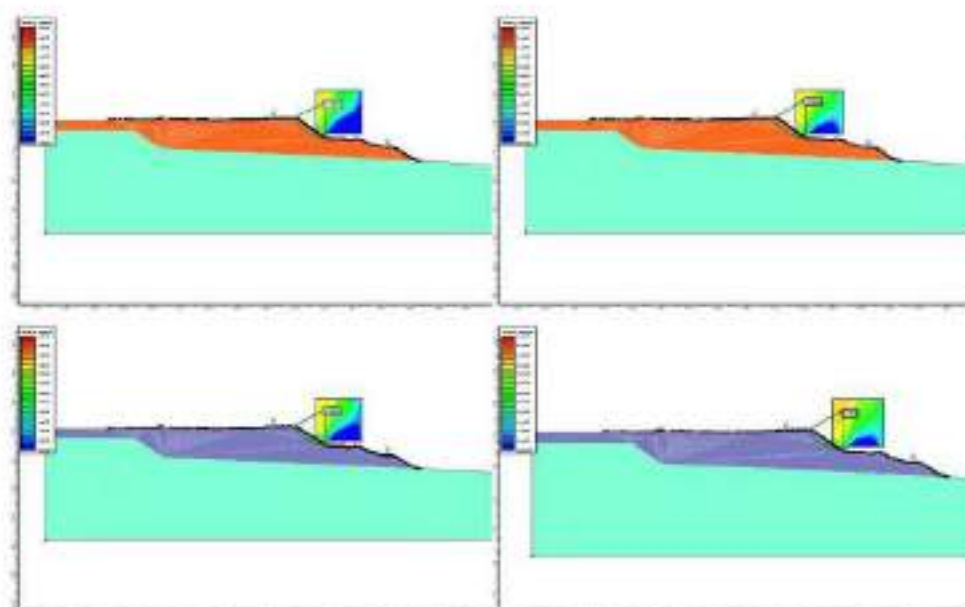


Fig 5.1.13 Simulation of OB dump slope of profile FF' under various constraints

Fig 5.1.14 and 5.1.15 shows the model of OB dumps along FF' and its simulation results under multiple constrains of water and seismicity.

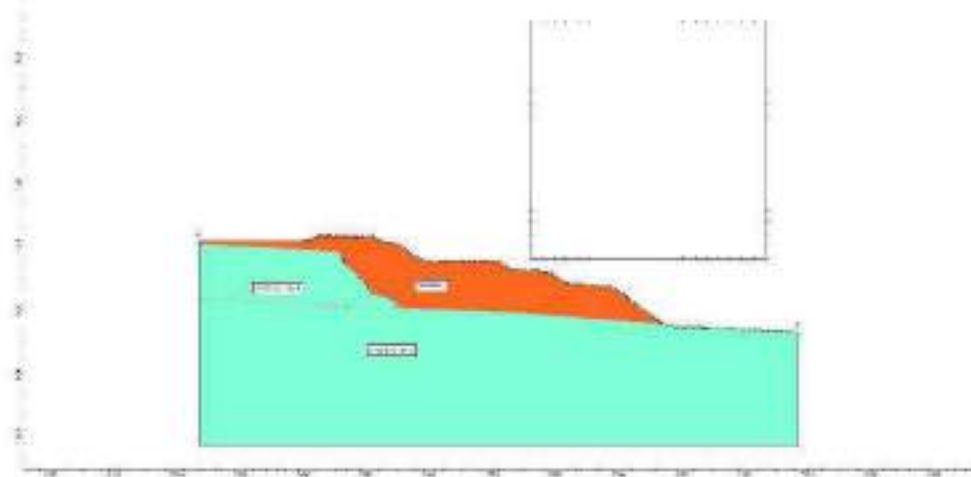


Fig 5.1.14 Model of OB Dumps along Profile HH'

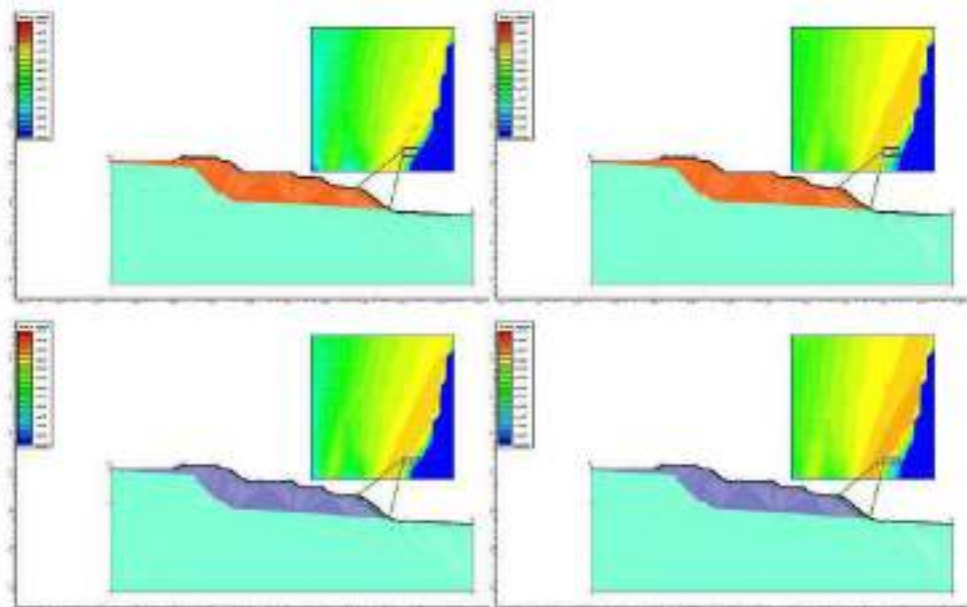
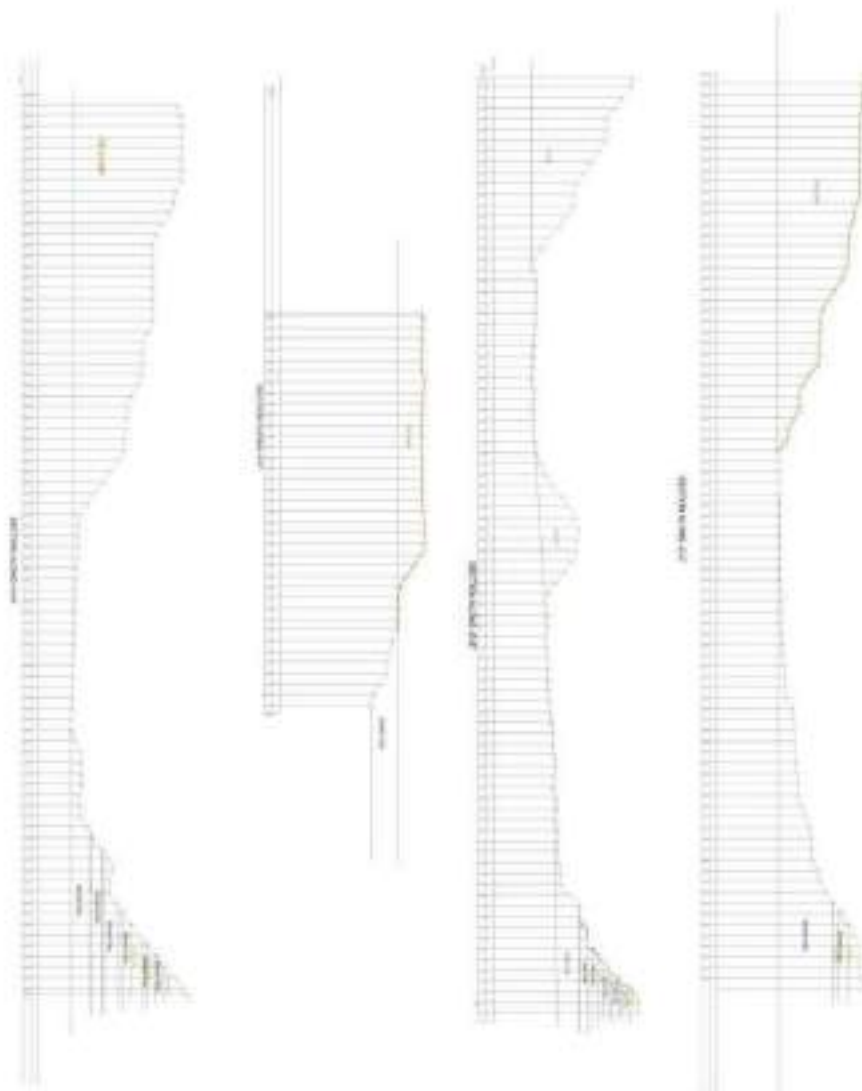


Fig 5.1.15 Simulation of OB dump slope of profile HH' under various constraints.



Working plan with Profile Sections across Quarry and Dump



COST OF GRASS SEEDING SOWING PER HECTARE**Wage Rate Rs.452/-**

| Sl. No | Purpose | No of Labour/ Quantity of materials | Rate (Rs.) | Amount (Rs.) |
|---------------|--|--|----------------------|-------------------------|
| 1 | Spreading of good earth and FYM including carriage | 20 Nos | 452.00 | 9040.00 |
| 2 | Adding FYM and good earth | 2 TL FYM | 1,000/TLFYM | 4000.00 |
| | | 2 TL Good Earth | 1,000/ TL Good Earth | |
| 3 | Cost of grass seed 50 kg/Ha. | | 100/kg | 5000.00 |
| 4 | Broadcast sowing | 20 nos. | 452.00 | 9040.00 |
| Total | | | | 27080.00 |

ESTIMATE FOR CONSTRUCTION OF RETAINING WALL

Wage rate Rs.452/Day

| Sl.No | Job Description | No | Length (In mtr.) | Width (in mtr.) | Height (in mtr.) | Unit | Quantity | Rate | Amount |
|--------|---|----|------------------------|-----------------------|------------------------|------|----------|---------|----------------|
| 1 | Earth work is hard soil or gravelly soil within 50 mtr initial lead & 1.50 mtr initial lift including rough dressing & breaking clods to maximum 5.00cm to 7.00 cm & laying layers not exceeding 0.30mtr in depth and as per the direction of the engineer -in charge. | 1 | 1000 | 0.7 | 0.7 | CUM | 490 | 269.70 | 132153.00 |
| 2 | Filling in foundation and plinth with sand watered and rammed | 1 | 1000 | 0.7 | 0.07S | CUM | 52.50 | 593.80 | 31174.50 |
| 3 | Cement concrete M-10 grade (PCC 1:4:8 for foundation) with crushed broken granite coarse aggregate of size 40 mm downgraded mixed in concrete mixture including cost conveyance and royalty of all materials, machineries and labour and laying in head works and canal structures with required lifts and de-lifts as per direction of Engineer-in-charge. | 1 | 1000 | 0.6 | 0.075 | CUM | 45.00 | 5644.80 | 254016.00 |
| 4 | BRICK WORK for foundation having crushing strength not less than 75 kg/cm ² with dimensional tolerance ± 8 percent in cement mortar (1:6) in foundation and plinth per cum | 1 | 1000 | 0.5 | 0.3 | CUM | 150 | 5244.30 | 786645.00 |
| 5 | BRICK WORK for S/S, having crushing strength not less than 75 kg/cm ² with dimensional tolerance ± 8 percent in cement mortar (1:6) in foundation and plinth per cum | 1 | 1000 | 0.25 | 1 | CUM | 250 | 5277.60 | 1319400.00 |
| 6 | Concrete for plinth M-20 grade with crushed broken granite coarse aggregate of size 20mm downgraded mixed plant including cost of all materials, machineries and labour and transportation of mixed concrete | 1 | 1000 | 0.25 | 0.1 | CUM | 25 | 5426.80 | 135670.00 |
| 7 | Concrete for coping M-20 grade with crushed broken granite coarse aggregate of size 20mm downgraded mixed plant including cost of all materials, machineries and labour and transportation of mixed concrete | 1 | 1000 | 0.35 | 0.025 | CUM | 8.75 | 5426.80 | 47485.00 |
| Total: | | | | | | | | | ₹ 27,06,543.00 |

(Rupees Twenty-Seven Lakhs Six Thousand Five Hundred Forty-Three only)

The cost for construction of Retaining Wall for 1000m is 27,06,543/- at Wages@452.00

The cost for construction of Retaining Wall for 1m is 27,06,543÷1000=2706.543 say 2707/-

The cost of Retaining Wall for 7500 m is 2707 X 1200 = 3248400/-



Office of the General Manager
(Bhubaneswari Area)
At/Po : Dera Colliery
Dist: Angul – 759103 (Odisha)
Website : www.mcl.gov.in
Email Id: cgm-bhubaneswari.mcl@coalindia.in



Annexure-

17

UNDERTAKING

PROPOSAL NO.:- FP/OR/MIN/155017/2022

(In compliance to Condition No. 7 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "User agency either himself or through the State Forest Department shall undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located in the area within 100 meter from outer perimeter of the mining lease. The plan for plantation and SMC activities will be prepared and submitted to MoEF&CC along with the compliance of 'in-principle' approval".

General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एम.सी.एल., भुवनेश्वरी क्षेत्र
MCL, Bhubaneswar Area

Divisional Forest Officer
Angul, Division



BHUBANESWARI OPEN CAST COAL PROJECT

Scheme for

**GAP PLANTING, SOIL & MOISTURE CONSERVATION
ACTIVITIES TO RESTOCK AND REJUVINATE THE DEGRADED
OPEN FORESTS (HAVING CROWN DENSITY < 0.4) WITHIN 100
M FROM OUTER PERIMETER OF MINING LEASE**

**in compliance
with**

Condition No.7 of

Stage-I approval granted vide

Letter No.8-18/2002-FC, Dated.24.09.2024

**of Govt. of India, Ministry of Environment, Forests
& Climate Change, New Delhi.**

for

**Diversion of 26.416 Ha. (Originally proposed area is 20.383 ha)
of Forest Land within 658.724 Ha. of ML area of Bhubaneswari OCP**

for Non forestry use U/s-2 (ii) of FC Act-1980

**in villages Jilinda, Hensmul (Sharasahi), Hensmul
(Talasahi), Naraharipur, Khandualbhal, Kandhal,
Madanmohanpur, Langijoda and Anadipur of
Angul District, Odisha.**

M/s. Mahanadi Coalfields Limited

SCHEME FOR GAP PLANTING, SOIL & MOISTURE CONSERVATION ACTIVITIES TO RESTOCK AND REJUVENATE THE DEGRADED OPEN FORESTS (HAVING CROWN DENSITY LESS THAN 0.40) WITHIN 100M FROM OUTER PERIMETER OF THE MINING LEASE.

1. INTRODUCTION

Bhubaneswari Open Cast Project is a mega coal mining project spread over a mining lease area of 658.724 ha. in Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur of Angul District, Odisha.

Mahanadi Coalfields Limited has named Bhubaneswari and combined Bhubaneswari, Sakhigopal-A, Arkhapal-A coal blocks as Bhubaneswari Open Cast Project.

As per approved Mining Plan and Mine Closure Plan, the mine life is 5 years. Out of total 658.72 Ha. of Mining Lease area, total forest land involved is 132.904 Ha out of which 112.521 Ha has got Stage 2 Forest clearance vide F.no:8-18/2002-FC, Dated 06/12/2004

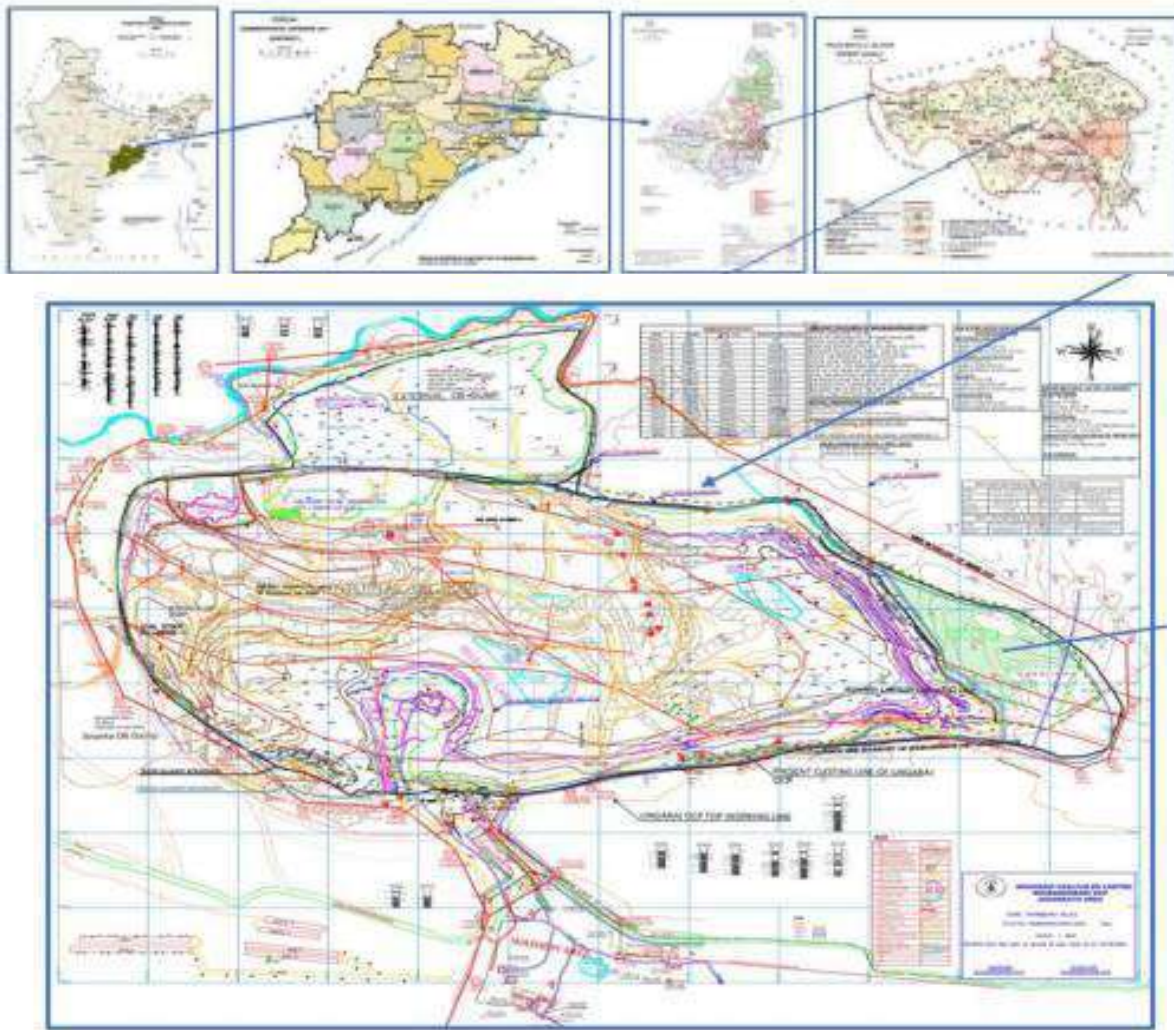
The Stage-I Forest Clearance approval over 26.416 ha of Forest Land Under Section- 2 (ii) (including 6.033 ha. of Safety Zone) of the Forest (Conservation) Act, 1980 has been granted by MoEF & CC, Government of India vide their Letter No. 8-18/2002-FC, dated 24.09.2024, where in it has been stipulated as per **Condition No. 7 for gap planting, soil & moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40) within 100m from outer perimeter of the mining lease.**

2. LOCATION

The mining lease area is covered in the Survey of India Topo sheet No. F45T1 and Special Topo sheet Nos. D1, D2, E1& E2 and situated between the latitude 20°57'53.53"N to 20°59'16.83"N, and longitude 85°08'27.17"E to 85°11'6.29"E. The above ML area covering villages are in Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur of Angul District, Odisha.

