CENTRAL COALFIELDS LIMITED
(A subsidiary of Coal India Limited)
Office of the Project Officer, KDH OCP
North Karanpura Area,P.O: Dakra 829210,
Dist: Ranchi (Jharkhand).

Ref. No.: PO/KDH/Forest/2026-27/ 34 Date: 22.04.2026

To,
The PCCF cum Executive Director
Wasteland Development Board,
Government Of Jharkhand,
Van Bhavan,.
Doranda, Ranchi

Sub: **Regarding proposal for non-forestry use of 126.72 ha (84.35 ha PF and 42.37 ha GMJJ) of forest land KDH OCP, NK Area, CCL.**

Respected Sir,

This is to humbly bring to your kind information KDH OCP, CCL has been accorded Stage -I approval vide reference no 8/62/2018-FC dated 27.02.2023 for an area of 126.72 ha (84.35 ha PF and 42.37 Ha GMJJ).

The initial compliance of Stage-I, submitted by the project, after due scrutiny were forwarded to MoEF&CC New Delhi vide letter ref no Van bhoomi-06/2017- 2046 dated 12.06.2025 from GoJ to MoEF&CC, New Delhi.

Subsequently, EDS from MoEF&CC were raised vide letter ref no 8/62/2018-FC 30.06.2025.

Thereafter, the project has submitted the compliances (with requisite annexures) of EDS raised vide letter ref no PO(KDH)/Forest/2025-26/279 dated 31.10.2025.

After due process, the said compliances have been forwarded to GoJ from your good office vide letter ref no 137 dated 17.02.2026. Thereafter the proposal has also been forwarded to MoEF&CC from GoJ vide letter ref no Van bhoomi-06/2017- 895 dated 10.03.2026

Dear Sir, this to further submit that the hard copies of the proposal with compliances have been forwarded and subsequently received to MoEF&CC, however due to some technical issues in PARIVESH 1.0 portal the said proposal was not forwarded electronically. After perusals with NIC the issue has been resolved, and the proposal is currently showing to be pending with User Agency due to EDS raised by HO for Stage-II.

22.04.26
परियोजना पदाधिकारी
केoडीoएचo परियोजना

Thus, the project is uploading the compliances (with requisite Annexures) of EDS raised in PARIVESH 1.0 portal.

It is humbly requested that the proposal may kindly be forwarded from your good office so that the Stage-II approval for KDH OCP may be accorded.

Thanking You.

Yours Faithfully

22.04.26

Project Officer (KDH OCP)
NK Area, Dakra

परियोजना पदाधिकारी
के0डी0एच0 परियोजना

Enclosure : As mentioned above

8/62/2018-FC

I/38990/2023

Government of India
Ministry of Environment, Forest and Climate Change
(Forest Conservation Division)
****

Indira Paryavaran Bhawan,
Jor Bag Road, Aliganj,
New Delhi – 110003.
Dated: 27th February, 2023

To

The Principal Secretary (Forests),
Government of Jharkhand,
Ranchi.

Sub: Proposal for non-forestry use of 126.72 ha (84.35 ha PF and 42.37 ha Jungle Jhari) of forest land for KDH Open Cast Mine in favour of M/s Central Coalfields Limited (CCL) in Ranchi District, Jharkhand – reg.

Madam/Sir,

I am directed to refer to the Government of Jharkhand's letter no. Van Bhumi-06/2017/3422/V.P. dated 13.08.2018 on the above subject seeking prior approval of the Central Government under Section 2 of the Forest (Conservation) Act, 1980 and letter no. Van Bhumi-06/2017-1201/V.P. dated 22.04.2022 and letter No. Vanbhumi-06/2017-2426-V.P. dated 22.08.2022 forwarding additional information as sought by the Ministry vide its letter of even number dated 22.08.2019 and 22.06.2022 respectively and to say that the proposal has been examined by the Forest Advisory Committee constituted by the Central Government under Section-3 of the aforesaid Act.

After careful examination of the proposal of the State Government and on the basis of the recommendations of the Forest Advisory Committee, and approval of the same by the competent authority of the MoEF&CC, New Delhi, the Central Government hereby accords '**In-principle/Stage-I**' approval under Section - 2 of the Forest (Conservation) Act, 1980 for non-forestry use of 126.72 ha (84.35 ha PF and 42.37 ha Jungle Jhari) of forest land for KDH Open Cast Mine in favour of M/s Central Coalfields Limited (CCL) in Ranchi District, Jharkhand subject to fulfilment of the following conditions:

A. Conditions which need to be complied prior to handing over of forest land by the State Forest Department and compliance is to be submitted prior to Stage-II approval :-

1. *As per the approved Mining plan, an additional forest area of 135.91 ha is required for the expansion of the project. However, the instant proposal has been submitted for 126.72 ha only, excluding the area of 9.19 ha forest land which as per approved mining plan is earmarked as safety zone. The State government shall either revise the Mining plan or seek the diversion of the 9.19 ha. for the purpose of safety zone;*

2. *The State Govt. shall submit a detailed status report of the approvals under FCA,1980 of the forest land involved in the entire lease area. The forest areas for which a valid approval under FCA, 1980 is not available shall not be used before a valid approval under FCA,1980 for the same is obtained;*

27/02/23

3. The cost of compensatory afforestation at the prevailing wage rates as per compensatory afforestation scheme and the cost of survey, demarcation and erection of permanent pillars, if required on the CA land, shall be deposited in advance with the Forest Department by the user agency. The CA will be maintained for 10 years. The

scheme may include afforestation of indigenous species with appropriate provision for anticipated cost increase for works scheduled for subsequent years;

4. The User Agency shall transfer the funds towards the cost of Net Present Value (NPV) of the forest land being diverted under this proposal in accordance with the MoEF&CC guidelines dated 6.01.2022 read with guidelines dated 19.01.2022;

5. Compensatory levies to be realized from the User Agency under the project shall be transferred/ deposited, through e-challan, in to the account of CAMPA pertaining to the State concerned through e-portal (*https://parivesh.nic.in/*);

6. The State Government shall complete settlement of rights, in term of the Scheduled Tribes and Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, if any, on the forest land to be diverted and submit the documentary evidence, along with compliance of Stage-I approval, as prescribed by this Ministry's letter No. 11-9/1998-FC (Pt.) dated 03.08.2009 read with 05.07.2013, in support thereof;

7. 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 de-silting of these village tanks and other water bodies so as to mitigate the impact of siltation of such tanks/water bodies. A detailed plan for de-silting of identified ponds and water bodies prepared in consultation with forest department shall be submitted;

8. 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 Stage II approval;

9. The compliance report shall be uploaded on e-portal (*https://parivesh.nic.in/*).

B. Conditions which need to be complied on field after handing over of forest land to the user agency by the State Forest Department but the compliance in form of undertaking shall be submitted prior to Stage-II approval:-

1. Legal status of the diverted forest land shall remain unchanged;
2. *Wildlife Management plan shall be prepared and implemented at the cost of the user agency. The approved Wildlife management plan shall be submitted and the applicable cost shall be deposited as per the guidelines issued by the Ministry in this regard;*
3. Compensatory afforestation over degraded forest land, double in extent to the forest land being diverted, shall be raised by the State Forest Department at the project cost within three years from the date of grant of Stage - II approval;
4. 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;
5. 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;
6. Trees should be felled in phased manner as per the requirement in the approved Mining Plan with prior permission of concerned DFO;

27/02/23

7. 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;
8. 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;
9. 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;
10. The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;
11. 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;
12. 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;
13. 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 Stage-I approval:

27/02/23

i. Mitigative measures to minimize soil erosion and choking of stream shall be implemented within a period of three year with effect from the issue of Stage-II clearance in accordance with the approved Plan in consultation with the State Forest Department.
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;
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;
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
v. No damage shall be caused to the top-soil and the user agency will follow the top soil management plan.

14. The User agency either himself or through the State Forest Department shall undertake gap planting and soil & 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 shall be prepared and submitted to MoEF&CC;

15. **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:

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 coordinates with barbed wire fencing and deploying adequate number of watchers under the supervision of the. State Forest Department;
ii. Boundary of the safety zone of the mining lease, adjacent to habitation/roads, should be properly fenced by the user agency;
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;
iv. Afforestation on degraded forest land to be selected elsewhere, measuring one and a half times the area under safety zone, shall also be done at the project cost under the supervisions of the State Forest Department. The degraded forest land (DFL) so selected will be informed to the MoEF& CC with shape files before Stage-II approval and afforestation will be done within three years from the date of Stage-II clearance and maintained thereafter in accordance with the approved Plan in consultation with the State Forest Department; and
v. The State Government and the user agency shall ensure that safety zone is maintained as per the prescribed norms;

16. The cost of felling of trees shall be deposited by the User Agency with the State Forest Department;

17. 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;

18. 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;

19. No damage to the flora and fauna of the adjoining area shall be caused;

20. 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;

27/02/23

21. 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;

22. The user agency shall comply all the provisions of the all 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; and

23. Violation of any of these conditions will amount to violation of Forest (Conservation) Act, 1980 and action would be taken as prescribed in para 1.21 of Chapter 1 of the Handbook of comprehensive guidelines of Forest (Conservation) Act, 1980 as issued by this Ministry's letter No. 5-2/2017-FC dated 28.03.2019.

After receipt of compliance report on fulfilment of the conditions mentioned above, the proposal shall be considered for final approval under Section-2 of the Forest (Conservation) Act, 1980. Transfer of forest land shall not be affected till final approval is granted by the Central Government in this regard.

Yours faithfully,

23/02/23

(Suneet Bhardwaj)
Assistant Inspector General of Forests

Copy to:-

1. The Principal Chief Conservator of Forests, Government of Jharkhand, Ranchi;
2. The Regional Officer, Integrate Regional Office of the MoEF&CC at Ranchi;
3. The Nodal Officer (FCA), O/o PCCF, Government of Jharkhand, Ranchi;
4. User Agency;
5. Monitoring Cell, Forest Conservation Division, MoEF&CC, New Delhi.

झारखण्ड सरकार
वन, पर्यावरण एवं जलवायु परिवर्तन विभाग

पत्र संख्या–वन भूमि–06/2017–2046 व०प०, राँची, दिनांक–12/06/2025

प्रेषक,

जलज कुमार,
विशेष कार्य पदाधिकारी

सेवा में,

सहायक वन महानिरीक्षक,
भारत सरकार,
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय,
इन्दिरा पर्यावरण भवन, अलीगंज, जोरबाग रोड,
नई दिल्ली–110003

Ministry of Env. Forest & CC
RECEIVED
18 JUN 2025
C.R. Section

विषय :– सी0सी0एल0 के नया प्रस्ताव के0डी0एच0 परियोजना हेतु 126.72 हे वनभूमि (84.35 हे0 अधिसूचित वनभूमि तथा 42.37 हे0 गैर मजरूआ जंगल–झाड़ी भूमि) अपयोजन का प्रस्ताव के संबंध में।

प्रसंग :– भवदीय पत्र संख्या–8/62/2018-FC दिनांक–27.02.2023

महाशय,

निदेशानुसार उपर्युक्त विषयक प्रासंगिक पत्र के आलोक में प्रधान मुख्य वन संरक्षक–सह–कार्यकारी निदेशक, बंजर भूमि विकास बोर्ड, झारखण्ड, राँची के पत्रांक–367 दिनांक–06.05.2025 से प्राप्त स्टेज–I की शर्तों का अनुपालन प्रतिवेदन की छायाप्रति (अनुलग्नक सहित) संलग्न है।

अनुरोध है कि विषयक प्रस्ताव पर अग्रत्तर कार्रवाई करने की कृपा की जाय।

अनु0–यथोक्त।

विश्वासभाजन

12/6/2025
(जलज कुमार)
विशेष कार्य पदाधिकारी

झारखण्ड सरकार
वन, पर्यावरण एवं जलवायु परिवर्तन विभाग

पत्र संख्या–वन भूमि–06/2017– व०प०, राँची, दिनांक–

प्रेषक,

जलज कुमार,
विशेष कार्य पदाधिकारी

सेवा में,

सहायक वन महानिरीक्षक,
भारत सरकार,
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय,
इन्दिरा पर्यावरण भवन, अलीगंज, जोरबाग रोड,
नई दिल्ली–110003

विषय :– सी0सी0एल0 के नया प्रस्ताव के0डी0एच0 परियोजना हेतु 126.72 हे वनभूमि (84.35 हे0 अधिसूचित वनभूमि तथा 42.37 हे0 गैर मजरूआ जंगल–झाड़ी भूमि) अपयोजन का प्रस्ताव के संबंध में।

प्रसंग :– भवदीय पत्र संख्या–8/62/2018-FC दिनांक–27.02.2023

महाशय,

निदेशानुसार उपर्युक्त विषयक प्रासंगिक पत्र के आलोक में प्रधान मुख्य वन संरक्षक–सह–कार्यकारी निदेशक, बंजर भूमि विकास बोर्ड, झारखण्ड, राँची के पत्रांक–367 दिनांक–06.05.2025 से प्राप्त स्टेज–I की शर्तों का अनुपालन प्रतिवेदन की छायाप्रति (अनुलग्नक सहित) संलग्न है।

अनुरोध है कि विषयक प्रस्ताव पर अग्रत्तर कार्रवाई करने की कृपा की जाय।

अनु0–यथोक्त।

विश्वासभाजन

ह०/–
(जलज कुमार)
विशेष कार्य पदाधिकारी

ज्ञापांक–वन भूमि–06/2017– व०प०, राँची, दिनांक–

प्रतिलिपि–उप वन महानिदेशक, भारत सरकार, पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, एकीकृत क्षेत्रीय कार्यालय, द्वितीय तल, झारखण्ड राज्य आवास बोर्ड, मुख्यालय, हरमू चौक, राँची–834002 को अनुलग्नक सहित सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

अनु0–यथोक्त।

ह०/–
विशेष कार्य पदाधिकारी

ज्ञापांक–वन भूमि–06/2017– 2046 व०प०, राँची, दिनांक– 12/06/2025

प्रतिलिपि–प्रधान मुख्य वन संरक्षक, झारखण्ड, राँची/प्रधान मुख्य वन संरक्षक–सह–कार्यकारी निदेशक, बंजर भूमि विकास बोर्ड, झारखण्ड, राँची/महाप्रबंधक (पर्यावरण एवं वन), सी0सी0एल0, दरभंगा हाउस, राँची–834029 को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

12/6/2025
विशेष कार्य पदाधिकारी

Government of India
Ministry of Environment, Forest and Climate Change
(Forest Conservation Division)
****

Indira Paryavaran Bhawan,
Jor Bag Road, Aliganj,
New Delhi – 110003
Dated: As per E-sign

To,

The Principal Secretary (Forests),
Government of Jharkhand,
Ranchi.

Subject: Proposal for non-forestry use of 126.72 ha (84.35 ha PF and 42.37 ha Jungle Jhari) of forest land for KDH Open Cast Mine in favour of M/s Central Coalfields Limited (CCL) in Ranchi District, Jharkhand State– regarding.

Madam/Sir,

I am directed to refer to the Government of Jharkhand letter No. Van Bhumi-06/2017/2046/V.P. dated 12.06.2025 on above subject submitting compliance report of the conditions stipulated in in-principle approval dated 27.02.2023 and to say that after examination of the compliance report the following shortfalls has been observed:

i. In compliance of condition no. A (1) of Stage-I approval, the State Government has informed that the user Agency has revised the mining plan and excluded the 9.19 ha forest land which was earmarked for safety zone as per CCL Board approval. However, the copy of revised approved mining plan has not been submitted. The same needs submission along with the comparative analysis of the land use approved earlier and the land use proposed as per revised mining plan.

ii. In compliance of condition no. A (4) of Stage-I approval, the State Government has informed that the user agency has deposited Rs. 12,13,69,882/- against NPV in account of NA, CAMPA. However, as per details available on web portal, it has been observed that the user agency has deposited Rs. 4,20,43,162/- against NPV. The State Govt. shall therefore provide the details of the remaining amount towards NPV deposited online in CAMPA account.

iii. In compliance of condition no. A (8) of Stage-I approval, the State Government has not submitted the details (ID No.) of KML files of diverted area, the CA areas, the proposed SMC treatment area and the WLMP area uploaded on the e Green watch portal and same needs submission.

iv. In compliance of condition no. B (2) of Stage-I approval, the State Government has informed that the Wildlife Management plan has been approved. However, a copy of the approved plan has not been submitted.

The detail of funds deposited by user agency in CAMPA account in this regard may also be submitted.

v. In compliance of condition no. B (4) of Stage-I approval, the User agency has submitted an undertaking, however, the undertaking is not in consonance with the condition. The State Govt. shall ensure that the user agency shall submit an undertaking as per the said condition.

vi. In compliance of condition no. B (13) of Stage-I approval, the State Government has not submitted copy of the approved Plan/Scheme w.r.t Mitigative measures to minimize soil erosion and choking of stream and same needs submission.

vii. In compliance of condition no. B (14) of Stage-I approval, the State Government has not submitted a copy of approved Soil & Moisture Conservation Plan.

In view of above, the State Government is requested to submit the information, as indicated above, for further consideration of the proposal.

Yours sincerely,

Digitally signed by
SUNEET BHARDWAJ
Date: 30-06-2025
10:11:34

Sd/-
(Suneet Bhardwaj)
Assistant Inspector General of Forests

Copy to:

1. The PCCF (HoFF), Department of Forest, Government of Jharkhand, Ranchi;
2. The Dy. DGF (Central), Regional Office, MoEF&CC, Ranchi;
3. The Nodal Officer, Department of Forest, Government of Jharkhand, Ranchi;
4. User Agency;
5. Monitoring Cell, FC Division, MoEF & CC, New Delhi for uploading on PARIVESH portal.

कार्यालय : प्रधान मुख्य वन संरक्षक–सह–कार्यकारी निदेशक, बंजर भूमि विकास बोर्ड, झारखंड, राँची।

वन भवन, डोरण्डा, राँची, झारखंड, पिन–834002. Email ID-pccf-ednodal@gov.in

पत्रांक :– दिनांक :–

सेवा में,

सचिव,
वन, पर्यावरण एवं जलवायु परिवर्तन विभाग,
झारखण्ड सरकार, राँची।

विषय :– **सी0सी0एल0 के के0डी0एच0 परियोजना हेतु 126.72 हे0 वनभूमि (84.35 हे0 अधिसूचित वनभूमि तथा 42.37 हे0 जी0एम0 जंगल–झाड़ वनभूमि) अपयोजन का प्रस्ताव।**

प्रसंग :– 1. भारत सरकार, पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, नई दिल्ली का पत्रांक 8/62/2018-FC दिनांक 30.06.2025

2. अपर प्रधान मुख्य वन संरक्षक, राँची रीजन, राँची का पत्रांक 102 दिनांक 29.01.2026

महाशय,

उपर्युक्त विषयक संदर्भ में सूचित करना है कि भारत सरकार, पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, नई दिल्ली के प्रासंगिक पत्र–1 द्वारा सी०सी०एल० के के०डी०एच० परियोजना हेतु 126.72 हे0 (84.35 हे0 अधिसूचित वनभूमि एवं 42.37 हे0 जंगल–झाड़ वनभूमि) वनभूमि अपयोजन प्रस्ताव में स्टेज–I के समर्पित अनुपालन प्रतिवेदन पर 7 बिन्दुओं पर पृच्छा की गयी है। उक्त पृच्छा का निराकरण प्रतिवेदन अपर प्रधान मुख्य वन संरक्षक, राँची रीजन, राँची के पत्रांक 102 दिनांक 29.01.2026 (छायाप्रति संलग्न) द्वारा इस कार्यालय को समर्पित किया गया है।

अपर प्रधान मुख्य वन संरक्षक, राँची रीजन, राँची से प्राप्त प्रतिवेदन के अनुसार पृच्छा का निराकरण निम्नवत् प्रतिवेदित है :–

क्र0 सं0	भारत सरकार द्वारा की गयी पृच्छा	वन प्रमण्डल पदाधिकारी, राँची/वन संरक्षक का मंतव्य
1	In compliance of condition no. A (1) of Stage-I approval, the State Government has informed that the user Agency has revised the mining plan and excluded the 9.19 ha. forest land which was earmarked for safety zone as per CCL Board approval. However, the copy of revised approved mining plan has not been submitted. The same needs submission along with the comparative analysis of the land use approved earlier and the land use proposed as per revised mining plan.	इस संबंध में प्रयोक्ता अभिकरण द्वारा सूचित किया गया है कि पूर्व में स्वीकृत योजना में 9.19 हे० को सुरक्षित क्षेत्र चिन्हित किया गया था, लेकिन स्टेज–1 की स्वीकृति की शर्त–A (1) के अनुसार खनन योजना को संशोधित कर इस 9.19 हे0 को सुरक्षा क्षेत्र से हटाया गया। जिसकी स्वीकृति सी०सी०एल० बोर्ड द्वारा दिनांक–13.09.2023 को प्राप्त हुयी है। (अनुलग्नक–I) 9.19 हे० क्षेत्र हटाने के अलावा खनन योजना में कोई परिवर्तन नहीं किया गया है। संशोधित भूमि अध्याय की (Mining Plan) प्रति अनुलग्नक–II के रूप में संलग्न है।
2	In compliance of condition no. A (4) of Stage-I approval, the State Government has informed that the user agency has deposited Rs. 12,13,69,882/- against NPV in account of NA, CAMPA. However, as per details available on web portal, it has been observed that the user agency has deposited Rs. 4,20,43,162/- against NPV. The	इस संबंध में प्रयोक्ता अभिकरण द्वारा सूचित किया गया है कि एन०पी०भी० के रूप में प्रथम किस्त की राशि 7,93,26,720.00 रूपये कैम्पा खाते में आर०टी० जी०एस० द्वारा जमा की गई थी। भुगतान किए गए राशि की परियोजनावार विवरणी अनुलग्नक–IV के रूप में संलग्न है एवं जिसकी पुष्टि वन प्रमण्डल पदाधिकारी, राँची वन प्रमण्डल द्वारा की गयी है। जो अनुलग्नक–III के रूप में संलग्न है।

क्र0 सं0	भारत सरकार द्वारा की गयी पृच्छा	वन प्रमण्डल पदाधिकारी, राँची/वन संरक्षक का मंतव्य
	State Govt. shall therefore provide the details of the remaining amount towards NPV deposited online in CAMPA account.	चूँकि NPV की कुल राशि 12,13,69,882/– मात्र होती है। अतः द्वितीय किस्त 4,20,43,162.00 इ–चालान जेनेरेट कर ऑनलाईन जमा की गई है। (अनुलग्नक–V)
3	In Compliance of condition no. A (8) of State-l approval, the State Government has not submitted the details (ID No.) of KML files of diverted area, the CA areas, the proposed SMC treatment area and the WLMP area uploaded on the e Green watch portal and same needs submission.	इसका अनुपालन राँची वन प्रमण्डल द्वारा करते हुए अपयोजित होने वाले वन भूमि, क्षतिपूरक वनरोपण हेतु प्रस्तावित वन भूमि की विवरणी (के०एम०एल० फाईल) इ–ग्रीनवॉच पोर्टल पर अपलोड कर दी गई है, जिसकी प्रति अनुलग्नक–VI के रूप में संलग्न है। SMC treatment plan area तथा WLMP का कार्य क्षेत्र जिसपर कार्य संपादित होते हैं वह अपलोड नहीं होता है। यह क्षेत्र वार्षिक कार्य योजना निर्माण के समय ही बनता है तथा कार्य होते समय assets की विवरणी इ–ग्रीनवॉच पोर्टल पर अपलोड होता है।
4	In compliance of condition no. B (2) of Stage-l approval, the State Government has informed that the Wildlife Management plan has been approved. However, a copy of the approved plan has not been submitted. The detail of funds deposited by user agency in CAMPA account in this regard may also be submitted.	इस संबंध में प्रयोक्ता अभिकरण द्वारा स्वीकृत वन्यप्राणी प्रबंधन योजना की प्रति अनुलग्नक VII के रूप में संलग्न किया है। प्रयोक्ता अभिकरण द्वारा राशि को कैम्पा खाता में अबतक जमा नहीं किया गया है। एवं सूचित किया गया है कि स्टेज–A की स्वीकृति में लगाये गये शर्तों के कंडिका–B (Conditions which need to be complied on field after handing over of forest land to the user agency by the State Forest Department but the compliance -in form of undertaking shall be submitted prior to Stage-II approval) के अनुरूप मात्र वचनबद्धता समर्पित किया गया है।
5	In compliance of condition no. B (4) of Stage-I approval the User agency has submitted an undertaking, however, the undertaking is not in consonance with the condition. The State Govt. shall ensure that the user agency shall submit an undertaking as per the said condition.	इस संबंध में प्रयोक्ता अभिकरण द्वारा संशोधित वचनबद्धता समर्पित किया गया है। अनुलग्नक–VIII
6	In compliance of condition no. B (13) of Stage-l approval the State Government has not submitted copy of the approved Plan/Scheme w.r.t. Mitigative measures to minimize soil erosion and choking of stream and same needs submission.	इस संबंध में प्रयोक्ता अभिकरण द्वारा स्वयं निर्मित एवं उनके सक्षम पदाधिकारी द्वारा अनुशंसित Mitigative measures to minimize soil erosion and choking of stream योजना की प्रति अनुलग्नक–IX के रूप में संलग्न किया है।
7	In compliance of condition no. B (14) of Stage-I approval, the State Government has not submitted a copy of approved Soil & Moisture Conservation Plan.	इस संबंध में स्वीकृत मृदा एवं नमी योजना की प्रति प्रयोक्ता अभिकरण द्वारा अनुलग्नक–X के रूप में संलग्न किया है।

उपरोक्त पृच्छा संख्या–4 के संदर्भ में प्रयोक्ता अभिकरण द्वारा अनुमोदित वन्यप्राणी प्रबंधन योजना की राशि अबतक कैम्पा खाता में जमा नहीं की गयी है। प्रयोक्ता अभिकरण द्वारा स्टेज–1 में अधिरोपित शर्त्त का उल्लेख करते हुये सिर्फ वचनबद्धता समर्पित की गयी है।

अतः विषयगत परियोजना में अपर प्रधान मुख्य वन संरक्षक, राँची रीजन, राँची से प्राप्त निराकरण प्रतिवेदन की तीन प्रतियाँ इस पत्र के साथ संलग्न कर आवश्यक कार्रवाई हेतु भेजा जा रहा है।

संचिका में प्रधान मुख्य वन संरक्षक (HoFF), झारखण्ड का अनुमोदन प्राप्त है।

अनु0:– यथोक्त।

आपका विश्वासी,

ह0/–
प्रधान मुख्य वन संरक्षक–सह–कार्यकारी निदेशक,
बंजर भूमि विकास बोर्ड, झारखण्ड, राँची।

ज्ञापांक :– 137 दिनांक :– 17/2/2026

प्रतिलिपिः– अपर प्रधान मुख्य वन संरक्षक, राँची रीजन, राँची/वन संरक्षक प्रादेशिक अंचल, राँची/वन प्रमण्डल पदाधिकारी, राँची वन प्रमण्डल/महाप्रबंधक (पर्यावरण एवं वन), सी0सी0एल0 दरभंगा हाउस, राँची को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

17/2/26
प्रधान मुख्य वन संरक्षक–सह–कार्यकारी निदेशक,
बंजर भूमि विकास बोर्ड, झारखण्ड, राँची।

17-2

झारखण्ड सरकार
वन, पर्यावरण एवं जलवायु परिवर्तन विभाग

पत्र संख्या–वन भूमि–06/2017– 895 **व०प०, राँची, दिनांक–** 10/03/26

प्रेषक,

चन्द्रशेखर प्रसाद,
सरकार के उप सचिव।

सेवा में,

सहायक वन महानिरीक्षक,
भारत सरकार,
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय,
इन्दिरा पर्यावरण भवन, अलीगंज, जोरबाग रोड,
नई दिल्ली–110003

विषय :– सी0सी0एल0 के नया प्रस्ताव के0डी0एच0 परियोजना हेतु 126.72 हे वनभूमि (84.35 हे0 अधिसूचित वनभूमि तथा 42.37 हे0 गैर मजरूआ जंगल–झाड़ी भूमि) अपयोजन का प्रस्ताव के संबंध में।

प्रसंग :– भवदीय पत्र दिनांक–30.06.2025

महाशय,

निदेशानुसार उपर्युक्त विषयक प्रासंगिक पत्र के आलोक में प्रधान मुख्य वन संरक्षक–सह–कार्यकारी निदेशक, बंजर भूमि विकास बोर्ड, झारखण्ड, राँची के पत्रांक–137 दिनांक–17.02.2026 से प्राप्त निराकरण अनुपालन प्रतिवेदन की छायाप्रति (अनुलग्नक सहित) संलग्न है।

अनुरोध है कि विषयक प्रस्ताव पर अग्रत्तर कार्रवाई करने की कृपा की जाय।

अनु0–यथोक्त।

विश्वासभाजन

(चन्द्रशेखर प्रसाद)
सरकार के उप सचिव।

ज्ञापांक–वन भूमि–06/2017– 895 व०प०, राँची, दिनांक– 10/03/26

प्रतिलिपि–उप वन महानिदेशक (केन्द्रीय), भारत सरकार, पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, क्षेत्रीय कार्यालय, द्वितीय तल, झारखण्ड राज्य आवास बोर्ड, मुख्यालय, हरमू चौक, राँची–834002 को अनुलग्नक के साथ सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

अनु0–यथोक्त।

सरकार के उप सचिव।

ज्ञापांक–वन भूमि–06/2017– 895 व०प०, राँची, दिनांक– 10/03/26

प्रतिलिपि–प्रधान मुख्य वन संरक्षक, झारखण्ड, राँची/प्रधान मुख्य वन संरक्षक–सह–कार्यकारी निदेशक, बंजर भूमि विकास बोर्ड, झारखण्ड, राँची/उप महाप्रबंधक (पर्यावरण एवं वन), सी0सी0एल0 दरभंगा हाउस, राँची को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

सरकार के उप सचिव।

CENTRAL COALFIELDS LIMITED
(A subsidiary of Coal India Limited)
Office of the Project Officer
KDH Project, P.O: Dakra 829210,
Dist: Ranchi (Jharkhand)

Fuelling Sustainable Growth

Ref No: Ref. No.: PO(KDH)/Forest/2025-26/ 279 Date 31/10/2025

To
Divisional Forest Officer
Ranchi Division
Vanbhavan-Ranchi
Email: dforanchi2@gmail.com

Subject: Submission of pointwise reply in reference to query raised by MoEF&CC in compliance of In principle/ Stage-I approval in respect of proposal for non-forestry use 126.72 ha(84.35 PF and 42.37 ha Jungle Jhari) of forest land for KDH Opencast Mine of M/s Central Coalfields Limited in Ranchi District Jharkhand.