LOCATION MAP

Fig-1. Location Map of Bhubaneswari OCP, MCL



3. TOPOGRAPHY

The surface topography is (majorly) predominantly soil covered and gently undulating with paddy fields and is used for agricultural purpose and some patches of barren lands. Around south eastern part, the surface topography is mildly undulating and slopes towards north. The ground level rises towards south-eastern corner of the block with highest elevation above Mean Sea Level of about 167.50 meter. A small seasonal stream (part of Bangaru stream) is flowing along the northern boundary of the project. Elevations of the area vary between 92 m to 137 m above mean sea level.

4. LAND USE PATTERN

The proposed land use pattern of 658.724 Ha. of mining lease area as per approved Mining Plan and Mine Closure Plan is given below:

Table 1: Purpose wise break up forest and non-forest land

| Sl. No. | Type of Land Use | Forest Land in Ha | Non-Forest Land in Ha | Total Land in Ha |
|--------------|---|-------------------|-----------------------|------------------|
| 1 | Mining Excavation Area | 126.191 | 488.531 | 614.722 |
| 2 | Safety Zone | | 6.163 | 6.163 |
| 3 | Infrastructure (CHP, Washery, Silo point, project office, laying of railway lines for dispatch point) and Future working expansion Area | 6.713 | 18.606 | 25.319 |
| 4 | Embankment | NIL | 12.52 | 12.52 |
| Total | | 132.904* | 525.820 | 658.724 |

Note: Out of total 658.72 Ha. of Mining Lease area, total forest land involved is 132.904 Ha out of which 112.521 Ha has got Stage 2 Forest clearance vide F.no:8-18/2002-FC, Dated 06/12/2004

5. DETAILS OF FOREST LAND WITHIN THE ML AREA

| | |
|---|-----------------|
| Forest land to be worked for mining and allied purpose- | 20.383 Ha |
| Area set aside for Safety Zone | <u>6.033 Ha</u> |
| | 26.416 Ha |

6. SOIL TYPE

The areas primarily consist of sandy and lateritic soil, with an additional presence of clay. In most of the area the soil is moderately coarse in nature whereas it is loamy in the cultivated land. The area nearby has a nala Bangaru stream - one seasonal stream (flows in the northern boundary). There were two periods of glacial advance and retreat during the deposition of Talcher sediments.

7. CLIMATE

The area experiences a sub-tropical warm temperature. Monsoon is from mid of June and continues till end of September. The average annual rainfall as recorded at IMD observatory at Angul is 1277 mm. and the highest rainfall occurs in the month of August (84.0 mm with a mean rainfall of 4.4 mm for the year 2020). Around 78% of rainfall occurs during the monsoon season. The temperature varies from 5.6oC to 43.7oC. Maximum temperature is being observed in the month of May and minimum in the month of December.

8. DRAINAGE

Brahmani River, flowing approximately north to south along the eastern boundary of the Talcher coalfield, provides the main drainage of the region. This river is fed by seasonal nalas, viz. Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor and a few small nalas. From the eastern boundary of the block, the Brahmani River lies eastward at a distance of about 20 km.

Bangaru stream River drains this entire block. Bangaru Stream River emerges as seasonal third order streams in Ambapal, Natara and Kalamchhuin village areas and flows into Brahmani River. The general slope is towards north. The local drainage is mainly dendritic in nature. Entire Mining area in north is drained by Bangaru Stream, in south by Nandira Stream and east by seasonal streams. These streams are ultimately joining in the North West –South East flowing Brahmini River east of the Mining area. Small ponds are common in this block and are utilized for drinking purpose.

9. EXISTING VEGETATION

The boundary description of the mining lease area is described below:

North: North of Arkhapal Srirampur Block and Arkhapal-A Block in rest of the area

East: Sakhigopal-A coal block Fault F11-F11 with straightening in the north and south

South: Lingaraj Block and part of Ananta Extn. Block

West: Ananta Exp OCP & Subhadra east coal block.

10. SURVEY AND DEMARCATION OF BOUNDARY FOR PROPOSED GAP PLANTATION AND SOIL MOISTURE CONSERVATION

After survey, it is found that the total forest area involved within 100 metre outer perimeter of the Mining Lease area of Subhadra OCP is 38.2096 Ha. The village-wise details of forest land measuring 38.2096 Ha. is given below: The only feasibility of taking up The gap plantation will be carried out over an area of 28.92 Ha in Open Jungles and Rakas RF located adjacent to the Bhubaneswari OCP, remaining area within 100-meter outer perimeter is not feasible for plantation due to existence of mines, Industry, state Highway and other Infrastructure.

Table 2: Area within 100 meter outer Perimeter of Mine Lease Area of Bhubaneswari OCP.

| Total Area within 100 meter outer Perimeter of Mine Lease Area of Subhadra OCP | | | | | | | |
|--|--------------|------------|---|-----------------|--------------------|--|--|
| Sl. No | Village Name | Direction | Village wise Forest and Non-Forest Area within 100-meter Outer Perimeter (in Ha). | | | Existence of Mines/industry/State Highway and Other Infra Structures | Feasibility to Undertake Gap Plantation/SMC Forest (in Ha) |
| | | | Forest Area | Non-Forest Area | Total Area (in Ha) | | |
| 1 | Hensmul | North West | 0 | 7.29 | 7.29 | Combined Bhubaneswari, Sakhigopal-A, Arkhapal-A coal block | 0 |
| 2 | Jilinda | North | 3.77 | 19.07 | 22.84 | Combined Bhubaneswari, Sakhigopal-A, Arkhapal-A coal block and Open Jungle | 3.77 |
| 3 | Naraharipur | North East | 11.68 | 5.43 | 17.11 | Combined Bhubaneswari, Sakhigopal-A, Arkhapal-A coal block and Open Jungle | 11.68 |
| 4 | Langijoda | East | 2.17 | 8.59 | 10.76 | Combined Bhubaneswari, Sakhigopal-A, Arkhapal-A coal block and Open Jungle | 2.17 |
| 5 | Anantha OCP | South West | 0 | 20.53 | 20.53 | Combined Bhubaneswari, Sakhigopal-A, Arkhapal-A coal block | 0 |
| 6 | SILO project | South | 0 | 4.08 | 4.08 | Combined Bhubaneswari, Sakhigopal-A, Arkhapal-A coal block | 0 |
| 7 | Lingaraj OCP | South East | 0 | 20.45 | 20.45 | Combined Bhubaneswari, Sakhigopal-A, Arkhapal-A coal block | 0 |
| 8 | Rakas RF | North West | 11.3 | 0 | 11.3 | | 11.3 |
| | Total | | 28.92 | 85.44 | 114.36 | | 28.92 |

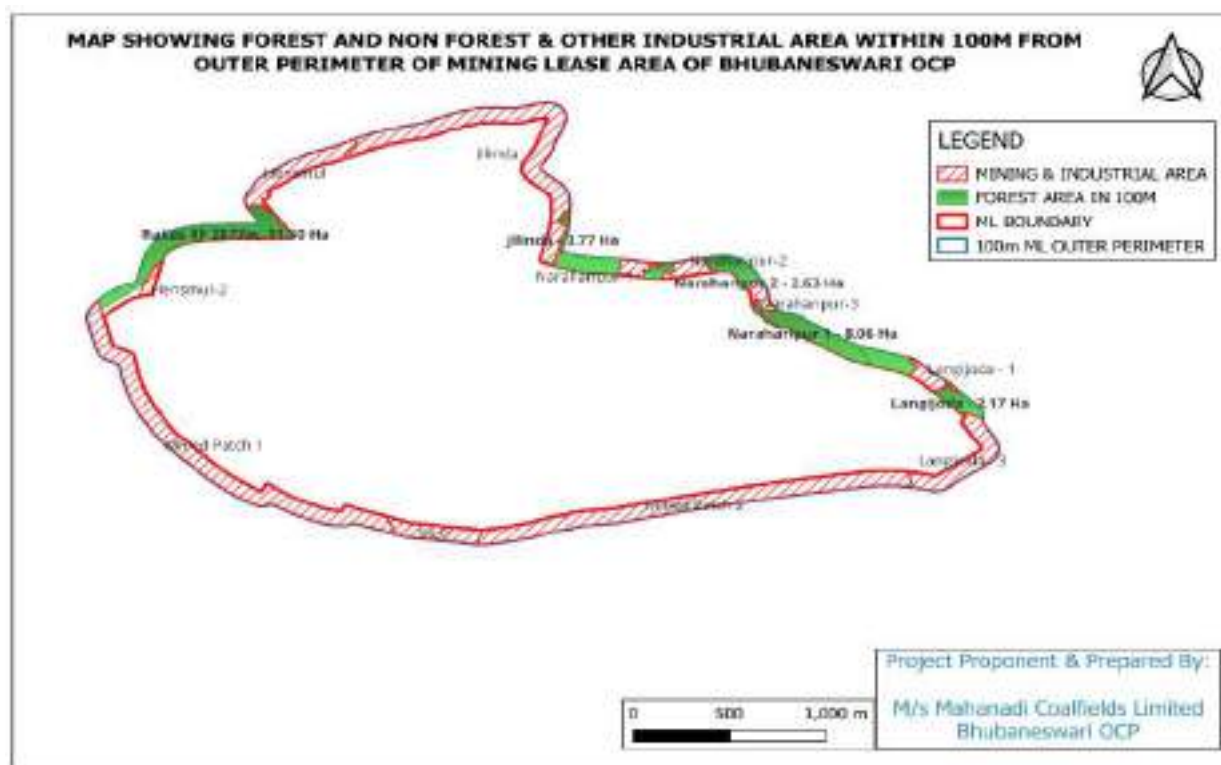


Fig-2 Map showing forest and non-forest & other industrial area within 100m
Mine Lease Area of Bhubaneswari OCP.



Fig -3 Showing satellite image of 100m outer perimeter Mine Lease Area of Bhubaneswari OCP.

11. DESCRIPTION OF THE EXISTING VEGETATION

The proposed site for gap plantation has dense growth of weeds like *Cromolena odoratum* *Lantama camra* etc. along with sparsely available *Sal* with its associates. The available growth is degraded due to biotic pressure like grazing and fire wood collection.

Choice of species:

As far as possible, care shall be taken to select indigenous species for plantation.

The list of species to be adopted for the plantation is as follows:

| Sl. No. | Local Name | Botanical Name | Family |
|---------|------------|---------------------------|---------------|
| 1 | Jamun | <i>Syzygium cumini</i> | Myrtaceae |
| 2 | Mango | <i>Mangifera indica</i> | Anacardiaceae |
| 3 | Neem | <i>Azadirachta indica</i> | Meliaceae |
| 4 | Pipal | <i>Ficus religiosa</i> | Moraceae |

| | | | |
|----|----------|----------------------|------------------|
| 5 | Mahua | Madhuca latifolia | Sapotaceae |
| 6 | Teak | Tectona grandis | Lamiaceae |
| 7 | Ber | Ziziphus mauritiana | Rhamnaceae |
| 8 | Kachnar | Bauhinia racemosa | Fabaceae |
| 9 | Sal | Shorea robusta | Dipterocarpaceae |
| 10 | Khajur | Phoenix dactylifera | Arecaceae |
| 11 | Haldu | Adina cordifolia | Rubiaceae |
| 12 | Kusum | Schleichera oleosa | Sapindaceae |
| 13 | Jam Tree | Acacia acuminata | Fabaceae |
| 14 | Saj | Terminalia tomentosa | Combretaceae |
| 15 | Babul | Acacia arabica | Fabaceae |

12. OBJECTIVE OF THE SCHEME

The main objective of the present scheme is to fulfil the Condition No.7 of the Stage-I approval granted vide Letter 8-18/2002-FC, dated 24.09.2024 of MoEF & CC, Government of India, New Delhi, to undertake **“gap planting and soil & moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density < 0.4), if any, located in the area within 100 m from outer perimeter of the mining lease. The plan for plantation and SMC activities will be prepared and submitted to MoEF & CC before Stage-II clearance”**. The steps to be followed are as under:

- To re-stock and rejuvenate the degraded forest land by ANR plantation within 100m from the outer perimeter of the lease area.
- To Demarcate and fence the area in ground to dispense with biotic interferences.
- To improve the micro edaphic conditions by undertaking suitable soil and moisture conservation measures within the ANR Plantation
- To create awareness among the local villagers for protection and maintenance of this plantation and the adjoining forest for ensuring enrichment of the ecosystem in general.

13. PROPOSED TECHNIQUE

To achieve the above objectives, it has been proposed to take up ANR plantation @ 200 plants/ha at a spacing of 2.5 mt X 2.5 mt in identified permanent gaps. The following items of works prescribed in the scheme will be taken up, the detailed expenditure statement of which is enclosed in **Annexure-I**.

To achieve the above objectives, the following items of work are mainly prescribed to be taken up:

14. SURVEY AND DEMARCATION OF BOUNDARY

The boundary of this lease area is as details below:

North: North of Arkhapal-Srirampur Block and Arkhapal-A Block in rest of the area

South: Lingaraj Block and part of Ananta Extn. Block.

East: Sakhigopal-A coal block Fault F11-F11 with straightening in the north and south.

West: Ananta Exp OCP & Subhadra east coal block.

Land Schedule of the forest area within 100m from outer perimeter of the Mining Lease of Subhadra OCP of M/s Mahanadi Coalfields Ltd. is as under:

| Location | Length of Outer Perimeter (in mtr) | Area in Ha. |
|--------------|------------------------------------|--------------|
| Jilinda | 569.22 | 3.77 |
| Naraharipur | 1577 | 11.68 |
| Langijoda | 351 | 2.17 |
| Rakas RF | 1193 | 11.3 |
| Total | 3692 | 28.92 |

The cost of fencing over ML boundary safety zone over **8.01 ha.** will be implemented by User agency to fence **11.63 Km** length of safety zone perimeter. The area proposed for 100 m gap plantation over **28.92 ha.** as proposed is adjacent to ML boundary line safety zone. Hence one side fencing will be common for both purposes. So there is need of fencing one side of the proposed area over **3692 mtr.** Map showing within 100 mtr. Outer perimeter of ML area attached as **Annexure-II.**

The GPS reading of the above identified area is as mentioned below.