Ref No: 8/62/2018-FC dated 27.02.2023
Letter of MoEF&CC, New Delhi Dated 30.06.2025

Dear Sir,

This is to bring to your kind notice that KDH OCP, CCL has been accorded Stage-I forestry clearance for an area of 126.72 ha forest land by MoEF&CC vide letter no 8-62/2018-FC dated 27.02.2023.

MoEF&CC has raised queries in respect to the compliance of In principle/ Stage-I approval, The point wise Reply to queries are as follows:

S No.	Query	Compliance
1	In compliance of condition no. A (1) of Stage-I approval, the State Government has informed that the user Agency has revised the mining plan and excluded the 9.19 ha forest land which was earmarked for safety zone as per CCL Board approval. However, the copy of revised approved mining plan has not been submitted. The same needs submission along with the comparative analysis of the land use approved earlier and	As per the earlier approved PR, forest land of 9.19 Ha was earmarked to be maintained as Safety Zone outside the lease area. However as per the Stage I FC condition (Condition no. A.1 of MoEF&CC letter dated 21.02.2023) the mine plan was to be revised excluding the safety zone area of 9.19 Ha. Accordingly, keeping all the other parameters of PR/mine plan of KDH OCP same, only the land chapter of the mine plan was revised by excluding 9.19 Ha of the Safety Zone. Competent approval for the same has also been obtained on 13.09.2023. (Approval of CCL Board is enclosed as **Annexure I.**) An area of 9.19 Ha earmarked for safety zone has only been excluded in revised land chapter of the mine plan,, as such there is no change in land use proposed in earlier mine plan and revised mine plan.

	the land use proposed as per revised mining plan.	The mining plan with the revised land chapter duly approved by CCL Board is attached as **Annexure II.**
2	In compliance of condition no. A (4) of Stage-I approval, the State Government has informed that the user agency has deposited Rs. 12,13,69,882/- against NPV in account of NA, CAMPA. However, as per details available on web portal, it has been observed that the user agency has deposited Rs. 4,20,43,162/- against NPV. The State Govt. shall therefore provide the details of the remaining amount towards NPV deposited online in CAMPA account.	The details of the payment made in respect of NPV i.e Rs. 12,13,69,882/- was submitted along with duly signed Ad Hoc CAMPA format with Stage I FC compliance. However, the details are again being reiterated below: **1. 1st time NPV paid – Rs. 7,93,26,720/-** The amount of Rs. 7,93,26,720/- was paid in CAMPA account as a part payment of Rs. 220,50,41,439/- paid vide RTGS UTR no. PUNBR52016033110025459 and SD1288460349 as per MoEF&CC guideline dated 01.04.2015 in offline mode. Payment of Rs. 7,93,26,720/- has also been endorsed by State Forest Department vide various letters (**Enclosed as Annexure III**) based on which Stage I FC has been issued to the instant proposal. The details of payment along with bank certificate is enclosed as **Annexure IV.** **2. 2nd time NPV paid - Rs. 4,20,43,162/-** The amount of Rs. 4,20,43,162/- has been paid as per the demand note of DFO Ranchi dated 06.07.2023 at revised rate of NPV as per MoEF&CC guideline dated 06.01.2022 through e-challan. The details of the same is available on PARIVESH portal and enclosed as **Annexure V.**
3	In compliance of condition no. A (8) of Stage-I approval, the State Government has not submitted the details (ID No.) of KML files of diverted area, the CA areas, the proposed SMC treatment area and the	The details of KML files of diverted area, the CA areas, the proposed SMC treatment area and the WLMP area uploaded on the e Green watch portal. The same has been endorsed by PCCF/Nodal Officer, GoJ in letter dated 06.05.2025. Copy of letter enclosed as **Annexure VI**

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के०डी०ए०व० परियोजना

	WLMP area uploaded on the e Green watch portal and same needs submission.	8 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 Stage II approval; — In this regard, the details have been uploaded on e-Green Watch portal by DFO, Ranchi Forest Division. (Annex- C) of Folder-II).
4	In compliance of condition no. B (2) of Stage-I approval, the State Government has informed that the Wildlife Management plan has been approved. However, a copy of the approved plan has not been submitted. The detail of funds deposited by user agency in CAMPA account in this regard may also be submitted.	**Condition no. B (2) is part of condition mentioned at point (B) which needs to be complied on field after handing over of forest land to the user agency by the State Forest Department but the compliance in the form of Undertaking shall be submitted prior to Stage II approval.** However, as an advance action, KDH Project, CCL has got approved the Wild life Management Plan (WLMP). A copy of approved WLMP enclosed as **Annexure VII.** As the given condition is part of condition mentioned at point (B) which needs to be complied after handover of the forest land , KDH Project, CCL undertakes to pay the cost of WLMP after Stage II FC and before handing over of forest land.
5	In compliance of condition no. B (4) of Stage-I approva,l the User agency has submitted an undertaking, however, the undertaking is not in consonance with the condition. The State Govt. shall ensure that the user agency shall submit an undertaking as per the said condition.	Revised undertaking has been enclosed as **Annexure VIII** The undertaking is as under: ***"KDH Project CCL undertakes to pay the additional amount of NPV, if so, determined, as per the final decision of the Hon'ble Supreme Court of India."***
6	In compliance of condition no. B (13) of Stage-I approva,l the State Government has not submitted copy of	**Condition no. B (13) is part of conditions mentioned at point (B) which needs to be complied on field after handing over of forest land to the user agency by the State Forest Department but the**

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	the approved Plan/Scheme w.r.t Mitigative measures to minimize soil erosion and choking of stream and same needs submission.	**compliance in the form of Undertaking shall be submitted prior to Stage II approval.** However, KDH project CCL hereby submits the copy of the Plan w.r.t Mitigative measures to minimize soil erosion and choking of stream before handing over of the forest land. The plan is enclosed as **Annexure IX.**
7	In compliance of condition no. B (14) of Stage-I approval, the State Government has not submitted a copy of approved Soil & Moisture Conservation Plan.	**Condition no. B (14) is part of conditions mentioned at point (B) which needs to be complied on field after handing over of forest land to the user agency by the State Forest Department but the compliance in the form of Undertaking shall be submitted prior to Stage II approval.** However, as an advance action, KDH Project, CCL has got approved the Soil & Moisture Conservation Plan. A copy of approved Soil & Moisture Conservation Plan is enclosed as **Annexure X.**

This is for your kind information please.

Thanking You.

Yours Faithfully

Project Officer,
KDH Project
NK Area, Dakra

Enclosures: As mentioned above

Copy to:-

1) General Manager, NK Area: for kind information
2) TS to DT(P&P), CCL HQ for kind information
3) General Manager(Forest), CCL HQ: for kind information
4) SO(P&P), NK Area
5) O/c

Annexure -I

Pg. No. 1

सेंट्रल कोलफील्ड्स लिमिटेड
दरभंगा हाउस, राँची

विषय : दिनांक 19.10.2024 को आयोजित निदेशक मंडल की 543 वीं बैठक (2024 का क्रमांक 09) का अग्रेषित कार्यवृत्त।

निम्नलिखित मद के संबंध में उपरोक्त बैठक के कार्यवृत्त से उद्धरण नीचे दिया गया है:

Item No. 543.4(8): Proposal seeking approval for Mining Plan & Mine Closure Plan of KDH Extension OCP (PROJECT AREA- 489.30 Ha, CAPACITY- 4.5/5.0 MTY).

The Board was apprised regarding the subject proposal as below:

1. The KDH Extension OCP was accorded EC within the project area of 489.30 Ha on 30.01.2015. As per the EC, the life of mine was 5 years. However, the project produced less than the planned capacity and the balance mineable reserve as on Jan'2020 had been estimated as 6.51 Mn Te.
2. Accordingly, a revised Mining plan was prepared with revised calendar plan for obtaining extension of validity of EC from MoEF&CC as per EIA Notification, 2006.
3. The revised mining plan of KDH Extension OCP with an additional 5 years life and project area of 489.30 ha (Nominal Capacity 4.5 MTPA, Peak Capacity 5.00 MTPA) was approved by CCL board on 03.02.2020 in its 483rd meeting and accordingly the validity of EC was extended further for 2 years by MoEF&CC on 14.07.2020, which subsequently stands deemed extended till 30.01.2025, as per MOEF&CC notification vide SO 221(E) dated 18.01.2021, SO 1807(E) dated 12.04.2022 and OM dated 13.12.2022.
4. As assessed by CMPDI, there is remaining mineable reserve of 2.97 MTe with a corresponding OB of 5.68 Mn Cum within the same project area and accordingly prepared a mining plan to seek extension of the EC validity one more time in line with the aforesaid MoEF&CC S.O. Dated:12.04.2022, which will enable the project to extract the balance mineable reserve.
5. The salient features of the mining plan & mine closure plan placed as below:

SN	Parameter	Values
1	Capacity (in MTY)	4.5/5
2	Total Land requirement (in Ha)	489.30
3	Balance Life (in years)	05
4	Balance Mineable Reserve (Mn Te)	2.97
5	Average Grade	G9-G10
6	Balance Overburden (Mn m3)	5.68
7	Av. Stripping Ratio (m3/te)	1.94
8	Mining Technology	By Shovel-Dumper Combination
9	Seams Considered	Bisrampur, Bukbuka T, Bukbuka B, Upper Dakra, Lower Dakra
10	Maximum Depth of working	200 meter

Contd...P/2

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Annexure - I
Pg. No. 2

6. The details of progressive & Final Mine Closure Plan is provided as below:

SN	Particulars	Value
1	Current value of Mine Closure Corpus as on Aug 2024	5618.26 Lakh
2	Total amount deposited till 31.03.2024	5560.06 Lakh
3	Balance Corpus for Mine Closure Corpus	58.20 Lakh
4	Balance Life	5 Years
5	Annual Corpus	11.64 Lakh
6	Total Mine Closure Cost (including 5% increment/ year)	5624.36 Lakh

7. A cost benefit analysis of the project has been prepared and summarized as below:

(In Lakhs)

Total Cost in Rs.	17142.29
Sale Value of coal* in Rs.	34986.60
Profit/Loss (-) in Rs.	17844.31

*As per average Sale Price Per Te. taken Rs. 1178 of G-11 grade sales (80% of Rail sale Power sector and 20% Road sale).

8. As per assessment, the project will have overall profit of Rs. 178.44 Crore during its balance life of 5 years.

The Board after detailed deliberation, accorded its approval for Mining Plan & Mine Closure Plan of KDH Extension OCP (PROJECT AREA- 489.30 Ha, CAPACITY- 4.5/5.0 MTY), as brought out in the agenda note.

बोर्ड निर्देशों के अनुपालन सुनिश्चित करने हेतु शीघ्र कारवाई के लिए प्रस्तुत। कृपया कर, की गई कार्रवाई प्रतिवेदन (ATR) 08 दिनों के अंदर प्रस्तुत करें ताकि उसे बोर्ड के समक्ष कम से कम अग्रिम 07 दिनों के अंदर प्रस्तुत किया जा सके।

अमरेश प्रधान
कंपनी सचिव

महाप्रबंधक (पर्यावरण)

निदेशक (तकनीकी/ योजना एवं परियोजना), सी.सी.एल.

सन्दर्भ संख्या: सी.एस./बी.एम./543/2024/ 331

दिनांक: 01.11.2024

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Annexure - II

CENTRAL COALFIELDS LIMITED

EXTENSION PROJECT REPORT
FOR

KDH OCP

(4.5 MTY)

(LEASEHOLD AREA EXPANSION)

Revised till 06.09.2023

REGIONAL INSTITUTE-III
MAY 2010

परियोजना प्रतिनिधिकारी
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CENTRAL COALFIELDS LIMITED
DARBHANGA HOUSE RANCHI

Subject/Forwarding Minutes of the 370th (No.6 of 2010) Meeting of the Board of Directors held on 19.08.2010.

Extracts from the minutes of the above meeting, in respect of following item, is appended below:

Item No.4(1): Proposal seeking 1st stage 'In-Principle' approval of Extension Project Report of KDH OCP (Normative capacity-4.5 MTY).

The Board noted that KDH OC RPR (4.5 MTY) was sanctioned by Govt. vide letter no. No.43011/23/2000-CPAM, dated 21.11.2001 for a capital investment of Rs.316.12 crore, which was also completion cost., at February, 2001 price level. The project was completed in March'2002 and the completion report was approved by CCL Board in its 304th meeting held on 19.04.2002.

The Board further noted that the present sanctioned KDH Expansion OC is [illegible] exhaustion and the mine is likely to be exhausted in 3-4 years. The mine is required to be extended towards the dip side property of the KD South Geological Block and a part of Barkera Geological Block on the West, through out the Extension proposal.

The proposed extension will sustain the level of production from the existing KDH OCP for next 25 years and will fulfill the demand of power grade coal from N.K. Coalfield which will help to reduce, to some extent, the gap in demand and production of CCL for XI & XII plan.

It was viewed that KDH Extension OC was placed in the 15th (No.1 of 2010) meeting of the ESC of Directors held on 25.02.2010. The ESC recommended the proposed Extension of KDH OC (Normative capacity 4.5 MTY) with an additional Capital investment of Rs. 201.11 Crore and at a Financial IRR of 37.80% and 24.33% at 100% and 85% rated output respectively. The ESC also directed to place the same to the Board for consideration and approval.

CGM(P&P)/08/2&18/10/30

1. As per the new policy for final approval of projects shall be effective only after grant of all clearances was issued by CIL. In 253rd meeting of Board of Directors of Coal India Limited held on 22.12.2009, two stage approval procedure, for approval of the projects, within delegated powers of the respective Boards was approved. Further, the same was discussed in 256th meeting of the Board of Directors of Coal India Limited held on 07.5.2010. The salient points of the deliberations are as follows:

- The First stage being the "In-Principle" Approval of PR to facilitate application of for Environmental and Forestry clearances and the Second Stage being the Final Approval of the investment decision for implementation of the Project after obtaining the clearances.
- In case of proposals of Subsidiary Companies, requiring CIL Board's approval, recommendation of the Subsidiary Company's Board may be sought for Approval of the PR for processing of application for above clearances.

Sent Secy(CoM(P&P) - Copies to RD-R/III, GM[NK], CGM(X), CGM(E&S) CGM[CMC], GM(LA), GM(E&M), GM(PMD) CL

*Board file
@KDH file

28/8/10

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2. The total extractable reserves have been estimated as 107.15Mtes corresponding to a volume of OBR of 164.99 Meum at an average stripping ratio of 1.54 cum/te.

3. The capital requirements are given below:

Particulars	Unit	Amount
Additional capital for sanction	Rs. Crs	219.91
Actual capital expenditure upto 31.3.09 considered	Rs. Crs	268.03
Total estimated project capital	Rs. Crs	487.94
Capital outlay per tonne of annual output	Rs/t	1084.31
Capital requirement beyond 4th year	Rs. Crs	15.43

4. Phasing of additional capital requirement in Rs. Lakhs is:

	1	2	3	4	Total
Additional capital	7142.86	7380.40	7170.58	297.05	21990.89
Production Mty	4.50	4.50	4.50	4.50	

5. Capital requirement beyond 4th year is for:

(Rs. Lakh)

Electricals	0.59
Rehabilitation, Compensatory Afforestation etc.	14.84
Total	15.43

The additional estimated capital investment (upto 4th year) for KDH OCP has been estimated as Rs.219.91 Crore. The estimated capital investment (beyond target year) is Rs.15.43 Crore.

Keeping in view of the above, after detailed deliberation, the Board approved the proposal for 1st stage 'In-Principle' approval for Extension Project Report of KDH OCP (Normative capacity 4.5 MTY) as brought out in the agenda note.

It is requested kindly to take necessary action on the decision, wherever necessary, under intimation to this office.

25/8/11

(C.V.N. Gangaram)
Company Secretary

CGM(P&P)

U.O.No.CS/BM/370/2010/ 1113 Dated: 25.08.2010

परियोजना पदाधिकारी
केंडीओसी परियोजना

E-1309089

सेंट्रल कोलफील्ड्स लिमिटेड
दरभंगा हाउस, राँची

विषय : दिनांक 06.09.2023 को आयोजित निदेशक मंडल की 531वीं बैठक (2023 का क्रमांक 8) का अग्रेषित कार्यवृत्त |

निम्नलिखित मद के संबंध में उपरोक्त बैठक के कार्यवृत्त से उद्धरण नीचे दिया गया है:

Item No. 531.4(09): Proposal seeking approval of revision in plan of mining (Chapter XVII - Land Requirement) as per the approved Extension Project Report (EPR) of KDH OCP (Capacity: 4.5 MTY).

Board was apprised that in KDH OCP, safety zone & green belt of 2.89 Ha has been kept under the Forest application. However as per the approved EPR, an area of 9.19 Ha was also earmarked as forest land in Safety Zone which was outside the project lease hold area.

MoEF&CC while according stage-I approval, has directed to either seek diversion of the above 9.19 Ha or revise the Mining plan (by excluding 9.19 Ha from the land requirement, as per approved EPR). It is proposed to revise the plan of mining by removing the component of 9.19 Ha from the Chapter XVII- Land Requirement.

After detailed deliberations, Board accorded its approval for revision in plan of mining (Chapter XVII – Land Requirement) as per the approved Extension Project Report (EPR) of KDH OCP (Capacity: 4.5 MTY) by excluding the Safety Zone Forest Land of 9.19 Ha depicted outside the project boundary.

बोर्ड निर्देशों के अनुपालन सुनिश्चित करने हेतु शीघ्र कारवाई के लिए प्रस्तुत। कृपया कर, की गई कार्रवाई प्रतिवेदन (ATR) 08 दिनों के अंदर प्रस्तुत करें ताकि उसे बोर्ड के समक्ष कम से कम अग्रिम 07 दिनों के अंदर प्रस्तुत किया जा सके।

अमरेश प्रधान
कंपनी सचिव

GM(Env)/HOD

D(T/P&P)

सन्दर्भ संख्या: सी.एम./बी.एम./531/2023/225

दिनांक:- 13-09-*2023*

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SUMMARISED DATA

Sl. No.	Particulars	Unit	Value
A.	GENERAL		
1	Name of Project		KDH OCP (4.5MTY)
2	Type of Project		Existing
3	Name of Area / Company		N.K. Area/Central Coal Field Ltd.
4	Nearest Railway Station from project	Name km	Khalari Railway Station 1km
5	Nearest National / State Highway / Approach road	Name	State Highway 7
B.	GEOLOGICAL		
1	Name of geological blocks considered	Name	K D South & Karkata
2	Area of the geological blocks	sq. km	1.45 sq. km+ 0.715sq km
3	Borehole Density within blocks	BHs / sq.km	18.6
4	Description of all coal seams within block		

Stratigraphic Sequence	*Thickness (m)*		*No. of borehole intersections*	*Net Geological Reserves (MT)*	*Remarks*
	Min.	*Max.*			
K5	5.25	5.85	4	-	Reserve not considered
Parting	28.79	33.20			
K4	2.95	5.70	7	2.82	
Parting	26.79	42.91			
K3	0.23	1.45	8	1.42	
Parting	5.86	10.00			
K2	1.65	7.04	10	6.38	
Parting	2.43	18.00			
K1	1.74	4.53	11	4.13	
Parting	3.42	14.61			
Karkata	2.12	6.15	9	4.75	
Parting	17.35	40.90			
Bisrampur	1.60	6.15	23	24.07	
Parting	5.58	22.87			
Bukbuka	10.12	22.38	25	40.70	
Parting	25.46	34.90			
Parting (Between Dakra Top and Bukbuka)	16.25	29.54			
Dakra Top	0.72	11.89		21.33	
Parting	1.44	7.24			
Dakra Bot	15.57	21.37		59.32	
TOTAL				164.93	

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C.	TECHNICAL						
1	Area of the proposed mine block				sq. km	1.75	
2	Borehole density within mine area				BHs/sq. km	16	
3	Mine parameters: Extent along strike (Avg.) Extent along dip (Avg.)				km km	1.43 0.75	
4	Description of coal seams proposed to be worked along with the parting details						
Name of seam	***Thickness range considered (m)***		***Av. Thickness/ Parting Thickness (m)***	***Av. Grade (U.H.V.) K. Cal/Kg***	***Av. gradient (deg)***	***Mineable Reserves (Mt)***	***Volume of OB (Mcum)***
	Min	***Max***					
Top OB			34.10				40.77
K3	1.00	1.45	1.05	2830	6-8	0.84	
Parting	5.86	10.00	8.90				7.34
K2	1.65	7.04	4.88	3905-4140	6-8	4.49	
Parting	2.43	18.00	6.60				3.73
K1	1.74	4.53	2.25	4185-5215	6-8	2.45	
Parting	3.42	14.61	8.10				8.01
Karkata	2.12	6.15	4.37	3670-4650	6-8	4.18	
Parting	17.35	40.90	23.00				22.72
Bisrampur	1.60	6.15	4.26	2995-4290	6-8	14.54	
Parting	5.58	22.87	13.00				17.94
Bukbuka Top	0.82	2.00	1.00	2995-4290	6-8	4.80	
Parting			0.50				9.61
Bukbuka Bottom	9.30	20.40	16.5	2995-4290	6-8	30.77	
Parting			21.40				36.59
Upper Dakra	1.00	11.89	4.93	3695-4515	6-8	7.81	
Parting	1.44	7.24	2.60				18.28
Lower Dakra	15.57	21.37	20.03	2550-3545	6-8	37.25	
Total Coal OB						**107.15**	**164.99**
5	Av. Stripping Ratio				m^3/t	**1.54**	
6	Method of Mining				Opencast by Shovel-Dumper Combination		
7	Target Output Normative production capacity (at 100%) Peak production capacity (at 115%) Production capacity (at 85%)				 Mt Mt Mt	 4.50 5.175 3.825	
8	Year of achieving Target Production (from zero date)					1st Year	

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9	Year of start of Internal Dumping		1st Year
10	Production Phasing (from zero date upto target year)	Mt	

Year	Year 1	Year 2	Year 3	Year 4
Coal (Mt)	4.50	4.50	4.50	4.50
OB (Mcum)	7.0	7.0	7.0	7.0

11	Total Mine Life (at Norm production capcity)	Years	25
	Pre-construction period	Years	NA
	Construction period	Years	Nil
	Production build-up period	Years	Nil
	Production period	Years	22
	Tapering / mine closure period	Years	3
12	Major HEMM Deployed for Coal	Capacity	(Up to Tgt Yr)
	Electric Rope Shovel	(5 Cum)	3
	Rear Dumper	(50/60T)	19
	Drill	(160 mm)	4
	Dozer	(410 HP)	4
13	Major HEMM Deployed for OB (Up to Tgt Yr)	Capacity	(Up to Tgt Yr)
	Electric Rope Shovel	(10 Cum)	3
	Electric Rope Shovel	(5 Cum)	1
	Rear Dumper	(100T)	23
	Rear Dumper	(60T)	6
	Elec. RBH Drill	(250 mm)	4
	Dozer	(410 HP)	8
14	Total Manpower (Up to Tgt Yr)		(Up to Target Year)
	Existing	Nos	1023
	Additional	Nos.	Nil
15	Overall Output per manshift (OMS)		Main Variant
		Tonnes	16.66
16	Seam-wise weighted average grade of coal (non-coking/coking)		Grade 'E'
17	Presence of Major Surface Constraints (nallas, road, power line, etc.)	(type)	Sonadoba Nala in Eastern side, Kendua nala in western side Jehlitand and Barkitand village
18	Coal Transport within the mine (In-pit belt conveying system or by Truck)		By Dumpers
19	Surface Coal Transport to Siding/Despatch Point and Mode of Despatch		By Truck
20	Any Railway Siding and distance		Dakra Siding at 1.5km
21	Name of any Specific Customer/Industry		-

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D.	ENVIRONMENTAL & OTHERS		
1	Civil Construction		
	Residential houses	Nos.	563
	Housing satisfaction	%	55
2	Water Demand	Klpd	
	Colony		513.75
	Industrial		773.32
3	Total Land required	Ha	195.96
	Forest land	Ha	101.06
	GMK Land	Ha	25.66
	Tenancy land	Ha	69.24
4	Land to be acquired for external dumping	Ha	Nil
5	Net Present Value of Forest Land	Rs.Lakhs/Ha	7.84
	Total Area	Ha	101.06
	Total Value	Rs.Lakhs	792.31
6	Habitation & Rehabilitation		
	No. of villages within mine boundary	Nos.	2
	No. of PAFs to be rehabilitated		800
7	Average annual rainfall	mm	1250
8	Make of Water on the day of Maxm Rain fall	cum/day	208310
9	Total installed pumping capacity	lps	530
10	Drainage of the Area (Name of river/nalla)		Through Sonadoba Nala & Kendua Nala to Damodar River
11	Any proposed diversion of nala or power line		None
E.	FINANCIAL		Coal & OB Both Departmental
1	Total Capital Investment	Rs. crores	
		Existing	268.03
		Additional	219.91
		Total	487.94
2	Specific Investment	Rs. / tonne	
		Total	1084.31
		Additional	488.69
		Rs./m3	
		Total	697.06
		Additional	314.16
3	Total Capital Investment on P&M	Rs. crores	
		Existing	228.55
		Additional	158.64
4	Specific Investment on P&M	Rs. / tonne	
		Total	860.40
		Additional	352.52
5	Capital requirement upto target year	Rs. Crores	219.91

6	Year of opening of Revenue account (from zero date)		1st year
7	Earnings per manshift (EMS) (target year)	Rs.	1548.28
8	Estimated Cost of Production	Rs. / tonne	
	At 100% production level		510.57
	At 85% production level		587.52
9	Estimated average selling price	Rs. / tonne	849.00
10	Estimated Profit	Rs. / tonne	
	At 100% production level		338.43
	At 85% production level		261.48
11	Financial Internal rate of return (FIRR)	%	
	At 100% production level		36.96%
	At 85% production level		23.66%
12	Economic rate of return (only for projects to be approved by Govt.)	%	
	At 100% production level		46.81%
	At 85% production level		31.99%
13	Desired av. Selling Price to yield 12% FIRR	Rs. / tonne	
	At 100% production level		555.73
	At 85% production level		642.35
14	Break-even point		
	Production	Mty	2.52
	Production level	%	56.02
15	Mine Closure Cost (for corpus fund) / te		2.20
16	Expected Completion Capital	Rs. crores	529.91
17	Financial IRR for completion cost	%	35.01%
18	Economic IRR for completion cost	%	44.88%

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List of Appendices

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CHAPTER-I

INTRODUCTION

1.1 Background of the Project Report:

KD Hesalong Opencast Mine is situated in the North Karanpura Coalfield of Jharkhand. Presently, it is a part of North Karanpura Area of CCL. The mine was nationalised in 1973, when the mine was producing about 0.2Mte of coal per annum.

1.1.1 PR for KDH OCP (Expn):

The Project Report for KD Hesalong opencast project (Expansion) was prepared in March'87 for a rated capacity of 4.5 MTY of coal at an average stripping ratio of 1.19m^3/te. The above report was approved by CCL and CIL Boards in May'87 and July'87, respectively. The PR had envisaged working the quarry with 7 no. of 5m^3 Rope Shovels and 68 no. of RD 35T Dumpers for OB removal and 4 no. of 3.5m^3 Hyd. Shovels & 20 no. of 60T BDCH for coal winning. Later on, it was felt that the above fleet of HEMM was very large and proper maintenance and operation of this large fleet of HEMM would be difficult in actual practice. Therefore, "*an addendum to the original report of March'87*" was prepared in April'92, as a second alternative to work the mine with 3 nos. of 10m^3 Elect. Rope Shovels, 1 no. of 5m^3 Elect. Rope Shovel, 28 nos. of RD 85T Dumpers for OBR; 4 nos. of 5m^3 Elect. Rope Shovels and 12 nos. of RDCH 85T Dumpers for coal production. This alternative with higher size HEMM was recommended for KD Hesalong opencast mine. Accordingly, the Expansion PR with the addendum of second alternative was sanctioned by the Govt. in Dec.'95 vide letter No.43011/9/84-CPAdt.29.12.95 for an additional estimated capital investment of Rs. 214.93 Crores and total sanctioned capital is Rs.273.41 Crores, including existing capital of Rs.58.48Crs. as on 31.3.1994.

Since, the Project has achieved 92% of the rated composite capacity during 99-2000; the project has been treated as complete in March'2000. This is as per the decisions taken in Project Review Meeting with additional Secretary at New Delhi on 17.4.2000. Completion report has been approved by CIL Board.

1.1.2 RPR for KD Hesalong OCP (4.50MTY)

The above sanctioned PR envisaged construction of a CHP, which included a receiving pit, crusher house, self flowing bunker of 13500T capacity and a pre-weight hoppers for loading @ of 5000TPH into railway wagons, for additional 3.0 MTY of coal costing Rs. 27.98Crores. However, in the review meeting of CCL projects, costing more than 100 crores, taken by Secretary (Coal) on 4.8.99, it was decided that a RPR for KD Hesalong OCP should be prepared with the following modifications:

Instead of the construction of a CHP for an additional capacity of 3.0 MTY of coal, **four feeder breakers** of 400-500TPH each will crush the additional 3.00 MTY of coal. The coal crushed by these feeder breakers will be transported by trucks to the existing Railway Siding and will be loaded by FE loaders to railway wagons for despatch to different consumers. In addition to this, 8 no. of sanctioned RDCH 85T Dumpers have been substituted by 15 no. of 50T Dumpers under CSRP.