GPS reading of 28.92 Ha of land is identified for ANR Plantation with 200 plants per Ha will be raised

1. Naraharipur (1):

| Sl.no | Latitude | Longitude |
|-------|----------------|----------------|
| 0 | 20° 58' 35" | 85° 10' 30.19" |
| 1 | 20° 58' 35.05" | 85° 10' 29.11" |
| 2 | 20° 58' 35.23" | 85° 10' 28.84" |
| 3 | 20° 58' 35.42" | 85° 10' 28.55" |
| 4 | 20° 58' 35.65" | 85° 10' 28.04" |
| 5 | 20° 58' 36.71" | 85° 10' 26.33" |
| 6 | 20° 58' 36.87" | 85° 10' 26.14" |
| 7 | 20° 58' 37.75" | 85° 10' 25.24" |
| 8 | 20° 58' 38.59" | 85° 10' 24.3" |
| 9 | 20° 58' 39.7" | 85° 10' 23.91" |
| 10 | 20° 58' 39.54" | 85° 10' 24.22" |
| 11 | 20° 58' 40.26" | 85° 10' 24.22" |
| 12 | 20° 58' 40.87" | 85° 10' 24.63" |
| 13 | 20° 58' 40.82" | 85° 10' 24.95" |
| 14 | 20° 58' 39.4" | 85° 10' 24.82" |
| 15 | 20° 58' 39.42" | 85° 10' 25.45" |
| 16 | 20° 58' 39.16" | 85° 10' 25.57" |
| 17 | 20° 58' 38.66" | 85° 10' 25.56" |
| 18 | 20° 58' 38.54" | 85° 10' 25.89" |
| 19 | 20° 58' 38.58" | 85° 10' 27.21" |
| 20 | 20° 58' 38.6" | 85° 10' 27.84" |
| 21 | 20° 58' 38.73" | 85° 10' 28.5" |
| 22 | 20° 58' 38.04" | 85° 10' 29.75" |
| 23 | 20° 58' 38.03" | 85° 10' 30.33" |
| 24 | 20° 58' 37.93" | 85° 10' 30.82" |
| 25 | 20° 58' 37.84" | 85° 10' 31.32" |
| 26 | 20° 58' 37.66" | 85° 10' 31.87" |
| 27 | 20° 58' 37.34" | 85° 10' 32.49" |
| 28 | 20° 58' 37.22" | 85° 10' 32.84" |
| 29 | 20° 58' 37.17" | 85° 10' 32.86" |
| 30 | 20° 58' 37.03" | 85° 10' 33.07" |
| 31 | 20° 58' 36.32" | 85° 10' 33.73" |
| 32 | 20° 58' 36.3" | 85° 10' 33.75" |
| 33 | 20° 58' 36.28" | 85° 10' 33.76" |
| 34 | 20° 58' 36.27" | 85° 10' 33.78" |
| 35 | 20° 58' 34.71" | 85° 10' 36.67" |
| 36 | 20° 58' 31.33" | 85° 10' 42.93" |
| 37 | 20° 58' 31.33" | 85° 10' 42.94" |
| 38 | 20° 58' 30.13" | 85° 10' 47.61" |
| 39 | 20° 58' 29.04" | 85° 10' 51.66" |
| 40 | 20° 58' 28.49" | 85° 10' 52.22" |
| 41 | 20° 58' 28.14" | 85° 10' 52.38" |

| | | |
|----|----------------|----------------|
| 42 | 20° 58' 27.89" | 85° 10' 52.67" |
| 43 | 20° 58' 27.52" | 85° 10' 53.41" |
| 44 | 20° 58' 27.06" | 85° 10' 53.43" |
| 45 | 20° 58' 26.27" | 85° 10' 52.85" |
| 46 | 20° 58' 25.41" | 85° 10' 52.25" |
| 47 | 20° 58' 25.87" | 85° 10' 51.49" |
| 48 | 20° 58' 26.13" | 85° 10' 50.77" |
| 49 | 20° 58' 26.37" | 85° 10' 50.01" |
| 50 | 20° 58' 26.95" | 85° 10' 47.72" |
| 51 | 20° 58' 27.65" | 85° 10' 45.03" |
| 52 | 20° 58' 27.94" | 85° 10' 43.87" |
| 53 | 20° 58' 28.52" | 85° 10' 41.67" |
| 54 | 20° 58' 29.95" | 85° 10' 39.02" |
| 55 | 20° 58' 31.61" | 85° 10' 35.96" |
| 56 | 20° 58' 34.3" | 85° 10' 30.98" |
| 57 | 20° 58' 34.71" | 85° 10' 31" |
| 58 | 20° 58' 35" | 85° 10' 30.19" |

2. Langijoda

| Sl.no | Latitude | Longitude |
|-------|----------------|----------------|
| 1 | 20° 58' 19.28" | 85° 10' 59.75" |
| 2 | 20° 58' 19.51" | 85° 10' 59.47" |
| 3 | 20° 58' 19.8" | 85° 10' 59.18" |
| 4 | 20° 58' 20.21" | 85° 10' 58.68" |
| 5 | 20° 58' 20.62" | 85° 10' 58.25" |
| 6 | 20° 58' 22.2" | 85° 10' 56.35" |
| 7 | 20° 58' 22.35" | 85° 10' 56.53" |
| 8 | 20° 58' 22.45" | 85° 10' 56.62" |
| 9 | 20° 58' 22.47" | 85° 10' 56.7" |
| 10 | 20° 58' 22.4" | 85° 10' 57.05" |
| 11 | 20° 58' 22.46" | 85° 10' 57.17" |
| 12 | 20° 58' 22.55" | 85° 10' 57.58" |
| 13 | 20° 58' 22.82" | 85° 10' 58.34" |
| 14 | 20° 58' 23.08" | 85° 10' 58.92" |
| 15 | 20° 58' 23.18" | 85° 10' 58.68" |
| 16 | 20° 58' 23.44" | 85° 10' 58.85" |
| 17 | 20° 58' 23.71" | 85° 10' 58.71" |
| 18 | 20° 58' 24.09" | 85° 10' 58.37" |
| 19 | 20° 58' 24.25" | 85° 10' 58.42" |
| 20 | 20° 58' 24.4" | 85° 10' 58.59" |
| 21 | 20° 58' 23.64" | 85° 10' 59.5" |
| 22 | 20° 58' 23.41" | 85° 10' 59.75" |
| 23 | 20° 58' 22.94" | 85° 10' 59.19" |
| 24 | 20° 58' 22.54" | 85° 10' 59.75" |
| 25 | 20° 58' 22.17" | 85° 11' 0.37" |

| | | |
|----|----------------|---------------|
| 26 | 20° 58' 21.97" | 85° 11' 0.68" |
| 27 | 20° 58' 22.28" | 85° 11' 1.01" |
| 28 | 20° 58' 21.59" | 85° 11' 1.87" |
| 29 | 20° 58' 19.59" | 85° 11' 4.08" |
| 30 | 20° 58' 18.53" | 85° 11' 4.97" |
| 31 | 20° 58' 17.78" | 85° 11' 5.31" |
| 32 | 20° 58' 16.78" | 85° 11' 5.34" |
| 33 | 20° 58' 16.96" | 85° 11' 4.5" |
| 34 | 20° 58' 17.33" | 85° 11' 3.42" |
| 35 | 20° 58' 17.62" | 85° 11' 2.62" |
| 36 | 20° 58' 17.8" | 85° 11' 2.04" |
| 37 | 20° 58' 17.88" | 85° 11' 1.36" |

3. Jilinda

| Sl.no | Latitude | Longitude |
|-------|----------------|---------------|
| 1 | 20° 58' 47.58" | 85° 9' 48.42" |
| 2 | 20° 58' 47.73" | 85° 9' 47.53" |
| 3 | 20° 58' 48.09" | 85° 9' 46.66" |
| 4 | 20° 58' 48.41" | 85° 9' 45.94" |
| 5 | 20° 58' 48.22" | 85° 9' 46.86" |
| 6 | 20° 58' 47.85" | 85° 9' 48.47" |
| 7 | 20° 58' 48.65" | 85° 9' 48.48" |
| 8 | 20° 58' 49.11" | 85° 9' 48.72" |
| 9 | 20° 58' 49.92" | 85° 9' 48.96" |
| 10 | 20° 58' 50.1" | 85° 9' 50.08" |
| 11 | 20° 58' 50.38" | 85° 9' 49.55" |
| 12 | 20° 58' 50.58" | 85° 9' 49.55" |
| 13 | 20° 58' 50.61" | 85° 9' 49.09" |
| 14 | 20° 58' 51.07" | 85° 9' 49.09" |
| 15 | 20° 58' 51.3" | 85° 9' 49.35" |
| 16 | 20° 58' 54.37" | 85° 9' 50.07" |
| 17 | 20° 58' 54.6" | 85° 9' 50.49" |
| 18 | 20° 58' 55.31" | 85° 9' 50.64" |
| 19 | 20° 58' 56.13" | 85° 9' 49.48" |
| 20 | 20° 58' 56.44" | 85° 9' 48.75" |
| 21 | 20° 58' 57.07" | 85° 9' 49.66" |
| 22 | 20° 58' 57.47" | 85° 9' 49.72" |
| 23 | 20° 58' 58.27" | 85° 9' 49.87" |
| 24 | 20° 58' 58.73" | 85° 9' 50.21" |
| 25 | 20° 58' 58.45" | 85° 9' 51.1" |
| 26 | 20° 58' 57.04" | 85° 9' 51.08" |
| 27 | 20° 58' 55.44" | 85° 9' 50.95" |
| 28 | 20° 58' 54.76" | 85° 9' 50.81" |
| 29 | 20° 58' 52.95" | 85° 9' 50.41" |
| 30 | 20° 58' 51.5" | 85° 9' 49.93" |

| | | |
|----|----------------|---------------|
| 31 | 20° 58' 50.38" | 85° 9' 49.59" |
| 32 | 20° 58' 50.03" | 85° 9' 50.77" |
| 33 | 20° 58' 49.82" | 85° 9' 51.71" |
| 34 | 20° 58' 49.36" | 85° 9' 53.55" |
| 35 | 20° 58' 49.18" | 85° 9' 55.5" |
| 36 | 20° 58' 48.95" | 85° 9' 58.29" |
| 37 | 20° 58' 48.8" | 85° 10' 0.35" |
| 38 | 20° 58' 45.79" | 85° 9' 59.87" |
| 39 | 20° 58' 46.03" | 85° 9' 57.03" |
| 40 | 20° 58' 46.36" | 85° 9' 53.06" |
| 41 | 20° 58' 46.88" | 85° 9' 50.87" |
| 42 | 20° 58' 47.18" | 85° 9' 49.63" |
| 43 | 20° 58' 47.36" | 85° 9' 49.2" |
| 44 | 20° 58' 47.43" | 85° 9' 48.92" |
| 45 | 20° 58' 47.49" | 85° 9' 48.68" |

4. Naraharipur (2)

| Sl.no | Latitude | Longitude |
|-------|----------------|----------------|
| 0 | 20° 58' 43.28" | 85° 10' 22.6" |
| 1 | 20° 58' 43.71" | 85° 10' 22.28" |
| 2 | 20° 58' 43.98" | 85° 10' 22.09" |
| 3 | 20° 58' 44.36" | 85° 10' 21.88" |
| 4 | 20° 58' 44.8" | 85° 10' 21.61" |
| 5 | 20° 58' 45.43" | 85° 10' 21.13" |
| 6 | 20° 58' 45.98" | 85° 10' 20.57" |
| 7 | 20° 58' 46.27" | 85° 10' 19.94" |
| 8 | 20° 58' 46.41" | 85° 10' 19.37" |
| 9 | 20° 58' 46.4" | 85° 10' 19.31" |
| 10 | 20° 58' 46.4" | 85° 10' 19.11" |
| 11 | 20° 58' 46.4" | 85° 10' 19.04" |
| 12 | 20° 58' 46.39" | 85° 10' 18.87" |
| 13 | 20° 58' 46.39" | 85° 10' 18.79" |
| 14 | 20° 58' 46.38" | 85° 10' 18.74" |
| 15 | 20° 58' 46.39" | 85° 10' 18.64" |
| 16 | 20° 58' 46.39" | 85° 10' 18.43" |
| 17 | 20° 58' 46.37" | 85° 10' 18.33" |
| 18 | 20° 58' 46.37" | 85° 10' 18.21" |
| 19 | 20° 58' 46.34" | 85° 10' 17.99" |
| 20 | 20° 58' 46.32" | 85° 10' 17.61" |
| 21 | 20° 58' 46.54" | 85° 10' 17.36" |
| 22 | 20° 58' 47.02" | 85° 10' 16.73" |
| 23 | 20° 58' 47.06" | 85° 10' 16.29" |
| 24 | 20° 58' 47.28" | 85° 10' 15.94" |
| 25 | 20° 58' 47.58" | 85° 10' 16.21" |

| | | |
|----|----------------|----------------|
| 26 | 20° 58' 48.11" | 85° 10' 15.65" |
| 27 | 20° 58' 48.74" | 85° 10' 15.06" |
| 28 | 20° 58' 48.97" | 85° 10' 14.89" |
| 29 | 20° 58' 49.2" | 85° 10' 16.31" |
| 30 | 20° 58' 49.3" | 85° 10' 17.13" |
| 31 | 20° 58' 49.35" | 85° 10' 17.71" |
| 32 | 20° 58' 49.4" | 85° 10' 18.3" |
| 33 | 20° 58' 49.42" | 85° 10' 19.29" |
| 34 | 20° 58' 49.32" | 85° 10' 20.21" |
| 35 | 20° 58' 49.18" | 85° 10' 20.77" |
| 36 | 20° 58' 48.97" | 85° 10' 21.38" |
| 37 | 20° 58' 48.65" | 85° 10' 22.05" |
| 38 | 20° 58' 48.43" | 85° 10' 22.36" |
| 39 | 20° 58' 48.04" | 85° 10' 22.92" |
| 40 | 20° 58' 47.89" | 85° 10' 23.07" |
| 41 | 20° 58' 47.58" | 85° 10' 23.4" |
| 42 | 20° 58' 47.28" | 85° 10' 23.68" |
| 43 | 20° 58' 46.67" | 85° 10' 24.15" |
| 44 | 20° 58' 46.23" | 85° 10' 24.46" |
| 45 | 20° 58' 45.49" | 85° 10' 24.89" |
| 46 | 20° 58' 45.18" | 85° 10' 25.11" |
| 47 | 20° 58' 44.25" | 85° 10' 25.94" |
| 48 | 20° 58' 44" | 85° 10' 26.1" |
| 49 | 20° 58' 43.42" | 85° 10' 26.46" |
| 50 | 20° 58' 43.16" | 85° 10' 26.57" |
| 51 | 20° 58' 43.15" | 85° 10' 26.47" |
| 52 | 20° 58' 43.21" | 85° 10' 26.32" |
| 53 | 20° 58' 43.7" | 85° 10' 25.83" |
| 54 | 20° 58' 43.85" | 85° 10' 25.66" |
| 55 | 20° 58' 43.91" | 85° 10' 25.57" |
| 56 | 20° 58' 44.02" | 85° 10' 25.53" |
| 57 | 20° 58' 44.12" | 85° 10' 25.41" |
| 58 | 20° 58' 44.11" | 85° 10' 25.16" |
| 59 | 20° 58' 44.44" | 85° 10' 24.95" |
| 60 | 20° 58' 44.51" | 85° 10' 24.61" |
| 61 | 20° 58' 44.54" | 85° 10' 24.19" |
| 62 | 20° 58' 44.36" | 85° 10' 23.67" |
| 63 | 20° 58' 44.11" | 85° 10' 23.16" |
| 64 | 20° 58' 43.55" | 85° 10' 22.79" |
| 65 | 20° 58' 43.28" | 85° 10' 22.6" |

5. Naraharipur (3)

| Sl.no | Latitude | Longitude |
|-------|----------------|---------------|
| 0 | 20° 58' 45.27" | 85° 10' 4.39" |
| 1 | 20° 58' 45.75" | 85° 10' 4.49" |

| | | |
|----|----------------|----------------|
| 2 | 20° 58' 46.59" | 85° 10' 4.48" |
| 3 | 20° 58' 46.43" | 85° 10' 5.54" |
| 4 | 20° 58' 47.41" | 85° 10' 5.68" |
| 5 | 20° 58' 48.07" | 85° 10' 6.02" |
| 6 | 20° 58' 47.76" | 85° 10' 6.96" |
| 7 | 20° 58' 47.44" | 85° 10' 6.86" |
| 8 | 20° 58' 47.32" | 85° 10' 7.39" |
| 9 | 20° 58' 48.01" | 85° 10' 8.3" |
| 10 | 20° 58' 48.01" | 85° 10' 9.19" |
| 11 | 20° 58' 48.12" | 85° 10' 10.06" |
| 12 | 20° 58' 48.24" | 85° 10' 10.52" |
| 13 | 20° 58' 47.85" | 85° 10' 10.07" |
| 14 | 20° 58' 47.45" | 85° 10' 9.85" |
| 15 | 20° 58' 47" | 85° 10' 9.85" |
| 16 | 20° 58' 46.12" | 85° 10' 9.59" |
| 17 | 20° 58' 45.82" | 85° 10' 9.43" |
| 18 | 20° 58' 46.6" | 85° 10' 8.39" |
| 19 | 20° 58' 45.22" | 85° 10' 7.68" |
| 20 | 20° 58' 45" | 85° 10' 7.55" |
| 21 | 20° 58' 45.02" | 85° 10' 6.66" |
| 22 | 20° 58' 45.07" | 85° 10' 6.14" |
| 23 | 20° 58' 45.11" | 85° 10' 5.29" |
| 24 | 20° 58' 45.27" | 85° 10' 4.39" |