Hence, the RPR for KD Hesalong OCP has been prepared in September' 99 for a rated capacity of 4.50 MTY of coal and 5.60 M.m^3 of OBR (peak) per annum, considering the existing status of the mine including the geometry of the mine and the strength of HEMM etc.

The various reports prepared for this Project at different periods of time are detailed in the following table:

Table 1.1: Chronology of Previous Approved Reports

Year of Preparation	Year of Approval	Name of the Report	Technology adopted	Production Capacity (Mty)	Approved Capital (Rs.crores)
May '1978	1979	FR for KDH OCP	Shovel-Dumper	1.5	14.44
Mar '1987	1995	PR for KDH OCP (Expn) (4.5 MTY)	Shovel-Dumper	4.5	273.41
Sep '1999	2000	RPR for KDH OCP (Expn) (4.5 MTY)	Shovel-Dumper	4.5	313.43

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Summarised Data of the RPR for KDH OCP (Expn) (4.5 MTY), Sept '99:

Seams to be Worked	Seam- Bisrampur, Bukbuka (Comb), Lower Bukbuka, Upper Bukbuka, Dakra (Comb), Lower Dakra, Upper Dakra
Mineable Reserve	47.50 MT
Volume of OB	58.67 Mcum
Avg. Stripping Ratio	1.23 cum/te
Target output	4.50 MTY
Life of the mine	11 years
Grade of coal	Gr. E/F
Total Capital outlay	Rs. 313.43
Capital outlay per te	Rs.696.51
Cost of production (Rs.)	
at 100%	199.93
at 85%	225.93
Profit / Loss (Rs/T)	
at 100%	230.67
at 85%	204.67
No. of personnel	1167
O.M.S (Old)	14.61
E.M.S. (Rs)	389.58

1.2 Agency wise Exploration Status :

Hesalong Block - Total area of the block is 4.15 Sq Km.

Particulars	Year of Drilling	Mererage (m)	No. of Bore holes
CMPDI	1972-73	3271.75	36

Borehole Density (per sq km) – 9.8.

Net geological reserves within the block are estimated at 148.16 MT of coal and 131.48 Mcum of overburden at a stripping ratio of 0.88cum/te.

KD South Block - Total area of the block is 1.45 Sq Km.

Particulars	Year of Drilling	Mererage (m)	No. of Bore holes
CMPDI	1973-80	2519.03	16
CMPDI	1988-89	1526.80	11
Total		4045.83	27

Borehole Density (per sq km) – 18.6

Net geological reserves within the block are estimated at 126.73 MT of coal and 185.96 Mcum of overburden at a stripping ratio of 1.47 cum/te.

1.3 Present Status of the mine/project:

The projectised area of the KDH OCP is nearing exhaustion. From the sanctioned boundary of KDH Expn OCP (4.5MTY), a balance of about 14.51 MT of coal and 22.50 Mcum of OB at a stripping ratio of 1.55cum/te is left. So it is proposed to exploit the coal seams in the dip side of the existing KDH Expn OCP from K3 Seam to Lower Dakra Seam which is demarcated by the KD South Geological Block and o a part of Karkata Geological Block (upto Kendua Nala in the West). The proposed Project Report has been prepared by extending the dip side boundary of the existing KDH Expn OCP (4.5MTY) into the above area without any expansion in the mine capacity.

1.4 Justification of Preparation of PR

The Expansion Project Report of KDH OCP (4.5MTY) has been proposed in order to sustain the level of production from the existing KDH OCP and also to fulfill the demand of power grade coal from N.K. Coalfield and to reduce the gap to some extent of demand and production of CCL for XI plan period.

1.5 Salient features of proposed PR (Capacity, Capital, etc.)

The Project Report has been formulated considering departmental production of coal and overburden removal throughout the life of the mine. The proposed normative capacity is 4.5 MTY at an additional investment of Rs 219.91 crore. The mine can achieve peak capacity of about 5.00 MTY in any one or more years during its production plan period.

1.6 Difficulties and constraints in mining with associated risk.

a) The proposed mining block contains old underground workings (developed/ depillared) in K2 and Karkata seams. Suitable statutory precautions need to be taken during the extraction of upper seams while working over developed pillars/ goaf.

b) The mining in the proposed mining block has a starting depth of 130m and the maximum depth of the mine goes upto 200m. It is envisaged to have an efficient sump management plan to avoid any water logging in the working area.

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c) An extensive built up area is located within the proposed quarry, which includes miners' quarters, hutments and two villages known as Jehlitand village and Barkitand village. These needs to be shifted and/or rehabilitated.

1.7 Technology Upgrade:

Upgrading technology is a prerequisite for more effective use of resources and thus improving environmental performance, which becomes all the more important in view of a rapidly growing demand of coal in our country. In most cases, newer technologies and processes are both more efficient and less polluting than the technology they replace, allowing increased production using less material and causing less pollution.

Considering, what has been stated in the above paragraph, the proposed mining plan suggests flexibility in the implementation stage within the scope of the proposed mining plan to respond to improvements in technology and equipment which would result in improved profitability, productivity and mitigate environmental hazards due to mining.

CHAPTER-II

MARKETABILITY & JUSTIFICATION

2.1 Demand and Supply Scenario

The availability and demand from CCL is given in Table-2.0 below:

Table No. 2.0

COAL DEMAND AND AVAILABILITY OF CCL

(Basis : Chairman CIL's letter to Secy. Coal in Nov '08)

Sl No.	Coal Consuming Sectors	Coal Demand (MT)				
		2008-09	2009-10	2010-11	2011-12	2016-17
A. TPPs						
1	Existing TPSs (that came up prior to XIth Plan)	29.21	29.21	29.21	29.21	29.21
2	XI Plan TPSs (including IPPs)	4.09	11.23	15.32	27.35	49.17
	TOTAL for TPPs	**33.31**	**40.44**	**44.53**	**56.56**	**78.38**
B. Captive Power Plants (CPPs) #		3.28	4.03	4.03	4.03	4.03
TOTAL COMMITMENT FOR POWER SECTOR		**36.59**	**44.47**	**48.56**	**60.59**	**82.41**
C. Cement Plant #		0.10	0.42	0.42	0.42	0.42
D. Steel*		4.35	4.70	5.00	5.30	10.00
E. Fertilizer		0.82	0.82	0.82	0.82	0.82
F. Sponge Iron #		1.56	2.63	2.63	2.63	2.63
G. E-Auction @10% of production		4.70	4.90	6.20	7.80	11.50
H. Others i.e, CPSU, State Agencies, Bricks etc.		2.77	2.77	2.77	2.77	2.77
TOTAL Commitment on CCL		50.89	60.71	66.40	80.33	110.55
PRODUCTION		47.00	48.00	62.00	78.00	115.00
GAP		-3.89	-12.71	-4.40	-2.33	4.45

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2.2 **Utility or Market for the coal from project**

Liberalisation of power sector by Govt. of India has generated wide spread interests for Private and Public sector investments in power generation. As such, there is an appreciable increase in the number of upcoming new thermal power projects in both Private and Public Sectors. This has resulted in a sharp increase in the demand of power grade coal in CCL. Project Report of the KDH OCP (4.50 MTY) is therefore, proposed with a view to partially fulfil the above indicated growth in demand.

2.3 **Available Linkage or firm Fuel Supply Agreement (FSA)**

At present there is no specific fuel supply agreement for KDH OCP. Coal from KDH OCP is being proposed to be despatched partly through basket linkage to consumers in Power Sector and E-Booking.

2.4 **Justification of opening the project based on Marketability (to fulfill the gap in demand) and/or firm linkage (FSA)**

The availability figures till end of XIth plan period (2008-17), as shown in the Table 2.0, have been obtained from CCL. It appears from the figures that till 2009-10 there is a gap of about 12.71MT. After considering the production from the upcoming projects this gap reduces to about 2.33MT in the year 2011-12 and reverse the scenario in the subsequent year. The gap in demand and availability of coal over the year justifies implementation of this project.

CHAPTER-III

PROJECT SITE INFORMATION

3.1 Location

The KDH Opencast project falls within Hesalong and KD South geological blocks. It is located in the south central part of North Karanpura Coalfields and is included in Survey of India toposheet no. 73 E/2 and 73 A/14 in Ranchi district of Jharkhand. KDH Opencast project is bounded between latitude 23°39' 21" to 23°42'0" and longitude 84°59'15" to 85°00'24".

Area of the Project in sq. kms.

a) Quarry area of the project: 1.75 sq km.

b) Additional leasehold area of the project: 1.96 sq km.

Limiting Boundaries of the Projectised Area:

a) Northern Boundary: Along the floor of Lower Dakra in the existing KDH OCP.

b) Southern Boundary: Leaving a barrier of about 60m from Sonadoba Jore and upon the F4 fault.

c) Eastern Boundary: Leaving a surface barrier of about 60m from Sonadoba Jore.

d) Western Boundary: Leaving a surface barrier of about 60m from Kendua Nala.

3.2 Accessibility and Communication:

The area is connected to Ranchi by State Highway no 7. The distance between Ranchi and the block is around 65km. The Khalari railway station on the Gomoh-Dehri-on-Sone loop line of the Eastern Railway is about 1 km from the southern extremity of the KD South block.

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3.3 Climate and Rainfall Data:

The climate is tropical with severe summer. The temperature during summer (March-June) goes as high as 45^0C. Summer days are hot with dusty wind, but nights are generally pleasant. The minimum summer temperature is 20^0C. The winter (November-February) is cold and the minimum temperature recorded is 10^0C. The Rainy season is generally from June to October. The average monthly rainfall during monsoon season (June to October) has been 198.7 mm. During non-monsoon period, the average monthly rainfall has been 17.83 mm.

3.4 Topography with drainage pattern of area:

The topography of the Hesalong block is undulating and rolling. There are small ridges aligned in nearly N60°W to S60°E direction which is influenced by the general strike of the underlying strata. The ridges are formed by the sandstones occurring above thick coal seams. The intervening valleys and low flat grounds are generally coincident with the outcrops of the coal seams. The maximum and minimum elevations are 466m (situated to the NE of the abandoned Bisrampur incline) and 418m (near Sonadoba jore) respectively. A very flat low ground of about 27 hectares area is noticed in the NE corner of the block, adjacent to Sonadobajore. The topography of the K.D South block is gently undulating. The maximum and minimum elevations are 465 m and 430 m respectively.

The area is drained mainly by seasonal Kendua Nala in the west of the block and Sonadoba jore in the east. Both the nalas, flowing south to north carries the run-off to the Damodar River flowing in the north of the property.

CHAPTER-IV

GEOLOGY AND DEPOSIT APPRAISAL

4.1 Background/Introduction-

The Hesalong Block in North Karanpura Coalfield, District Ranchi, Jharkhand, was reported to contain thick coal seams. The block, however, remained unexplored and untapped due to the inferior quality of the coal seams. The area gained importance due to demand of inferior non-coking coals for thermal power generation. With a view to increasing the production of non-coking coal to meet the demand of thermal power stations, erstwhile NCDC selected a number of coalfields for exploration including North Karanpura Coalfield. Reconnaissance mapping and scout drilling in the south Central part of North Karanpura coal-field was carried out by the Department of Exploration, beginning from Dec. 1972 till March-April, 1973. Based on this work, a block comprising the Northern part of the leaseholds of Karkata and Karanpura - Dewarkhand collieries and the entire New Dakra leasehold of NCMI Ltd. were selected for detailed exploration after the take-over of the management of the private collieries in 1973. This block has been designated as Hesalong Block after the name of a village in the area. In the south, another block KD South, which forms the dip side of Hesalong block, was also explored during July 1973 to March 1980 and again in June 1988 to Nov 1988. In the west of these block(s), Karkata block is located, which marks the western limit of south-central part of N.K. Coalfield.

The present endeavor is limited to KD South block and south eastern part of Karkata block (upto Kendua nala in the west).

4.1.1 Different GRs prepared at different period for the blocks under reference:

Sl No	Name of the GR	Year of preparation
1	Geological Report of Hesalong Block, North Karanpura Coalfield.	Nov, 1974
2	Geological Report of KD South Block, North Karanpura Coalfield.	Mar, 1989

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3	Geological Report on Karkata Block, North Karanpura Coalfield.	August, 1979

4.1.2 Block Boundaries

Boundary	Hesalong Geological Block	KD South Geological Block
Northern	Damodar River	Floor incrop of Bisrampur seam and southern edge of Bukbuka quarry.
Eastern	Sonadoba jore flowing south to north.	Limited by western boundary of Dakra colliery and leasehold boundary of M/s ACC Ltd.
Southern	Approx up-dip limit of underground workings of the Karkata seam	Northern leasehold boundary of M/s ACC Ltd.
Western	Kendua Nala flowing south to north.	Karkata block.

4.1.3 Any other relevant details

An extensive built up area is located within the property of KD South block, which includes miners' quarters, hutments and two villages known as Jehlitand village and Barkitand village.

4.2 Exploration Status

4.2.1 Number of boreholes and meterage drilled by the various agencies and period of drilling thereof, in the block area

Table 4.1: Summary of Exploratory Boreholes

Year	Agency	Block Name	Number of boreholes	Meterage
1	2	3	4	5
1972-73	CMPDI	Hesalong	36	3271.75
1973-80	CMPDI	K D South	16	2519.03
1988-89	1526.80	K D South	11	1526.80

4.3 Geology and Structure of Block area

4.3.1 Brief geological setting along with generalized sequence within the block/coalfield

The North Karanpura Coalfield forms a prominent east-west trending valley between Hazaribagh plateau in the north and Ranchi plateau in the south, The Aswa Pahar in the south-east separates the North and South Karanpura Coalfields by east-west elongated metamorphic patch. However, they are interconnected near Bachra and Hindegir by a narrow tongue of Talchir outcrops. On the eastern side, North Karanpura Coalfield is separated from the West Bokaro Coalfield by a narrow stretch for metamorphic rocks having several outliers of Talchir Formation. In the west, it is separated by a stretch of about 20 kms wide metamorphic belt from Auranga Coalfield

The generalized stratigraphic sequence of North Karanpura Coalfield as established has been given below:-

4.3.2 Coal bearing formations and their general behavior

Geological Succession of North Karanpura Coalfield

Period	Group	Sub-Group	Formation	Lithology
Recent	-	-	Alluvium	Detrital & alluvial soil/sub-soil.
Jurassic	-	Co-ovals of Rajmahal Trap	Igneous intrusive	Dolerite and Mica Peridotite.
Triassic	Upper-Gondwana	-	Mahadeva	Massive coarse to conglomeratic, feldspathic & ferruginous sandstone, shale intercalations.
Upper permian to Lower Triassic	Lower Gondwana	-	Panchet	Yellowish to white coarse grained sandstone. red, chocolate coloured plastic clays. In the upper part yellowish friable sandstone whereas in the lower part greenish yellow sand/silt stone.
Upper Permian	-	-	Raniganj	Fine to medium grained quartzo-feldspathic & quartzitic sandstone often micaceous,

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				interbanded shale & sandstone, carbonaceous shale and thin coal seams.
		Damuda	Barren Measures	Dark shale, sandy micaceous shale with sideritic interbanded shale and sandstones.
			Barakar	Conglomerate, sandstone, shale, intercalation siltstone & shale, carbonaceous shale, fire clay, coal seams.
			Karharbari	Dark mottled sandstone with occacional shale bands, fireclay, chocolate coloured clays and coal seams
Permo-Carboniferous	-	-	Talchir	Rikba plant beds, boulders, conglomerates, varvites, sandstone, tilloids and tillites.
----------Unconformity----------				
Pre-Cambrian	-	-	Metamor-phics	Granite gneisses, pegmatite, phyllites, mica schist, amphibolites and quartzites.

4.3.3 Sequence of coal seams and partings within the block area

Table 4.2: Sequence and brief description of Coal Seams in the block

Seam	Thickness range (m)		U.H.V. (kcal/kg)	Borehole intersection (s)	Geological Reserve (MT)
	Min	Max			
K5	5.25	5.85		4	-
Parting	28.79	33.20			
K4	2.95	5.70	1695-2070	7	2.817
Parting	26.79	42.91			
K3	0.23	1.45	2830	8	0.827
Parting	5.86	10.00			
K2	1.65	7.04	3905-4140	10	3.536
Parting	2.43	18.00			
K1	1.74	4.53	4185-5215	11	2.671
Parting	3.42	14.61			
Karkata	2.12	6.15	3670-4650	9	3.814
Parting	17.35	40.90			
Bisrampur	1.60	6.15	2995-4290	23	15.949
Parting	5.58	22.87			

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Bukbuka	10.12	22.38	2995-4290	25	39.028
Parting	25.46	34.90			
Dakra (Combined)	15.20	34.65	3495-3905	22	25.886
P (Bet Dakra Top and Bukbuka)	16.25	29.54			
Upper Dakra	0.72	11.89	3695-4515		9.559
Parting	1.44	7.24			
Lower Dakra	15.57	21.37	2550-3545		22.698
Total					126.785

4.3.4 Structural setting within the project area

The coal bearing rocks and the coal seams occurring within the projectised area belong to the Barakar Formation of the Lower Gondwana Group. The contact between the coal bearing rocks and metamorphics in the South is faulted.

4.3.5 Dip and Strike

The general strike of the beds in the KD South swings from NW-SE in the West to almost E-W in the east and south east part. Whereas, in the part of Karkata block under consideration, the general strike of the beds is in WNW-ESE. The gradient varies from 1 in 9 to 1 in 4 due South. The flatter gradient is however restricted to the northern part of the block.

4.3.6 Faults and their characteristic features –

The K D South geological block under consideration has been traversed by 6 no. of faults. These have been numbered from
F1-F1 to F6-F6. Faults F1-F1 to F3-F3, with down throw due north are located in the northern part of the block. Faults F4-F4 to F6-F6 with down throw due South are located in the Southern part. F3-F3 fault extends in the adjoining Karkata

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block whereas F4-F4 fault has the extension in the Dakra colliery extension area. The maximum throw of these faults is upto around 70 m (F5). The details are given in the table below:

Brief Description of Faults in the K D South block

Fault	Location	General Trend of fault trace	Amount of throw & direction
1	2	3	4
F1	Northern part of the block.	E-W	Northerly (20m)
F2	Northern part of the block.	NW-SE	North easterly (0-15m)
F3	Northern part of the block.	NW-SE	North easterly (0-25m)
F4	Southern part of the block.	NW-SE to WNW-ESE	Southerly (10-25m)
F5	Southern part of the block.	E-W to WNW-ESE	Southerly (30-70m)
F6	Southern part of the block.	E-N	Southerly (15-30m)

Additional faults pertaining to Karkata block has been encountered in the projectised area. They are detailed as under:

Fault	Location	General Trend of fault trace	Amount of throw & direction
1	2	3	4
F8	Between boreholes NNKK-1 & 27.	NNW-SSE	NNE to East (0-30m)
F21	North of boreholes NNKK-29 & south of NNKH-29.	WNW-ESE	SSW (0-5m)
F22	North of boreholes NNKK-3 & NNKD-1.	WNW-ESE	SSE (5m)

4.4 Description of Coal Seams

A total of nine coal seams have been encountered in the projectised area. Out of nine seams, K5 seam has a very limited spatial extent in the property in the South of the major fault F5-F5. As such this coal seam has not been considered for the purpose of reserve calculation in this block.

4.4.1 Important coal seams of the project area and their general behavior

The most potential coal seams of the block from thickness point of view are Dakra Seam, Bukbuka Seam and Bisrampur Seam. The coal seams from Dakra to Bukbuka do not crop out in the area as the block boundary in the north has been considered upto the incrop of Bisrampur seam.

4.4.2 Description of Individual coal seams of the project area:

The descriptions of individual seams have been given below:

4.4.2.1 Dakra Seam

Stratigraphic position- The Dakra seam is the bottom most seam in the block and lies about 25.46m to 34.90m below the Bukbuka seam. The stratigraphic position of the seam has been established with the help of 22 boreholes. Dakra seam is a potential seam in the area due to its large thickness. The seam splits up into two sections in the western half. The thickness of combined seam varies from 15.20m to 34.65m. The thickness range for Upper Dakra and Lower Dakra seams are from 0.72m to 11.89m and 15.57 m to 21.37m respectively.

The seam does not incrop within the property. Its incrop lies in the KD (Hesalong) block which is situated north of this block. Dakra seam is being quarried there. But within the block under consideration the seam is virgin

Dakra seam does not have any inseam band of thickness more than 1m. The details of dirt bands have been given in Annexure-IV.

Quality- The summarised statement of quality data is given below:

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Particulars	On equilibrated basis (including bands)		
	Dakra (Com.)	Dakra (Top)	Dakra(Bot.)
Moisture%	5.6 - 6.4	5.7 - 7.1	5.0 - 6.2
Ash%	30.0 -33.7	29.2- 31.6	33.6-40.4
VM%	26.7 -27.4	26.7 -27.2	23.9-26.3
VM% (dmmf basis)	40.7		40.1
UHV Kcal/kg	3450-3905	3695-4515	2550-3545
Grade	E	E-D	F-E

Ultimate analysis- Ultimate analysis of Dakra seam is available from one borehole. These data are summarised below.

Parameters	Equilibrated basis		Unit coal basis	
	In-band	Ex-band	In-band	Ex-band
C%	49.67	49.86	81.43	81 .87
H%	2.70	2.45	4.42	4.02-4.90
S%	0.74	0.60	—	0.5
N%	1.10	1.05	—	1.6
Borehole considered - NNKK-12				

Ash analysis- Results of chemical composition of coal ash from Dakra seam is available from two boreholes. Details are given below:

Parameters	Range
SiO2%	56.76 - 56.85
Al2O3%	30.06 - 30.92
Fe2O5%	5.49 - 5.79
TiO2%	2.30 - 2.50
P2O5%	0.70 - 0.74
SO3%	0.29 - 0.70
CaO%	0.38 - 1.07
MgO%	1.05 - 1.24
Alkali by diff.	1.37 - 1.77
Boreholes	NNKK-12+ NNKK-14

Ash fusion temperature range- The data of initial deformation temperature only of the coal ash of Dakra seam is available for one borehole NNKK-12. The I.D.T is >1400°C.

H.G.I - Hard grove grindability index of Dakra seam has been carried out on the coal cores of one borehole (NNKD-12). The HGI is 47.

4.4.2.2 Bukbuka seam

Stratigraphic position- The Bukbuka seam lies about 5.58m to 22.87m below the Bisrampur seam and is about 25.46m to 54.90m above the Dakra seam. The stratigraphic position of the seam has been established with the help of 25 boreholes. Bukbuka seam is second thickest seam in the area. It splits up in two sections in North Western corner, North eastern corner and in the Southern part of the property. The thickness of combined seam varies from 10.12m to 22.38m. The top split thickness ranges between 2.90m to 9.37m whereas that of bottom split ranges between 4.84 m to 16.49 m. The parting between top split and bottom split ranges between 1.36m to 5.51 m.

The seam incrops just outside the northern boundary of the property. In fact the southern edge of the Bukbuka quarry limits the major part of the northern boundary of the block.

Bukbuka seam does not have any in seam band of thickness more than 1 m.

Quality- The summarised statement of quality data is given below:

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Particulars	On equilibrated basis (including bands)		
	Bukbuka (combined)	Bukbuka (Top)	Bukbuka (Bot)
Moisture %	5.3 - 7.2	6.3 - 8.1	5.9
Ash%	28.1 -35.6	26.3 -39.3	38.20-40.4
VM%	26.1 -29.0	23.9 -27.8	22.8
VM% (DMMF basis)	39.5 -41.1	-	-
UHV K.cal/kg	2995 -4290	2605 -	2510
Grade	F - D	F	F

Ultimate Analysis -Ultimate analysis of Bukbuka seam is available from one borehole. These data are summarised below.

Parameters	Equilibrated basis		Unit coal basis	
	Incl. band	Ex-band	Incl. band	Exband
C%	46.79	48.28	79.86	78.60-80.05
H%	2.38	2.92	4.92	4.80- 4.84
S%	0.62	0.64	-	0.6 - 0.7
N%	1.00	1.05	-	1.7 - 1.8
Borehole considered -NNKK-12			NNKD- 2 & 5	

Ash analysis- Results of chemical composition of coal ash from Bukbuka seam are available from 2 boreholes. Details are given below.

Parameters	Range
SiO2%	55.80 - 57.98
Al2O5%	28.59 - 29.76
Fe2O3%	5.99 - 6.24
TiO2%	1.55 - 2.40
P2O5%	0.90 - 1.15
SO3%	0.33 - 0.59
CaO%	0.44 - 1.69
MgO%	1.06 - 1.95
Alkali by diff %	1.52 - 2.06
Boreholes considered	NNKK-12 & NNKK-14

Ash Fusion Temperature Range- The data of initial deformation temperature and hemispherical temperature of coal ash of Bukbuka seam is available for the borehole NNKK-12. The IDT is 1290°C and the H.T is >1400°c.

H.G.I- Hard Grove Grindability Index of Bukbuka seam has been carried out on the coal cores of one borehole (NNKK-12). The HGI is 50.

4.4.2.3 Bisrampur Seam

Stratigraphic position- The Bisrampur seam lies about 17.35m to 40.90m below Karkata seam and is about 5.58m to 22.87m above the Bukbuka seam. The stratigraphic position of the seam has been established with the help of 23 boreholes.

Bisrampur seam is the third thickest seam in the area. The thickness of the seam varies from 1.60m to 9.45 m. (This 1.60m thickness has been encountered in only one borehole (CNKKD-2) which is near the Southern boundary. In rest of the area the thickness is around 7 to 8 m.

The seam incrops just at the northern boundary of the property. In fact, its incrop has been taken as the northern limit of the block. Bisrampur seam does not have any in seams band of thickness more than 1 m.

Quality- The summarised statement of quality data is given below:

Particulars	On equilibrated basis (incl bands)
Moisture %	7.2-8.8
Ash%	25.1-50.4
VM%	25.9-28.0
VM% (DMMF basis)	59.2
UHV K.cal/kg	5710-4620
Grade	E- D

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Ultimate analysis- Ultimate analysis of Bisrampur seam is available from one borehole. These data are summarised below:

Parameters	Equilibrated basis		Unit coal basis	
	Incl. band	Ex-band	Incl. band	Exband
C%	48.52	49.79	79.82	78.6-80.79
H%	2.95	3.08	4.82	4.70-5.01
S%	0.66	0.62	-	0.6
N%	1.14	1.05	-	1-8
Borehole considered	NKKD-12		NKKD-5 & NKKD-12	

Ash analysis- Results of chemical composition of coal ash from Bisrampur seam are available from 2 boreholes. Details are given below:-

Parameters	Range
SiO2%	56.75 - 58.13
Al2O5%	29.27 - 31.39
Fe2O3%	4.99 - 5.49
TiO2%	2.25 - 2.40
P2O5%	0.80 - 1.90
SO3%	0.33 - 0.35
CaO%	0.44 - 0.66
MgO%	1.10 - 1.18
Alkali by diff %	1.49 - 1.69
Boreholes considered	NNKK-12 & NNKK-14

Ash Fusion Temperature Range- The data of initial deformation temperature and hemispherical temperature of coal ash of Biarampur seam are available for two boreholes and one borehole respectively. These are given below:-

Parameters	Range	Boreholes
IDT	1240°C- 1330°C	NNKK-12 & NNKK-14
HT	>1400°C	NNKK-12

HGI- Hard Grove Grindability Index of Bisrampur seam has been carried out on the coal cores of one borehole (NNKK-12). The HGI is 49.

4.4.2.4 Karkata Seam

Stratigraphic position- The Karkata seam lies about 3.42m to 14.61m below the K1 seam and is about 17.35m to 40.90m above Bisrampur seam. The stratigraphic position of the seam has been established with the help of nine boreholes.
Karkata seam has been developed through inclines in the block. The development is up to the fault F4F4. The thickness of the seam varies from 2.12m to 6.15m.
The seam incrops in the middle of the property. Karkata seam does not have any in seam band of thickness more than 1m.

Quality- The summarised statement of quality data is given below:

Particulars	On equilibrated basis (incl bands)
Moisture %	8.0 - 8.7
Ash%	22.8 -29.3
VM%	25.0 -27.2
VM% (DMMF basis)	38.0
UHV K.cal/kg	3670 - 4650
Grade	E- D

Ultimate analysis- Ultimate analysis of Karkata seam is available from one borehole. These data are given in below.

Parameters	Unit coal basis (Ex-band)
C%	78.1
H%	5.0
S%	0.6
N%	1.9
O% (by difference)	14.4
Borehole considered	NKKD-2

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4.4.2.5 K1 Seam

Stratigraphic position- The K1seam lies about 2.43m to 18.00m below K2 seam and is about 3.42m to 14.61m above the Karkata seam. The stratigraphic position of the seam has been established with the help of eleven boreholes. The seam incrops in the Southern half of the property. Its thickness varies from 1.74 m to 4.53 m. It is a virgin seam. K1 seam does not have any in seam bands of thickness more than 1m.

Quality- The summarised statement of quality data is given below:

Particulars	On equilibrated basis (incl bands)
Moisture %	7.7 - 9.8
Ash%	16.9 -26.4
VM%	26.7 -29.2
VM% (DMMF basis)	37.0 -37.8
UHV K.cal/kg	4195 - 5215
Grade	E – C

Ultimate analysis-Ultimate analysis of K1 seam is available for three boreholes. These data are summarised below.