6. Rakas RF:

| Sl.no | Latitude | Longitude |
|-------|----------------|---------------|
| 0 | 20° 58' 36.96" | 85° 8' 27.67" |
| 1 | 20° 58' 38.74" | 85° 8' 27.11" |
| 2 | 20° 58' 40.84" | 85° 8' 26.89" |
| 3 | 20° 58' 42.04" | 85° 8' 28.6" |
| 4 | 20° 58' 42.85" | 85° 8' 29.94" |
| 5 | 20° 58' 43.47" | 85° 8' 31.04" |
| 6 | 20° 58' 43.86" | 85° 8' 32.09" |
| 7 | 20° 58' 44.21" | 85° 8' 33.15" |
| 8 | 20° 58' 44.29" | 85° 8' 33.56" |
| 9 | 20° 58' 45.89" | 85° 8' 34.01" |
| 10 | 20° 58' 48.22" | 85° 8' 34.66" |
| 11 | 20° 58' 49.58" | 85° 8' 35.05" |
| 12 | 20° 58' 49.92" | 85° 8' 35.13" |
| 13 | 20° 58' 51.01" | 85° 8' 35.67" |
| 14 | 20° 58' 51.63" | 85° 8' 36.08" |
| 15 | 20° 58' 51.84" | 85° 8' 36.29" |
| 16 | 20° 58' 53.3" | 85° 8' 37.63" |
| 17 | 20° 58' 53.86" | 85° 8' 38.4" |
| 18 | 20° 58' 54.23" | 85° 8' 39.28" |

| | | |
|----|----------------|---------------|
| 19 | 20° 58' 54.67" | 85° 8' 40.34" |
| 20 | 20° 58' 54.27" | 85° 8' 40.34" |
| 21 | 20° 58' 54.59" | 85° 8' 40.96" |
| 22 | 20° 58' 55" | 85° 8' 41.8" |
| 23 | 20° 58' 55.16" | 85° 8' 42.11" |
| 24 | 20° 58' 55.47" | 85° 8' 43.52" |
| 25 | 20° 58' 55.67" | 85° 8' 44.76" |
| 26 | 20° 58' 55.78" | 85° 8' 45.88" |
| 27 | 20° 58' 55.87" | 85° 8' 48.54" |
| 28 | 20° 58' 55.99" | 85° 8' 49.88" |
| 29 | 20° 58' 56.08" | 85° 8' 51.15" |
| 30 | 20° 58' 56.07" | 85° 8' 52.59" |
| 31 | 20° 58' 56.04" | 85° 8' 53.97" |
| 32 | 20° 58' 56.1" | 85° 8' 55.12" |
| 33 | 20° 58' 56.12" | 85° 8' 55.58" |
| 34 | 20° 58' 58.98" | 85° 8' 53.46" |
| 35 | 20° 58' 59.15" | 85° 8' 53.38" |
| 36 | 20° 58' 59.46" | 85° 8' 53.98" |
| 37 | 20° 58' 59.8" | 85° 8' 54.52" |
| 38 | 20° 58' 59.78" | 85° 8' 55.72" |
| 39 | 20° 58' 59.4" | 85° 8' 56.38" |
| 40 | 20° 58' 58.95" | 85° 8' 56.63" |
| 41 | 20° 58' 58.33" | 85° 8' 57.6" |
| 42 | 20° 58' 58.25" | 85° 8' 57.91" |
| 43 | 20° 58' 53.25" | 85° 9' 1.65" |
| 44 | 20° 58' 53.14" | 85° 8' 56.2" |
| 45 | 20° 58' 53.1" | 85° 8' 51.75" |
| 46 | 20° 58' 52.83" | 85° 8' 47.7" |
| 47 | 20° 58' 52.83" | 85° 8' 45.99" |
| 48 | 20° 58' 52.59" | 85° 8' 44.27" |
| 49 | 20° 58' 52.21" | 85° 8' 42.89" |
| 50 | 20° 58' 51.87" | 85° 8' 41.65" |
| 51 | 20° 58' 51.67" | 85° 8' 40.99" |
| 52 | 20° 58' 51.5" | 85° 8' 40.58" |
| 53 | 20° 58' 51.32" | 85° 8' 40.14" |
| 54 | 20° 58' 50.44" | 85° 8' 39.19" |
| 55 | 20° 58' 48.8" | 85° 8' 38.14" |
| 56 | 20° 58' 47.81" | 85° 8' 37.12" |
| 57 | 20° 58' 43.87" | 85° 8' 34.71" |
| 58 | 20° 58' 42.03" | 85° 8' 34.11" |
| 59 | 20° 58' 41.32" | 85° 8' 34" |
| 60 | 20° 58' 40.97" | 85° 8' 32.96" |
| 61 | 20° 58' 40.43" | 85° 8' 31.84" |
| 62 | 20° 58' 39.88" | 85° 8' 30.91" |
| 63 | 20° 58' 38.99" | 85° 8' 29.59" |
| 64 | 20° 58' 38.29" | 85° 8' 28.71" |
| 65 | 20° 58' 37.82" | 85° 8' 28.23" |

| | | |
|----|----------------|---------------|
| 66 | 20° 58' 37.42" | 85° 8' 27.92" |
| 67 | 20° 58' 36.96" | 85° 8' 27.67" |

The identified degraded forest lands will be surveyed clearly with reference to the village maps and reserve forest boundary and demarcated by posting R.C.C. pillars at every corner/turning point of boundary line and the Scheme proposes financial implication for the same is included in the Cost Norms for ANR Plantation. **(Annexure-I)**

15. REGENERATION CLEANING AND TENDING OPERATION

The operation aims at tending (climber cutting, cleaning, double shoot cutting, pruning etc.) of the existing crop for the growth of promising principal species of the locality (Sal with associates) for ensuring better growth of the plants. It includes removal of inferior, diseased, malformed, dead, dying and defective tree growth and disposal of them by distributing it among the local VSS members. Apart from it, weed eradication is also an integral part as they interfere with the growth of both planted species and natural regeneration. The detailed operation to be carried out is as follows

- i) Cutting of herbs and shrubs interfering with the growth of the promising species.
- ii) Cutting back of top broken pole crops interfering with growth of well-formed pole crops.
- iii) Cutting back of malformed and diseased species.
- iv) Cutting of climbers up to hand's reach.
- v) Sharp cutting of high stumps at a height of 0.5 mtr above the ground level to get a smooth stool with least damage to the cortex layer. This will promote growth of new stool shoots as well as root collar shoots of species having coppicing vigor.
- vi) Singling out the coppice shoots coming out from stools and retaining two to three most promising ones.
- vii) Pruning of the branches of the pole crops up to hand's reach.

During the 1st year, climber cutting, and cutting of high stumps, weeds and malformed and diseased species will be done. In the next two years, cutting back of malformed individuals and singling of coppice shoots in case of desired species will be done in the subsidiary silvicultural activities.

16. PLANTING & POST-PLANTING

The area will be re-stocked by raising plantation @ 200 plants per hectare in ANR (Assisted Natural regeneration) model. Taking into consideration, the site-specific soil condition, existing indigenous

species growing there and the bonafied requirement of the local people, the species have been proposed to be planted in the area as mentioned in Point No.16 below.

The main objective of the present scheme is to raise gap plantation in degraded forest as well as to apply soil & moisture conservation measures, restock & rejuvenate degraded forest within 100 m. in the outer perimeter of Mining lease of Subhadra OCP such Plantations will act as a Transition Crop to support the main crop of the lease area.

Hence, the main objective of the present scheme is as follows: -

- i) To afforest the degraded forest land and to restore the degraded forest lands by ANR model.
- ii) Clearly demarcating and fencing with brush wood the area to dispense with the biotic interferences.
- iii) To improve the micro edaphic conditions by undertaking suitable soil and moisture conservation measures.
- iv) To protect the area against encroachment, illicit felling, fire incidences, grazing and all other forms of biotic interference.
- v) To create awareness among the local villagers for protection and maintenance of plantation for ensuring enrichment of the ecosystem and replacement of the degraded areas with natural green cover.

17. SELECTION OF SITE FOR GAP PLANTING

The above degraded forest land is situated in the 100m outer perimeter of the mining lease of Bhubaneswari OCP of M/s Mahanadi Coalfields Ltd. in Angul District of Odisha. The proposed area has been selected considering proximity of the mining lease area. The main purpose of the plantation will be to involve the local VSS. The VSS member will have a share in the usufruct in future which will cater to their need, so far as Bonafide requirement of fuel wood and small timber is concerned. The topography of the site is sloppy in nature. The soil is mostly rocky / sandy loam type at patches and depth of the soil is of limited extent. The gap plantation will be carried out over an area of 28.92 Ha in Open Jungles and Rakas RF as shown in the table above.

18. RAISING OF NURSERY

Seedlings required for the plantation shall be raised in the nursery of Forest Dept. which will meet the requirement. The Nursery should have a capacity of raising adequate seedlings. The selection of saplings will be undertaken in consultation with the Forest Department. All the infrastructures will be provided by the User Agency. Work will commensurate one and half year before the year

of plantation. About 10% extra seedlings shall be raised to compensate casualty in the nursery. Standard nursery practices shall be followed for raising seedlings in polyplots

19. ALIGNMENT AND STACKING

Alignment, stacking and pitting will be taken up in the month of March-April, Pits of size 45cmX 45cm X 45cm will be dug maintaining a spacing of 2.5 mt x 2.5 mt @ 200 plants per hectare.

20. PLANTING

The seedlings will be planted in dug out pits of 45 cm³ maintaining a spacing of 2.5 mt between the pits @ 200 seedlings per hectare. Plantation should be taken up after first regular shower of monsoon and should be completed by end of August. NPK/DAP fertilizer @ 50 gms per plant should be given as basal dose. Anti- termite and insecticide like @ 5gms. per plant should be applied per pit. Foreign earth shall be provided in each pit to enrich the growth of seedlings within a marked period. Casualty replacement when required during the planting year and in the second year should be undertaken for which the seedlings shall be raised.

21. WEEDING, SOIL WORKING AND MANURING

For establishment and better growth of the planted seedlings, weeding, soil working and manuring are necessary. It is proposed to carry out two weeding, soil working and manuring added with vermin compost @ 200 gm/plant during the first year and second year of plantation. Weeding and manuring for the first and second year shall be carried out during September–October Urea 70 gm & NPK 50 gm and the second one during September October along with soil working during which 70 gms of vermi compost shall be added to the soil per plant. First weeding shall be for entire area weeding and the second weeding should be strip weeding. The weeding of third year will be for entire area and weeding shall be carried out during August

22. APPLICATION OF INSECTICIDES

The plantation site after planting with good seedlings may in course of time get infested with diseases owing to influx of insects and pests into the area which usually cause heavy damage to the soft, tender and avidly growing parts of the plant that affects the rate of growth and sometimes causes wide spread casualty of the seedlings. To avoid such incidences, foliar spray and ground application of insecticides at regular intervals usually on a sunny day in the fore noon shall be done.

23. FIRE LINE TRACING AND MAINTENANCE

Fire causes irreparable damage to the plantation and the forest growth during fire season and to prevent such fire out-breaks in the area, the plantation area shall be divided into suitable blocks by tracing fire lines. Boundaries of the plantation patches and these block lines will be scrapped of forest growth to a width of 3.0 mt. during Feb-March and the cut back materials and the dry leaves stacked along these fire lines shall be burnt under direct supervision. This operation is highly essential, and the scheme proposes to carry this operation for the first three years

The detailed cost estimate of various operations to be taken up in ANR plantation has been furnished in **Annexure-I**

24. POINTS OF IMPORTANCE

While taking up plantation, the following vital points shall be taken up for consideration:

- All care to be taken to raise healthy seedlings of minimum 45 cm and 20% extra of the required stock is raised. One & half year seedlings are to be used for planting in area. Pitting shall be invariably done during February – March. In hilly areas, pits shall be dug along the contours. Planting shall be done on the onset of monsoon and should not be delayed. The gradient of the site is 1:10 which is considered as level ground with slight undulating at places.
- Basal dose of 70 grams Urea and 50-200 gms of Vermi Compost of NPK and 5 grams of granular insecticide be applied at the time of planting. Casualty replacement, weeding and soil working, application of fertilizer and insecticides shall be taken up as per the provisions in the cost- norm at the proper time. Engaging requisite watchers as 15 per norm who shall take up tracing of inspection path and fire line and maintenance of fence and provide watch and ward for the entire life of plantation i.e 10 years.
- All-out efforts be taken to keep the plantation free from grazing, fire and other biotic interference.

25. MOTIVATION OF PEOPLE

The villagers / VSS Committee members of the adjoining villages are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the adjoining villages and resolution will be passed to support plantation activities. For motivation of the villagers/ VSS Committee members, they will be provided incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure for this purpose.

26. EXECUTING AGENCY

The work will be executed by the User Agency i.e. M/s Mahanadi Coalfields Limited through dedicated departments manned by technically qualified persons with outsourced man and machinery as and when required. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department.

EXECUTING AGENCY



27. INSPECTION, MONITORING AND EVALUATION

Proper inspection, monitoring and evaluation will be done in-house by designated authorities of MCL under supervision of Forest Department.

28. REQUIREMENT OF FUNDS

The total cost of the implementation of proposed scheme will be Rs. **1,86,83,500.00** (Rupees One Crore Eighty Six Lakh Eighty three thousand five hundred Only) only, details are as under

FINANCIAL FORECAST


TOTAL COST OF GAP PLANTING, SOIL & MOISTURE CONSERVATION ACTIVITIES WITHIN 100 M FROM OUTER PERIMETER OF BHUBANESWARI OCP MINES OF M/s MAHANADI COALFIELDS LIMITED (28.92 Ha) TO RESTOCK AND REJUVINATE THE DEGRADED OPEN FOREST

As per base cost – 452.00

| Sl. No. | Description of the Work | Fund Required |
|-------------|--|---------------|
| | | (in Rs.) |
| 1 | ANR plantation with 200 seedlings per ha over 28.92 ha @Rs.1,16,852.00 per ha (for the year 2025-26) x 28.92 Ha. | 3379359.84 |
| 2 | Watering (solar bore well) fitted with Drip System @Rs.2,45,933.00 per Ha (for the year 2025-26) x 28.92 Ha. | 7112382.21 |
| 3 | SMC @Rs. 43,310.00 per Ha (for the year 2025-26) x 28.92 Ha. | 1252525.2 |
| 4 | Fencing (Bamboo Twig) for the year 2025-26 @Rs. 1,21,512.00 for 250 RMT over 3692m (Rs 1,21,512.00/250m x 3692m) | 1794489.22 |
| Sub Total | | 13538756.47 |
| 2 | 15% of the total cost for motivation of VSS / People involved | 2030813.47 |
| Sub Total | | 15569569.94 |
| 3 | Price escalation @ 20% | 3113913.99 |
| Grand Total | | 18683483.93 |
| Say Or | | 18683500 |

(Rupees One Crore Eighty Six Lakh Eighty three thousand five hundred Only)

Countersigned


M/s Mahanadi Coalfields Ltd
General Manager
एम.सी.एल., भुवनेश्वर क्षेत्र
MCL, Bhubaneswar Area

Approved for Rs. 1,86,83,500/-


Divisional Forest Officer
Angul Division


Regional Chief Conservator
of Forests, Angul Circ'e.

**UNDERTAKING FOR GAP PLANTING, SOIL & MOISTURE CONSERVATION ACTIVITIES
TO RESTOCK AND REJUVINATE THE DEGRADED OPEN FORESTS (HAVING CROWN
DENSITY < 0.4) WITHIN 100 M FROM OUTER PERIMETER OF MINING LEASE**

I do hereby undertake to bear additional cost, if required for Gap Planting, Soil & Moisture Conservation activities to restock and rejuvenate the degraded open forests (having crown density < 0.4) within 100 m from outer perimeter of mining lease over and above the approved cost that may be required to do so as per due approval from competent authorities

05/12/2024

M/s Mahanadi Coalfields Ltd

मह प्रबंधक

General Manager

एम.सी.एल, भुवनेश्वर क्षेत्र

MCL, Bhubaneswar Area

Countersigned

[Signature]

Divisional Forest Officer
Divisional Forest Officer
Angul Division
Angul Division

ANR base Cost Norm for Compensatory Afforestation
@ 200 Plants/ Ha. with 10 year Maintenance
Wage rate @ ₹311/- per Manday

| Sl No. | Items of Work | Preferable Period of Execution | No. of Mandays | Labour Cost (₹) | Material Cost (₹) | Total Cost (₹) |
|---|---|--------------------------------|----------------|-----------------|-------------------|----------------|
| 0th Year (Advance work) Pre-Planting Operation | | | | | | |
| 1 | Survey, Demarcation and Pillar posting | Nov/Dec | 2 | 622 | 0 | 622 |
| 2 | Preparation of Treatment Map (Digital Map) | Nov/Dec | 1 | 311 | 100 | 411 |
| 3 | Site preparation | Nov/Dec | 2 | 622 | 0 | 622 |
| 4 | Silvicultural operations including clearance of weed, cutting of climber, high stump cutting, singling of shoots & removal of cut out after drying from the field to blank space | Jan/Feb | 15 | 4665 | 0 | 4665 |
| 5 | Alignment and stacking for digging of pits | Feb/Mar | 0.5 | 156 | 0 | 156 |
| 6 | Digging of pits (45cm x 45cm x 45cm) in hard & gravelly soil | Feb/Mar | 8 | 2488 | 0 | 2488 |
| | Total | | 28.5 | 8863.5 | 100 | 8963.5 |
| 1st Year/Planting Year | | | | | | |
| 1 | Refilling of pits by altering the dug-out soil of the pits, application of organic compounds / CDM/ FYM & mixing the same perfectly | Jun/Jul | 1.5 | 460.5 | 1000 | 1467 |
| 2 | Transportation of 18 months old polythene bag seedlings in hired truck/tractor from the Permanent/Mega nursery to planting site including loading & unloading. (Average lead of 10 Rkm) & stacking the seedlings @ Rs.6/- per seedling. (220 nos.) | Jul/Aug | 0 | 0 | 1320 | 1320 |
| 3 | Watering polythene bag seedlings at stacking site of plantation | Jul/Aug | 0.5 | 155.5 | 0 | 156 |
| 4 | Conveyance of polythene bag seedlings on head load from the stacking site to individual dugout pits within the planting site, applying insecticide, fertilizers & planting after scooping the soil with other applied materials & pressing the soil perfectly around the planted seedlings. | Jul/Aug | 4.5 | 1399.5 | 0 | 1400 |
| 5 | Cost of Fertilizer & Insecticide | Jul/Aug | 0 | 0 | 600 | 600 |
| | (a) NPK/Bio-fertilizer @ 50 gms/plant as basal dose = 10kg @ Rs.30/- per kg = Rs.300/- | | | | | |

| Sl. No. | Items of Work | Preferable Period of Execution | No. of Mandays | Labour Cost (₹) | Material Cost (₹) | Total Cost (₹) |
|-----------------------------|--|--------------------------------|----------------|-----------------|-------------------|----------------|
| | (b) Urea/Vermicompost/Mo Khata/any other fertilizer @ Rs.150/- | | | | | |
| | (c) Insecticide/ Bio-pesticide @ 5 gms/plant = 1 kg @ Rs.150/- per kg = Rs.150/- | | | | | |
| 6 | Casualty Replacement @ 10% (20 nos.) | Jul/Aug | 0.5 | 156 | 0 | 156 |
| 7 | 1st Weeding & Manuring | Aug/Sep | 2 | 622 | 0 | 622 |
| 8 | 2nd Weeding, Soil working (1mt. diameter around the plants) & Manuring | Oct/Nov | 3 | 933 | 0 | 933 |
| 9 | Fire line tracing & inspection path | Feb/Mar | 3 | 933 | 0 | 933 |
| 10 | Watch & Ward including watering as per requirement | Aug-Mar | 8 | 2488 | 0 | 2488 |
| | Total | | 23 | 7153 | 2920 | 10073 |
| 2nd Year Maintenance | | | | | | |
| 1 | Transportation of 20 seedlings from Nursery to plantation site including loading, unloading & conveyance by Tractor @Rs.6/- per seedling | Jul | 0 | 0 | 120 | 120 |
| 2 | Planting of Casualty replacement | Jul | 0.5 | 155.5 | 0 | 155.5 |
| 3 | Cost of Fertilizer & Insecticide- | Jul | 0 | 0 | 575 | 575 |
| | A) Cost of Insecticide/Bio-pesticide(Themet/Foret)@5gms/plant = 0.1Kg @ Rs.150/- per kg = Rs.15/- | | | | | |
| | B) Urea/NPK/Bio-fertilizer/Vermicompost/ Mo Khata/any other fertilizer @Rs.560/- | | | | | |
| 4 | Complete Weeding, Manuring & Soil working, (1mt. diameter around the plants) | Sep/Oct | 4 | 1244 | 0 | 1244 |
| 5 | Fire line tracing (2 m. wide fire line over 400 m long) & inspection path | Feb/Mar | 3 | 933 | 0 | 933 |
| 6 | Watch & Ward including watering as per requirement | Apr-Mar | 12 | 3732 | 0 | 3732 |
| | Total | | 19.5 | 6064.5 | 695 | 6759.5 |
| 3rd Year Maintenance | | | | | | |
| 1 | Cost of fertilizer Urea/NPK/Bio-fertilizer/ Vermicompost/Mo Khata/any other fertilizer = Rs.560/- | Sep/Oct | 0 | 0 | 560 | 560 |
| 2 | Complete Weeding, Manuring & Soil working, (1mt. diameter around the plants) | Aug/Sep | 4 | 1244 | 0 | 1244 |

| Sl. No. | Items of Work | Preferable Period of Execution | No. of Mandays | Labour Cost (₹) | Material Cost (₹) | Total Cost (₹) |
|-----------------------------|---|--------------------------------|----------------|-----------------|-------------------|----------------|
| 3 | Fire line tracing(2m. wide fire line over 400m long) & inspection path | Feb/Mar | 3 | 933 | 0 | 933 |
| 4 | Watch & Ward including watering as per requirement | Apr/Mar | 12 | 3732 | 0 | 3732 |
| | Total | | 19 | 5909 | 560 | 6469 |
| 4th Year Maintenance | | | | | | |
| 1 | Fire line tracing (2m. wide fire line over 400m long) & inspection path | Feb/Mar | 3 | 933 | 0 | 933 |
| 2 | Watch & Ward including watering as per requirement | Apr/Mar | 12 | 3732 | 0 | 3732 |
| | Total | | 15 | 4665 | 0 | 4665 |
| 5th Year Maintenance | | | | | | |
| 1 | Fire line tracing (2 m. wide fire line over 400 m length) & inspection path | Feb/Mar | 3 | 933 | 0 | 933 |
| 2 | Watch & Ward including watering as per requirement | Apr/Mar | 12 | 3732 | 0 | 3732 |
| | Total | | 15 | 4665 | 0 | 4665 |
| 6th Year Maintenance | | | | | | |
| 1 | Fire line tracing (2 m. wide fire line over 400 m length) & inspection path | Feb/Mar | 3 | 933 | 0 | 933 |
| 2 | Watch & Ward including watering as per requirement | Apr/Mar | 12 | 3732 | 0 | 3732 |
| | Total | | 15 | 4665 | 0 | 4665 |
| 7th Year Maintenance | | | | | | |
| 1 | Fire line tracing (2 m. wide fire line over 400 m length) & inspection path | Feb/Mar | 3 | 933 | 0 | 933 |
| 2 | Watch & Ward including watering as per requirement | Apr/Mar | 12 | 3732 | 0 | 3732 |
| | Total | | 15 | 4665 | 0 | 4665 |
| 8th Year Maintenance | | | | | | |
| 1 | Fire line tracing (2 m. wide fire line over 400 m length) & inspection path | Feb/Mar | 3 | 933 | 0 | 933 |
| 2 | Watch & Ward including watering as per requirement | Apr/Mar | 12 | 3732 | 0 | 3732 |
| | Total | | 15 | 4665 | 0 | 4665 |
| 9th Year Maintenance | | | | | | |
| 1 | Fire line tracing (2 m. wide fire line over 400 m length) & inspection path | Feb/Mar | 3 | 933 | 0 | 933 |
| 2 | Watch & Ward including watering as per requirement | Apr/Mar | 12 | 3732 | 0 | 3732 |
| | Total | | 15 | 4665 | 0 | 4665 |

....

| Sl. No. | Items of Work | Preferable Period of Execution | No. of Mandays | Labour Cost (₹) | Material Cost (₹) | Total Cost (₹) |
|------------------------------|---|--------------------------------|----------------|-----------------|-------------------|----------------|
| 10th Year Maintenance | | | | | | |
| 1 | Fire line tracing (2 m. wide fire line over 400 m length) & inspection path | Feb/Mar | 3 | 933 | 0 | 933 |
| 2 | Watch & Ward including watering as per requirement | Apr/Mar | 12 | 3732 | 0 | 3732 |
| | Total | | 15 | 4665 | 0 | 4665 |

Year wise Abstract of Cost Norm (Showing Seedling Cost separately)

| Sl. No. | Year | No. of Mandays | Labour Cost ₹311/- per day | Material Cost (₹) | MELD and other contingency 5% of (4+5+6) | Cost of Seedling @₹50.31 per Seedlings | Total Cost (₹) |
|---------|---------------|----------------|----------------------------|-------------------|--|--|----------------|
| 1 | 0th year | 28.5 | 8863.5 | 100 | 436.5 | 0 | 9400 |
| 2 | 1st year | 23 | 7153 | 2920 | 427 | 11068 | 21568 |
| 3 | 2nd year | 19.5 | 6064.5 | 695 | 240.5 | 1006 | 8006 |
| 4 | 3rd year | 19 | 5909 | 560 | 231 | 0 | 6700 |
| 5 | 4th year | 15 | 4665 | 0 | 135 | 0 | 4800 |
| 6 | 5th year | 15 | 4665 | 0 | 135 | 0 | 4800 |
| 7 | 6th year | 15 | 4665 | 0 | 135 | 0 | 4800 |
| 8 | 7th year | 15 | 4665 | 0 | 135 | 0 | 4800 |
| 9 | 8th year | 15 | 4665 | 0 | 135 | 0 | 4800 |
| 10 | 9th year | 15 | 4665 | 0 | 135 | 0 | 4800 |
| 11 | 10th year | 15 | 4665 | 0 | 135 | 0 | 4800 |
| | Total: | 195 | 60645 | 4275 | 2280 | 12074 | 79274 |

Matrix for ANR Plantation for Compensatory Afforestation @ 200 Seedlings/ Ha. with 10 year maintenance

| Sl. No. | Commencement Year | I | II | III | IV | V | VI | VII | VIII | IX | X | XI | XII | XIII | XIV | XV | XVI | XVII | XVIII | XIX | XX | XXI | Total Cost (10Yrs) |
|---------|-------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|-------|-------|-------|-------|-----|--------------------|
| | Base Norm | 9400 | 21968 | 3006 | 6700 | 4800 | 4800 | 4800 | 4800 | 4900 | 4900 | 4900 | | | | | | | | | | | |
| 01 | 2021-22 | 9400 | 22546 | 8836 | 7756 | 5004 | 6126 | 6432 | 6754 | 7092 | 7446 | 7819 | | | | | | | | | | | 95131 |
| 02 | 2022-23 | | 9470 | 23778 | 9267 | 8144 | 6126 | 6432 | 6754 | 7092 | 7447 | 7818 | 8219 | | | | | | | | | | 103636 |
| 03 | 2023-24 | | | 10064 | 24967 | 9730 | 8661 | 6432 | 6754 | 7092 | 7447 | 7819 | 8208 | 8621 | | | | | | | | | 105985 |
| 04 | 2024-25 | | | | 10892 | 26215 | 10217 | 8879 | 6754 | 7092 | 7447 | 7819 | 8210 | 8619 | 9052 | | | | | | | | 111295 |
| 05 | 2025-26 | | | | | 11426 | 27528 | 10728 | 9428 | 7092 | 7447 | 7819 | 8210 | 8621 | 9050 | 9505 | | | | | | | 118852 |
| 06 | 2026-27 | | | | | | 11997 | 28802 | 11264 | 9689 | 7447 | 7819 | 8210 | 8621 | 9052 | 9503 | 9980 | | | | | | 125594 |
| 07 | 2027-28 | | | | | | | 12597 | 30047 | 11827 | 10094 | 7819 | 8210 | 8621 | 9052 | 9505 | 9976 | 10479 | | | | | 128029 |
| 08 | 2028-29 | | | | | | | | 13227 | 11884 | 12418 | 10914 | 8210 | 8621 | 9052 | 9505 | 9980 | 10477 | 11003 | | | | 135271 |
| 09 | 2029-30 | | | | | | | | | 13868 | 13467 | 13009 | 11460 | 8621 | 9052 | 9505 | 9980 | 10479 | 11001 | 11553 | | | 142035 |
| 10 | 2030-31 | | | | | | | | | | 14582 | 13530 | 13881 | 12033 | 9052 | 9505 | 9980 | 10479 | 11003 | 11551 | 12101 | | 149137 |

Add on Model - Watering Provision

Watering Model W-I: Bore well fitted with Solar & Drip System

| Solar system with Bore well (1 system for 5 Ha Plantation) fitted with Drip system, Wage rate @ Rs.311/- | | | |
|--|--|-----------------|--------------|
| Year of Installation (0th Year) | | | |
| 1 | Cost of Bore well | 1,50,000 | |
| 2 | Installation of Solar panel & other System | 3,00,000 | |
| 3 | Cost of 0.5 HP submersible motor with accessories | 50,000 | |
| 4 | Water Storage Tanks/ Flexible pipes | 15,000 | |
| 5 | Cost of laying Drip system including all accessories, fittings etc. with 12% GST | 3,02,431 | |
| | Total | 8,17,431 | |
| 6 | Cost of Water & watering per Ha. (8,17,431/ 5)= Rs. 1,63,486/- | | 1,63,486 |
| 1st Year Watering | | | |
| 7 | No maintenance required | 0 | |
| | Total | | 0 |
| 2nd Year Watering | | | |
| 8 | Maintenance of system @ 5% of initial cost of installation | | 8,174 |
| | Total | | 8,174 |
| 3rd Year Watering | | | |
| 9 | Maintenance of system @ 5% of initial cost of installation | | 8,174 |
| | Total | | 8,174 |
| 4th Year Watering | | | |
| 10 | Maintenance of system @ 5% of initial cost of installation | | 8,174 |
| | Total | | 8,174 |
| 5th Year Watering | | | |
| 11 | Maintenance of system @ 5% of initial cost of installation | | 8,174 |
| | Total | | 8,174 |

Abstract

| Sl. No | Year | No. person days | Labour cost @ Rs. 311/-per day | Material Cost | Total cost (Rs.) |
|--------|--------------|-----------------|--------------------------------|---------------|------------------|
| 1 | 0th year | 0 | 0.0 | 163486.0 | 163486.0 |
| 2 | 1st year | 0 | 0.0 | 0.0 | 0.0 |
| 3 | 2nd year | 0 | 0.0 | 8174.0 | 8174.0 |
| 4 | 3rd year | 0 | 0.0 | 8174.0 | 8174.0 |
| 5 | 4th year | 0 | 0.0 | 8174.0 | 8174.0 |
| 6 | 5th year | 0 | 0.0 | 8174.0 | 8174.0 |
| | Total | 0 | 0 | 196182 | 1,96,182 |

Matrix for Watering Model-W-1 (Solar bore well) fitted with Drip System (per Ha)

| Sl. No. | Commencement Year | I | II | III | IV | V | VI | VII | VIII | IX | X | XI | XII | XIII | XIV | XV | XVI | Total Cost |
|---------|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-----|------------|
| | Base Norm | 163486 | 0 | 8174 | 8174 | 8174 | 8174 | | | | | | | | | | | |
| 1 | 2021-22 | 163486 | 0 | 9011 | 9453 | 9935 | 10432 | | | | | | | | | | | 202327 |
| 2 | 2022-23 | | 171660 | 0 | 9462 | 9936 | 10432 | 10954 | | | | | | | | | | 212444 |
| 3 | 2023-24 | | | 180243 | 0 | 9935 | 10433 | 10954 | 11502 | | | | | | | | | 223067 |
| 4 | 2024-25 | | | | 188255 | 0 | 10432 | 10955 | 11502 | 12077 | | | | | | | | 234021 |
| 5 | 2025-26 | | | | | 198718 | 0 | 10954 | 11503 | 12077 | 12681 | | | | | | | 245933 |
| 6 | 2026-27 | | | | | | 208654 | 0 | 11502 | 12078 | 12681 | 13315 | | | | | | 258230 |
| 7 | 2027-28 | | | | | | | 219087 | 0 | 12077 | 12882 | 13315 | 13961 | | | | | 271142 |
| 8 | 2028-29 | | | | | | | | 230041 | 0 | 12681 | 13316 | 13961 | 14680 | | | | 284659 |
| 9 | 2029-30 | | | | | | | | | 241543 | 0 | 13315 | 13962 | 14680 | 15414 | | | 298034 |
| 10 | 2030-31 | | | | | | | | | | 253820 | 0 | 13961 | 14681 | 15414 | 16185 | | 313861 |

Matrix for Soil & Moisture Conservation (SMC) works

| Sl. No. | Commencement Year | I | II | III | IV | V | VI | VII | VIII | IX | X | XI | XII | XIII | XIV | XV | XVI | Total Cost |
|---------|-------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|-----|------------|
| | Base Norm | 0 | 20215 | 3032 | 3032 | 3032 | 3032 | | | | | | | | | | | |
| 1 | 2021-22 | 0 | 21226 | 3342 | 3510 | 3685 | 3870 | | | | | | | | | | | 35633 |
| 2 | 2022-23 | | 0 | 22287 | 3509 | 3686 | 3869 | 4064 | | | | | | | | | | 37415 |
| 3 | 2023-24 | | | 0 | 23401 | 3684 | 3870 | 4062 | 4267 | | | | | | | | | 39284 |
| 4 | 2024-25 | | | | 0 | 24571 | 3868 | 4064 | 4265 | 4480 | | | | | | | | 41248 |
| 5 | 2025-26 | | | | | 0 | 25800 | 4061 | 4267 | 4478 | 4704 | | | | | | | 43310 |
| 6 | 2026-27 | | | | | | 0 | 27090 | 4264 | 4480 | 4702 | 4939 | | | | | | 45475 |
| 7 | 2027-28 | | | | | | | 0 | 28445 | 4477 | 4704 | 4937 | 5186 | | | | | 47749 |
| 8 | 2028-29 | | | | | | | | 0 | 29867 | 4701 | 4939 | 5184 | 5445 | | | | 50136 |
| 9 | 2029-30 | | | | | | | | | 0 | 31360 | 4936 | 5186 | 5443 | 5717 | | | 52642 |
| 10 | 2030-31 | | | | | | | | | | 0 | 32928 | 5183 | 5445 | 5715 | 6003 | | 55274 |

Fencing Model F-I: Provision of fencing with Bamboo Twigs and thorns.