Parameters	Unit coal basis (Ex-band)
C%	78.0 - 81.6
H%	4.6 - 4.8
S%	0.6
N%	1.8 - 1.9
O% (by difference)	11.3 - 15.1
Borehole considered	NKKD 2, 5 & 8

4.4.2.6 K2 seam

Stratigraphic position- The K2 seam lies about 5.86m to 10.00m below K3 seam and is about 2.43m to 18.00m above K1 seam. The

stratigraphic position of the seam has been established with the help of ten boreholes.

The seam incrops in the Southern half of the property. The seam has been found to be splitted in two parts in 5 boreholes (NKKD-3, 5, 8 & CNKKD-11). The thickness of combined seam varies from 1.65m to 5.71m. The top split thickness ranges from 1.80m to 3.99m whereas that of bottom split ranges from 1.37m to 3.05m. The parting between top split & bottom split varies from 1.20 m to 3.30 m.

K2 seam has been developed through inclines in the block. The development is confined upto the fault F4-F4. K2 seam does not have any in seam bands of thickness more than 1m. The details of dirt bands have been given in annexure-IV.

Quality- The summarised statement of quality data is given below:

Particulars	On equilibrated basis (incl bands)		
	K2	K2 (Top)	K2 (Bot)
Moisture %	6.9-8.2	7.8 -9.2	8.1-8.3
Ash%	27.4-29.1	26.0 -30.8	25.6-28.4
VM%	26.3-27.5	25.4 -2.8.2	26.4-27.3
VM% (DMMF	38.9		
UHV K cal/kg	3905-4140	3575-4235	3865-4220
Grade	E	E - D	E - D

Ultimate analysis- Ultimate analysis of K2 seam is available for only one borehole. The data is given below:

Parameters	Unit coal basis (Ex-band)
C%	77.8
H%	4.9
S%	0.6
N%	1.9
O% (by difference)	14.8
Borehole considered	NKKD 8

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4.4.2.7 K3 Seam

Stratigraphic position- The K3 seam lies about 26.79m to 42.91m below K4 seam and is about 5.86m to 10.00m above K2 seam. The stratigraphic position of the seam has been established with the help of eight boreholes. The seam incrops in the Southern half of the property. Its thickness varies from 0.23m to 1.45m. It is a virgin seam. K3 seam does not have any in seam bands of thickness more than 1m.

Quality- The summarised statement of quality data is given below:

Particulars	On equilibrated basis (incl bands)
Moisture %	9.5
Ash%	31.9-34.5
VM%	
VM% (DMMF basis)	38.5
UHV K.cal/kg	2830
Grade	F

Ultimate analysis- Ultimate analysis of K3 seam is available for only one borehole. The data is given below:

Parameters	Unit coal basis (Ex-band)
C%	77.2
H%	4.6
S%	0.8
N%	1.9
O% (by difference)	15.5
Borehole considered	NKKD 8

4.4.2.8 K4 seam

Stratigraphic position - The K4 seam lies about 28.79m to 33.20m below K5 seam and is about 26.79m to 42.91m above K3 seam. The stratigraphic position of the seam has been established

with the help of seven boreholes. The seam incrops in the Southern half of the property. The seam has been found to be splitted in two parts with more than 1m parting in one borehole (CNKKD-2). The thickness of combined seam varies from 3.78m to 5.70m. The top split and the bottom split thickness as encountered in the borehole are 2.20m & 0.75m respectively. The seam is virgin. K4 seam does not have any in seam bands of thickness more than 1m.

Quality- The summarised statement of quality data is given below:

Particulars	On equilibrated basis (incl bands)
Moisture %	6.1 - 7.2
Ash%	42.3 -46.1
VM%	21.5 -22.5
VM% (DMMF basis)	39.2
UHV K.cal/kg	1695 - 2070
Grade	G

Ultimate analysis - Ultimate analysis of K4 seam is available for only one borehole. The data is given below.

Parameters	Unit coal basis (Ex-band)
C%	77.7
H%	4.8
S%	0.6
N%	2.0
O% (by difference)	14.9
Borehole considered	NKKD 8

4.4.2.9 K5 Seam

This seam has been encountered in 4 boreholes located in the Southern part of the property. This part of the property is very much structurally disturbed. As the seam has very limited extent and is located in the much disturbed zone, this has not been considered at

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all for reserve calculation etc. It will not have any effect on the overall picture of the coal reserve. Due to less number of boreholes (only four) encountered this seam floor contours & isochore plans have not been prepared.

4.5 Geological Reserves

Out of the nine coal seams present in the projectised area, all the seams, except K5, have been considered for reserve estimation. All the seams considered for reserve calculation are thick except K3. These seams are best suited for multi seam quarry. Further, the average grade of the geological reserves comes to Grade 'E'.

4.5.1 Brief methodology adopted for reserve estimation

Isochore method of reserve estimation has been employed for each seam. The volume of reserves for individual areas between the isochore lines were multiplied with the corresponding specific gravity of the coal seam to get the "gross" geological reserve. Heave zones of the faults on the floor of the individual seam marked on the respective plans have been excluded from the reserve estimation. A deduction of 10% was made from this to get the "net" geological reserve. Vertical excavation was considered for estimation. For developed seams further of 40% deduction from the net reserve has been done to calculate the reserve standing on pillars.

4.5.2 Net Geological Reserves within the projectised area:

Table 4.5: Grade-wise Geological Reserve

(Fig in MT)

	Karkata block	C	D	E	F	G	Total
K3	0.60	-	-	-	0.83	-	1.42
K2	2.85	-	-	3.54	-	-	6.38
K1	1.45	0.87	1.81	-	-	-	4.13
Karkata	0.93	-	2.44	1.37	-	-	4.75
Bisrampur	8.12	-	4.20	11.75	-	-	24.07
Bukbuka	1.67	-	0.56	29.96	8.50	-	40.70
Dakra Comb	9.02	-	-	25.89	-	-	34.90
Upper Dakra	2.54	-	-	9.56	-	-	12.10
Lower Dakra	10.95	-	-	7.41	15.28	-	33.65
Total	38.14	0.87	9.01	89.48	24.61	0.00	162.11

Note: The reserve from seam K4 have been excluded as it is not encountered in the projectised area.

4.6 Recommendation- An additional net geological reserve of 38.14MT of has been added from Karkata block in the KD South block reserve to arrive at the total net geological reserve.

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CHAPTER-V

MINE BOUNDARY, RESERVES AND MINE LIFE

5.1 Introduction

The existing KDH OCP is nearing exhaustion. From the sanctioned boundary of KDH Expn OCP (4.5MTY), a balance of about 14.51 MT of coal and 22.50 Mcum of OB at a stripping ratio of 1.55cum/te is left. So it is proposed to exploit the coal seams in the dip side of the existing KDH OCP from K3 Seam to Lower Dakra Seam. The proposed quarriable block is based on the "Geological Report on KD South Block, North Karanpura Coalfield" prepared in March 1989. The parameters of the opencast minefield and the technical condition of its development make it feasible to produce 4.50 MT of ROM coal per annum with normal technical indices i.e., deployment of equipment, strike length of the quarry, annual advances of the faces, etc.

Nine (9) numbers of coal horizons, namely Seams K3, K2, K1, Karkata, Bisrampur, Bukbuka Top, Bukbuka Bottom, Upper Dakra & Lower Dakra are occurring within this mining block. The Lower Dakra Seam is the base seam of the quarry.

The mineable reserves within the proposed quarriable block have been estimated as 107.15MT of coal corresponding to a volume of OBR of 164.99 Mcum at an average stripping ratio of 1.54 cum/te. The life of the project is estimated as 25 years for a rated output of 4.5 Mtes of 'E' grade coal per annum.

5.2 Mine Boundaries:

a) Northern Boundary:

The northern floor boundary of the quarry has been fixed along the floor of Lower Dakra seam in the existing KDH OCP.

b) Eastern Boundary:

The eastern surface boundary has been fixed leaving a surface barrier of about 60m from Sonadoba Jore.

c) Western Boundary:

The western floor boundary has been fixed leaving a surface barrier of about 60m from Kendua Nala in Karkata block.

d) Southern Boundary:

The southern surface boundary has been fixed leaving a barrier of about 60m from Sonadoba Jore and upon the F4 fault.

5.3 Mineable Reserves:

The quarry boundaries have been maximized to the extent possible and area upto fault F4 in KD South mining block has been considered for mining up to the base seam (Lower Dakra) and the extractable reserves have been maximized to produce coal @ 4.50 MTY within the proposed boundaries of the quarries.

Seamwise Details of Mineable Reserves:

Name of seam	Thickness variation 'm'	Net Geological Reserve (MT)	Mineable Reserve (MT)
K3	0.35-1.45	1.42	0.84
K2	2.75-7.04	6.38	4.49
K1	1.74-4.03	4.13	2.45
Karkata	2.12-6.15	4.75	4.18
Bisrampur	1.60-3.15	24.07	14.54
Bukbuka Top	0.82-1.00	40.70	4.80
Bukbuka Bottom	9.30-20.40		30.77
Upper Dakra	0.72-11.89	80.65	7.81
Lower Dakra	15.57-21.37		37.25
Total		162.11	107.15

*: About 35.00 MT coal has been left out in the barrier left against Sonadoba jore nalla in the East and area to the south of fault F4-F4.

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Section wise sector wise Mineable Reserves:

The calendar programme has been drawn by dividing the mining block into eleven sectors. The details of the sections are as follows:

(All Fig in MT)

SECTORS	1	2	3	4	5	6	7	8	9	10	11	TOTAL
COAL	**14.51**	**5.44**	**4.21**	**6.59**	**11.12**	**5.12**	**13.69**	**12.82**	**13.02**	**12.13**	**8.49**	**107.15**
K3	0.00	0.00	0.00	0.00	0.00	0.06	0.13	0.19	0.19	0.17	0.10	0.84
K2	0.00	0.00	0.00	0.00	0.23	0.27	0.73	0.98	0.95	0.86	0.48	4.49
K1	0.00	0.00	0.00	0.00	0.15	0.17	0.47	0.50	0.47	0.44	0.26	2.45
Karkata	0.00	0.00	0.00	0.23	0.40	0.37	0.70	0.73	0.69	0.65	0.42	4.18
Bisrampur	2.34	0.33	0.39	0.80	1.19	0.55	2.26	1.83	1.89	1.74	1.25	14.54
Bukbuka Top	2.62	0.08	0.35	0.30	0.24	0.20	0.20	0.20	0.20	0.20	0.20	4.80
Bukbuka Bot	2.95	1.34	1.53	2.38	3.68	1.77	4.28	3.48	3.57	3.29	2.50	30.77
Upper Dakra	0.93	0.53	0.41	0.71	1.13	0.38	0.76	0.72	0.76	0.76	0.72	7.81
Lower Dakra	5.66	3.16	1.53	2.17	4.10	1.36	4.15	4.20	4.31	4.03	2.57	37.25

5.4 Target Output & Mine Life:

The mine has been planned for a nominal production capacity of 4.50MT per annum of coal and peak production 5.0 MTY. The target has been assessed based on geological constraints, optimization of mining operations, size of the quarry, rate of advance, etc.

Mine Life.

The project will sustain a mine life at nominal production for a period of 25 years of mining operations. The break-up of total period is as follows:

- Construction period – Nil,
- Production build-up period - Nil,
- Production period - 22 years,
- Tapering period - 3 years,
- Total period - 25 years.

CHAPTER-VI

METHOD OF MINING

6.1 General

Considering the geo mining characteristics of the mining block i.e. thick deposits at shallow depth, moderate gradient of the seams, occurrence of geological disturbances, opencast method of mining with shovel-dumper combination is proposed to work in KDH Expansion mining block.

6.2 Geo-Mining Characteristics

The Geo-Mining characteristics of the proposed KDH Expansion OCP (4.50MTY) are given in the table below. A total no. of nine coal horizons is occurring within the quarriable area.

6.2.1 Seam Gradient – The dip of the formation varies from 6° -8° towards south.

6.2.2 Geological Disturbances

6 (six) faults have been encountered in KD South block as per the Geological Report of KD South Block.

Fault	Extent	Trend	Direction & Amount of Throw
F1	Northern part of the block	E-W	Northerly (20m)
F2	Northern part of the block	NW-SE	North easterly (0-15m)
F3	Northern part of the block	NW-SE	North easterly (0-25m)
F4	Southern part of the block	NW-SE to WNW-ESE	Southerly (10-25m)
F5	Southern part of the block	E-W to WNW-ESE	Southerly (30-70m)
F6	Southern part of the block	E-N	Southerly (15-30m)

An additional 3 (three) faults from Karkata block has also been encountered in the projectised area. The details are as follows:

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Fault	Extent	Trend	Direction & Amount of Throw
1	2	3	4
F8	Between boreholes NNKK-1 & 27.	NNW-SSE	NNE to East (0-30m)
F21	North of boreholes NNKK-29 & south of NNKH-29.	WNW-ESE	SSW (0-5m)
F22	North of boreholes NNKK-3 & NNKD-1.	WNW-ESE	SSE (5m)

6.2.3 Details of sequence of coal seam and parting

Name of Seam / Parting	Thickness of coal/ parting (m) with range	
	Min	Max
K3	0.23	1.45
Parting	5.86	10.00
K2	1.65	7.04
Parting	2.43	18.00
K1	1.74	4.53
Parting	3.42	14.61
Karkata	2.12	6.15
Parting	17.35	40.90
Bisrampur	1.60	6.15
Parting	5.58	22.87
Bukbuka	10.12	22.38
Parting	25.46	34.90
Dakra (combined)	15.20	34.65
Parting (Between Dakra Top and Bukbuka)	16.25	29.54
Dakra Top	0.72	11.89
Parting	1.44	7.24
Dakra Bot	15.57	21.37

6.3 Mine parameters

Particulars	Minimum(m)	Maximum(m)
Dimension of the quarry along strike (on floor)	1100	1750
Depth of quarry	130	200
Dip rise length (on floor)	500	980
Final Quarry Floor area (in Ha)	129.85	
Final Quarry Surface area (in Ha)	175.22	
Mineable reserves (Mt)	107.15	
Total OB (Mcum)	164.99	
Average Stripping Ratio (Cum/Tonne)	1.54	
Seam gradient (Avg. gradient of the quarry floor)	6 - 8 deg	

6.4 Choice of Technology:

Shovel Dumper Combination

Keeping in view of the Geological and Mining parameters of KDH mining block i.e. moderate gradient of the seam (6^0-8^0), rated output of 4.50 MTY, Shovel-dumper mining system with inclined slicing has been envisaged for the quarry.

6.4 Equipment Selection

Considering the average strike length of the quarry, gradient and thickness of the seam, annual load of excavation and lead the following equipments have been selected.

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Population of Equipment – MAIN VARIANT (FULLY DEPARTMENTAL)			
Particulars	**Size/Cap**	**Existing No(s)**	**Proposed No(s)**
Coal			
Electric Rope Shovel	5 cum	4	3
Rear Dumper	50/60 T	15	19
Drill	160 mm	4	4
Dozer	410 HP	4	4
OB			
Electric Rope Shovel	10 Cum	3	3
Electric Rope Shovel	5 Cum	1	1
Rear Dumper	85/100 T	28	23
Rear Dumpers	50/60 T	-	6
Elec RBH Drill	250 mm	4	4
Dozer	410HP	8	8
Common			
Hyd. Shovel (with backhoe)	1.2 Cum	2	2
Dump Truck	10T	4	4
Grader	280HP	3	3
RT crane	50T	1	1
RT crane	20T	1	1
FE Loader	5-6 Cum	2	2
Wagon Drill	100-120mm	2	2
Tyre Handler	35kN	-	1
Water Sprinkler	28 KL	3	4
Wheel Dozer	460 HP	2	2
Vibratory Compactor	30T	1	1
Fuel Truck	16KL	1	1
Cable Handler		-	1
Fire Truck		1	1
Reclamation			
F E Loader	5-6Cum	-	1
Water Sprinkler (wide spray system)	28 KL	-	2
Dozer	410 HP	-	1
Dumper	35T	-	2

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6.5 Mining System and system parameters

Inclined mining system with shovel-dumper combination has been adopted considering the geo-mining conditions. Following mining system parameters have been considered in the project:

S. No	Particulars	Unit	Value
1	Bench Height	m	10-12
2	Working bench width	m	40
3	Non-working bench width	m	25
4	Bench slope	deg	70
5	Blast hole dia	mm	250/160
6	Powder Factor	kg/cum	0.2-0.3

While working above underground workings, suitable precautions as laid down by DGMS vide its various Circulars should be strictly observed.

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CHAPTER-VII

MINING & DUMPING STRATEGY

7.1 Constraints on Mine Development

a) **Underground Workings:** The proposed mining block contains old underground workings in K2 and Karkata seams. Suitable statutory precautions need to be taken during the extraction of upper seams.

b) **Depth of working:** The mining in the proposed mining block has a starting depth of 130m and the maximum depth of the mine is 200m.

c) **Built-up:** An extensive built up area is located within the proposed quarry, which includes miners' quarters, hutments and two villages known as Jehlitand village and Barkitand village. These needs to be shifted and/or rehabilitated.

7.2 Mining Strategy / Mining Sequence

KDH OCP is an existing mine. The quarry is proposed to be worked by inclined slicing method by shovel-dumper combination. A haul road has been proposed in the western side of the quarry on the floor of base seam (Lower Dakra). This will also facilitate future accessibility in Karkata block from the floor of Lower Dakra seam. The proposed haul road should be made by diverting the existing sump and rehandling a part of the existing OB dump.

7.3 Mining Parameters:

Some major system parameters for both coal winning & OB removal are given below:-

1. Mining Benches:

a) Maximum Bench Height

- 10 Cum Electric Rope shovel Bench - 15-18m
- 5 Cum Electrical Rope shovel Bench - 10-12m

b) Minimum Bench Width:

Working Bench Width for 10cum Rope Shovel	- 40m
Non-working Bench width for 10cum Rope Shovel	- 25m
Working Bench Width for 5cum Hyd Shovel	- 40m
Non-working Bench width for 5cum Hyd Shovel	- 25m

2.	Width of the permanent haul road	-	30 m.
3.	Usual height of the spoil dump bench	-	30 m.
4.	The width of the active dump bench	-	60 m.
5.	Bench Slope (working)		
	O.B. bench	-	70^0
	Coal bench	-	70^0
	Dump bench	-	37^0
6.	Overall pit slope	-	40^0

7.4 Dumping Strategy

Spoil Dump

Total volume of overburden of the proposed OCP has been estimated as 164.99 Mcum. Total overburden is proposed to be dumped internally.

		Volume of OB (M cum)
1	Internal Dump	164.99
	Total	164.99

The maximum RL of the internal dump is +460m.

Top Soil Management

The saiväging, stockpiling and re-application of topsoil to be used as growth medium in the reclamation of Internal & External overburden dumps within the mining area is a major environment protection programme. Soil

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management in opencast mine is necessary to re-establish the stability & productivity of lands disturbed due to mining activity.

Year-wise internal dumping:

(Fig in Mcum)

YEAR	Volume of External dumping	Volume of Internal dumping	Total
(a)	*(b)*	*(c)*	*(d)*
1	-	7.00	7.00
2	-	7.00	7.00
3	-	7.00	7.00
4	-	7.00	7.00
5	-	7.00	7.00
6	-	7.00	7.00
7	-	7.00	7.00
8	-	7.00	7.00
9	-	7.00	7.00
10	-	6.85	6.85
11	-	6.85	6.85
12	-	6.85	6.85
13	-	6.85	6.85
14	-	6.85	6.85
15	-	6.85	6.85
16	-	6.85	6.85
17	-	6.85	6.85
18	-	6.85	6.85
19	-	6.85	6.85
20	-	6.85	6.85
21	-	6.80	6.80
22	-	6.60	6.60
23	-	6.48	6.48
24	-	4.87	4.87
25	-	1.89	1.89
Total	-	**164.99**	**164.99**

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7.5 Sequence of Dumping Operations and Stage-Wise Details

Sl. No.	Particulars	
1.	Coal Mined (MT)	107.15
2.	OB removed (M cum)	164.99
3.	Stripping Ratio (M cum/t)	1.54
4.	Excavated quarry area (Ha)	175.22
5.	Internal dump (Mcum)	164.99

Dumping Arrangements

The maximum RL of the internal dump is +460m. However, the internal dump may require to be raised further by few meters during the quarry operation, which will subsequently be brought down to +460m at the final stage of quarry operation so as to maintain the pre-mining topography of the area. The height of the individual bench in the internal dumps is 30m with facing berm width of 30m and side berm width of 20m.

The void left at the end of mine life is 45.00 Ha in the southernmost part of the quarry. The void is proposed to be filled to the extent possible by physical reclamation of last stage dump. The depth of the mine is proposed to be minimized to 30m (max.). The void thus left shall be used as water reservoir.

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CHAPTER-VIII

MINING SCHEDULE & EQUIPMENT PHASING

8.1 Design criteria:

The following design criterion has been adopted for the mining operations as per prevalent norms of mine design considered in CIL mine.

No. of annual working days	-	330
No. of daily shifts	-	3
Duration of each shift	-	8 hrs.

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

Calendar days per annum	-	365
Less- Public Holidays	-	-8
Unscheduled delays	-	-5
Bad weather effect	-	-22
Working days per annum with Sunday working:	-	330

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

Excavation Category:

a) Coal	-	Cat-III
b) OB	-	50% Cat.III+50% Cat.IV
c) Alluvium	-	Cat.I/II

Insitu Volume Weight:

For Coal	-	1.60
For OB	-	2.40

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8.2 Annual productivity of HEMM

Productivity of Excavators

Sl.	Equipment	Annual Productivity (Mcum.)
1.	FOR O.B/Parting:	
	10Cum.Elect. Rope Shovel + 100 RD	2.27
	5 Cum Elect Hyd.Shovel + 60T RD	1.13
2.	FOR COAL:	
	5 Cum Elect. Hyd. Shovel + 60T RD	1.22

Productivity of Rear Dumpers

Lead (in Km)	O.B		Coal
	Annual Productivity (M. Cum)		Annual Productivity (M. Cum)
	10 Cum ERS+ 100T RD	5 Cum ERS+ 60T RD	5 Cum ERS + 60T RD
1.0	0.3943	0.2417	0.2657
1.5	0.3328	0.2061	0.2275
2.0	0.2960	0.1842	0.2039
2.5	0.2713	0.1696	0.1881
3.0	0.2462	0.1544	0.1716
3.5	0.2269	0.1427	0.1588
4.0	0.2116	0.1334	0.1486
4.5	0.1992	0.1259	0.1404
5.0	0.1890	0.1196	0.1334

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8.3 Calendar Programme of Excavation

The mining schedule has been formulated based on the adopted sequence of opencast mine development at optimum conditions of mining operations for the entire life of KDH Expansion opencast mine. The KDH Expn OCP (4.5MTY) is a running mine. The property within the sanctioned mine boundary of KDH Expn OCP will sustain for another 4 (four) years at the rated capacity. Additional land acquisition and construction work related to rehabilitation of PAFs, construction of infrastructure (roads, buildings, CHP, etc) can be taken up during these four years. As such no construction period for the project has been considered. Likewise, no production built-up period has been proposed.

The total extractable reserves have been estimated as 107.15Mtes corresponding to a volume of OBR of 164.99 Mcum at an average stripping ratio of 1.54 cum/te. The seam-wise coal and OB is given in the Table below:

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DETAILED CALENDAR PLAN

	YEAR	COAL (MT) SEAMS K3	K2	K1	Karkata	Bisrampur	Bukbuka Top	Bukbuka Bottom	Upper Dakra	Lower Dakra	TOTAL Coal (MT)
Existing	1	0.00	0.00	0.00	0.00	0.73	0.81	0.92	0.29	1.75	4.50
	2	0.00	0.00	0.00	0.00	0.73	0.81	0.92	0.29	1.75	4.50
	3	0.00	0.00	0.00	0.00	0.73	0.81	0.92	0.29	1.75	4.50
	4	0.00	0.00	0.00	0.00	0.37	0.24	1.07	0.40	2.42	4.50
Total		**0.00**	**0.00**	**0.00**	**0.00**	**2.55**	**2.68**	**3.81**	**1.27**	**7.69**	**18.00**
Expansion	5	0.00	0.00	0.00	0.00	0.35	0.24	1.41	0.44	2.06	4.50
	6	0.00	0.00	0.00	0.10	0.50	0.26	1.63	0.47	1.54	4.50
	7	0.00	0.02	0.01	0.16	0.54	0.18	1.60	0.48	1.52	4.50
	8	0.00	0.09	0.06	0.16	0.48	0.10	1.49	0.46	1.66	4.50
	9	0.00	0.09	0.06	0.16	0.48	0.10	1.49	0.46	1.66	4.50
	10	0.04	0.19	0.13	0.27	0.48	0.15	1.54	0.37	1.34	4.50
	11	0.05	0.24	0.15	0.27	0.63	0.11	1.47	0.29	1.29	4.50
	12	0.04	0.24	0.15	0.23	0.74	0.07	1.41	0.25	1.37	4.50
	13	0.04	0.24	0.15	0.23	0.74	0.07	1.41	0.25	1.37	4.50
	14	0.06	0.29	0.16	0.24	0.69	0.07	1.31	0.25	1.42	4.50
	15	0.07	0.34	0.17	0.26	0.64	0.07	1.22	0.25	1.47	4.50
	16	0.07	0.34	0.17	0.26	0.64	0.07	1.22	0.25	1.47	4.50
	17	0.07	0.33	0.17	0.25	0.65	0.07	1.23	0.26	1.48	4.50
	18	0.07	0.33	0.16	0.24	0.65	0.07	1.23	0.26	1.49	4.50
	19	0.07	0.33	0.16	0.24	0.65	0.07	1.23	0.26	1.49	4.50
	20	0.06	0.32	0.16	0.24	0.65	0.07	1.22	0.28	1.49	4.50
	21	0.06	0.32	0.16	0.24	0.64	0.07	1.22	0.28	1.49	4.50
	22	0.06	0.31	0.16	0.24	0.65	0.08	1.23	0.29	1.48	4.50
	23	0.05	0.23	0.12	0.20	0.59	0.09	1.18	0.34	1.21	4.00
	24	0.03	0.17	0.09	0.15	0.44	0.07	0.88	0.26	0.91	3.00
	25	0.01	0.06	0.04	0.06	0.17	0.03	0.34	0.10	0.35	1.15
Total		**0.84**	**4.49**	**2.45**	**4.18**	**11.99**	**2.12**	**26.96**	**6.54**	**29.56**	**89.15**
Grand Total		**0.84**	**4.49**	**2.45**	**4.18**	**14.54**	**4.80**	**30.77**	**7.81**	**37.25**	**107.15**

The above reserve includes about 14.51MT of coal and 22.50Mcum of OB from the sanctioned boundary of KDH Expn OCP (4.5MTY). The rated output of 4.5 MTY would be achieved from the 1st year of the project.

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		OB (M CUM)									
	YEAR	TOP OB	Parting between								Total OB (Mcum)
			K3-K2	K2-K1	K1-Karkata	Karkata-Bisrampur	Bisrampur-Bukbuka Top	Bukbuka Top-Bukbuka Bottom	Bukbuka Bottom - Upper Dakra	Upper Dakra-Lower Dakra	
Existing	1	1.73	0.00	0.00	0.00	0.00	1.04	0.85	1.98	1.40	7.00
	2	1.73	0.00	0.00	0.00	0.00	1.04	0.85	1.98	1.40	7.00
	3	1.73	0.00	0.00	0.00	0.00	1.04	0.85	1.98	1.40	7.00
	4	3.48	0.00	0.00	0.00	0.00	0.50	0.39	1.76	0.86	7.00
Total		**8.68**	**0.00**	**0.00**	**0.00**	**0.00**	**3.63**	**2.93**	**7.69**	**5.07**	**28.00**
Expansion	5	3.56	0.00	0.00	0.00	0.00	0.35	0.45	1.72	0.92	7.00
	6	2.47	0.00	0.00	0.00	1.00	0.40	0.51	1.65	0.97	7.00
	7	2.08	0.00	0.01	0.02	1.52	0.44	0.45	1.60	0.87	7.00
	8	2.42	0.00	0.08	0.14	1.25	0.45	0.36	1.53	0.77	7.00
	9	2.42	0.00	0.08	0.14	1.25	0.45	0.36	1.53	0.77	7.00
	10	1.43	0.18	0.19	0.23	1.72	0.40	0.41	1.48	0.82	6.85
	11	1.31	0.28	0.23	0.30	1.69	0.62	0.37	1.39	0.67	6.85
	12	1.50	0.29	0.22	0.32	1.50	0.81	0.32	1.34	0.54	6.85
	13	1.50	0.29	0.22	0.32	1.50	0.81	0.32	1.34	0.54	6.85
	14	1.59	0.37	0.24	0.36	1.37	0.76	0.30	1.31	0.55	6.85
	15	1.67	0.45	0.25	0.39	1.24	0.72	0.28	1.29	0.56	6.85
	16	1.67	0.45	0.25	0.39	1.24	0.72	0.28	1.29	0.56	6.85
	17	1.60	0.52	0.24	0.42	1.18	0.76	0.28	1.29	0.56	6.85
	18	1.56	0.55	0.24	0.44	1.15	0.78	0.28	1.29	0.56	6.85
	19	1.56	0.55	0.24	0.44	1.15	0.78	0.28	1.29	0.56	6.85
	20	1.23	0.71	0.27	0.62	1.02	0.85	0.28	1.31	0.57	6.85
	21	1.08	0.75	0.27	0.67	0.98	0.87	0.28	1.31	0.57	6.80
	22	0.78	0.74	0.27	0.71	0.95	0.91	0.29	1.36	0.58	6.60
	23	0.30	0.60	0.22	1.03	0.50	1.18	0.29	1.76	0.61	6.48
	24	0.23	0.45	0.16	0.77	0.37	0.89	0.22	1.32	0.46	4.87
	25	0.12	0.17	0.06	0.30	0.14	0.34	0.08	0.50	0.17	1.89
Total		32.09	7.34	3.73	8.01	22.72	14.31	6.68	28.90	13.21	136.99
G. TOTAL		**40.77**	**7.34**	**3.73**	**8.01**	**22.72**	**17.94**	**9.61**	**36.59**	**18.28**	**164.99**

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SUMMARISED CALENDAR PLAN

	YEAR	Coal (MT)	OB (M cum)	S.R (cum/te)
Production Period	1	4.50	7.00	1.56
	2	4.50	7.00	1.56
	3	4.50	7.00	1.56
	4	4.50	7.00	1.56
	5	4.50	7.00	1.56
	6	4.50	7.00	1.56
	7	4.50	7.00	1.56
	8	4.50	7.00	1.56
	9	4.50	7.00	1.56
	10	4.50	6.85	1.52
	11	4.50	6.85	1.52
	12	4.50	6.85	1.52
	13	4.50	6.85	1.52
	14	4.50	6.85	1.52
	15	4.50	6.85	1.52
	16	4.50	6.85	1.52
	17	4.50	6.85	1.52
	18	4.50	6.85	1.52
	19	4.50	6.85	1.52
	20	4.50	6.85	1.52
	21	4.50	6.80	1.51
	22	4.50	6.60	1.47
Tapering Period	23	4.00	6.48	1.62
	24	3.00	4.87	1.62
	25	1.15	1.89	1.65
	TOTAL	107.15	164.99	1.54

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Equipment Schedule:

Population of Equipment - MAIN VARIANT (FULLY DEPARTMENTAL)				
Particulars	**Size/Cap**	**Total**	**Existing**	**Additional**
Coal				
Electric Rope Shovel	5 cum	3	4	-
Rear Dumper	50/60 T	19	15	4
Drill	160 mm	4	4	-
Dozer	320 HP	-	4	-
Dozer	410 HP	4	-	4 (Replacement)
OB				
Electric Rope Shovel	10 Cum	3	3	-
Electric Rope Shovel	5 Cum	1	1	-
Rear Dumper	85/100 T	23	28	-
Rear Dumpers	50/60 T	6		4
Elec RBH Drill	250 mm	4	4	-
Dozer	320 HP	-	4	-
Dozer	410HP	8	4	4 (Replacement)
Common				
Hyd. Shovel (with backhoe)	1.2 Cum	2	2	-
Dump Truck	10T	4	4	-
Grader	280HP	3	3	-
RT crane	50T	1	1	-
RT crane	20T	1	1	-
FE Loader	5-6 Cum	2	2	-
Wagon Drill	100-120mm	2	2	-
Tyre Handler	35kN	1		1
Water Sprinkler	28 KL	3	4	-
Wheel Dozer	460 HP	2	2	-
Vibratory Compactor	30T	1	1	-
Fuel Truck	16KL	1	1	-
Cable Handler		1		1
Fire Truck		1	1	-
Reclamation				
F E Loader	5-6Cum	1		1
Water Sprinkler (wide spray system)	28 KL	2		2
Dozer	410 HP	2		2
Dumper	35T	2		2

8.4 Drilling & Blasting Operation:

Salient Physico-Mechanical Features of OB Rock and coal

Overburden rocks consist of medium grained sandstone to coarse grained sandstone. Assumed category of rock is 50% of CAT-3 + 50% of CAT-4.