[illegible]

| 3rd Year Maintenance | | | | | | |
|--|--|----------|----|------|------|-------|
| 1 | Repair & Maintenance of Bamboo Twigs fence including Material cost | Feb./Mar | 20 | 6220 | 5675 | 11895 |
| Rate per running mt. $11895 / 250 = 47.58$ or say Rs. 48-Rmt | | | | | | |
| 4th Year Maintenance | | | | | | |
| 1 | Repair & Maintenance of Bamboo Twigs fence including Material cost | Feb./Mar | 20 | 6220 | 5675 | 11895 |
| Rate per running mt. $11895 / 250 = 47.58$ or say Rs. 48-Rmt | | | | | | |
| 5th Year Maintenance | | | | | | |
| 1 | Repair & Maintenance of Bamboo Twigs fence including Material cost | Feb./Mar | 20 | 6220 | 5675 | 11895 |
| Rate per running mt. $11895 / 250 = 47.58$ or say Rs. 48-Rmt | | | | | | |

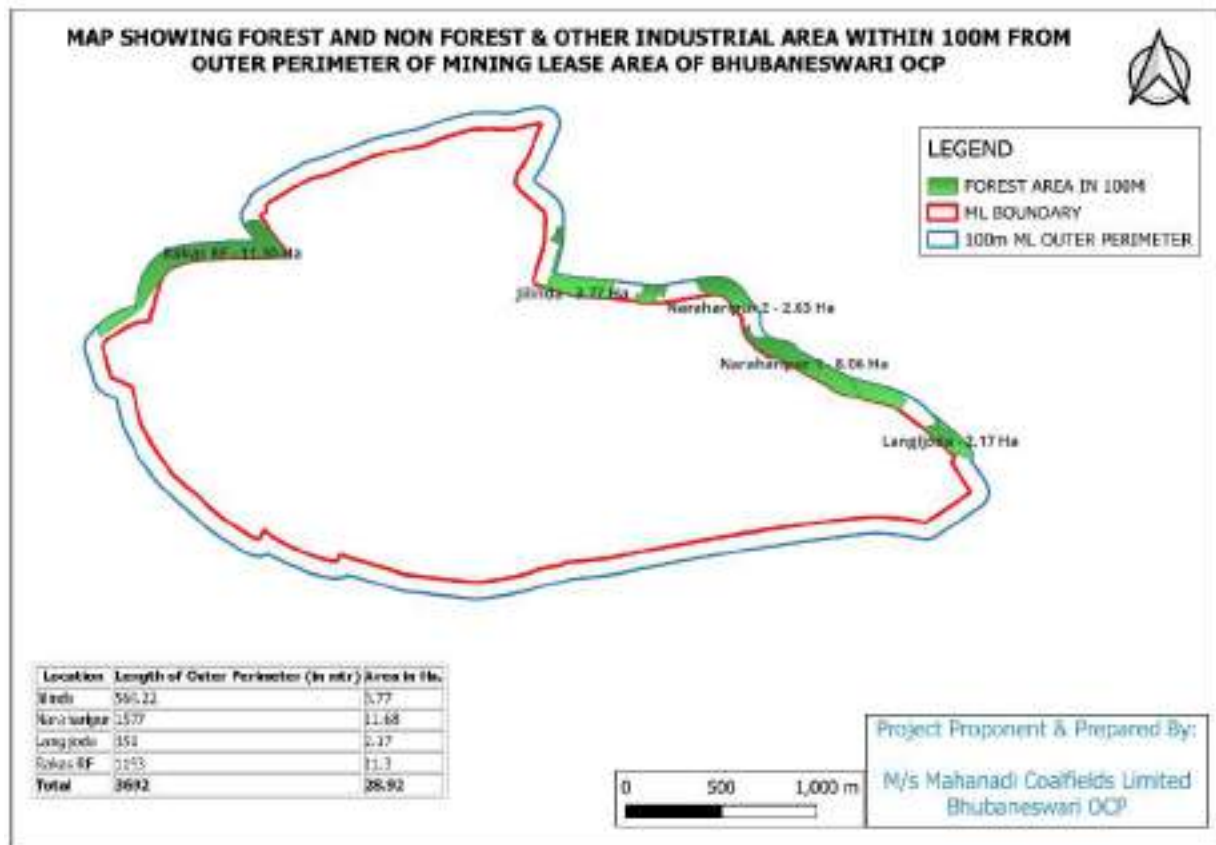
Abstract

| Sl. No | Year | No. person days | Labour cost @ Rs. 311/-per day | Material Cost | Total cost (Rs.) |
|--------|----------|-----------------|--------------------------------|---------------|------------------|
| 1 | 0th year | 0.0 | 0.0 | 0.0 | 0.0 |
| 2 | 1st year | 45.5 | 14150.5 | 31608.5 | 45759.0 |
| 3 | 2nd year | 20.0 | 6220.0 | 1500.0 | 7720.0 |
| 4 | 3rd year | 20.0 | 6220.0 | 5675.0 | 11895.0 |
| 5 | 4th year | 20.0 | 6220.0 | 5675.0 | 11895.0 |
| 6 | 5th year | 20.0 | 6220.0 | 5675.0 | 11895.0 |
| Total: | | 125.5 | 39030.5 | 50133.5 | 89164.0 |

Model : F-1

Matrix for Fencing (Bamboo Twigs and thorn)

| Sl. No. | Commencement Year | I | II | III | IV | V | VI | VII | VIII | IX | X | XI | XII | XIII | XIV | XV | XVI | Total Cost |
|---------|-------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|-------|-------|-------|----|-----|------------|
| | Base Norm | 0 45759 | | 7720 | 11895 | 11895 | 11895 | | | | | | | | | | | |
| 1 | 2021-22 | 0 48047 | | 8511 | 13770 | 14458 | 15181 | | | | | | | | | | | 99967 |
| 2 | 2022-23 | | 0 50449 | 8937 | 14459 | 15181 | 15940 | | | | | | | | | | | 104966 |
| 3 | 2023-24 | | | 0 52971 | 9384 | 15182 | 15940 | 16737 | | | | | | | | | | 110214 |
| 4 | 2024-25 | | | | 0 55620 | 9853 | 15941 | 16737 | 17574 | | | | | | | | | 115725 |
| 5 | 2025-26 | | | | | 0 58401 | 10346 | 16738 | 17574 | 18453 | | | | | | | | 121512 |
| 6 | 2026-27 | | | | | | 0 61321 | 10863 | 17575 | 18453 | 19376 | | | | | | | 127588 |
| 7 | 2027-28 | | | | | | | 0 64387 | 11406 | 18454 | 19376 | 20345 | | | | | | 133968 |
| 8 | 2028-29 | | | | | | | | 0 67606 | 11976 | 19377 | 20345 | 21362 | | | | | 140666 |
| 9 | 2029-30 | | | | | | | | | 0 70986 | 12575 | 20346 | 21362 | 22430 | | | | 147699 |
| 10 | 2030-31 | | | | | | | | | | 0 74535 | 13204 | 21363 | 22430 | 23552 | | | 155084 |

MAP SHOWING FOREST WITHIN 100M MINE LEASE AREA**MAP SHOWING FOREST WITHIN 100M MINE LEASE AREA**

Annexure - III



Annexure- 18

UNDERTAKING

PROPOSAL NO.:- FP/OR/MIN/155017/2022

(In compliance to Condition No. 8 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "The User Agency shall prepare a list of existing village tanks and other water bodies with GPS co-ordinates located within five km from the mine lease boundary. This list is to be duly verified by the concerned Divisional Forest Officer. The User Agency shall regularly undertake desilting of these village tanks and other water bodies so as to mitigate the impact of siltation of such tanks/water bodies. A detailed approved plan for desilting of identified ponds and water bodies to be prepared in consultation with forest department and shall be submitted to MoEF& CC along with the compliance of 'in-principle' approval".



General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एन.डी.सी. भुवनेश्वरी क्षेत्र
MCL, Bhubaneswar Area



Divisional Forest Officer
Angul, Division



BHUBANESWARI OPEN CAST COAL PROJECT

Scheme for

**DE-SILTING OF VILLAGE TANKS AND OTHER WATER
BODIES LOCATED WITHIN 05 KM FROM THE MINE LEASE
BOUNDARY SO AS TO MITIGATE THE IMPACT OF
SILTATION OF SUCH TANKS/ WATER BODIES**

***in compliance
with***

Condition No.8 of

Stage-I approval granted vide

Letter No.8-18/2002-FC, Dated.24.09.2024

**of Govt. of India, Ministry of Environment, Forests
& Climate Change, New Delhi.**

for

**Diversion of 26.416 Ha. (Originally proposed area is 20.383 ha)
of Forest Land within 658.724 Ha. of ML area of Bhubaneswari OCP
for Non forestry use U/s-2 (ii) of FC Act-1980
in villages Jilinda, Hensmul (Sharasahi), Hensmul
(Talasahi), Naraharipur, Khandualbhal, Kandhal,
Madanmohanpur, Langijoda and Anadipur of
Angul District, Odisha.**

M/s. Mahanadi Coalfields Limited

SCHEME FOR DE-SILTING OF VILLAGE TANKS AND OTHER WATER BODIES LOCATED WITHIN 05 KM FROM THE MINE LEASE BOUNDARY SO AS TO MITIGATE THE IMPACT OF SILTATION OF SUCH TANKS/ WATER BODIES

1. INTRODUCTION

Bhubaneswari Open Cast Project is a mega coal mining project spread over a mining lease area of 658.724 ha. in Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur of Angul District, Odisha.

Mahanadi Coalfields Limited has named Bhubaneswari and combined Bhubaneswari, Sakhigopal-A, Arkhapal-A coal blocks as Bhubaneswari Open Cast Project.

As per approved Mining Plan and Mine Closure Plan, the mine life is 5 years. Out of total 658.72 Ha. of Mining Lease area, total forest land involved is 132.904 Ha out of which 112.521 Ha has got Stage 2 Forest clearance wide F.no:8-18/2002-FC, Dated 06/12/2004

The Stage-I Forest Clearance approval over 26.416 ha of Forest Land Under Section-2 (ii) (including 6.033 ha. of Safety Zone) of the Forest (Conservation) Act, 1980 has been granted by MoEF & CC, Government of India vide their Letter No. 8-18/2002-FC, dated 24.09.2024, where in it has been stipulated as per **Condition No. 8 for undertaking de-silting of village tanks and other water bodies located within 05 km from the mine lease boundary so as to mitigate the impact of siltation of such tanks/ water bodies.**

2. LOCATION

The mining lease area is covered in the Survey of India Topo sheet No. F45T1 and Special Topo sheet Nos. D1, D2, E1& E2 and situated between the latitude 20°57'53.53"N to 20°59'16.83"N, and longitude 85°08'27.17"E to 85°11'6.29"E. The above ML area covering villages are in Jilinda, Hensmul (Sharasahi), Hensmul (Talasahi), Naraharipur, Khandualbhal, Kandhal, Madanmohanpur, Langijoda and Anadipur of Angul District, Odisha.

LOCATION MAP

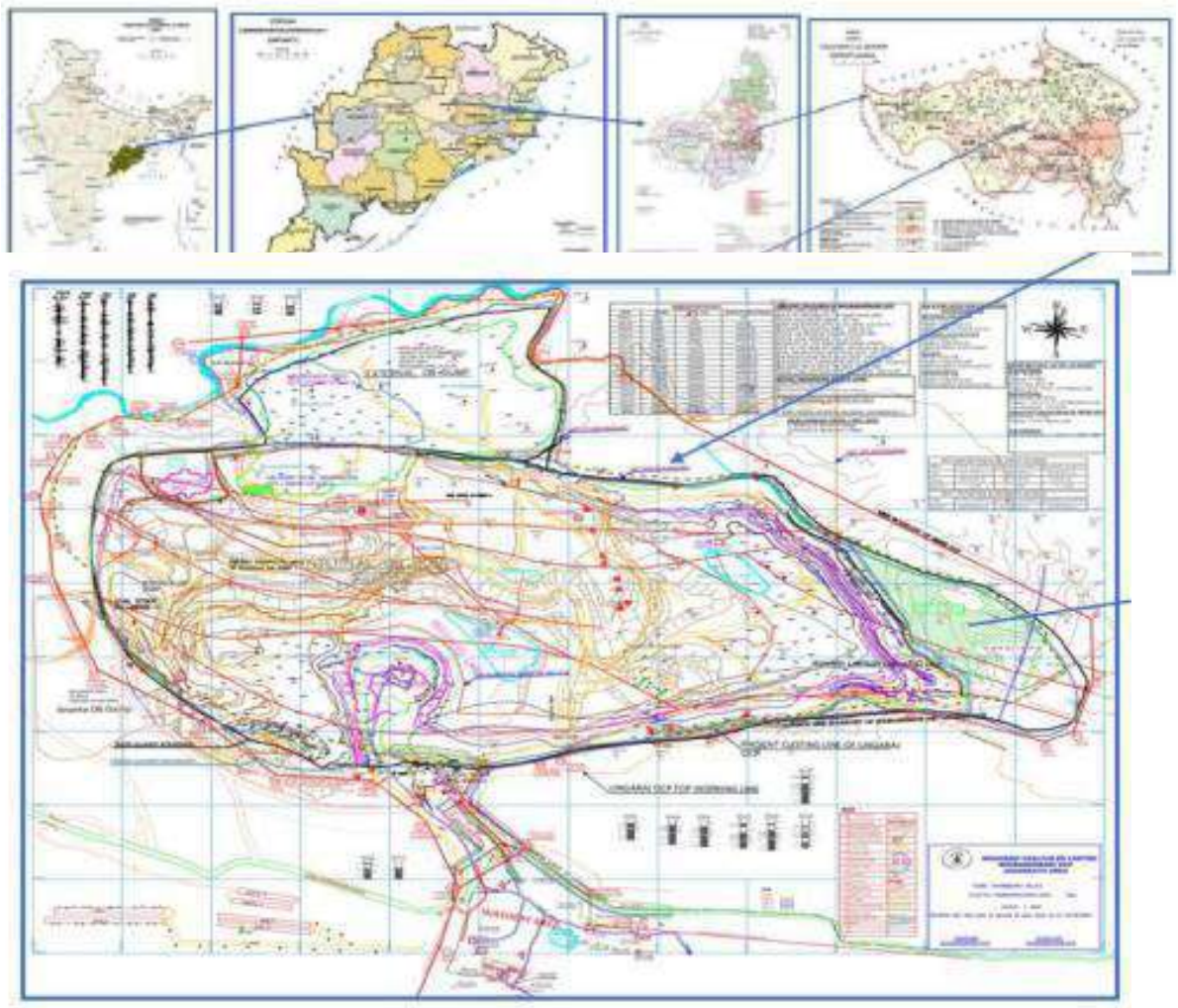


Fig-1. Location Map of Bhubaneswari OCP, MCL

3. TOPOGRAPHY

The surface topography is (majorly) predominantly soil covered and gently undulating with paddy fields and is used for agricultural purpose and some patches of barren lands. Around south western part, the surface topography is mildly undulating and slopes towards north. The ground level rises towards south-eastern corner of the block with highest elevation above Mean Sea Level of about 167.50 meter. A small seasonal stream (part of Bangaru stream) is flowing along the northern boundary of the project. Elevations of the area vary between 92 m to 137 m above mean sea level.

4. LAND USE PATTERN

The proposed land use pattern of 658.724 Ha. of mining lease area as per approved Mining Plan and Mine Closure Plan is given below:

Table 1: Purpose wise break up forest and non-forest land

| Sl. No. | Type of Land Use | Forest Land in Ha | Non-Forest Land in Ha | Total Land in Ha |
|--------------|---|-------------------|-----------------------|------------------|
| 1 | Mining Excavation Area | 126.191 | 488.531 | 614.722 |
| 2 | Safety Zone | | 6.163 | 6.163 |
| 3 | Infrastructure (CHP, Washery, Silo point, project office, laying of railway lines for dispatch point) and Future working expansion Area | 6.713 | 18.606 | 25.319 |
| 4 | Embankment | NIL | 12.52 | 12.52 |
| Total | | 132.904* | 525.820 | 658.724 |

Note: Out of total 658.72 Ha. of Mining Lease area, total forest land involved is 132.904 Ha out of which 112.521 Ha has got Stage 2 Forest clearance vide F.no:8-18/2002-FC, Dated 06/12/2004

5. DETAILS OF FOREST LAND WITHIN THE ML AREA

| | |
|---|-----------------|
| Forest land to be worked for mining and allied purpose- | 20.383 Ha |
| Area set aside for Safety Zone | <u>6.033 Ha</u> |
| | 26.416 Ha |

6. SOIL TYPE

The areas primarily consist of sandy and lateritic soil, with an additional presence of clay. In most of the area the soil is moderately coarse in nature whereas it is loamy in the cultivated land. The area nearby has a nala Bangaru stream - one seasonal stream (flows in the northern boundary). There were two periods of glacial advance and retreat during the deposition of Talcher sediments.

7. CLIMATE

The area experiences a sub-tropical warm temperature. Monsoon is from mid of June and continues till end of September. The average annual rainfall as recorded at IMD observatory at Angul is 1277 mm. and the highest rainfall occurs in the month of August (84.0 mm with a mean rainfall of 4.4 mm for the year 2020). Around 78% of rainfall occurs during the monsoon season. The temperature varies from 5.6oC to 43.7oC. Maximum temperature is being observed in the month of May and minimum in the month of December.

8. DRAINAGE

Brahmani River, flowing approximately north to south along the eastern boundary of the Talcher coalfield, provides the main drainage of the region. This river is fed by seasonal nalas, viz. Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor and a few small nalas. From the eastern boundary of the block, the Brahmani River lies eastward at a distance of about 20 km.

Bangaru stream River drains this entire block. Bangaru Stream River emerges as seasonal third order streams in Ambapal, Natara and Kalamchhuin village areas and flows into Brahmani River. The general slope is towards north. The local drainage is mainly dendritic in nature. Entire Mining area in north is drained by Bangaru Stream, in south by Nandira Stream and east by seasonal streams. These streams are ultimately joining in the North West –South East flowing Brahmini River east of the Mining area. Small ponds are common in this block and are utilized for drinking purpose.

9. EXISTING VEGETATION

The forest growth available in the area resembles Northern Tropical Dry Deciduous Forest similar to other regions in Talcher coalfield. Dominant tree species include Sal (*Shorea robusta*), Mahua (*Madhuca indica*), Neem (*Azadirachta indica*), Teak (*Tectona grandis*), Jamun (*Syzygium cumini*), and Mango (*Mangifera indica*)

The vegetation of the applied area is composed of Sal (*Shorea robusta*), Mahua (*Madhuca indica*), Neem (*Azadirachta indica*), Teak (*Tectona grandis*), Jamun (*Syzygium cumini*), Mango (*Mangifera indica*), Pipal (*Ficus religiosa*), Khajur (*Phoenix dactylifera*), Kusum (*Schleichera oleosa*), Tendu (*Diospyros melanoxylon*), Haldu (*Adina cordifolia*), Ber (*Ziziphus mauritiana*), and Saj (*Terminalia tomentosa*). **Sal (*Shorea robusta*)** is noted as the predominant species within the area

10. RAINFALL

There is a wide variation of rainfall in the catchment area and around 10 kms radius of buffer zone of this mine. The average annual rainfall of this mine area is affected by steep hills, forest cover etc. The average annual rainfall of last 10 years comes to 1317.494 mm. in Angul block and 1437.95 mm. in Talcher block.

Table 1: Monthly Rainfall Data of Angul Block (in mm)
Average Rainfall = 1317.494 mm

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec | Total |
|------|------|------|-------|------|-------|-------|-------|-------|-------|-------|------|------|---------|
| 2014 | 0.00 | 25.2 | 44.84 | 23.2 | 143.4 | 76.4 | 450.2 | 258.6 | 301.3 | 125 | 0.00 | 0.00 | 1448.14 |
| 2015 | 29.8 | 4 | 0.00 | 30.5 | 31 | 187 | 374.6 | 336.3 | 164 | 29.8 | 0.00 | 27.4 | 1214.4 |
| 2016 | 0.00 | 17 | 65.2 | 12.2 | 96 | 137.8 | 224.2 | 438.4 | 155.4 | 81.8 | 7.6 | 0.00 | 1235.6 |
| 2017 | 2.4 | 0.00 | 20.6 | 3.8 | 23.6 | 184.4 | 184.2 | 205.6 | 154.8 | 57.4 | 30.6 | 0.00 | 867.4 |
| 2018 | 0.00 | 0.00 | 0.8 | 92.8 | 133.8 | 261.4 | 297 | 301.2 | 272.6 | 114.8 | 0.6 | 64.6 | 1539.6 |

| | | | | | | | | | | | | | |
|----------------|------|-------|--------|-------|-------|--------|--------|--------|--------|--------|------|------|-----------------|
| 2019 | 0.00 | 30.2 | 19 | 44.6 | 94.8 | 140.4 | 234.6 | 219 | 268 | 191.4 | 0.00 | 4 | 1246 |
| 2020 | 13.8 | 72.6 | 79 | 98.8 | 93.8 | 227.6 | 147.2 | 474.5 | 108.4 | 270.8 | 0.00 | 0.00 | 1586.5 |
| 2021 | 0.00 | 0.00 | 20.8 | 19 | 145 | 271.8 | 230.6 | 111 | 415.4 | 24.6 | 52.4 | 70 | 1360.6 |
| 2022 | 51.2 | 3.9 | 0.00 | 0.00 | 86.6 | 160.6 | 333.8 | 446.8 | 85.2 | 49.6 | 0.00 | 0.00 | 1217.7 |
| 2023 | 0.00 | 0.00 | 46.6 | 42.2 | 41.6 | 361.4 | 311 | 269 | 312 | 68 | 1 | 6 | 1459 |
| Average | 9.72 | 15.29 | 29.684 | 36.71 | 88.96 | 200.88 | 278.74 | 306.04 | 223.71 | 101.32 | 9.22 | 17.2 | 1317.494 |

Source: <https://rainfall.nic.in/>

Table 2: Monthly Rainfall Data of Talcher Block (in mm)
Average Rainfall = 1437.95 mm

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|----------------|------|------|------|-------|-------|-------|-----|-----|-------|-------|-----|------|----------------|
| 2014 | 0 | 26 | 40 | 6 | 164 | 51 | 687 | 338 | 276 | 95 | 0 | 0 | 1683 |
| 2015 | 18 | 5 | 0 | 25 | 24 | 252 | 398 | 267 | 187 | 35 | 0 | 63 | 1274 |
| 2016 | 0 | 17 | 86 | 0 | 67.2 | 80 | 335 | 433 | 132 | 94 | 2 | 0 | 1246.2 |
| 2017 | 0 | 0 | 47 | 0 | 97 | 152 | 170 | 156 | 157 | 166 | 22 | 0 | 967 |
| 2018 | 0 | 0 | 0 | 85.3 | 27 | 148 | 292 | 254 | 441 | 165 | 15 | 48 | 1475.3 |
| 2019 | 0 | 22 | 9 | 10 | 128 | 219 | 134 | 326 | 344 | 121 | 0 | 5 | 1318 |
| 2020 | 58 | 72 | 78 | 72 | 53 | 399 | 293 | 662 | 224 | 203 | 0 | 0 | 2114 |
| 2021 | 0 | 0 | 4 | 8 | 172 | 168 | 301 | 112 | 684 | 70 | 18 | 33 | 1570 |
| 2022 | 45 | 7 | 0 | 0 | 103 | 176 | 228 | 365 | 169 | 115 | 0 | 0 | 1208 |
| 2023 | 0 | 0 | 54 | 29 | 19 | 176 | 422 | 357 | 269 | 160 | 30 | 8 | 1524 |
| Average | 12.1 | 14.9 | 31.8 | 23.53 | 85.42 | 182.1 | 326 | 327 | 288.3 | 122.4 | 8.7 | 15.7 | 1437.95 |

Source: <https://rainfall.nic.in/>

11. FACTORS RESPONSIBLE FOR SILTATION

Siltation is an inherent problem with ponds, lakes and almost all types of water reservoirs world over. Siltation occurs due to deposition or settling of soil eroded from the land mass, decaying fallen leaves, grass and other vegetative materials and decomposed organic materials settled on pond bottoms. Soil erosion may be attributed as the primary factor responsible for pond siltation in this area. Higher gradient and excess rainfall are the most common reasons of soil erosion. Erosion of Soil occurs from the waste dumps, excavated areas and naturally denuded ground surface. However, looking into the current problem of siltation of the village ponds, the major factors are the surface runoff containing silt particles entering into the pond. As the age of the ponds increases, new layers of silt accumulate on the older ones and the silt layers become thicker. Finally, the depth of the pond decreases and it loses its water storage capacity. At this time, it needs to be de-silted to recover. The best practice against siltation is to de-silt the bottom of the pond at regular intervals as well as taking adequate preventive measures.

12. DETAIL OF PONDS/ WATER BODIES WITHIN 5 KMS BUFFER AREA

For the purpose as mentioned in Condition No. (8) of the Stage-I approval letter, a list of 48 village tanks/ water bodies situated within the buffer area of 5 Kms from the lease boundary is prepared based on Topographical Map. The Topographical Map showing 5 kms

buffer area of Bhubaneswari OCP is furnished as **Annexure-I**, wherein, location of 48 ponds and water bodies have been identified. The list of 48 ponds and water bodies with corresponding coordinates is provided as **Annexure-II**.

13. POSSIBILITY OF SILTATION OF THE VILLAGE PONDS / WATER BODIES DUE TO MINING ACTIVITIES

Entire Mining area in north is drained by Bangaru Stream, in south by Nandira Stream and east by seasonal streams. These streams are ultimately joining in the North West –South East flowing Brahmini River east of the Mining area. The local drainage is mainly dendritic in nature.

As far as village ponds within 05 kms buffer zone of the lease are concerned, it is observed that 48 tanks / water bodies are located in other mines and mining projects.

MCL do undertake to carry out desilting activities in those all these 48 nos. of tanks/water bodies identified on the basis of Topographical Map as stipulated under Condition No.8 of the Stage I Forest Clearance. Besides MCL do further undertake to carry out desilting in any other tanks/water bodies identified in course of time in future too.

14. METHODOLOGY

It is proposed to carry out the total de-siltation of the tanks/water bodies every five years during summer when the ponds shall dry up exposing the silts. The dried silt shall be removed manually or mechanically based on the ground condition. In case of mechanical removal of silt, small excavators such as back-hoe / small hydraulic shovels or pay loader, depending upon the quantity of silt accumulation shall be used.

The work shall comprise: -

- a) Total de-siltation in the five-year period.
- b) Implementing preventive measures during the following four years to minimize re-siltation of the ponds.

It is proposed that the ponds having accumulation of over 1000 m³ shall be de-silted by mechanical means and the rest shall be handled manually. It is proposed to deploy one 0.9 m³ back hoe with one 10 tonne tipper for de-silting of the pond in a period of two-three days. The machines shall be deployed in a planned manner to complete the work in a shortest time frame. Necessary advice of BDO, Angul and Talcher & Panchayat Sarpanch will be taken into account.

In case of smaller ponds, where the accumulation of silt is very small, the de-siltation operation shall be done manually by engaging sufficient manpower.

The ponds shall be allowed to dry up completely during the early summer i.e. during March and April followed by de-siltation in the above-described manner.

a) 1st Year Plan & Management:

The first-year work shall also comprise the following preventive measures to minimize siltation.

- Providing embankment to the ponds where ever necessary.
- Strengthening the existing pond embankment to check external flow of surface run-off in to the pond.
- Regular removal of aquatic weeds and polythene bags / bottle thrown by villagers.

b) Subsequent 2 Years Plan and Management: In the subsequent 2 years, the rate of siltation shall be negligible, which can be dealt by manual methods using the local labourers. This will also otherwise help in employment generation.

c) Preventive Measures & Maintenance: It is essential to take up preventive measures in order to minimize re-siltation of the ponds.

d) Dewatering of village pond: This will be carried out by engaging dewatering pump, if necessary.

e) De-silting: After pumping out the water from the pond, silts are to be removed either manually by deploying labour or excavator & dumper combination.

f) Earthwork Excavation: Wherever required, soil has to be removed for deepening the pond to increase water holding capacity of the pond.

15. INSPECTION AND MONITORING

Proper inspection, monitoring and evaluation will be done in-house by designated authorities of MCL under supervision of Forest Department.

16. MOTIVATION OF PEOPLE

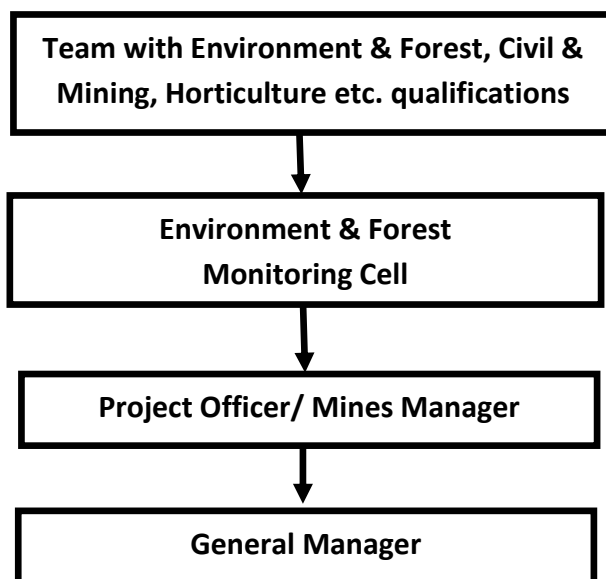
The villagers / VSS Committee members of the adjoining villages are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the adjoining villages and resolution will be passed to support plantation activities. For motivation of the villagers/ VSS Committee members, they will be provided incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure for this purpose.

17. EXECUTING AGENCY

The work will be executed by the User Agency i.e. M/s Mahanadi Coalfields Limited through dedicated departments manned by technically qualified persons with outsourced man and machinery as and when required. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural

facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department

EXECUTING AGENCY



REQUIREMENT OF FUNDS

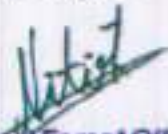
As and when required appropriate expenditure shall be incurred in accordance to prevailing Govt. approved rates in consultation with concerned village committees under the supervision of State Forest Dept. MCL is providing herewith an Undertaking to carry out desilting of these village tanks and other water bodies located within 05 (Five) KM from the mining lease boundary so as to mitigate the impact of siltation of such tanks/water bodies.

UNDERTAKING

UNDERTAKING FOR UNDERTAKING DE-SILTING OF VILLAGE TANKS AND OTHER WATER BODIES LOCATED WITHIN 05 KM FROM THE MINE LEASE BOUNDARY SO AS TO MITIGATE THE IMPACT OF SILTATION OF SUCH TANKS/ WATER BODIES IN CONSULTATION WITH THE STATE FOREST DEPT.

M/s Mahanadi coalfields limited. do hereby undertake to execute of village tanks and other water bodies located with in 05(Five) Kms from the mine lease boundary of Bhubaneswar OCP as per Govt approved rates in consultation with and under the supervision of state forest Dept.

Countersigned

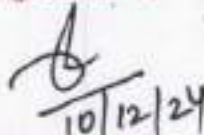


Divisional Forest Officer
Divisional Forest Officer
Angul Division

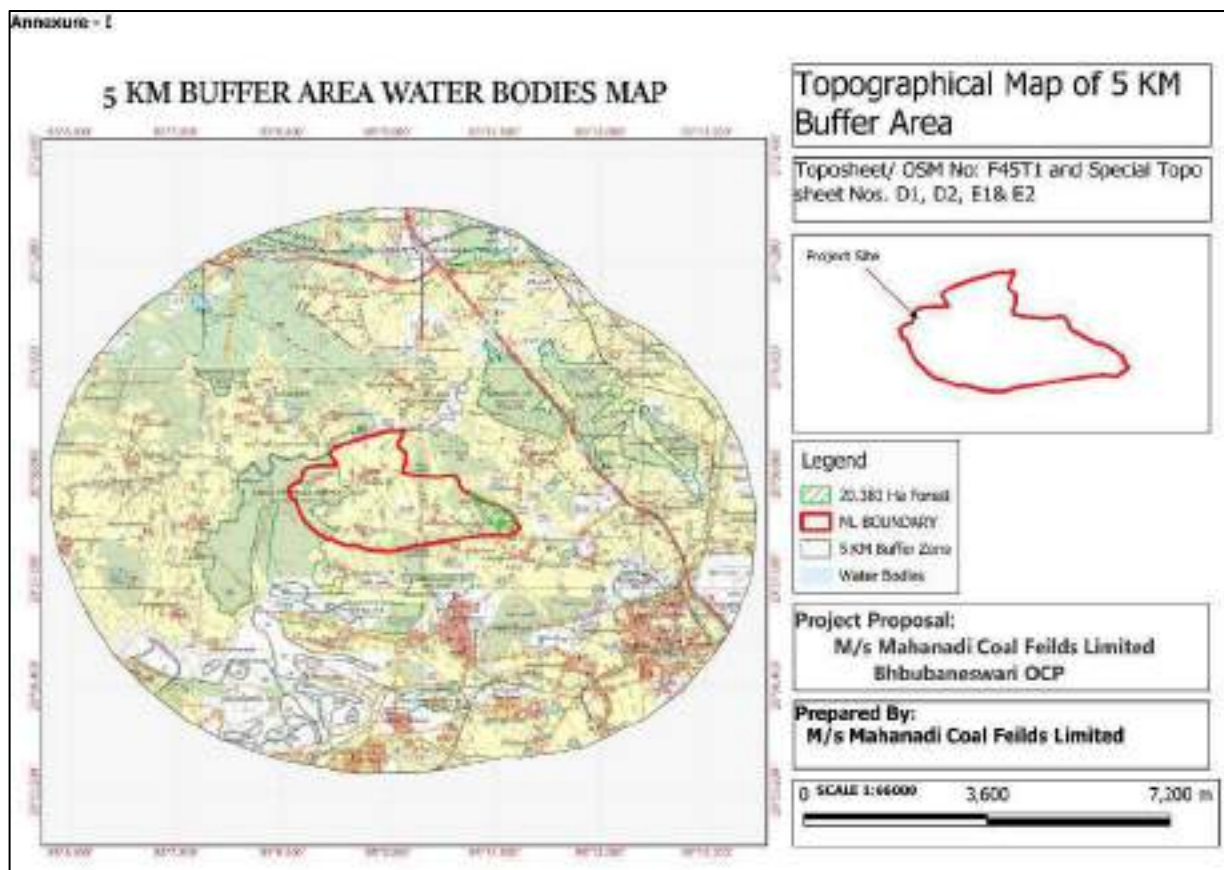
General Manager
Bhubaneswar Area

ସହ ସମ୍ବେଦକ
Divisional Manager
ए.सी.एल. भुवनेश्वर क्षेत्र
MCL, Bhubaneswar Area

Approved.


10/12/24

Regional Chief Conservator
of Forests, Angul Circle.