Type, capacity and productivity of drills

This mining plan envisages the drills for Top OB bench and for partings and coal:

Sl	OB bench	Partings/coal
1	250mm dia drill	160mm drill
2	Blast hole depth-10-12m (5/10 Cum Rope Shovel)	Max depth-10m

Elements of Drilling and Blasting:

Drilling of top OB, Partings and Coal envisages to be done by 250/160mm drills. Drilling of coal & OB benches is recommended to be done vertically at 90^0. It is suggested to use slurry explosive in cartridge/site mixed slurry for better result and enhance safety with proper stemming material. Secondary blasting is not suggested in any circumstances. Mine shall create proper explosive storage capacity to cater daily explosive requirement to meet the annual coal target.

Powder Factor

- For OB -0.3 Kg/Cum of OB
- For Coal-0.2 Kg/Te of Coal

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8.5 Year wise Weighted Average lead:

(Fig in km)

Year of Operation	1	2	3	4	5	6	7	8	9
For Coal	3.44	3.44	3.45	3.45	3.46	3.46	3.47	3.47	3.48
For OB	2.41	2.41	2.42	2.41	2.42	2.42	2.43	2.43	2.44

Year of Operation	10	11	12	13	14	15	16	17	18
For Coal	3.47	3.48	3.48	3.49	3.49	3.50	3.50	3.51	3.51
For OB	2.44	2.45	2.45	2.46	2.46	2.47	2.47	2.48	2.48

Year of Operation	19	20	21	22	23	24	25
For Coal	3.52	3.52	3.53	3.53	3.63	3.63	3.63
For OB	2.49	2.49	2.50	2.50	2.52	2.52	2.51

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CHAPTER-IX

COAL QUALITY

9.1 Introduction

The coal seams encountered in the mining block of KDH Expansion OC are Lower Dakra, Upper Dakra, Bukbuka Bottom, Bukbuka Top, Bisrampur, Karkata, K1, K2 & K3.

9.2 Quality Analysis

- Mineable reserves seam-wise, grade-wise distribution along with overall specific gravity/UHV :

Name of seam	Grade-wise distribution of reserve					Total	Sp. Gr. Overall	U.H.V. Overall
	C	D	E	F	G			
K3	0.00	0.00	0.00	0.84	0.00	**0.84**	**1.66**	2830
K2	0.00	0.00	4.49	0.00	0.00	**4.49**	**1.59**	3905-4140
K1	0.80	1.66	0.00	0.00	0.00	**2.45**	**1.50**	4185-5215
Karkata	0.00	2.68	1.50	0.00	0.00	**4.18**	**1.55**	3670-4650
Bisrampur	0.00	3.83	10.71	0.00	0.00	**14.54**	**1.56**	2995-4290
Bukbuka Top	0.00	0.07	3.68	1.04	0.00	**4.80**	**1.60**	2995-4290
Bukbuka Botom	0.00	0.00	30.77	0.00	0.00	**30.77**	**1.60**	2995-4290
Upper Dakra	0.00	0.00	7.81	0.00	0.00	**7.81**	**1.59**	3695-4515
Lower Dakra	0.00	0.00	12.17	25.09	0.00	**37.25**	**1.64**	2550-3545
Total	**0.80**	**8.24**	**71.14**	**26.97**	**0.00**	**107.15**		

9.3 Projected Coal Quality

The overall grade of the product mix of project will be "E".

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CHAPTER - X
PUMPING AND DRAINAGE

10.1 INTRODUCTION

The proposed KD Heslong Opencast Project is located in N.K Area of N.K. Coalfield of CCL. The pumping system of KD Heslong Opencast project of CCL has been designed to dewater the inflow of water due to precipitation within the active pit limit during the monsoon and non-monsoon season and the ground water discharged from aquifers to enable the mining activity to continue round the year.

The planning of dewatering the mine has been done in such a way that the working faces and haul roads will remain dry as far as possible. The layout of the quarry provides suitable gradient along the quarry floors and the benches to facilitate self drainage of water to the sump at the lowest level of the quarry.

The pumping system has been designed to deal mainly with rainfall water, which is non-uniform during the year. The maximum make of water will be in the monsoon period i.e from June to September.

10.2 SOURCE OF WATER

The intake of rainwater to the opencast mine is non-uniform during the year. The maximum rainwater intake will be during the period of about four months (middle of June to middle of October) in a year. During dry season, seepage from strata is expected to be moderate and the same can be dealt by running a few number of pumps provided for pumping during monsoon. During the non-monsoon period, repair & overhauling of the pumps will be done by rotation.

It is proposed to make garland drains around the quarry and divert the surface water including rainwater from catchments area to near by natural course of water drainage.

The main pumps will handle the quantity of water inflow during the peak rainfall in monsoon.

During the heavy monsoon period, the work in lower most bench may have to be stopped as it will not be possible to pump out the entire make of water

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on the wettest day. Therefore, it is proposed to draw a part of the lower-most bench which would then act as sump.

Water accumulated in the sump will be pumped out to the surface and discharged into the nallah flowing outside the quarry. It is proposed to create a sedimentation lagoon by constructing a series of check dams across the nallah. Water overflowing the check dams would join near by Sonadobazore nala and finally join Damodar River. The lagoon will help to separate the suspended solids from the mine water.

Surface drainage and flood protection

The area is drained mainly by Sonadobazore nala which carries the run-off of the Damodar River. The average monthly rainfall during monsoon season (June to October) has been 198.7mm. During non-monsoon period, the average monthly rainfall has been 17.83 mm.

The topography of the K.D South block is gently undulating. The maximum and minimum elevations are 465 m and 430 m respectively.

River Damodar flows on northern fringe of the block. Sonadoba nala flows on eastern and southern fringe of the block and drains into the river Damodar. The general slope of the ground is from south to north.

All the smaller natural channels like nalla, join the Damodar river. Together these form the group representing the surface water resources in the region.

Catchment area on the north-west side of quarry is naturally draining into Damodar river through nala. A garland drain is proposed to arrest the rainwater entering into the mine during the mine operation. Boundary of quarries has been kept at safe distance from bank of Sonadobazore nala.

The surface drainage and flood protection system for the mine will include:

- Diversion of water courses to other water courses away from the mining area.
- Diversion dams/ bunding arrangement as part of water course diversions to prevent water entering the mining area.
- Cross drainage structures where the haul road and other access roads cross diversions.
- Various inlet, outlet and erosion protection structures.

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In-pit Drainage Work

- During the rainy season, water will be allowed to accumulate in the sump on the floor of lower most Seam of the quarry.
- Sumps are provided for the dewatering pumps which will transfer in-pit water for controlled discharge off the site.

The planning of dewatering the mine shall be done in such a way that the working faces and haul roads in the quarry shall remain dry as far as possible. The layout of the quarry provides suitable gradient along the quarry floors and the benches to facilitate self drainage of water to the sump at the lowest level of the quarry. During the heavy monsoon period, the work in lower most bench may have to be stopped as it will not be possible to pump out the entire make of water on the wettest day. Therefore, it is proposed to draw a part of the lower-most bench which would then act as sump.

Water accumulated in the mine sump will be pumped out to the surface and finally discharged into the near by main drain / nallah and finally join river Damodar.

10.3 GENERAL CONSIDERATIONS

10.3.1 The pumping requirement has been calculated on the basis of the following general considerations:-

- The geographical location of the Project.
- Meteorological data from the area / nearby rain-gauge station concerning rainfalls.
- Life of the mine and percentage probability of maximum rainfall in one day during the life of the mine.
- General climatic conditions, Surface features of the terrain beyond the boundary of the mine / opencast working.
- Catchments area: Mined out areas and areas beyond excavation, and dumped / spoil dump area.
- Run-off characteristics of the area.
- Depth of the quarries at different stages.
- Inflow to the quarry of UG water & seepage from near by nallah/ river.
- Desired location at the surface where the quarry water can be discharged, considering the Surface drainage system.

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- Maximum number of days to pump out the accumulated water in the quarry during peak rainfall in monsoon and the number of pumping operation hours per day.
- Geological characteristics of OB and coal seams.
- Desired location at surface where quarry water can be discharged considering the surface drainage system.
- Effective working hours – 20 hours/day for pumping calculation, but in monsoon period pumping may be done round the clock.

10.3.2 BASIC DATA

The following data has been taken into consideration for arriving at the volume of water accumulating in the quarry and the size of the pumps:-

(a)	Maximum depth of the mine	:	200 m.
(b)	Percentage probability of maximum rainfall considering 18 yrs life	:	5.55
(c)	Probable maximum rainfall in a day in monsoon period from the probability curve	:	146 mm
(d)	Depth and Catchments area stage wise	:	Given in the stage wise calculation of water volume.
(e)	Run-off Co-efficient considered	:	i) For mined out area = 0.7 ii) For area internal dump area = 0.15 iii) For area beyond excavation = 0.10
(f)	Inflow of water to the quarry due to seepage and underground precipitation	:	10% of probable water accumulation due to rainfall.
(g)	The rainfall data has been adopted as recorded by IMD Hazaribag.	:	Hazaribag Dist.

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10.4.1 **ASSEMENT OF MAXIMUM RAINFALL IN A DAY**

This has been drawn from the probability curve of rain-fall data received from Hydrogeology department for past 15 years. The calculation has been done taking into consideration the entire area of the quarry of the proposed mine for its 18 years of life. The probable maximum daily rainfall has been taken as 146 mm from the probability curve.

10.5 CALCULATIONS AND ASSESSMENT OF VOLUME OF WATER TO BE PUMPED

The calculation has been done taking into consideration the entire area of all the quarries of the proposed mine.

Pumping system has been designed for the volume of water accumulated in the mine at the final stage of production considering probable maximum daily rainfall as 146 mm.

Pumping capacity worked out as under (considering water to be pumped out in 120 hrs @ 20 hrs pumping per day). The volume of maximum precipitation of water taking 10% for seepage and underground precipitation on the day of maximum rainfall computed is tabulated below:

At the end of	Approx. Catchment's area in km^2				Depth of mine (m)	Max. ^{m} probable rainfall in a day (mm)	Volume of water ('000 Cum/day)
	Total quarry area	Mined-out area	Internal dump area	Area beyond excavation			
5th year	**2.74**	**1.54**	**1.20**	**0.13**	**135**	**146**	**204.25**
10th year	**3.01**	**1.51**	**1.50**	**0.15**	**160**	**146**	**208.31**
15^{th} Year	**3.31**	**1.31**	**2.00**	**0.17**	**200**	**146**	**198.11**

10.6 **PUMPING CAPACITY**

PUMPING CAPACITY REQUIRED FOR THE MINE:

Probable water accumulation on the day of maximum rainfall taking 10% for seepage and underground precipitation = 208310 cum

Pumping capacity/hr = 1910 Cum/hr (530 lps)

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10.7 SELECTION OF PUMPS AND DELIVERY RANGES:

On the basis of the calculation and providing standby pumping capacity, the main pumps have been provided for each variant of the mine.

Four nos. 540 cum/hr x 240 m head pumps and three nos. 300 Cum/hr x 240 m head pumps have been provided for the mine.

Low Head Pumps

300 Cum/hr x 150 /100/60 m head pumps are already existing in the mine which is sufficient. Therefore no additional pumps have been provided. The existing pumps will be used to dewater the quarries for their initial years of operation when depth of quarries will be less.

Diesel Pumps

One number of 300 Cum./hr x 240 m head pump has been provided for any emergency requirement.

Face Pumps and Slurry Pumps

Four Nos. of Face Pumps of 50 Cum./hr. x 45/25 m head and two nos. of Slurry Pumps of 80Cum./hr. x 45/25 m head capacities are already existing in the mine Therefore no additional pumps have been provided. The existing pumps will be used to pump out the water & slurry respectively accumulated near the working faces.

SELECTION OF DELIVERY RANGES

The delivery ranges have been selected on the basis of the pumping capacity during probable maximum rainfall and velocity of flow within the reasonable limit. The delivery ranges for different capacity of pumps have been selected for nominal diameters as 300mm, 250mm, 200mm, 150mm and 100mm for the pumps as per manufacturer's standard.

10.8 ESTIMATED CAPITAL COST

The details of cost estimate along with the phased requirement have been given in Appendix-A.3.4 of pumps, pipes and fittings

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CHAPTER-XI

COAL HANDLING & DESPATCH ARRANGEMENTS

11.1 INTRODUCTION

The total production of K.D. Hesalong OCP has been proposed as 4.50 MTY. Coal Handling Plant has been proposed to handle the entire production of ROM coal produced from the mine.

Presently loading of crushed coal into public railway rakes is performed by means of Front End Loaders at KDH siding. There are four crushing arrangements – a) A CHP for 1.5 Mtpa (with roll crusher), b) Feeder Breakers nos. 1 & 2, c) Feeder Breakers nos. 3 & 4 and d) Feeder Breakers nos. 5,6 & 7 spread over one kilometre length. Crushed coal from the Feeder Breakers is loaded into trucks by means of Front End Loaders. The trucks carry the coal to discharge it at the railway siding for onward loading of coal into the wagons.

As per approved Project Report (1979) of K.D. Hesalong OCP, a Coal Handling Plant to handle 1.5 Mtpa coal was provided (featured with Crushers, 5000t bunker, railway loading point and wagon hauler for wagon hauling). However, full-fledged CHP could not come up and there is no mechanized railway loading point in existence. The approved Expansion Project Report of K.D. Hesalong OCP (4.5 Mtpa) provided for construction of additional CHP with RLS to handle 3.0 Mtpa. However, approved Revised Project Report (1999) of K.D. Hesalong OCP withdrew the provision of 3.0 Mtpa CHP. Presently, coal is being loaded at KDH siding having Wharf wall arrangement.

A Coal Handling Plant has been proposed to handle the entire production of ROM coal produced from the mine.

The proposed coal handling plant shall have facilities for receiving of ROM coal from rear discharge dumpers, crushing of ROM coal from (-)1200mm to (-) 200 mm size, conveying, storing, reclamation and loading into railway wagons through Rapid Loadout System. The coal handling plant has also

been provided with suitable repair & maintenance, communication and other auxiliary facilities to meet the day to day requirement in the plant operation.

11.2 DESIGN PARAMETERS

11.2.1 BASIC DATA

Production capacity in MTY	-	4.50
No. of working days / annum	-	330
No. of working shifts / day	-	3
Number of effective working hours/day	-	15
Feed size of R.O.M coal (mm)	-	(-) 1200
Product size in mm	-	(-) 200
Type of unloading dumpers at receiving pit of CHP	-	Rear discharge Dumpers of 50/60 Te
Type of loading envisaged	-	Rapid Loadout System
Loading hours	-	Round the clock
Average Grade of coal	-	E
H.G.I.	-	45-60
Consumer	-	Basket Linkage
Mode of Despatch	-	By Railway wagon
Life of the mine	-	25 years

11.2.2 CHP WORKING SCHEDULE

The coal handling plant will be working in three shifts per day and seven days a week basis with its all units like receiving of ROM coal, crushing, storage in ground bunker and loading into railway wagons.

11.2.3 SYSTEM CAPACITY

The handling capacity of the CHP has been decided to match with the production capacity of the mine. In order to meet the fluctuations of coal output from the mine due to irregularities of despatch / transport system and seasonal fluctuations, the system capacity of the CHP has been selected as

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1200 tph for crushing to storage bunker & 3600 tph for reclaim to Loading point.

11.2.4 SALIENT FEATURES

The following factors have been considered in finalising the location and system of proposed CHP:

- Mine boundary
- Mine entry
- Loading arrangement
- Topography
- Availability of space
- Receiving arrangements(size and type of dumpers)
- Power supply and distribution network
- Miscellaneous facilities like dust control system, fire fighting and ventilation system. Plant cleaning and infrastructure for preventive maintenance are also envisaged.
- Necessary Electrical, interlocking, signalling and communication facilities.
- Railway siding (Existing as well as proposed modification)

11.2.5 SYSTEM DESCRIPTION

The CHP will have the following functional units as shown in the key plan of CHP. Please refer our drawing no. R 3 / E&M / 002423 (REV. No.1).

- Receiving Pit and Crushing complex
- Ground storage bunker & Reclamation
- Load-out system
- Dust control system
- Dust suppression system
- Noise control system
- Fire Protection system
- Plant cleaning system
- Plant preventive maintenance
- Weighment

11.2.6 PLANT DESCRIPTION

11.2.6.1 Receiving Pit and Sizer Complex

The Run-Off-Mine coal from the open cast mine / Project shall be received into receiving pit by means of rear discharge dumpers as mentioned earlier. Receiving pits have been provided with sufficient capacity to accommodate payload of two/ three dumpers. The ROM coal will be reclaimed by apron feeder and fed to two nos. of coal Sizers (one standby) each of 1200tph for crushing to specified size of (-) 200 mm. Crushed coal of (-) 200 mm will be collected by the conveyor(1C) of 1400 mm width.

Coal from the conveyor 1C will be carried to a transfer point where a provision has been made to unload / discharge coal on to the tripper conveyor (2C) of 1400 mm width.

11.2.6.2 Storage Bunker and Reclamation system

The tripper conveyor (2C) is being installed over the ground bunker which will uniformly discharge crushed coal from one end to the other end of the bunker with the help of tripper & cascading chute. The ground bunker (above ground) has been provided a storage facility of 15,000te capacity. The bunker shall be constructed of pre-cast concrete slabs sloping at 55 deg. to the horizontal with two slit type openings for plough feeder. The ground bunker is being provided with four nos. of plough feeders having capacity of 3600 TPH (each). Each slit opening of the bunker will have two nos. of plough feeders- one as working and other as standby. Below the slit opening, reclaim conveyors (3C & 4C) of 1800mm width each is provided to collect coal from the plough feeder. The capacity of the reclaim conveyors shall be of 3600 tonnes per hour each. At a time, one reclaim conveyor will be working and one standby. The reclaim conveyor from bunker will discharge coal into the loading conveyors (5C & 6C) of same width and capacity. At one time, one loading conveyor will be working and one standby.

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11.2.6.3 **Load out system**

The loading conveyor will receive coal from the reclaim conveyor and will discharge coal into the loading hopper of 400/500t capacity. The rapid load-out system at the loading hopper will discharge coal through pre-weigh hopper to ensure exact pay load into each railway wagon through suitable chute operating over wagons. The empty rake will be hauled by creep controlled railway locomotive (at suitable speed: 0.8-1 2 kmph) during loading of coal by RLS.

11.2.6.4 **Dust Control System**

The Dust control system envisages both dust extraction as well as dust suppression system.

Dust Extraction system

The objective of the system is to extract coal dust from various dust generating points, clean the dust laden air by trapping coal particles and finally discharge clean air into the atmosphere so that dust concentration in the CHP premises, even under the critical / worst operating condition.

The dust extraction system envisaged is of wet type. This will include net-work of suction hoods and ducting connected to a wet wall cyclone for separating dust from the air stream. Air outlet of cyclone collectors will be connected so as to discharge clean air to atmosphere. Collected dust from the cyclone collector shall be disposed off suitably. The wet type extractor is preferred because of its high efficiency and elimination of risks of secondary dusting problem and coal dust explosion.

Dust Suppression System

The objective of this system is to eliminate the air born coal dust or suppress the dust at its source The system involves confinement of the dust within the dust producing area by a curtain of moisture and wetting the coal dust by direct contact between the particles and droplet of water. Adequate number of precision anti-clog nozzles will be installed at suitable locations for

suppressing dust by spraying water mixed with suppressant. Suitable control for dust suppression shall be provided and the system shall be so inter-locked that it functions only when the conveyor system is operating or the loading operation is on.

11.2.6.5 **Noise Control**

Noise pollution causes fatigue to operating personals. Provision will therefore be made to keep down the noise level to the extent possible. All machine mountings will have in their foundations anti-vibration pads/sheets for reducing the vibration and thereby noise. All transfer chutes and hoppers shall have wear resistant rubber or ultra high molecular weight plastic / synthetic liners of various thicknesses as per design requirement and their suitability.

11.2.6.6 **Fire Fighting System**

Necessary fire fighting system has also envisaged for the plant, which includes fire hydrant tees at strategic locations at equal spacing of 25 to 35 meters with suitable water supply pipe lines. Also portable type fire extinguishers to deal with electrical / oil /ordinary fires shall be provided at all strategic locations in the plant.

11.2.6.7 **Plant cleaning system**

To facilitate cleaning at strategic locations ample number of high pressure water servicing points have been envisaged. These service points will be so located that with a 15/20 m long hose, any working area in the plant or equipment working place can be reached. These service points will be provided with quick connecting hose couplings for easy fixing and dismantling of hoses.

To handle discharge from plant effluent and washing of the plant area, sump pumps of suitable design and capacities have also been envisaged where required. Plant effluent shall be discharged through open drain/ pipe.

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11.2.6.8 **Plant Preventive Maintenance**

For effective maintenance of all the equipment, there will be sufficient working space around the equipment/machinery. All the equipment and conveyor discharge drums/transfer points, etc shall have covered and well ventilated housing complete with access stair ways, hand rails, platforms, cross-over ladders, etc as required.

Necessary mono-rails electric hoists and chain pulley blocks at suitable points of adequate capacity will also be provided on respective floors.

11.2.6.9 **Weighment**

Coal will be loaded into railway wagons by RLS with pre weigh hopper. However, one no. in motion rail weigh bridge has also been provided to monitor individual pay load of wagon along with total pay load of the rake.

11.3 ELECTRICALS

The electrical system shall comprise:

- Power reception and distribution system
- Centralized sequence control–cum–interlocking, automation, signaling and instrumentation system
- Illumination of plant and adjacent area
- Centralized welding circuit
- Earthing

11.4 CAPITAL INVESTMENT REQUIREMENT

The details of cost estimate for capital requirement of CHP have been shown in Appendix – A.3.5.0

11.5 DRAWING

A tentative key plan of the proposed Coal Handling Plant has been given in the drawing no. R3/E&M / 002423 (REV. No. 1).

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11.6 RAILWAY SIDING

Presently, two railway lines with wharf wall loading arrangement exist, in which loading of coal being carried out through Front End loaders. It has been proposed to load the coal through RLS. To facilitate RLS with hopper, one additional / engine escape & empty receiving rail line will be required with necessary arrangements. This RLS would also require provision of Creep-controlled locomotive from the Indian Railways.

The cost estimate for the proposed expansion of Railway siding arrangement has been envisaged in Appendix A.5.

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CHAPTER-XII

WORKSHOP

12.0 INTRODUCTION

KD Hesalong OCP, is a working mine of Central Coalfields Ltd. The mine is working as per the sanctioned Expansion Project Report of 4.50 MTY with the help of 10 Cu.M. Rope Shovels and 85/100T Rear Dumpers for OB removal and 5.0 Cu.M. Rope Shovels and 50/60T Rear Dumpers for coal winning.

A Unit Workshop exists in this project. This Workshop is suitable to cater to the need of Daily Maintenance, Schedule Maintenance, Lubrication and Routine Inspection. Minor Repairs & Unit replacement of parts/Sub-Assemblies of HEMM and other E&M Equipment deployed in the project. Only some additional P&M has been provided for strengthening this workshop.

A new field workshop has been proposed near the mine. The existing workshop will be utilized as Base workshop. In the field workshop only excavation workshop will be provided or the running repair & maintenance of HEMM. Any major/ medium repair will be done at the Base workshop. This field workshop will be dependent on the Base workshop. This arrangement will save the time & fuel consumption considering the long lead of HEMM from quarry to Base workshop. The repair & maintenance facilities which are not provided in the field workshop will be done at the Base workshop.

Any major overhaul of Equipment and manufacture of spares on large scale are beyond the scope of this Workshop. These works will be carried out in Regional Workshop, Dakra or in Central Workshop, Barkakana.

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12.1 EXCAVATION WORKSHOP

This part of Workshop has the facilities for attending the Schedule Maintenance, minor and medium repair or replacement of parts/Sub-assemblies of the Face and Transport equipment such as Shovels, Drills, Dumpers, Dozers, Graders, Crane and other miscellaneous equipment used for mining operations.

It is proposed that mining and mechanical equipment like-Shovels, Drills, Graders and Crane etc. being bulky in size will be repaired at the site of work as far as possible. The Components / assemblies requiring further repair will be dis-assembled and replaced with Spares Units. The dis-assembled component will be brought to the Heavy Repair Shop. In case of major repair, these will be sent to Regional / Central Workshop.

12.2 E&M Workshop

An E&M Workshop exists in this project which is sufficient to cater to the need of Schedule maintenance, Day-to-day maintenance and minor and medium repair by parts / Units replacement method of all E&M equipment deployed in the project such as – pumps, electricals equipment, CHP equipments and light vehicles etc. Only some P & M has been provided in this workshop for enhancing its strength.

12.3 Field Workshop

A new field workshop has been proposed near the mine considering the long lead distance between the existing workshop and the mine. In this Field workshop only Excavation workshop has been provided for the running repair & maintenance of HEMM deployed in the mine.

This field workshop will have the facilities for attending to scheduled maintenance, daily maintenance, minor repair or replacement of parts/ sub-assemblies of face and transport equipment such as dumpers, shovels, drills, dozers, cranes, grader and other miscellaneous equipment

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used for mining operation. A schematic layout plan of the workshop is shown in Drawing No. R-3/E&M/2422

Broadly this Field workshop will have the following functional shops: -

i) Machine shop
ii) Electrical repair shop
iii) Welding & Structural shop
iv) Dumper repair shop
v) Dumper daily maintenance shop
vi) Dumper schedule maintenance shop
vii) Dozer repair shop
viii) Washing stations
ix) Stores and Common facilities

i) Machine Shop

This shop will have the necessary machine tools for restoration of worn out parts and manufacture of small non-complicated spare parts which are in short supply and are required for the repair of HEMM.

There is a common 30T. floor operated E.O.T Crane, which will serve Machine Shop as well as other Shops like Dumper daily & schedule maintenance shop and tyre section.

ii) Electrical Repair Shop

This shop will have the facilities for carrying out the minor repairs of the electrical components for the mining equipment. The repair facilities have been limited to the parts replacement and repair of Self starter, Dynamo, Battery Charger etc.

iii) Welding & structural Shop

This shop will take-up the welding of buckets of shovels and other jobs of dumper etc. It will also undertake other non-standard welding works.

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iv) Dumper Repair Shop

This shop will cater to the need of repair/replacement of parts/components of the Dumpers needing repair after their proper inspection & diagnosis of defects in the Schedule Maintenance.

The Dumpers which experience incidental problem in the field and require minor repair will also be attended in this shop.

All Dumpers coming for repairing must be first washed at the washing station before entering this shop.