(Map Showing 48 village tanks/ water bodies are attached as Annexure-1)

| Coordinates of Water Bodies | | | |
|-----------------------------|----------------|----------------|---------------|
| Pond no | Coo-ordinate | | Village name |
| 1 | 21° 1' 25.68" | 85° 9' 56.72" | Sunakhani |
| 2 | 21° 1' 32.1" | 85° 9' 58.54" | Sunakhani |
| 3 | 20° 59' 9.29" | 85° 11' 31.33" | Anandapur |
| 4 | 20° 59' 6.14" | 85° 11' 12.85" | Kandhal |
| 5 | 20° 58' 57.18" | 85° 11' 9.6" | Kandhal |
| 6 | 20° 58' 0.79" | 85° 11' 16.51" | Madanmohanpur |
| 7 | 20° 58' 45.35" | 85° 12' 22.86" | Banamalipur |
| 8 | 21° 0' 8.96" | 85° 7' 53.8" | Ekdal |
| 9 | 21° 0' 38.94" | 85° 7' 34.5" | Ekdal |
| 10 | 21° 1' 10.04" | 85° 7' 46.28" | Sibarampur |
| 11 | 21° 1' 6.2" | 85° 7' 39.32" | Sibarampur |
| 12 | 20° 59' 21.01" | 85° 7' 52.07" | Hiloi |
| 13 | 20° 56' 39.99" | 85° 12' 42.57" | Hatatota |
| 14 | 20° 58' 39.25" | 85° 12' 2.51" | Talabeda |
| 15 | 20° 56' 6.48" | 85° 11' 51.53" | Handidhua |
| 16 | 20° 58' 39.15" | 85° 12' 2.58" | Talabeda |
| 17 | 20° 56' 7.49" | 85° 11' 45.72" | Handidhua |
| 18 | 20° 59' 13.32" | 85° 13' 4.3" | Scotlandpur |
| 19 | 20° 58' 36.37" | 85° 12' 3" | Talabeda |
| 20 | 20° 56' 11.36" | 85° 11' 31.43" | Ghantapada |
| 21 | 20° 55' 39.36" | 85° 11' 15.48" | Chalagarh |
| 22 | 20° 55' 51.1" | 85° 11' 25.45" | Chalagarh |
| 23 | 20° 59' 5.01" | 85° 13' 14.25" | Kishoripal |
| 24 | 20° 59' 46.4" | 85° 13' 4.39" | Kankili |
| 25 | 20° 59' 40.84" | 85° 13' 10.32" | Kankili |
| 26 | 20° 59' 40.82" | 85° 13' 10.33" | Kankili |
| 27 | 20° 59' 6.85" | 85° 12' 32.8" | Pramodprasad |
| 28 | 20° 59' 2.22" | 85° 12' 42.61" | Pramodprasad |
| 29 | 20° 59' 20.72" | 85° 12' 18.92" | Bidyadharpur |
| 30 | 20° 58' 45.35" | 85° 12' 22.86" | Banamalipur |
| 31 | 20° 58' 7.86" | 85° 12' 1.6" | Balunga |
| 32 | 20° 58' 12.06" | 85° 12' 10.34" | Balunga |
| 33 | 20° 58' 18.48" | 85° 12' 17.58" | Talabeda |
| 34 | 20° 59' 18.88" | 85° 8' 21.93" | Hilloi |
| 35 | 20° 56' 16.53" | 85° 12' 47.48" | Baghuabol |
| 36 | 20° 59' 27.69" | 85° 13' 23.11" | Kankili |
| 37 | 21° 0' 46.07" | 85° 10' 41.45" | Bholeswarpur |
| 38 | 21° 0' 37.67" | 85° 10' 50.83" | Bholeswarpur |
| 39 | 20° 58' 25.07" | 85° 12' 31.7" | Talabeda |
| 40 | 20° 58' 6.72" | 85° 12' 41.55" | Scotlandpur |
| 41 | 20° 59' 19.72" | 85° 8' 52.75" | Raghunathpur |
| 42 | 20° 59' 48.66" | 85° 9' 24.43" | Arakhpal |

| | | | |
|----|----------------|----------------|--------------|
| 43 | 20° 59' 38.37" | 85° 9' 49.21" | Arakhpal |
| 44 | 21° 0' 2.2" | 85° 10' 2.44" | Jadunathpur |
| 45 | 21° 0' 22.5" | 85° 10' 12.87" | Jadunathpur |
| 46 | 21° 0' 26.68" | 85° 10' 8.84" | Brajanathpur |
| 47 | 21° 0' 3.84" | 85° 9' 59.18" | Brajanathpur |
| 48 | 20°56'55.5" | 85°11'46.8" | Telisahi |

Annexure- 19

UNDERTAKING

PROPOSAL NO.:- FP/OR/MIN/155017/2022

(In compliance to Condition No. 9 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "Safety Zone Management: Following activities, at project cost, shall be undertaken by the user agency for the management of safety zone as per relevant guidelines issued by the Ministry's guidelines:".



General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एन.पी.एन. भुवनेश्वरी क्षेत्र
MCL, Bhubaneswari Area



Divisional Forest Officer
Angul, Division

Annexure- 20

UNDERTAKING

PROPOSAL NO.:- FP/OR/MIN/155017/2022

(In compliance to Condition No. 9 (i) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "User agency shall ensure demarcation of safety zone (7.5 meter strip all along the inner boundary of the mining lease area), and its fencing, protection and regeneration by erecting adequate number of 6 feet high RCC boundary pillars inscribed with DGPS coordinates with barbed wire fencing and deploying adequate number of watchers under the supervision of the. State Forest Department;"



General Manager
Bhubaneswari Area, MCL

ମହାନାଦୀ କୋଲିୟାରୀ
General Manager
ପ୍ରାଥମିକ କ୍ଷେତ୍ର ଅଫିସ
MCL, Bhubaneswari Area



Divisional Forest Officer
Angul, Division

PHOTOGRAPHS OF DGPS PILLARS IN SAFETY ZONE

General Manager

Bhubaneswari Area

General Manager
 Bhubaneswari Area
 MCL, Bhubaneswar, India

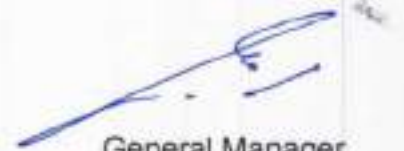
Annexure- 21

UNDERTAKING

PROPOSAL NO.:- FP/OR/MIN/155017/2022

(In compliance to Condition No. 9 (ii) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "Boundary of the safety zone of the mining lease, adjacent to habitation/roads, should be properly fenced by the user agency,".



General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एम.डी.ए. भुवनेश्वरी क्षेत्र
MCL, Bhubaneswari Area



Divisional Forest Officer
Angul, Division

Annexure- 22

UNDERTAKING

PROPOSAL NO.:- FP/OR/MIN/155017/2022

(In compliance to Condition No. 9 (iii) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "Safety zone shall be maintained as green belt around mining lease and to ensure dense canopy in the area, regeneration shall be taken up in this area by the user agency at project cost under the supervision of the State Forest Department".



General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एम.सी.एल., भुवनेश्वरी
MCL, Bhubaneswari Area



Divisional Forest Officer
Angul, Division



Office of the General Manager
(Bhubaneswari Area)
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Dist: Angul – 759103 (Odisha)
Website : www.mcl.gov.in
Email Id: cgm-bhubaneswari.mcl@coalindia.in



MCL

Annexure- 23

UNDERTAKING

PROPOSAL NO.:- FP/OR/MIN/155017/2022

(In compliance to Condition No. 9 (iv) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "The State Government and the user agency shall ensure that safety zone is maintained as per the prescribed norms."

General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एम.सी.एल. भुवनेश्वरी क्षेत्र
MCL, Bhubaneswari Area

Divisional Forest Officer
Angul, Division



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(Bhubaneswari Area)
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Annexure- 24

UNDERTAKING

PROPOSAL NO:-FP/OR/MIN/155017/2022

(In compliance to Condition No. 11 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "The cost of felling of trees shall be deposited by the User Agency with the State Forest Department".

General Manager
Bhubaneswari Area, MCL

पहल प्रबंधक
General Manager
एम.सी.एल. भुवनेश्वरी क्षेत्र
MCL, Bhubaneswari Area

Divisional Forest Officer
Angul, Division

Annexure- 25

UNDERTAKING

PROPOSAL NO.:- FP/OR/MIN/155017/2022

(In compliance to Condition No. 11 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake that "Trees should be felled in phased manner as per the requirement in the approved Mining Plan with prior permission of concerned DFO".



General Manager
Bhubaneswari Area, MCL

महानदी कोयला क्षेत्र
General Manager
एम्.सी.एल., भुवनेश्वर क्षेत्र
MCL, Bhubaneswari Area



Divisional Forest Officer
Angul, Division



Office of the General Manager
(Bhubaneswari Area)
At/Po :Dera Colliery
Dist: Angul – 759103 (Odisha)
Website :www.mcl.gov.in
Email Id: cgm-bhubaneswari.mcl@coalindia.in



Annexure- 26

UNDERTAKING

PROPOSAL NO:-FP/OR/MIN/155017/2022

(In compliance to Condition No.12 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake "The user agency shall explore the possibility of translocation of maximum number of trees identified to be felled and shall ensure that any tree felling shall be done only when it is unavoidable and that too under strict supervision of the State Forest Department".


General Manager
Bhubaneswari Area, MCL
महा प्रबंधक
General Manager
एम.सी.एल., भुवनेश्वरी क्षेत्र
MCL, Bhubaneswari Area


Divisional Forest Officer
Angul, Division

Annexure- 27

UNDERTAKING

PROPOSAL NO:-FP/OR/MIN/155017/2022

(In compliance to Condition No. 13 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake "The User Agency shall undertake mining in a phased manner after taking due care for reclamation of the mined over area. The concurrent reclamation plan as per the approved mining plan shall be executed by the User Agency from the very first year, and an annual report on implementation thereof shall be submitted to the Nodal Officer, Forest (Conservation) Act, 1980, in the concerned State Government and the concerned Regional Office of the Ministry. If it is found from the annual report that the activities indicated in the concurrent reclamation plan are not being executed by the User Agency, the Nodal Officer or the concern Addl. Principle Chief Conservator of Forests (Central) may direct that the mining activities shall remain suspended till such time, such reclamation activities area satisfactorily executed".



General Manager
Bhubaneswari Area, MCL

सहा प्रबंधक
General Manager
एम.सी.एल, भुवनेश्वरी क्षेत्र
MCL, Bhubaneswari Area



Divisional Forest Officer
Angul, Division



Office of the General Manager
(Bhubaneswari Area)
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Dist: Angul – 759103 (Odisha)
Website :www.mcl.gov.in
Email Id: cgm-bhubaneswari.mcl@coalindia.in



MCL

Annexure- 28

UNDERTAKING

PROPOSAL NO:-FP/OR/MIN/155017/2022

(In compliance to Condition No. 14 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake "The User Agency shall comply with the Hon'ble Supreme Court order on re grassing, and re-grass the mining area and any other areas which may have been disturbed due to mining to restore them to a condition which is fit for growth of fodder, flora, fauna, etc. in a timely manner".

General Manager
Bhubaneswari Area, MCL

ସହା ମନେ
General Manager
एम.सी.एल., भुवनेश्वरी क्षेत्र
MCL Bhubaneswar Area

Divisional Forest Officer
Angul, Division

Annexure- 29

UNDERTAKING

PROPOSAL NO:-FP/OR/MIN/155017/2022

(In compliance to Condition No. 15 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake "Period of diversion of the said forest land under this approval shall be for a period co-terminus with the period of the mining lease proposed to be granted under the Mines and Minerals (Development and Regulation) Act, 1957, as amended and the Rules framed there-under".





General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एम. सी. एल. भुवनेश्वरी क्षेत्र
MCL, Bhubaneswari



Divisional Forest Officer
Angul, Division

| | | |
|--|--|---|
|  | <p>Office of the General Manager (Bhubaneswari Area) At/Po : Dera Colliery Dist: Angul – 759103 (Odisha) Website : www.mcl.gov.in Email Id: cgm-bhubaneswari.mcl@coalindia.in</p> |  |
|--|--|---|

Annexure- 30

UNDERTAKING

PROPOSAL NO:-FP/OR/MIN/155017/2022

(In compliance to Condition No. 16 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake "The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required".


General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एम सी एम, भुवनेश्वरी क्षेत्र
MCL, Bhubaneswari Area


Divisional Forest Officer
Angul, Division

Annexure- 31

UNDERTAKING

PROPOSAL NO:-FP/OR/MIN/155017/2022

(In compliance to Condition No. 17 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake "No labour camp shall be established on the forest land and the User Agency shall provide fuels preferably alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas".



General Manager
Bhubaneswari Area, MCL

मह प्रबंधक
General Manager
एच.सी.एल., भुवनेश्वरी क्षेत्र
MCL, Bhubaneswari Area



Divisional Forest Officer
Angul, Division

Annexure- 32

UNDERTAKING

PROPOSAL NO:-FP/OR/MIN/155017/2022

(In compliance to Condition No. 18 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake "The boundary of the diverted forest land, mining lease and safety zone, as applicable, shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS coordinates".



General Manager
Bhubaneswari Area, MCL

महानदी कोयला
General Manager
एच.सी.एल., भुवनेश्वरी क्षेत्र
MCL, Bhubaneswari Area



Divisional Forest Officer
Angul, Division

Annexure- 33

UNDERTAKING

PROPOSAL NO:-FP/OR/MIN/155017/2022

(In compliance to Condition No. 19 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake "The layout plan of the mining plan/ proposal shall not be changed without the prior approval of the Central Government and the forest land shall not be used for any purpose other than that specified in the proposal".



General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एम.ई.ए.ए.ए., भुवनेश्वरी क्षेत्र
MCL, Bhubaneswari Area



Divisional Forest Officer
Angul, Division



Office of the General Manager
(Bhubaneswari Area)
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Website : www.mcl.gov.in
Email Id: cgm-bhubaneswari.mcl@coalindia.in



MCL

Annexure- 34

UNDERTAKING

PROPOSAL NO:-FP/OR/MIN/155017/2022

(In compliance to Condition No. 20 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake "The forest land proposed to be diverted shall under no circumstances be transferred to any other agency, department or person without prior approval of the Central Government".

General Manager
Bhubaneswari Area, MCL

मह प्रबंधक
General Manager
एप सी एन, एन. डी. ३३
MCL, Bhubaneswari Area

Divisional Forest Officer
Angul, Division

UNDERTAKING

PROPOSAL NO:-FP/OR/MIN/155017/2022

(In compliance to Condition No. 21 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake "No damage to the flora and fauna of the adjoining area shall be caused".



General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एम.सी.एल, भुवनेश्वरी क्षेत्र
MCL, Bhubaneswari Area



Divisional Forest Officer
Angul, Division



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Email Id: cgm-bhubaneswari.mcl@coalindia.in



MCL

Annexure- 36

UNDERTAKING

PROPOSAL NO:-FP/OR/MIN/155017/2022

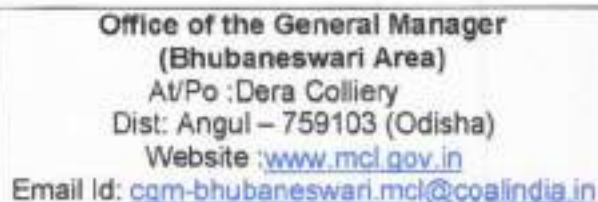
(In compliance to Condition No. 22 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake "Any other condition that the concerned Regional Office of this Ministry may stipulate with the approval of competent authority in the interest of conservation, protection and development of forests & wildlife".

General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एम.सी.एल, भुवनेश्वर क्षेत्र
MCL, Bhubaneswari Area

Divisional Forest Officer
Angul, Division



Nitin
Divisional Forest Officer
Angul, Division


Annexure- 38

UNDERTAKING

PROPOSAL NO:-FP/OR/MIN/155017/2022

(In compliance to Condition No. 24 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake "Violation of any of these conditions will amount to violation of Forest (Conservation) Act, 1980 and action would be taken as prescribed in para 8-18/2002-FC(vol) I/82877/2024 1.16 of Chapter 1 of the Consolidated Guidelines And Clarifications Issued Under Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and Van (Sanrakshan Evam Samvardhan) Rules, 2023 issued by this Ministry's letter No. 5-2/2017-FC dated 29.12.2023".



General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एम्.सी.एल., भुवनेश्वर क्षेत्र
MCL, Bhubaneswari Area



Divisional Forest Officer
Angul, Division

Annexure- 39

UNDERTAKING

PROPOSAL NO:-FP/OR/MIN/155017/2022

(In compliance to Condition No. 25 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake "The User Agency shall submit the annual self -compliance report in respect of the above stated conditions to the State Government, concerned Regional Office and to this Ministry by the end of March every year regularly".



General Manager
Bhubaneswari Area, MCL

महा प्रबंधक
General Manager
एम.सी.एल., भुवनेश्वर क्षेत्र
MCL, Bhubaneswari Area



Divisional Forest Officer
Angul, Division



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Website : www.mcl.gov.in
Email Id: cgm-bhubaneswari.mcl@coalindia.in



Annexure- 40

UNDERTAKING

PROPOSAL NO:-FP/OR/MIN/155017/2022

(In compliance to Condition No. 26 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Bhubaneswari OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-18/2022-FC(vol) Dt. 24-09-2024)

I do hereby undertake "The compliance report shall be uploaded on e-portal (<https://parivesh.nic.in/>)".

General Manager
Bhubaneswari Area, MCL

सह प्रबंधक
General Manager
एच सी एन, पुर्नपुरी क्षेत्र
MCL, Bhubaneswari Area

Divisional Forest Officer
Angul, Division