This shop is equipped with floor operated E.O.T crane of 30T &20 T capacities. The Dumpers entry and exit will be from one side only. A Tyre Section is provided beside the Dumper Repair Shop.

v) Dumper Daily Maintenance Shop

Checking of water and oil levels, greasing of lubrication points, changing of air and fuel filters as per maintenance schedule and checking of tyre inflation will be performed in this shop.

vi) Dumper Schedule Maintenance (Lubrication & Inspection) Shop

The schedule maintenance (lubrication & Inspection) of the Dumpers as per schedule recommended by the manufacturer will be done in this shop.

vii) Dozer Repair Shop

The Dozers which experience incidental problem in the field and require minor repair will be attended in this shop.

This shop is equipped with a floor operated E.O.T crane of 10/5T. Capacity.

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viii) Washing Station

A high pressure water and steam jet washing system has been envisaged for washing of Dumpers and Dozers separately.

ix) Stores & Common Facilities

A small store is provided for storing the spares and consumables required for repair and maintenance of HEMM and other mining equipment.

12.4 Working Schedule

This workshop will work mainly in two shifts of eight hours duration. But a group of technical personnel will also be provided in the third shifts to look after the field repairs of mining equipment deployed in this shift.

12.5 Capital Investment

The details of P&M provided for the workshop along with their estimated cost have been given in Appendix – A.3.2.

CHAPTER-XIII

POWER SUPPLY, ILLUMINATION AND COMMUNICATION

13.1 Power Supply

13.1.1 Existing Source of Power & Supply Voltage :

The source of power for K. D. Hesalong OCP, is 2X50 MVA, 132/33 KV sub-station of DVC, located at Piparwar. This sub-station, in turn, feeds power to one 33 KV switching station of CCL, located adjacent of the above mentioned DVC sub-station. Two numbers of 33 KV OHTL feeders (one of 9.7 Kms. and other of 7 Kms) with ACSR "Wolf" conductor, originating from this switching station, feeds power to two central sub-stations, namely KDH(old) and KDH(new), established near K.D. Hesalong Project of CCL. Both the central sub-stations are also interconnected by an O.H. Tie Line for reliable and uninterrupted incoming power supply.

13.1.2 Existing Power supply & Distribution System:

Presently, power is distributed to all the consuming areas of KDH project from the above mentioned two central sub-stations i.e. KDH (new) & KDH (old).

KDH (new) Sub-station

As per existing arrangement, KDH (new) sub-station has 2X7.5 MVA, 33/6.6 KV transformers and feeds power to different feeders through 6.6 KV VCBs. There are six (6) nos. of outgoing feeders which cater to different loads of KDH project. One feeder of this substation feeds power to 6.6/0.44 KV, 1200 KVA transformer which caters to workshop equipment and workshop illumination loads. Second feeder feeds power to two (2) nos. of 6.6 KV Marion shovel and one (1) no. of 6.6 KV drill. Third feeder feeds power to one (1) no. 6.6 KV Marion shovel and two (2) nos. of 6.6 KV pumps. Remaining feeders are idle. There are 2 nos. of 2X150 KVAR capacitor bank at this substation. Refer drawing no. - R3 E&M 2407.

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KDH (old) Sub-station

There is one no. of 33/11 KV, 10 MVA transformer and another one is of 33/11 KV, 5 MVA transformer at this old substation of KDH project. 10 MVA transformer feeds power to 11 KV bus-bar, from where three (3) nos. of 11 KV feeders; namely Dakra feeder, Karkata feeder and Rohini feeder, are coming out. Karkata feeder feeds power to Karkata substation. From Karkatta sub-station feeder no. 2 and feeder no. 3 are coming to KDH OCP through 3.3 KV OH line. Feeder no. 2 feeds power to one shovel & one drill. Feeder no. 3 feeds power to two (2) shovels & one (1) drill. One 3.3/0.44 KV, 160 KVA transformer is also charged from feeder no. 3. This transformer feeds power to one (1) 440 V pump.

5 MVA transformer of this sub-station feeds power to one no. 11/3.3 KV, 3 MVA transformer and two nos. of 11/3.3 KV, 1 MVA transformers through VCBs. The outgoing of 3 MVA transformer feeds power to feeder no. 9, 10 & 24 through 3.3 KV OCBs and also feeds power to a transformer of 1 MVA, 3.3/0.44 KV capacity. The outgoing of this transformer feeds power to IR feeder breaker namely 5, 6 & 7.

The outgoing of two 1 MVA transformers feeds power to feeder no. 11, 12 & 15 though 3.3 KV OCBs.

Feeder no. 11 feeds power to 3.3 / 0.44 KV, 1200 KVA and 3.3 / 0.44 KV, 630 KVA transformers. 1200 KVA transformer feeds power to CHP and 630 KVA transformer feeds power to Elecon make feeder breakers namely 1 & 2.

Feeder no. 24 feeds power to 3.3 KV HEC drill and a small 15 KVA, 3.3 / 0.22 KV lighting transformer.

Feeder no. 15 feeds power to a 3.3 / 0.44 KV transformer and the outgoing of this transformer feeds power to IR feeders namely 3 & 4.

Feeder no. 9 feeds power to three (3) nos. of 3.3kV pumps and one 3.3/0.44 kV, 160 kVA lighting transformer for field lighting.

Feeder no. 10 feeds power to three (3) nos. of lighting transformers for colony lighting.

Refer drawing no. - R3 E&M 2408.

13.1.3 Utilization Voltage

The utilization voltages of various equipment / installations of the project are as given below:

a) Incoming Supply Voltage: 33 KV
b) Utilization Voltage for shovels / drills: 6.6 KV
c) Utilization Voltage for Workshop Equipment: 440 V
d) Pumps 110 KW and above: 6.6/3.3 KV
e) Pumps below 110 KW: 440 V
f) Township: 0.440 / 0.230 KV
g) CHP: 6.6 KV / 0.440 KV
h) Lighting: 220 V

13.2 Proposed Source of Power Supply & Distribution

i) Power Supply to HEMM / Pumps

The proposed OHTL feeders may be used to supply power to the Shovels and Drill machines which are to be deployed at quarry. Similarly, the proposed feeders may be used to feed power to the additional / proposed pumps also from KDH (new) sub-station.

From these OHL feeders drawn up to the quarry / pumping station, power shall be tapped by means of outdoor type isolators and power cables to energize the respective field switches etc. meant for supplying power to different quarry equipment / pumps and other installations. Provision of Lightning Arrestors, Isolators, Field switches & power cables etc. have been made for this purpose.

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ii) Power Supply to CHP

Power supply to CHP through 6.6 KV OHTL has been envisaged from the KDH (New) sub-station through outgoing control VCBs (2 nos), which are presently idle. Provision of outgoing control of 6.6 KV OHTL has been kept for this purpose. The estimated cost of electrical sub-stations / electrical P&M / sequence control operation, Illumination for CHP etc. has been included in the Appendix for CHP.

iii) Power Supply to Workshop

The existing arrangement of power supply to workshop may be used to feed power to additional/ proposed equipment & lighting etc. This power comes from KDH(New) sub-station at 6.6 KV. At the workshop, power at 6.6 KV will be stepped down to 0.433 KV for supplying power to various power consumers of the workshop.

iv) Power Supply to Colony

Power supply to colony / township may be re-arranged keeping in view of shifting of old quarters and construction of new quarters of the project. Existing arrangement of supplying power for colony from KDH(old) sub-station may be continued for quarters and others which may not be affected by shifting / expansion of the project. A lump sum provision has been kept in this report for replacement / installation of transformer(s), strengthening of OHTL, street lighting luminaries etc.

13.2.1 Illumination

i) Illumination of Mine Site / Quarry / Haul Road

For illumination of mine sites, quarry and haul road, due to change / expansion of the project, provision of fund has been made in this report.

ii) Township Street Illumination

Similarly, for illumination of colony / Township Street due to shifting / new construction of various types of quarters of the project, provision of fund has been kept also.

13.3 Power Balance / Annual Energy Consumption / Year wise Energy Consumption

Based on the deployment of different equipment / installations in all the quarries of the project, a power balance has been prepared to know the maximum power demand and maximum annual energy consumption and other related matters of the whole project (Refer Table - 13.1). Maximum Annual Power bill and maximum annual energy consumption has also been calculated (refer Table - 13.2). Year wise phasing of energy consumption, specific consumption and power bill has also been calculated. (Refer Table - 13.3).

13.4 Salient Electrical Features & Cost Estimate.

- Salient Electrical Features:

  Max. Demand (At an Improved P.F of 0.98): 8438 KVA.

  Maximum Annual Power Consumption: 27.064 MKWH.

  Maximum Annual Power Bill: 9.202 Crore.

  Specific Power Consumption: 6.014 KWH / t.

  Power Cost: Rs. 20.448 / t.

  Capacitor Bank Provided: (2X2000) KVAR.

  Capacity of Existing Transformer: 2 x 7.5 MVA, 33 / 6.6 KV &
  1 x 5 MVA, 33 /11 KV.

- Cost Estimate (P&M – Electrical)

The estimated total capital investment on P&M – Electrical & others has been worked out. Details of such items are given in APPENDIX – A.3.2.

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13.5 **COMMUNICATION:**

For effective management of different production, service units and for ensuring safety, the following communication facilities have been envisaged for KDH Expansion Opencast Project (4.5 MTY).

- Voice Communication
- Data Communication System

Voice Communication

Following different type of administrative communication system have been envisaged:

13.6 **Specification of IPPBX**

A 400 line IPPBX upgradable to 1000 lines has been envisaged for the effective communication between various production units, quarry workings, workshops, main and site offices, stores and sub-stations etc

IPPBX system should support and capable of Call Detail Recording, Best Service Routing, Alphanumeric Dialing, Alternate Routing, Call Restriction, Malicious Call trace facility, Authorization Codec, DID, Class of Service, Least Cost Routing, System Traffic Reports, Uniform Numbering Plan, CLI information on analog phones, Simultaneous six party conferences.

Trunk facilities - Hotline Service, Automatic trunk selection, Busy tone detection, Trunk to Trunk transfer, Call forwarding, Trunk Conferencing, Outgoing Trunk Queuing.

Port capacity	:	1500 min.
Station capacity	:	1000 min. in any mix & match of digital, Analog and IP end points.
Trunk capacity	:	100 min.
Operating System	:	Open system Architecture / Industry standard
Busy Hour Call Completion (BHCC)	:	50,000 min.

Supported Trunks	:	Digital : ISDN - PRI, ISDN - BRI Analog : Loop and Gr. Start CO, FX, WATS, 2/4 Wire E&M, 4 wire DX, DID, TIE
Standards & Protocols	:	H 323 V4, SIP, LDAP, Qsig, QSS, 802.1 P/q, 802.11a/b/g, SNMP, DHCP, RTP, RTCP, TAPI
Processor	:	RISC Based
Gateway for Analog lines	:	Rack-mountable or stackable

No distance limitation between gateway and call processing server.

13.7 **External BSNL Telephone Communication**

30 telephone lines have been provided for BSNL communication and access to public communication grid. These telephone sets would be located in the residences and offices of key personnel of the project, sub-station, railway siding, CHP, workshop, etc. including 10 junction lines. Besides fixed line BSNL telephones, 20 nos. of BSNL cell one Mobile connection with sets may also be provided to important personnel of the project.

For communication with Area (HQ) either E1 radio or BSNL leased line is possible. However, 2 Mbps leased line is proposed to limit the capital expenditure.

13.8 **LAN and Internet:**

It is proposed to deploy electronic data processing facilities for production planning, control and project management etc. The system envisages to play a key role in establishment of highly effective Data Base Management System (DBMS) and Management Information System (MIS) etc.

The type of computer would be small business computer with broad facilities and also have specific facilities to carry out :

- Pay rolls
- Financial accounting
- Inventory control
- Material management

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- HEMM utilisation, breakdown analysis, idle time analysis etc.
- Production, dispatch schedule and variances.
- Accident records etc.
- Resource utilisation & MIS.

Before initiating action for installation and implementation of the above EDP system, a detailed system study would have to be carried out, with clearly defined system objectives for identifying the data processing needs and management information system needs of the project. Based on the results and findings of the study, the system configuration and specification have to be decided.

Before initiating action for installation and implementation of the above EDP system, a detailed system study would have to be carried out, with clearly defined system objectives for identifying the data processing needs and management information system needs of the project. Based on the results and findings of the study, the system configuration and specification have to be decided.

A Local Area Network with 25 PCs is proposed for this project. The PCs will be connected to a 48 port L2 switch. The proposed network structure will be that of a workgroup. Suitable OS and other application software will be provided. Suitable printers, plotters, CD-writer shall be provided. A server with Windows XP/Windows 2003 shall also be provided.

Internet facility shall also be provided through 128 Kbps leased internet from the nearest BSNL node.

13.9 48 Port L2 Switch

The L2 Switch shall be 48 port 10/100 having a gigabit uplink port and shall have sufficient backplane and throughput along with QoS features for both voice and data connectivity.

13.10 Technical Specification

- Configuration: 48 Nos. 10/100 Autosensing Ports + 1 gigabit uplink port.
- The switch should support QoS classification of incoming packets for QoS flows based on Layer 2, Layer 3 and Layer 4 fields.
- Standard Compliance- support IEEE 802.3 x (flow control), IEEE 802.1p), IEEE 802.1Q (V-LAN Trunking), IEEE 802.1d (spanning tree protocol)
- Management- Have built-in SNMP, Web based and Command Line Interface for Management. SNMP v1/v2/v3, RMON.

13.11 MASTER SLAVE DIGITAL CLOCK

Four-digit display units indicating hours and minutes, shall be installed at key location in the administrative building, coal handling plant, workshop and other selected areas. These will be controlled from a master station located in the dispatcher control room. Digits should be readable in day and night from a distance of at least 25 meters.

13.12 PLANT COMMUNICATION SYSTEM

A 25-point Plant Communication System is proposed for voice communication in the CHP.

The PCs shall be microprocessor controlled software programmable, central exchange based system. There shall be two-way communication facility between the central control and the remote points.

Loud speaking facility for broadcasting of messages/instructions shall be available in the PCs. The Plant Communication System shall have the facility of private communication between any two handset stations, handset to central station, in addition to the loud speaking facility.

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13.13 MOBILE COMMUNICATION

Instead of simplex type mobile sets, the TETRA-based system is proposed for mobile communication in the entire operational area of the Project including all important locations. The TETRA-based system has facility to incorporate GPS based Automatic Vehicle Location System (AVLS) and is very advantageous compared to the presently used VHF walkie-talkie sets. The system based on TETRA (Terrestrial Trunk Radio) is cost-effective, reliable, extremely spectrum efficient and has higher quality reception for voice, data and multimedia.

The TETRA based network combines all the features and benefits of conventional walkie-talkie and GSM mobile network like Digital PMR, Voice and Data, Digital Cellular Phone, Alphanumeric Pager, Mobile Data Unit and encryption etc.

The TETRA System can be interfaced with the exchange at the Project Office for seamless communication between the personnel in the quarry workings and those in the Project Office.

A radio survey of the mine shall have to be carried out to decide on the exact number of end equipment.

13.14 Budgetary Cost Estimate

Enclosed in Appendix- A

13.15 **Manpower Requirement:**

To maintain the TDS, IPPBX, LAN, Internet etc., the manpower requirement for E&T is as follows:

Sl.No.	Manpower	Nos.
1	Sr. Executive Engr.	1
2	Foreman	1
3	Technician	2
4	Lineman/Helper	4

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Extension Project Report FOR KDH OCP (4.50 MTY)

POWER DEMAND CHART SHOWING TOTAL CONNECTED LOAD, LOAD IN OPERATION, ANNUAL ENERGY CONSUMPTION AND ANNUAL AVERAGE POWER FACTOR AT KDH OCP

TABLE 13.1

Sl No	EQUIPMENT	Utilisation Voltage (KV)	QTY (Inst.)	Qty. (In opn)	Unit Load in kw (tentative)	Total Conn Load (kW)	Total Load in Opn (KW)	D.F	P.F	Active KW	React KVAR	App. KVA	Annual working Hours	Max. Annual En Consumpn. (MKWH)
1	**Coal Equipment :**													
i)	5 cum Elec Rope Shovel	6.6	3	3	250	750	750	0.5	0.8	375	281		4574	1.715
ii)	160 mm RBH Drill (Diesel)		4	4										
iii)	CHP (including Feeder Breakers - 7 nos.)	6.6/0.44				4000	3400	0.8	0.8	2720	2040		3600	9.792
iv)	Pumping													
a)		6.6	4	3	525	2500	1875	0.75	0.8	1406	1055		2000	2.813
b)		6.6	3	2	350	1050	700	0.75	0.8	525	394		2000	1.050
c)		6.6	3	2	275	825	550	0.75	0.8	413	309		1000	0.413
d)		6.6	9	7	200	1800	1400	0.75	0.8	1050	788		1000	1.050
f)		6.6	6	4	110	660	440	0.75	0.8	330	248		1000	0.330
g)		6.6	2	2	37	74	74	0.75	0.8	56	42		1000	0.056
h)		6.6	1	1	275	275	275	0.75	0.8	206	155		1000	0.206
		6.6	4	3	55	220	165	0.75	0.8	124	93		1000	0.124
	Sub Total (A)	6.6	8	6	22.5	180	135	0.75	0.8	101	76		1000	0.101
														17.649
2	**O.B. Equipment :**													
i)	10 cum Elec.Rope Shovel	6.6	3	3	447	1341	1341	0.5	0.8	671	503		4574	3.067
ii)	5 cum Elec Rope Shovel	6.6	1	1	250	250	250	0.5	0.8	125	94		4574	0.572
iii)	250 mm Elec. RBH Drill	6.6.	4	4	350	1400	1400	0.5	0.7	700	714		3168	2.218
	Sub Total (B)													5.856
	ENERGY CONSUMPTION (Major Electricall equipment)													23.505
3	**Common Electrical Loads**													
i)	Service Buildings And Other Miscll. Illumination	0.23				150	150	0.9	0.9	135	65		2920	0.394
ii)	Workshop	0.415				600	400	0.35	0.8	140	105		1485	0.208
iii)	Illumination of quarry & Others	0.23				100	100	0.9	0.9	90	44		4380	0.394
iv)	Township	0.415/0.23				1400	1300	0.9	0.9	1170	567		2190	2.562
	ENERGY CONSUMPTION (Common Electrical Loads)													3.559
	TOTAL :					17466	14705			10336	7571	12812		27.064
	TOTAL , AFTER COSIDERING DIV. FACTOR AS 1.25								0.81	8269	6056	10250		
	Max. Demand after considering Demand / Div. Factors & at an improved P.F Of 0.98								**0.98**	**8269**	**1679**	**8438**		
	CAPACITOR BANK PROVIDED (Excluding township load) FOR IMPROVING P.F. TO 0.98										**4377**	**After excluding the township load, the capacitor bank reqt. will be 4047 ≃ (2X2000) KVAr.**		
	EXISTING TRANSFORMER CAPACITY :	**2x7.5 MVA, 33/6.6 Kv (at new s/s.) & 1x5 MVA, 33/11 kV (at old s/s.)**												
	SPECIFIC ENERGY CONSUMPTION (kwh / t)	**6.014**												

ANNUAL POWER BILL OF KDH OCP [4.5 MTY]
TABLE 13.2

Average DVC Tariff (in Rs./kWh) = 3.40

Sl. No.	Power Consumers	Maximum Annual Power Consumption (Mkwh)	Target production of Coal In (Mt)	kWh / t. of Coal at Targeted Rate Of Production	Maximum Annual Power Cost (Rs. Crores)	Power Cost (Rs./ t. of Coal Production)
1	Coal Equipment	17.649	4.50	3.922		
2	O.B. Equipment	5.856		1.301		
3	Common Electrical Loads	3.559		0.791		
	TOTAL:	**27.064**		**6.014**	**9.202**	**20.448**

YEARWISE PHASING OF ENERGY CONSUMPTION, SPECIFIC ENERGY CONSUMPTION (kWh/t. Of COAL) POWER DEMAND AND POWER BILL OF KDH OCP [4.5 MTY]

AVERAGE DVC TARIFF/kWh : Rs. 3.40

TABLE 13.3

Particulars	YEAR WISE PHASING							
	Value	Yr. 1 to Yr. 9	Yr. 10 to Yr. 20	Yr.-21	Yr.-22	Yr.-23	Yr. 24	Yr.- 25
Maxm.Total Energy Consumption (Mkwh)	27.064	27.064	26.647	26.508	25.953	24.773	18.607	7.197
Specific Energy Consumption (kWh/t of Coal)	6.014	6.014	6.014	6.014	6.014	6.014	6.014	6.014
Specific Energy Consumption.(kWh/t of Coal)	6.014	6.014	5.922	5.891	5.767	6.193	6.202	6.258
Maxm. Power Demand (kVA)	8438	8438	8438	8438	8438	8438	8438	8438
Maxm. Power Demand (KVA)	8438	8438	8308	8264	8091	7723	5801	2244
Maxm.Annual Power Bill (Rs. in Crore)		9.202	9.202	9.202	9.202	9.202	9.202	9.202
Maxm. Annual Power Bill (Rs. in Lakh))	920.17	920.17	920.17	920.17	920.17	920.17	920.17	920.17
Maxm. Annual Power bill (Rs. in Lakh)	920.17	920.17	906.00	901.28	882.40	842.27	632.65	244.70

CHAPTER – XIV

CIVIL CONSTRUCTION & WATER SUPPLY

14.1 INTRODUCTION

This is an expansion project in terms of increase in the lease hold area only but maintaining the earlier production i.e. 4.5 MTY. The life of this project has been estimated as 25 years. Majority of the existing infrastructure will be used for this KDH EPR.

For service and welfare buildings as well as residencial buildings some permanent type of construction has been proposed. The cost estimate for civil construction has been prepared based on the cost index. The cost index has been worked out as 2082 with respect to 100 base at Delhi as on 01.10.1976. The details have been given in Appendix- A.2.3. Appendix- A.8.2 and Appendix- A.8.3.

14.2 BUILDINGS

14.2.1 RESIDENTIAL BUILDINGS

For residential buildings 55% housing satisfaction has been provided.

The manpower provision for this project upto target year is 1023 and only 147 nos. of B-type additional quarters is required to be constructed keeping in view of the existing different types of quarters. The details of number of houses are given in Appendix A.2.1.

14.2.2 SERVICE BUILDINGS

Almost all service and welfare buildings exist there. Provision has been made in this report for construction of site office, Excv. and E&M workshop, sub station and some statutory buildings. Details of service buildings and statement showing capital investment have been given in Appendix- A.2.2.

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14.3 ROADS & CULVERTS

14.3.1 Diversion road

Because of increase in the leasehold area, present road alignment is required to be changed. Provision of 5 km. long diversion has been made. Details have been given in Appendix-A.8.2.1.

14.3.2 Colony road

Provision for 1.5 km. long colony road due to increase in number of B-type quarters has been made. Details have been given in Appendix-A.8.2.2

14.3.3 Approach road to magzine

Provision for 1.0 km. long approach road to project has been made. Details have been given in Appendix-A.8.2.3

14.3.4 Haul road

Provision for 2.0 km. long haul road has been made. Details have been given in Appendix- A.8.2.4.

14.4 Water supply and sewerage

Water demand

The additional potable and industrial water requirement for the project has been assessed up to target year as follows:

(i) Portable Water Demand : 0.113 MGPD

(ii) Industrial Water Demand : 0.170 MGPD

14.4.1 Colony water supply

Due to additional B-type quarters, some additional capital expenditure will occur in this head. The estimated capital expenditure has been furnished in appendix-A.8.3.1

14.4.2 **Colony sewerage**

Due to additional B-type quarters, some additional capital expenditure will occur in this head. The estimated capital expenditure has been furnished in appendix-A.8.3.2

14.4.3 **Industrial water supply**

Details of industrial water supply scheme alongwith the estimated capital expenditure has been furnished in appendix-A.8.3.1

14.4.4 **Industrial sewerage**

Estimated capital expenditure for industrial sewerage scheme and details has been indicated in Appendix-A.8.3.2.

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CHAPTER- XV

15.0 SAFETY & CONSERVATION:

Deploying HEMM or any equipment in the mine for winning of coal shall be planned in confirmation with the prevailing statutory provisions as per Mines Act 1952 and CMR 1957 applicable for safety in opencast mines. However, all statutory rules, regulations, applicable laws etc. and statutory requirement related to Govt. licenses, workers compensation, Insurance, etc., including minimum wage act for workers employed in the mine shall have to be adhered to. Rules, if any imposed by local/State/Central authorities are to be complied by the mine authorities. Mine authorities shall have to supply various protective equipments viz. helmet, shoes etc. to the workmen at their cost.
All the regulations & schedules of Coal Mines Regulations 1957 relating to opencast mining have to be adhered to and implemented in order to maintain day to day safety precautions as per stature.

SAFETY ASPECTS FOR DEPLOYMENT of DEPT EQUIMENT OUTSOURCING/HIRING OF HEMM/EQUIPMENT:

Special precaution should be taken while deploying workers in the mine. Before employing any labour to the mine proper vocation training should be imparted and recommendations of VIII Safety Conference should be strictly followed. Management for deployment of labours by 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 driving license of operators shall be kept at the mine and shall be made readily available for inspection by management.

iv) No person shall be employed unless the person holds VTC certificate and Management is informed. A record of it shall be maintained.

v) Qualified competent persons shall maintain adequate supervision.

vi) Outside agency (if any deployed in mine) shall follow safety guidelines and safety instructions from Project Authorities.

B) <u>For Machineries as recommended by DGMS Cir. (Tech.) 1 of 1999:</u>

i) All the machineries to be deployed in mines should be checked before deployment by competent authority.

ii) Regular checking of m/c deployed by outside agency shall be done. No unfit machine shall be deployed before the defect is rectified.

iii) A proper record of repair and maintenance along with inspection done by management and defect pointed out shall be maintained and signed by authorized person.

iv) The trucks deployed outside agency shall be provided with Audio visual alarms, proper light for use at night and period when natural light is not sufficient. Also audio-visual alarms for reversing on trucks shall be provided.

<u>Other Precautions for machines</u>

i) RTO certificate photo copies of all vehicles shall be submitted to management

ii) Daily welding, monitoring, inspection shall be done by the agency's mechanic as directed by management.

iii) Machine manufacturers should be asked to give risk analysis details in respect machines deployed by outside agencies.

iv) Suitable type of the fire extinguishers shall be provided in every machine.

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C) **General:**

i) No person/vehicle shall be deployed at any place other than authorized place.

ii) All workers should obey lawful instruction of mine management.

iii) Risk Management Plan of tipper/pay loader shall be made and implemented.

iv) All drivers shall obey systematic traffics rules prepared by management

v) Before deploying workers they must be trained and briefed about safety aspects in opencast mine. However during 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/owner so that Notices of accidents in a 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.

vi) Mine shall be operated in such a way so as to minimize pollution in the mine.

Stability of Benches, Quarry Highwalls and Spoil Dumps:

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

During actual mining operation, systematic observations of the condition of benches, highwall slopes and spoil dumps should be carried out and the dimensions be modified if necessary to suit the local conditions.

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 season. The necessary precautions should be clearly laid down and implemented. A garland drain needs to be provided to drain away the surface rainwater from coming into the mine.

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.

Prevention 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 drown the lower-most bench, which would work as a sump. The water will be pumped out and discharged into the nearby nallah. For ensuring safety of the equipment while working out bottom horizons with no access to surface profile, the following measures should be taken:

1) Drivage of initial trenches and coal cutting on bottom 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 monsoon period, to the top horizons.

Prevention of Electric Shocks:

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

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1) For protection from electric shocks to persons, from electrical equipment with voltage up to 1000V Earth Leakage Relay should be provided which will automatically disconnect electrical circuits.

2) Closed mobile substations and switchgears should be mechanically interlocked which exclude the possibility of opening the door when oil switch and air circuit breakers are in operation.

3) All metal parts of electrical equipment should be properly earthed to avoid failure of insulation.

4) All H.T lines and cables located within the blasting zones should be disconnected during blasting operations.

Dust Suppression & Dilution of Exhaust Fumes:

The following measures should be adopted for dust suppression at all quarry working places, dumps, haul roads, CHP and near other auxiliary mining operations.

1) Spraying with water on all working faces & haul roads, by special spraying machines or water-sprinkler.

2) While drilling holes, it is necessary to use dust extraction devices.

3) Installation of local dust suppression and air conditioning devices in cabins of excavators and drilling rigs may be considered.

4) Leveling of spoil dump surface.

5) Separate dust suppression arrangement should be provided for CHP.

To prevent collection of harmful mixtures in the atmosphere, from the different sections of quarry workings, it is recommended: -

1) To spread out the sources of dust formation and omission of harmful gases throughout the working area of the quarry.

2) Drilling & blasting operations should be timed for periods of maximum wind activity during the day.

3) Dumpers may be provided with purifiers for exhaust gases.

Measures to be taken for Fire Fighting and Fire Prevention:

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

1) Organization of special 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) Provision of fire extinguishers

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 Mines Safety Act, rules and regulations. While working above underground workings DGMS Circulars should be strictly adhered to.

2) Adequate safety measures have to be taken during blasting operation in the quarry so that men/machine are not affected.

CONSERVATION

Conservation of coal enjoins maximum recovery of in-situ reserves of coal and its proper utilization.

Coal deposits in KDH Expn mining block upto Lower Dakra seam are potential seams for opencast mining, both qualitatively and quantitatively. These aspects are taken into account during mine planning and operation in ensuring maximum recovery.

Opencast mining using shovel dumper system is one of the very important technology of coal production of thick or even thin seams from shallow depth upto economic stripping ratio (cubic metre of overburden required to be removed to raise one tonne of coal). The coal production from opencast method in Indian mining is more than 75% of total production. This trend is likely to continue in near future.

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CHAPTER – XVI

ENVIRONMENTAL MANAGEMENT

The Environmental Management is one of the most important subject to deal after the preparation of the Project Report.

The EMP deals with Present Land Status, Land use during mining, Post mining use of the Land and its impact on the present environment scenario.

During mining operation, degradation of land, air, water, soil noise, Flora Fauna etc. occurs. Socio economic, hydro-geological status is also affected and these have been considered in the EMP report.

16.1 Existing Environment Quality

Pre-mining observation and a base line data in environmental study is to be generated and accordingly Environmental Impact is assessed. These basic data are taken from Pre-feasibility report, PR, terms of reference etc. It covers the core zone of the project as well as Buffer zone, which is 10 km away from periphery of the core zone.

The Project Report is under preparation. So, all the parameters regarding Environmental Management will be available only after study the area.

16.2 Environmental Impact Assessment

The mining operation in KDH Expansion OCP will generate a series of activities, which will produce air pollutions, waste water and effluent. It generates high noise level, degrade land and also will have impact on flora fauna. The project activities would also have impact on socio-economic profile of the area.

It is proposed to assess the likely impact of the mining in and around the surrounding of the project.

16.3 Environmental Control Measures

Mitigation measures are broadly divided into preventive measure and suppression measure. Stress is given on mitigation measure, which is well effective and economical and are discussed in detail in EMP report.

16.4 Environmental Management Plan

For effective implementation, mid-term corrective measures, monitoring and control measure of environmental management plan depends on time bound action programme. The success of environmental management plan depends on the well set-up organization with deeply involved persons. The objectives for creation of environmental plan are:

- To implement environmental control and protection measures.
- Subsequent environmental monitoring of the efficacy of various control measures.
- Plantation / Green Belt Development
- Land restoration

Keeping this in view, organizational structure responsible for the implementation of environmental control and mitigation measures as well as monitoring of such implementation will be discussed in the EMP report.

16.5 Cost Estimate

All the above activities in EMP involve some cost. The estimated capitals for capital outlay in mines and capital expenditure on environmental protection measures are provided in the PR of KDH Expansion OCP in Appendix-A.8.1 and Appendix-F respectively.

16.5.1 EMP Cost: The cost of EMP of KDH Expansion OCP is given in Appendix-A.8.1 and Appendix-F under the head of capital outlay in mines and capital expenditure on environmental protection measures respectively.

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16.5.2 Social Cost:

i) Rehabilitation & Resettlement:

There are many clauses under CIL R&R policy guidelines. The relevant clauses i.e. amount of tenancy land, lump sum grant and assistance are provided to the Project Affected Persons (PAPS) as per the prevailing R&R policy of CIL. In this project, there are 800 nos. of families to be shifted under PAPS, as per data available in the land-use plan.

The cost under this head is taken in **APPENDIX- A.1 & APPENDIX-F.**

ii) Corporate Social Responsibility (CSR):

Budgetary provision is created to intensify CSR activities in and around the village, where land is being acquired. A provision varying from **1 to 2.5%** of retained earnings shall be made initially, depending upon the requirement.

This requirement depends upon the no. of families to be shifted and kind of infrastructure provided at the shifted site.

Provisions for developing infrastructure for better quality of life viz., community centre, educational institution, medical facilities, drinking water, roads, sewerage system, rain-water harvesting, vocational training centre etc. are to be made.

iii) Community Development:

Community development is the development taken in the area of mining operation covering 8 Km radius. In exceptional cases like natural calamities/ disaster, area can be extended.

CCL has to create a fund for the purpose. A sum of Re.1.00 per tonne of coal produced by CCL may be arranged for this.

Development programme are same as covered in CSR or as per requirement in the area.

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CHAPTER-XVII (Revised)

LAND REQUIREMENT

The extension project report (EPR) of KDH OCP was approved in the 370th (No.6 of 2010) meeting of the Board of Directors of CCL. held on 19.08.2010. As per the EPR, an area of 195.96 Ha of land was envisaged for the expansion of KDH Project. The details of land requirement as per the approved EPR is given below:

SN	Particulars	Total Area(Ha)
1	Tenancy Land	69.24
2	GMK Land	25.66
3	Forest Land	101.06
	Total (in Ha)	**195.96 Ha**
4	Forest Land in safety zone(not to be acquired)	9.19

The area of 9.19 ha was kept outside the EPR boundary as Safety Zone as per the guidelines in respect of safety zone prevalent till 2010.

In-principle/ Stage-1 FC for 126.72 Ha was accorded on 27.02.2023. In respect of the Safety Zone of 9.19 Ha falling outside the EPR boundary, MoEF&CC directed the following :

"As per the approved Mining Plan, an additional forest area of 135.91 ha is required for the expansion of the project. However, the instant proposal has been submitted for 12672 ha only, excluding the area of 9.19 ha forest land which as per approved mining plan is earmarked as safety zone. The State government shall either revise the Mining plan or seek the diversion of the 9.19 ha for the propose of safety zone"

As such, to comply with condition of Stage- FC, vide approval of the 531 CCL Board of Directors meeting held on 06.09.2023 the Mining Plan (Chapter XVII-Land Requirement) to exclude the area of 9.19 ha earmarked as safety zone outside the project boundary was duly revised. Accordingly, the mine boundary of the EPR has been revised, as per requirement MoEF&CC and the revised land requirement is as below:

SN	Particulars	Total Area(Ha)
1	Tenancy Land	69.24
2	GMJJ Land	42.37
3	Notified Forest land	84.35
4	**Total forest Land (including GMJJ Land) (2+3)**	**126.72**
Total (including Safety Zone of 2.89 Ha) (1+4)		**195.96 Ha**

All other provisions of the earlier approved EPR OF KDH OCP approved in the 370th (No.6 of 2010) meeting of the Board of Directors of CCL held on 19.08.2010 stand largely unaffected.

CHAPTER-XVIII

Mine Closure Planning

Mine closure encompasses rehabilitation process as an ongoing programme designed to restore physical, chemical and biological quality disturbed by the mining to a level acceptable to all concerned. It aims at leaving the area in such a way that rehabilitation does not become a burden to the society after mining operation is over. It must also aim to create as self-sustained ecosystem.

Mine closure operation is a continuous series of activities starting from day one of the initiation of mining project. As progressive mine closure is a continuous series of activities, it is obvious that the proposals of scientific mining have included most of the activities in the progressive mine closure plan.

Final mine closure plan as per statute, shall be considered to have its approval at least nine months before the date of proposed closure of mine. This period of nine months is reckoned as preparatory period for final mine closure operations.

Pachra Integrated Mine shall have mine closure plan, which shall of two types:

a) Progressive Mine Closure Plan; and
b) Final mine closure plan

18.1 Progressive Mine Closure Plan

18.1.1 Reclamation

An additional 195.96 Ha land is required for KDH opencast. The mining has been planned to exploit 4.5 million te of coal per annum from opencast method by deploying shovel dumper combination.

The plan envisages OB dumping mostly in quarried out/ internal dumps. It is proposed to reclaim physically and biologically the excavated pit of KDH mine after dumping by OB material. Reclamation of internal OB dump shall be taken up concurrently with the KDH opencast mine operation.

The mined out area and external OB dump are proposed to be reclaimed as follows:

Phase-I: Physical /Technical Reclamation

In Phase-I, OB dump shall be dozed and leveled to a bench slope angle of 37^0. A layer of top soil is laid over this graded and leveled surface of OB dump. The internal dump shall be dozed and leveled to a bench slope of 28^0 to safe guard any slope failure during mining operation.

Phase-II: Biological Reclamation:

Biological reclamation is the Phase-II of reclamation process. Re-vegetation covers in terms of grass, trees of appropriate species are raised over physically reclaimed OB dump.

The reclamation of external OB dump shall be done concurrently with the Pachra Integrated mine operation. Most of the mined out area shall be reclaimed by overburden dump of Pachra Integrated Mine and balance area shall be converted into water body of very shallow depth after regarding and filling up the mined out area at the final stage.

18.1.2 Air Quality Management Plan:

Following mitigation measures are required to done to control the air quality during mining operation:

a) All blast hole drills are to be fitted with dust collection arrangements
b) Water sprinklers are to be provided for dust suppression on haul roads and industrial area.
c) Creation of green belt along roads and plantation in vacant land.
d) Air Quality of mine shall be taken and anlysed on a regular interval.

18.1.3 Water Quality Management Plan:

The lease area drains into Sonadoba jore which in turn drains to Damodar River. Following water Quality protection measures are suggested:

a) Industrial effluent treatment plant
b) Sedimentation pond for treatment of mine water
c) Garland drains to arrest surface run-off flowing in to mine pit.
d) Intercepting drains to collect water from external dumps.
e) Biological reclamation of disturbed land to arrest siltation.

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18.1.4 Waste Management:

Solid wastes that will be generated in course of coal mining are overburden material consisting of fragments of sandstone/shale of assorted size. They have not been found to generate acid mine drainage or leach high quantity of heavy metals.

A total of 164.99 Mcum of OB will be removed which is proposed to be dumped internally.

Several mitigation measures are proposed to for stabilisation of external dump and prevent siltation and erosion.

a) A Toe wall is proposed at the foot of the external dump.
b) A series of open drains to be provided on dump body to arrest surface run-off and prevent siltation.
c) Grasses are to be grown on dump slopes to minimise soil erosion.

18.1.5 Top Soil Management

In mining plan, it has been proposed to excavate top soil separately. This top soil shall be used for reclamation of the external & internal OB dump and other degenerated land for vegetation.

The salvaging, stockpiling and re-application of topsoil to be used as growth medium in the reclamation of Internal & External overburden dumps within the mining area is a major environment protection programme. Soil management in opencast mine is necessary to re-establish the stability & productivity of lands disturbed due to mining activity.

a) PLANNING CRITERIA

The following elements have been considered for developing a top soil management plan for Pachra Integrated opencast mine.

i. Estimate of amount and quality of existing topsoil or growth medium.

ii. The amount of surface disturbance (area), which will receive top soil or growth medium and the required depth of application.

iii. Methodology to be utilized for topsoil or growth medium salvage.

iv. Storage location, the duration of storage of salvaged soils and the protection of stockpiled soils to prevent erosion.

v. The feasibility of direct replacement of the salvaged soils.

vi. Availability of additional growth media to supplement topsoil replacement

b) **METHODS AND MATERIALS:**

i. **Conduct a site specific soil survey of the project area as a part of baseline investigations.** The soil survey will identify the soils suitable for salvaging, their depth and amount prior to disturbance.

ii. All suitable topsoil and suitable material to be utilized in reclamation of the surface disturbance should be salvaged wherever feasible and stockpiled for reapplication.

iii. If conditions permit, or if project schedules can accommodate, topsoil or growth medium should be applied directly to recontoured disturbance areas.

iv. Stockpiled soils should be properly stored and revegetated to protect from erosion. Long term storage of soils may result in the loss of vital organisms within the soil, thus jeopardising re-vegetation or landscaping success.

v) Soil replacement depths are determined by several factors including: pre-disturbance soil depths, vegetation types and the physical and chemical properties of the material being covered. Generally speaking, the poorer the physical and chemical properties of the spoil or waste material the greater the required depth of replacement soil. Soil testing (nutrients, pH and toxicity factors) of the replacement soils and the materials to be covered should be completed prior to reapplication.

c) MAINTENANCE

Topsoil stockpiles require periodic maintenance to prevent erosion. Based upon the anticipated length of time the soils will be stockpiled, the piles should be covered with plastic or another substrate to protect from wind, rain and erosion. If storage will be for a long period of time, the stockpiles should be seeded with either annual or perennial grasses. This will stabilize the stockpiles surface. Other mechanisms may include covering stockpiles with plastic or canvas tarps or rock mulches.

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d) EFFECTIVENESS

Proper topsoil management will result in successful revegetation of surface disturbances, reduce soil erosion, and initiate the restoration of the surface disturbance areas stability and productivity.

e) Conclusion:

Mine has been planned in such away that topsoil removed for Ist three years will be stored

18.1.6 Safety & Security

While carrying out all kinds of mining and allied activities in the project, the safety rules in force as per Rules and Regulations made under Mines Act - 1952 will be observed and required safety measures taken. Circulars issued time to time regarding safety to the personnel and equipment of the mine and to improve the working conditions of the mine, the mining plan envisages:

- Measures to prevent industrial accidents
- Measures to ensure stability of benches and OB dumps.
- Measures to ensure safety of equipment
- Measures to control fire
- Measures to control dust and emission of noxious gases
- Measures for pollution control.

18.2 Final Mine Closure Plan (Conceptual)

Mine closure operations is proposed to be undertaken after examination and detailed study that there is no further expansion possibility of the mine and the void is to be suitably filled up so that the land is utilized gainfully by the society. Intermediate stoppages of operations due to any reasons for a period of time do not come under the proposed scheme of mine closure. This chapter proposes following aspects:-

A. Technical Aspects
B. Environmental Aspects
C. Social Aspects
D. Financial Aspects

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18.2.1 TECHNICAL ASPECTS:

- ✓ Safety aspects.
- ✓ Pit slopes and waste dumps.
- ✓ Hydrology and hydrogeology.
- ✓ Details of decommissioning of the infrastructures.
- ✓ Closure of entries like pits and entry to the mine.

18.2.2 Safety:

After attaining the final stage dump (including internal Dump) the remaining portion between dump toe and final stage Quarry floor should be fenced properly so that no human being or stray animals should be trapped within. Internal dumps are proposed to be suitably re-graded to avoid deep trenches.

18.2.3 Pit Slopes and waste dumps:

The final pit slopes are designed to avoid any slope failure. Technical study is proposed to be conducted before deciding upon the final slope. Both the external and internal Dumps are designed in such a way that there are minimal chances of slope failure. The external Dump is sloped ultimately in the overall range of 25 degree to 28 degrees. The internal dump slopes are designed at milder gradient so that even with the percolation of water in the dip side of the quarry, the dumps remain stable. It is proposed that the internal and external dump must be provided with toe walls/ silt arrestors and garland drains. Vegetation cover on surface of these dumps is proposed to be ensured as a final closing operation.

18.2.4 Hydrology and Hydrogeology:

In the mine closure plan, the surface flow pattern of precipitation and mine water drainage is envisaged to be examined and the water channel suitably laid down so that this is acceptable to the local community and it do not disturb the general hydrology of the area. Efforts are proposed to be made to regenerate the ground water resources.

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18.2.5 Decommissioning of the infrastructure:

The coal project develops lot of infrastructure for sustaining their operations. These include Workshop, Coal Handling Plant, Railway Siding, Office Complex, Residential Complex, Roads, Pipe Lines and Transmission Line. Decommissioning of the infrastructure should be planned in such a way that the Land occupied by these infrastructures is released. However these infrastructures are proposed to be reused for the neighboring projects /mine.

18.2.6 Closure of entry to the mine:

All entries to the mine must be effectively sealed. This will prevent illegal mining, entry of fire and water etc.

18.3 ENVIRONMENTAL ASPECTS

- ✓ **Air, water, dust.**
- ✓ **Reclamation of forest/vegetation.**
- ✓ **Management of recharge areas.**
- ✓ **Acceptable surface and ground water flows.**
- ✓ **Alternative use of land**

18.3.1 Air, water, dust:

It is proposed that air quality; water quality and dust level is to be monitored. Necessary actions to check the pollution from the closed mine, if any, in respect of air, water and dust is to be taken after examining the local site conditions then prevailing.

18.3.2 Reclamation of Forests/vegetation:

It is proposed that major portion of the project area is covered with vegetation. This will involve both forest land as well as non-forest land. Certain areas, mostly industrial areas, where service building are proposed to be located and to be used are not proposed for plantation.

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18.3.3 Management of recharge areas:

It is proposed that the recharge areas are fully utilized and sufficient availability of water, if feasible, is ensured to enhance ground water availability.

18.3.4 Surface and ground water flows:

In the final stage, wherever the mine water is likely to flow out to surface and meet the natural drainage system, the quality of water is proposed to be assessed and flow pattern for mine water be properly modified/ redesigned. Alternately, the water treatment arrangements may be considered depending upon the local site conditions.

18.3.5 Alternative use of land:

During the mining operation, the land usage changes from its pre-mining scenario. The final stage land use plan shows the use of land in a post-mining scenario when coal-mining operations have completed. Alternative use of land, specially released from infrastructure areas and vacant areas, as proposed to be planned and properly designated for post-mining land uses depending on the existing conditions prevailing at that point of time. While for OB dumps and acquired forest areas, vegetation and afforestation has been proposed as a final land use. While agriculture may be the best land use, if feasible, and if it is supported by some irrigation facilities.

18.4 SOCIAL ASPECTS:

- ✓ **Re-deployment of work force.**
- ✓ **Management of community facilities**
- ✓ **Canalization of available water**

18.4.1 Re-deployment of work force:

The peak work force required for mine operations is in the first few years of the mine when construction activities as well as operational activities achieved their peak.

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This work force slowly goes down with completion of development and when only the operational work remains. Again near the end of the mine life, say 4-5 years before closure, the activity of the mine starts getting reduced and therefore management gets opportunity to taper the operational manpower. After closure, skeleton service people are proposed to be left for continuing with the actual closure operations. The reduction of manpower could be done as per the following options:

- Natural retirement.
- Implementation of VRS schemes for age group of +50.
- Retraining and redeployment of younger groups – 40.
- Transfer of experienced middle-aged groups between 40-50 years to other projects.

Retrenchment of people with suitable compensation after exhausting all the above options.

18.4.2 Management of Community Facilities:

The community facilities are proposed to be developed by coal projects for betterment of the neighboring community. The project management provides or assists in developing educational facilities, health facilities, community halls and also some communication facilities. After the mine closure, these facilities are to be continued for the neighboring communities to the possible extent. The closure plan will envisage interaction of mining company with the state or local bodies who will take over these facilities and run the same for the community. The coal companies towards running these facilities, which is proposed to be taken care of by the local/state bodies, may make a onetime payment.

18.4.3 Canalization of available water:

If it is found that the mine is having sufficient water and on closure, the mine water flows into the surface watercourses, canalizing this water for surrounding community for their irrigational/domestic uses may be taken up.

18.5 FINANCIAL ASPECTS:

- ✓ Creation of a corpus fund for the final mine closure
- ✓ Cost of progressive closure activities.
- ✓ Cost towards organization for executing the closure activities.
- ✓ Cost of the post project monitoring
- ✓ Bond/insurance for the closure cost

Financial Assurance:

As proposed above, many activities are to be undertaken for progressive mine closure plan concurrently with the mine operation and final closure plan after the closure of the mine, which naturally will involve expenditure. Some of the closure activities will, in fact, form part of normal mining operations. However, some activities are proposed to be addressed only after completion of the coal mining operations.

It is proposed that a fund for mine closure to be created from the retain earnings of the project **@ Rs. 6 per tonne of coal produced**. This comes to **Rs 64.29 Crore** for the corpus.

After the completion of the coal mining, an organization consisting of persons of different disciplines is proposed to be maintained to undertake and implement the closure activities. The organization may be provided with a vehicle for discharging day-to-day duties. Maintenance cost of this organization is proposed from the retain earnings of the project. A small team consisting of 2-3 technical people may be required to oversee the efficacy of the closure activities. This monitoring may be conducted for 4-5 years after the mine closure activities.

18.6 Disaster Management Plan & Risk Management:

There are various elements of risks in operation of the mine. They include following :-

- ✓ **Slope failure of External OB dump** –OB proposed is planned to be stacked in internal and external dumps having a total height of 60m in two tires of 30m each. The OB material consists of assorted size of sandstone fragments, other geological strata and sub-soil. It has to

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be ensured that slope of OB Dumps do not fail as it would cause damage to life & property.

- **Slope failure of Internal Dump** –The slope of the backfilled mass is dynamic i.e. it moves every day. It has to be ensured that slope of backfilled mass is safe otherwise it may pose risk to life & property and intrupt the mining operations.
- **Stability of High walls** – In course of opencast mining slopes if created on high wall sides in coal and OB/interburden formations unless properly planned, they may fail.
- **Fire** – There may be fire in working, store, industrial installations and other service building provided for the mine.
- **Inundation** – The open pit will collect water from direct precipitation and surface run-off from surrounding areas. This may lead to inundation of the mine pit.
- **Seismic activities** – The project is located in low risk seismic zone area.

Ameliorative Measures

Following ameliorative measures have been envisaged to be taken to prevent the risks/accidents

- Slope stability analysis is required to be conducted for high wall slopes, External Dumps and Internal Dump slopes.
- Adequate fire fighting arrangements to be made.
- For preventing mine inundation, sufficient pumping arrangements have been made to pump out the pit water continuously.
- Garland drains have been proposed around mine pit to intercept surface run-off.
- Medical facilities – A hospital with necessary infrastructure, doctors and paramedical staff and ambulance has been proposed to take care of emergency situation.

CHAPTER-XIX

19.0 MANPOWER AND PRODUCTIVITY

The manpower requirement for KDH Expn OCP for a rated capacity of 4.50 MTY of ROM coal from the 1st year has been estimated as 1042 resulting an overall OMS of 16.36 Te for coal & OB both departmental option. The no. of working days per year is adopted as 330.

The detailed category wise/scale wise manpower requirement has been given in Appendix-B.

The skill wise break-up of requirement of workers is given below:-

Sl. No.	Particulars	Category	Requirement	Percentage	Existing
1.	Unskilled	I	88	11.2%	114
2.	Semi-skilled	II, E	122	15.6%	206
3.	Skilled	C,D,III,IV,V,VI	272	34.7%	306
4.	Highly Skilled	Spl, A,B	302	38.5%	197
	Total		784	100%	834

The break-up of total manpower requirement in groups i.e. monthly paid workers, staff & officers are given below;

Sl. No.	Particulars	Requirement	Percentage	Existing
1.	Workers	784	76.6%	834
2.	Monthly Paid	191	18.7%	191
3.	Officers	48	4.7%	48
	Total	1023	100%	1073

The manpower already present in the existing KDH Expn OCP will suffice the manpower requirement. The unskilled/semi-skilled manpower may be trained to make them skilled/highly skilled in order to avoid additional recruitment.

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Chapter – XXI

ECONOMICS

21.1 The proposal of the Extension of KD Hesalong Opencast has been prepared considering the actual existing capital expenditure upto 31.3.09 and departmental coal winning and departmental OB removal has been considered.

The estimated economics has been discussed in the subsequent paragraphs.

21.2 Total Capital Investment

The total capital investment for KDH opencast upto 4th year of achieving the production of 4.50 Mty, after considering the existing capital expenditure as on 31.3.09, is summarised below. The capital investment upto achieving the production level of 4.50 Mty in the 4th year and beyond has been proposed from the internal resources of the Company. The capital requirements are given below:

Particulars	Unit	Amount
ADDITIONAL CAPITAL FOR SANCTION	Rs. Crs	219.91
ACTUAL CAPITAL EXPENDITURE UPTO 31.3.09 CONSIDERED	Rs. Crs	268.03
TOTAL ESTIMATED PROJECT CAPITAL	Rs. Crs	487.94
CAPITAL OUTLAY PER TONNE OF ANNUAL OUTPUT	Rs/t	1084.31
CAPITAL REQUIREMENT BEYOND 4th YEAR	Rs. Crs	15.43

Phasing of additional capital requirement in Rs. Lakhs is:

	1	2	3	4	Total
Additional capital	7142.86	7380.40	7170.58	297.05	21990.89
Production Mty	4.50	4.50	4.50	4.50	

Capital requirement beyond target year is for:

Capital Beyond target year

Electricals	0.59
Rehabilitation, Compensatory Afforestation etc.	14.84
Total	15.43

21.3 Capital Investments for P&M

Capital investment on P&M is given in Appendix-A.3. A summary of the proposed capital investment on P&M for all the variants is given below:

	Units	Amount
CAPITAL FOR P&M	Rs. Crs	387.18
CAPITAL FOR HEMM	Rs. Crs	228.74
VALUE OF EXISTING HEMM CONSIDERED	Rs. Crs	198.34
CAPITAL FOR P&M PER TONNE OF ANNUAL OUTPUT	Rs/t	860.40

Method of Estimation of Capital Cost

The method of estimation of capital investment for P&M, Civil estimates, Development Capital, Revenue expenditure capitalised etc. is as follows.

Prices of Plant & Machinery

For the plant and machinery, as far as possible, the prices have been taken from the Standard Price List of Mining Equipment published by CMPDI and whenever information regarding price was not available, a broad estimate was made.

21.4 Estimated Cost of Civil Construction

The basis for the estimation of the cost of civil construction viz. residential buildings, service buildings, roads etc. has been given in Appendices - A.2.1, A.2.2 & A.8.2. The Civil Cost Index adopted in the RCE is 2082.

21.5 Capital Investment on Vehicles

The total estimated existing capital expenditure on vehicles is Rs. 0.74 crs and an additional provision of Rs. 1.05 crs. has been provided.

21.6 Development

Under this head, estimated investment is given for (a) capital outlay in mines (Appendix A.8.1), (b) Roads and culverts, including haul roads (A.8.2), (c) Water Supply & Sewerage (A.8.3). The details of each item are given in the respective Appendix.

21.7 Opening of Revenue Account

KDH opencast is an existing mine.

21.8 Estimates of Operating Cost

Appendix-C of all the variants give the details of cost per tonne (25 years average) and profitability for the target production of 4.50 MTY. The method adopted in estimating the costs are briefly explained as follows:

(a) Wages

The requirement of manpower for the targeted production of 3.00 MTY of coal is estimated category wise/ scale wise and details of manpower are given in Appendix - B1. Prevalent pay scales for executives and non-executives are adopted. End points of the relevant pay scales of executives & non-executives have been considered in estimating the salary and wages cost.

(b) Stores

Stores cost consists (1) diesel and lubricants, (2) explosives and detonator, (3) spares for routine repairs etc. Prevalent norms have been followed in estimating stores cost.

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(c) Power

The Power cost is worked out on the basis of KWH for the machines and other electrical requirements.

(d) Miscellaneous Expenditure

This covers the expenditure on printing & stationery, postages, telephone, repairs and maintenance of assets other than P&M, workshop debits for annual servicing and overhauling of HEMM, insurance and taxes for vehicles, normative contractual cost of major maintenance of HEMM.

(e) Final Mine closure Cost

A fund equal to Rs. 6 lakhs/hectare of land (195.96 Ha) is proposed to be created towards a fund for final mine closure. The fund has been distributed over 25 years with a yearly escalation of 5%.

(f) Administrative Charges

This includes area overhead, apex overhead etc. and the cost has been taken as per the actual administration cost of CCL.

(g) Interest on Working Capital

Rate of the interest on working capital is taken as 14.50% per annum.

(h) Interest on Loan Capital:

As the investment for the project is proposed to be met from the internal resources of the Company, there is no impact due to interest on loan capital.

(i) Depreciation

Depreciation on assets is computed as per the prevalent norms. The straight-line method of charging depreciation has been adopted.

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(j) Cost & Profitability

The year-wise details of the cost and profitability estimates till the achievement of 3.0 MTY (upto 6th year), at 100% capacity and at 85% capacity are given in **Appendix-C**. These have been summarised in the table below for all the variants:-

Elements of Cost	Variant 1	
	100%	85%
Salaries & Wages	96.44	113.45
Stores cost	129.09	142.76
Power cost	20.30	22.99
Miscellaneous cost	23.98	25.67
Final Mine Closure Cost	2.20	2.59
Administrative Expenses	120.00	141.18
Interest on working capital	18.84	21.56
Total Cash cost	410.84	470.19
Depreciation	99.73	117.33
Total Cost	510.57	587.52
Selling Price/Te	849.00	849.00
Profit/Loss / Te	338.43	261.48

The declared Selling Price per tonne of coal has been taken for Grade E which is Rs. 790/- with additional charges of Rs. 39/ per tonne for sizing of coal up to -200mm and Rs. 20/t for despatch through rapid loading system.

21.9 FINANCIAL ANALYSIS

The year-wise cash flows at 100% and 85% capacity utilisation have been estimated and are detailed in Appendix-D. & D.1 respectively. The cash-flows exclude depreciation and interest on loan capital. The financial IRR on total capital of the project at 100% and 85% level of the rated output

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have been worked out based on the estimates of the aforesaid cash flows. These have been summarised in the table below.

	Variant1
IRR at 100%	36.96
IRR at 85%	23.66

21.10 ECONOMIC ANALYSIS

The year wise cash flow for the economic analysis at 100% and 85% capacity utilization have been estimated and are detailed in Appendix- D2 and D.3, respectively. In estimating the economic prices, all taxes, duties and levies have been excluded from cost of inputs and the shadow rate for wages and salaries have been taken as 1.00. The economic price of coal has been assumed to be same as its ruling price. Based on the above methodology, the economic IRR of the project, at 100% and 85% level of the rated output for all the variants have been summarised in the table below.

	Variant1
IRR at 100%	46.81
IRR at 85%	31.99

21.11 SENSITIVITY ANALYSIS

The following parameters have been identified for assessing their impact on the profitability of the project.

a) Capital investment
b) Operating cost
c) Capacity utilisation
d) Selling price of coal

The above parameters have been increased / decreased in Steps of 5% to a maximum of 25% over the base case and the IRR have been computed. The following table summarises the results of sensitivity analysis:

S No	Variable Parameter	IRR at different stages of					
		0%	5%	10%	15%	20%	25%
1	Increase in Capital	36.96	35.62	34.33	33.08	31.88	30.73
2	Increase in Cost of Production	36.96	34.62	32.31	30.02	27.76	25.52
3	Decrease in Capacity	36.96	32.42	27.98	23.66	19.44	15.34
4	Decrease in Selling Price	36.96	32.01	27.18	22.47	17.90	13.47

21.12 Completion cost of the project

Completion cost of the project is up to targeted year is given at Annexure-I. Financial and Economic IRR of the project, based on the estimated completion capital is given in Appendix- D.4, D.5, D.6 & D.7, respectively for both 100% and 85% capacity utilization.

		Amount
Estimated Completion Capital	Rs. Crs	529.91
IRR 100%	%	35.01
IRR 85%	%	22.21
EIRR 100%	%	44.88
EIRR 85%	%	30.44

APPENDICES

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Extension Project Report FOR KDH OCP (4.50 MTY)

Appendix-A

STATEMENT SHOWING ESTIMATED INITIAL INVESTMENT AND PHASING

(Fig in Rs Lakh)

COAL & OB BOTH DEPARTMENTAL

Sl. No.	Particulars	Total Amount (Upto 4th Year Target)	Existing as on 31.03.2009	Addl. Amount (Upto 4th Year Target)	Target year				Phasing Beyond Target		
					1	2	3	4	5	10	11
1	Land	638.98	519.96	119.02	35.71	35.71	23.80	23.80			
2	Buildings										
	(a) Residential	1221.52	537.05	684.47	171.12	342.24	171.12				
	(b) Service	2772.73	1174.63	1598.10	399.52	799.05	399.52				
3	Plant and Machinery										
	(a) HEMM	22874.02	19833.63	3040.39	2820.60			219.79			
	(b) Other than HEMM	15844.21	3021.00	12823.21	2522.39	4637.33	5625.03	38.46		32.08	27.01
	Total Plant & Machinery	38718.22	22854.63	15863.59	5342.98	4637.33	5625.03	258.25		32.08	27.01
4	Furniture	79.21	19.21	60.00	15.00	15.00	15.00	15.00			
5	Railway Siding	1825.81	790.81	1035.00	344.00	481.00	210.00				
6	Vehicles	178.89	74.33	104.56	78.47	26.09					
7	Prospecting & Boring	23.61	4.21	19.40	5.00	14.40					
8	Development										
(a)	Capital Outlay in Mines	1001.63	230.96	770.67	231.70	219.70	319.27		1484.29		
(b)	Roads & Culverts	1546.79	338	1208.79	305.47	600.95	302.37				
(c)	Water Supply	472.35	54.47	417.88	104.47	208.94	104.47				
(d)	PR preparation Cost	314.25	204.84	109.41	109.41						
Sub Total (8)		3335.02	828.27	2506.75	751.05	1029.59	726.11		1484.29		
Sub Total (1 to 8)		48793.99	26803.10	21990.89	7142.86	7380.40	7170.58	297.05	1484.29	32.08	27.01
9	Revenue Expenditure Capitalised										
10	LESS Depriciation										
Total initial Capital Investment		48793.99	26803.10	21990.89	7142.86	7380.40	7170.58	297.05	1484.29	32.08	27.01

Extension Project Report FOR KDH OCP (4.50 MTY)

Appendix-A.1

STATEMENT SHOWING THE ESTIMATED INVESTMENT IN LAND ACQUISITION

COAL & OB BOTH DEPARTMENTAL

(Amount in Rs. Lakhs)

Sl. No.	Particulars	Total land (in Ha)	Status (in Ha)		Payment made till 31.03.09	Cost in Lakhs/Ha.	Balance amount to be paid	Phasing of Balance Amount			
			Land acquired	Land to be acquired				1	2	3	4
1	Tenancy land	69.24	47.63	21.61	519.96	4.32	93.36	28.01	28.01	18.67	18.67
2	GMK land	25.66	15.40	10.26		2.50	25.65	7.70	7.70	5.13	5.13
3	Forest Land	101.06		101.06	Details of forest land has been shown in appendix-F						
4	Forest land in safety zone (not to be acquired)	9.19			**Cost of enrichment calculated in Appendix - F.**						
	TOTAL	**195.96**	**63.03**	**132.93**	**519.96**		**119.01**	**35.71**	**35.71**	**23.80**	**23.80**

APPENDIX-A.2

SUMMARY OF THE CAPITAL INVESTMENT ON BUILDINGS.

COAL & OB BOTH DEPARTMENTAL (AMOUNT IN RS.LAKH)

Sl. NO.	PARTICULARS.	TOTAL PROV.	Phasing			REFERENCE
			1	2	3	
1.	RESIDENTIAL BUILDINGS	684.47	171.12	342.24	171.12	APP.A.2.1.
2.	SERVICE BUILDINGS	1598.10	399.52	799.05	399.52	APP.A.2.2.
	T O T A L	**2282.57**	**399.52**	**799.05**	**399.52**	

EXPANSION PROJECT REPORT FOR KDH OCP (4.50 MTY)

APPENDIX A.2.1.

STATEMENT SHOWING THE ESTIMATED CAPITAL INVESTMENT ON RESIDENTIAL BUILDINGS

Both Departmental (AMOUNT IN Rs.'000')

SL. NO.	CATEGORY/SCALE	TYPE OF QTRS.	NO. OF PERS-ONS	%age SATISF-ACTION	TOTAL QTRS. REQD.	Existing Quarters on 31.03.200	Balance quarters required	UNIT COST AT 100 CI IN RS.	UNIT COST AT 2082 CI(IN RS.)	TOTAL COST
1.	CAT.I to V and GRADE E	MQ	507	41.42	210	236	0	12282	255711	0.00
2.	CAT.VI tc GR.C.D.	MQ								
3.	Rs.5691-8247 & Rs.5896 - 8644	A	69	65.00	45	100	0	15009	312487	0.00
4.	Rs.6219 - 12054	HOSTEL			52			9310	193834	0.00
	&		398	65.00						
	GR. A, B & SPECIAL GRADE	B			207	60	147	21713	452065	66453.51
				258.70						
5.	Rs.10750 - 18700	C	37	100.00	37	37	0	31717	660348	0.00
	Rs.16000 - 20800							36116	751935	0.00
6.	Rs.17500-23300 AND ABOVE	D	11	100.00	11	11	0	72284	1504953	0.00
7.	SECURITY									
	SECURITY OFFICER	C	1	100.00	1	1	0	31717	660348	0.00
	SUB-TOTAL		1023	55.00	563	445	147			66453.51
	CONTINGENCIES 3% OF ABOVE									1993.61
	GRAND TOTAL (IN Rs. LAKHS.)									**684.47**

DRAFT EXPANSION PROJECT REPORT FOR KDH OCP (4.50 MTY)

APPENDIX A.2.2

ESTIMATED CAPITAL EXPENDITURE ON SERVICE BUILDINGS FOR UNIT WORKSHOP

(Only for running maintenance)

Coal & OB Both Departmental (AMOUNT IN Rs.LAKH)

Sl.. NO.	PARTICULARS	NO	PLINTH (sq.mt)	PLINTH AREA RATE(Rs)	COST AT 100 C.I.	COST AT 2082 C.I.
	UNIT WORKSHOP					
A	**EXCV. WORKSHOP**					
1	OFFICE	1	120	450	54000	11.24
2	CYCLE STAND	1	30	160	4800	1.00
3	TIME OFFICE	1	16	450	7200	1.50
4	DOZER REPAIR SHOP	1	384	650	249600	51.97
5	DOZER WASHING STN.	1	120	200	24000	5.00
6	SETTLING TANK	1	40	L.S.		0.00
7	PUMP HOUSE	2	24	260	12480	2.60
8	WATER RESERVOIR	1	24	L.S.		0.00
9	DUMPER WASHING STN.	2	384	200	153600	31.98
10	ELECT. SUB STATION	1	80	400	32000	6.66
11	DUMPER DAILY & SCHD. MAINT SHOP	1	1080	550	594000	123.67
12	DUMPER REPAIR SHOP	1	720	1000	720000	149.90
13	ELECTRICAL REPAIR SHOP	1	162	550	89100	18.55
14	MACHINE SHOP	1	324	300	97200	20.24
15	WELDING AND STRUCTURAL SHOP	1	360	300	108000	22.49
16	TYRE SECTION	1	162	300	48600	10.12
17	STORE	1	324	450	145800	30.36
18	W/C	1	6	450	2700	0.56
19	CANTEEN	1	96	450	43200	8.99
20	FUELLING STATION	-	-			
21	POL STORE	1	60	220	13200	2.75
22	BOUNDARY WALL IN METER	1	714	220	157080	32.70
23	CONCRETE PAVEMENT	1	22253	220	4895660	1019.28
	SUB TOTAL(1-23)					**1551.55**
	TOTAL					**1551.55**
	CONTINGENCIES 3%					46.55
	GRAND TOTAL					**1598.10**

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APPENDIX - A.2.3.

STATEMENT SHOWING THE BUILDING COST INDEX.

(With Ref. to 100 base in Delhi as on 1.10.76)

IN MAY 2008

Sl. NO.	DESCRIPTION	UNIT	RATES AS ON 1.10.76 AT DELHI	RATES AT SITE	RATIO BET Col.5 & Col.4	WEIGH -TAGE	COST INDEX
1.00	2	3	4	5	6	7	8
1	BRICKS	1000.00	106.15	3000.00	28.26	16.00	452.19
2.	SAND: 35% Coarse Sand 65% Fine Sand	Cu.m.	21.92	370.00	16.88	5.00	84.40
3.	CEMENT	Quintal	35.28	440.00	12.47	21.00	261.90
4.	STONE AGGREGATE 50% 20 mm Size 50% 50 mm Size	Cu.m.	27.10	882.00	32.55	6.50	211.55
5.	TIMBER	Cu.m.	2021.00	33516.00	16.58	18.00	298.51
6.	MILD STEEL	Quintal	183.20	4600.00	25.11	10.00	251.09
7.	LABOUR: (a) Mason 50% 1st. Class 50% 2nd. Class	Each	9.89	146.55	14.82	8.50	125.95
	(b) Carpenter 50% 1st. Class 50% 2nd. Class	Each	9.89	146.55	14.82	4.00	59.27
	(c) Coolie/Beldar	Each	4.41	135.25	30.67	11.00	337.36
	TOTAL						2082.23
	i.e. COST INDEX					SAY	**2082.00**

Job No 340911

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Extension Project Report FOR KDH OCP (4.50 MTY)

APPENDIX-A.3

STATEMENT SHOWING ESTIMATED INVESTMENT ON PLANT & MACHINERY

COAL & OB BOTH DEPARTMENTAL

(AMOUNT IN RS. LAKH)

Sl. No.	Particulars	Total Provision (upto target year)	Existing as on 31.03.2009	Addl. Provision	Phasing upto Target year				Phasing beyond Target year	
					1	2	3	4	10	11
		Amt			Amt	Amt	Amt	Amt	Amt	Amt
A.1	H. E. M. M For Coal	680.82		680.82	680.82	0.00	0.00	0.00	0.00	0.00
A.2.	H. E. M. M For OB	1720.56		1720.56	1720.56	0.00	0.00	0.00	0.00	0.00
A.3.	HEMM For Common	121.53		121.53	121.53	0.00	0.00	0.00	0.00	0.00
A.4.	HEMM For Reclamation	517.48		517.48	297.69	0.00	0.00	219.79	0.00	0.00
	Total HEMM (A)	**22874.02**	**19833.63**	**3040.39**	**2820.60**	**0.00**	**0.00**	**219.79**	**0.00**	**0.00**
B.	*Other than HEMM*									
(a)	Pumps & Pipes	571.86	189.80	382.06	129.36	138.14	114.57			
(b)	C. H. P	12377.16	1368.26	11008.90	1306.32	4302.61	5399.96			
(c)	Workshop	751.02	230.47	520.55	497.04	23.51				
(d)	Electricals	860.42	783.43	76.99	76.99				32.08	27.01
(e)	Communication	272.70	12.50	260.20	26.68	123.03	110.50			
(f)	Other P & M	339.42	225.23	114.19	64.14	50.05				
(g)	Float Engines	519.61	211.31	308.30	280.83	0.00	0.00	27.47	0.00	0.00
(h)	Contingencies	152.02		152.02	141.03	0.00	0.00	10.99	0.00	0.00
	TOTAL (B)	**15844.21**	**3021.00**	**12823.21**	**2522.39**	**4637.33**	**5625.03**	**38.46**	**32.08**	**27.01**
GRAND TOTAL (A+B)		**38718.22**	**22854.63**	**15863.59**	**5342.98**	**4637.33**	**5625.03**	**258.25**	**32.08**	**27.01**

Appendix-A.3.1

STATEMENT SHOWING ESTIMATED INVESTMENT ON PLANT & MACHINERY

COAL & OB BOTH DEPARTMENTAL

Sl. No.	Particulars	Size/ Capacity	Total Prov. Upto Target year	Existing as on 31.03.2009		Additional Provision (upto target year)			Phasing Upto Target Year I		4	
				No.	Amt	No.	Unit Cost	Amt	No.	Amt	No.	Amt
A.1	***H. E. M. M For Coal***											
1	Electric Rope Shovel	5 cum					853.77					
2	Rear Dumper	50/60 T	210.35			1	210.35	210.35	1	210.35		
3	Elec RBH Drill	160 mm	250.68			1	250.68	250.68	1	250.68		
4	Dozer	410 HP	219.79			1	219.79	219.79	1	219.79		
	TOTAL COAL		680.82					680.82		680.82		
A.2.	***H. E. M. M For OB***											
1	Electric Rope Shovel	10 Cum					3727.44					
2	Electric Rope Shovel	5 Cum					853.77					
3	Rear Dumper	85/100 T					327.02					
4	Rear Dumpers	50/60 T	841.39			4	210.35	841.39	4	841.39		
5	Elec RBH Drill	250 mm					250.68					
6	Dozer	410HP	879.16			4	219.79	879.16	4	879.16		
	TOTAL O. B							1720.56		1720.56		
A.3.	***HEMM For Common***											
1	Hyd. Shovel (with backhoe)	1.2 Cum					73.52					
2	Dump Truck	10T					67.69					
3	Grader	280HP					209.63					
4	RT crane	50T					211.22					
5	RT crane	20T					114.29					
6	FE Loader	5-6 Cum					119.45					
7	Wagon Drill	100-120mm					46.86					
8	Tyre Handler	35kN	101.46			1	101.46	101.46	1	101.46		
9	Water Sprinkler	28 KL					82.30					
10	Wheel Dozer	460 HP					232.98					
11	Vibratory Compactor	30T					25.14					
12	Fuel Truck	16KL					17.62					
13	Cable Handler		20.07			1	20.07	20.07	1	20.07		
14	Fire Truck						28.07					
	TOTAL Common							121.53		121.53		
A.4.	***HEMM For Reclamation***											
1	F E Loader	5-6Cum	119.45			1	119.45	119.45	1	119.45		
2	Water Sprinkler (wide spray system)	28 KL	82.30			1	82.30	82.30	1	82.30		
3	Dozer	410 HP	219.79			1	219.79	219.79			1	219.79
4	Dumper	35T	95.94			1	95.94	95.94	1	95.94		
	TOTAL RECLAMATION							517.48		297.69		219.79
	Total HEMM(A)		22874.02		19833.63			3040.39		2820.60		219.79

Appendix : A.3.2

EPR FOR K. D. H. OCP [4.5 MTY]

SUMMARY OF CAPITAL INVESTMENT ON ELECTRICAL P&M - OTHERS

(Rs. In '000)

Sl. No.	PARTICULARS	Provision as per sanctioned PR (Amt.)	Existing as on 31.03.2009 (Amt.)		PHASING		
				T. Cost	Cost	Cost	Cost
1	2	3	4	7	9	11	13
1	POWER SUPPLY & DISTRIBUTION			8210.00	5155.00	1751.00	1304.00
2	ILLUMINATION & TOWNSHIP POWER DI			3500.00	1500.00	1000.00	1000.00
3	MEASURING & TESTING EQUIPMENT			200.00	100.00	50.00	50.00
4	MISC. OTHER ITEMS			100.00	40.00	30.00	30.00
E.	TOTAL : (A+B+C+D)			12010.00	6795.00	2831.00	2384.00
5	ERECTION CHARGES			1201.00	679.50	283.10	238.40
6	CONTINGENCIES @ 3%			396.33	224.24	93.42	78.67
G.	GRAND TOTAL	42722.00	78343.00	13607.33	7698.74	3207.52	2701.07
	Amount in lakh Rs.				76.99	32.08	27.01

Appendix : A.3.2

EXPANSION PROJECT REPORT FOR K. D. HESALONG OCP (4.5 MTY)

BREAK UP OF CAPITAL INVESTMENT ON ELECTRICAL P&M - OTHERS

(Rs. In '000)

Sl. No.	PARTICULARS	Provision as per sanctioned PR (Amt.)	Existing as on 31.03.2009 (Amt.)	Additional Provision			PHASING					
							1		10		11	
				Qty.	U. Cost	T. Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost
1	2	3	4	5	6	7	8	9	10	11	12	13
1	POWER SUPPLY & DISTRIBUTION											
i	33 KV Circuit Breaker											
ii	33 KV Lightning Arrestor											
ii(a)	6.6 KV Lightning Arrestor			2	12	24	1	12	1	12		
iii	11 KV Vaccum Circuit Breaker											
iv	33 KV Isolator											
iv(a)	6.6 KV Isolator			2	15	30	1	15	1	15		
v	7.5 MVA, 33/6.6-3.3 KV Transformer											
vi	5 MVA 33/11 KV Transformer											
vii	5 MVA 33/6.6-3.3 KV Transformer											
viii	3 MVA 33/6.6 KV Transformer											
ix	3 MVA 11-6.6/3.3 KV Transformer											
x	33 KV D.O. Fuse											
xi	160 KVA, 33/0.433 KV Lig. Transformer											
xii	6.6-3.3 KV Switch Board Comprising 11 nos. Circuit Breaker											
xiii	6.6-3.3 KV Switch Board Comprising 10 nos. Circuit Breaker											
xiv	6.6 KV CAPACITOR BANK											
	2000 KVAR (2 Sets)			2	950	1900	2	1900				
xv	6.6 KV OHTL (in Km.)			4	900	3600	2	1800	1	900	1	900
xv	3.3 KV OHTL											
xvi	6.6/3.3 KV Lightning Arrestor											
xvii	6.6/3.3 KV Isolator											
xix	6.6/3.3 KV Pole Mounted on load Isolator											
xx	6.6 KV Field Switch			2	420	840	1	420	1	420		
xxi	440 V Field Switch											
xxii	3 KVA, 6.6-3.3 KV/230 V Lighting Trans.											
xxiii	160 KVA, 6.6-3.3 KV/440 V Transformer											
xxiv	630 KVA, 6.6-3.3 KV/440 V Unitised Transformer with DO fuse assembly											

EXPANSION PROJECT REPORT FOR K. D. HESALONG OCP [4.5 MTY]

BREAK UP OF CAPITAL INVESTMENT ON ELECTRICAL P&M - OTHERS

xxv	POWER CABLE- PVC											
	a) 6.6 kV Grade 35 Sq.mm. (in Km.)			0.8	1020	816	0.4	408	0.2	204	0.2	204
	b) 3.3/1.1 kV Grade of various sizes											
	c) Various Grade of various sizes.			LS		1000		600		200		200
xxvi	TRAILING CABLE											
	a) 6.6./3.3 KV Grade, 4x35 sq.mm.											
	b) 1100 V Grade, 4x120 sq.mm.											
	c) 1100 V Grade, 4x95 sq.mm.											
A.	**TOTAL:1.(Power Supply & Distn.)**					8210		5155		1751		1304
2	**ILLUMINATION & TOWNSHIP POWER DISN.**											
i	Mine site, quarry & haul road illumination, and mine surface power distribution.			LS		2000		1000		500		500
ii	Colony power supply.			LS		1500		500		500		500
B.	**TOTAL:2.(Illumn. & Township Power Distn.).)**					3500		1500		1000		1000
3	**MEASURING & TESTING EQUIPMENT**											
i	Misc.items including measuring and testing equipment.			LS		200		100		50		50
C.	**TOTAL:3.(Measuring & Testing Eqpt.)**					200		100		50		50
4	**MISC. OTHER ITEMS**											
i	Misc. items like insulating materials hand gloves, fire extinguisher, blower etc.			LS		100		40		30		30
ii	Apportioned cost of 33kV switching station											
D.	**TOTAL:4.(Misc. other items)**					100		40		30		30
E.	**TOTAL : (A+B+C+D)**					12010		6795		2831		2384
5	**ERECTION CHARGES @10% of E**					1201		679.5		283.1		238.4
F.	TOTAL : (E+5)					13211		7474.5		3114.1		2622.4
6	CONTINGENCIES @ 3% of F					396.33		224.235		93.423		78.672
G.	GRAND TOTAL : (F+6)	42722	78343			13607.33		7698.735		3207.52		2701.072

Appendix: A.3.3

EPR FOR K.D.HESALONG OCP [4.5 MTY]

ESTIMATED PHASED CAPITAL EXPENDITURE ON P&M - FIELD WORKSHOP

SUMMARY

COAL & OB DEPARTMENTAL **(Amount in Rs. Lakhs)**

DESCRIPTION	Existing as on 31.03.09	Balance Provision	Phasing	
			1ST YR	2ND YR
EXCAVATION WORKSHOP	230.47	320.22	304.30	15.92
E &M WORKSHOP		54.85	52.62	2.23
FIELD WORKSHOP		145.47	140.11	5.36
TOTAL	**230.47**	**520.54**	**497.04**	**23.51**

Job No 340911

परियोजना अधिकारी
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APPENDIX-A.3.3

ESTIMATED PHASED CAPITAL EXPENDITURE ON P&M- WORKSHOP

COAL & OB DEPARTMENTAL

(Amt. in Rs. Lakhs)

Sl. No.	Particulars	As per RPR Sept'99		Existing as on 31.03.09		Balance Provision			Phasing			
		No.	Amt.	No.	Amt.	No.	Unit cost	Total cost	1st year		2nd year	
									Qty	Cost	Qty	Cost
	Excavation w/s											
A	**Motor Transport Repairing Shop**											
1	Lathe m/c (medium duty)	1	1.03	1								
2	Centre Lathe (heavy duty)	1	1.4	1								
3	Lathe LT20	1	0.34	1								
4	Power Hacksaw	1	0.16			1	1.64	1.64	1	1.64		
5	Radial Drill 25mm	1	0.91	1								
6	Shaping m/c	1	0.29	1								
7	Bench Drill, cap. In steel 13mm	1	0.39	1								
8	Portable Hand Drill 13mm	2	0.14	1								
9	Flexible shaft grinder 100mm	3	0.28	1								
10	Double ended pedestal grinder	3	0.76			3	0.31	0.93	2	0.62	1	0.31
11	Portable hand grinder 150mm	2	0.04			2	0.11	0.22	1	0.11	1	0.11
12	Tools & cutter grinder	1	3.85			1	0.16	0.16	1	0.16		
13	Transformer welding set 450 amp.	2	0.35	2				0				
14	Transformer welding set 600 amp.	1	0.45			1	0.83	0.83	1	0.83		
15	M.G. welding set	2	0.85	1		1	0.89	0.89	1	0.89		
16	Oxy-acetelene gas cutting & brazing set	3	0.52			3	0.22	0.66	2	0.44	1	0.22
17	Euto alloy welding torch	1	0.48			1	0.45	0.45	1	0.45		
18	Metal powder spray gun	1	0.48			1	0.45	0.45	1	0.45		
19	Portable air blower	1	0.03			1	0.18	0.18	1	0.18		
20	Valve refacer	2	0.44			2	0.37	0.74	1	0.37	1	0.37
21	Valve seat grinder	2	0.44			2	0.28	0.56	1	0.28	1	0.28
22	Gas torch for brazing of radiator	2	0.28			2	0.33	0.66	1	0.33	1	0.33
23	Air compressor $4m^3$/min, $7Kg/cm^2$	2	1.54	2								
24	Electric soldering iron 1500 watts	2	0.04			2	0.01	0.02	1	0.01	1	0.01
25	Power operated Hydraulic press 50 te.	1	0.34			1	2.24	2.24	1	2.24		
26	Master tool kit	12	2.11			12	0.52	6.24	8	4.16	4	2.08
27	Heavy duty impact socket (in sets)	2	1.80			2	0.9	1.8	1	0.9	1	0.9
28	Torque wrenches & multipliers (in sets)	2	0.40			2	0.22	0.44	1	0.22	1	0.22
29	Wall type tyre inflater	3	0.09			3	0.05	0.15	2	0.1	1	0.05
30	Pneumatic torque wrenches (in sets)	1	0.79			1	0.99	0.99	1	0.99		
31	Hyd. Equipment repair, testing, calibrating instrument tools & other implements (in sets)	1	2.10			1	2.71	2.71	1	2.71		
32	Hyd. Hose crimping m/c	1	0.22			1	0.25	0.25	1	0.25		
33	Hyd. Bearing puller kit	1	0.22			1	0.27	0.27	1	0.27		
34	High pressure water & steam jet washing unit for dumpers	1	5.20	1								
35	Hydraulic Jack 50 te.	4	1.00			4	0.42	1.68	2	0.84	2	0.84
36	Hydraulic Jack 25 te	2	0.25			2	0.3	0.6	1	0.3	1	0.3
37	Tyre handler	1	63.28	1								
38	Tyre mounting & Dismounting equipment/Bead breaker	1	3.11	1								
39	Battery charging set with control cevice 7	3	1.05	1		2	0.33	0.66	1	0.33	1	0.33
40	Distilled water plant. cap. 5ltr/hr	2	0.53			2	0.11	0.22	1	0.11	1	0.11
41	Greasing & other lubricating equipment	1	3.11			1	1.19	1.19	1	1.19		
42	Misc. tools & tackles gauges etc.	LS	0.19			LS		0.25	LS	0.25		0.50
43	Working tables, benches, racks etc.	LS	0.50			LS		0.65	LS	0.50		0.15
44	Blacksmith herth with electric blower	1	0.04			1	0.49	0.49	1	0.49		
45	Anvil tools for blacksmithy works	LS	0.25			LS		0.33	LS	0.20		0.13
46	EOT crane, 20/5 Te span-18m	1	29.34			1	26.71	26.71	1	26.71		
47	EOT crane, 10/5 Te span-16m	1	18.29			1	11.66	11.66	1	11.66		

EXPANSION PROJECT REPORT FOR K.D.HESALONG OCP [4.5 MTY]

APPENDIX-A.3.3

ESTIMATED PHASED CAPITAL EXPENDITURE ON P&M- WORKSHOP

COAL & OB DEPARTMENTAL

(Amt. in Rs. Lakhs)

Sl. No.	Particulars	As per RPR Sept'99		Existing as on 31.03.09		Balance Provision			Phasing			
		No.	Amt.	No.	Amt.	No.	Unit cost	Total cost	1st year		2nd year	
B	**Face equipment repair shop**											
1	Heavy duty centre Lathe CH 450mm, DBC-3000mm	1	29.41			1	35.05	35.05	1	35.05		
2	Pillar drill 25mm	1	0.21			1	1.58	1.58	1	1.58		
3	Portable Hand Drill 25mm	1	0.20			1	0.36	0.36	1	0.36		
4	Angle grinder	2	0.26			2	0.16	0.32	1	0.16	1	0.16
5	M.G. welding set (450-500A)	1	1.96			1	0.89	0.89	1	0.89		
6	Portable steam jenny	1	0.42			1	1.64	1.64	1	1.64		
7	Stand for repair & testing of radiators	1	0.30			1	0.55	0.55	1	0.55		
8	Nozzle scoop	2	0.06			2	0.04	0.08	1	0.04	1	0.04
9	Unversal test for testing brake componen	1	1.53			1	1.87	1.87	1	1.87		
10	Hyd. Bearing puller kit 50 Te.	1	0.40			1	0.53	0.53	1	0.53		
11	Diagonistic tools & instruments	LS	1.00			LS		1.30	LS			
12	Coil winding m/c	2	0.28			2	0.55	1.10	1	0.55	1	0.55
13	Cable vulcaniser	1	0.51			1	0.76	0.76	1	0.76		
14	Test bench for self starter	1	0.61			1	1.09	1.09	1	1.09		
15	Set of electrical measuring instruments	LS	0.50			LS		0.65	LS	0.50		0.15
16	Hyd. Crimping tool for trialing cable	1	0.22			1	0.99	0.99	1	0.99		
17	Portable relay & motor testing equipment	LS	0.12			LS		0.16	LS	0.16		
18	H.V. testing kit	1	0.30			1	0.27	0.27	1	0.27		
19	Cable fault detector	1	0.04			1	0.20	0.20	1	0.20		
20	Table for tinning of commutator	1	0.02			1		0.00	1	0.00		
C	**HEAVY REPAIR SHOP**											
1	Lathe m/c	1	0.84			1	6.00	6.00	1	6.00		
2	Lathe m/c 260mm, DBC 1500mm	1	1.50			1	10.36	10.36	1	10.36		
3	Pillar drill 25mm	1	0.21			1	1.58	1.58	1	1.58		
4	Bench Drill cap. In steel 13mm	1	0.02			1	0.23	0.23	1	0.23		
5	Portable Hand Drill 13mm	2	0.14			2	0.10	0.20	1	0.10	1	0.10
6	Double ended pedestal grinder, 250mm	1	0.58			1	0.31	0.31	1	0.31		
7	Flexible shaft grinder 100mm	2	0.26			2	0.27	0.54	1	0.27	1	0.27
8	M.G. welding set (450-500A)	1	0.60			1	0.89	0.89	1	0.89		
9	Transformer welding set 450 amp.	1	0.28			1	0.61	0.61	1	0.61		
10	Oxy-acetelene gas cutting & brazing set	2	0.46			2	0.22	0.44	1	0.22	1	0.22
11	Power operated hyd. Press cap. 200 Te.	1	6.00			1	9.53	9.53	1	9.53		
12	Hydraulic jack 100 te	1	0.37			1	0.51	0.51	1	0.51		
13	Hydraulic Jack 25 te	2	0.05			2	0.30	0.60	1	0.30	1	0.30
14	EOT crane cap. 20/5 Te span- 18 m	1	29.34			1	26.71	26.71	1	26.71		
15	Heavy duty impact socket (in sets)	1	0.89			1	0.90	0.90	1	0.90		
16	Master tool kit	2	0.62			2	0.52	1.04	1	0.52	1	0.52
17	Torque wrenches & multipliers (in sets)	1	0.20	1								
18	Misc tools, cutters, spl.purpose tools etc.	LS	1.00			LS		1.30	LS	1.00		0.30
19	Working tables, benches, cabinets etc.	LS	0.50			LS		0.65	LS	0.50		0.15
D	**Field maintenance shop**											
1	Mobile Service Van	1	7.79	1								
2	Air compressor 2.5 m^3/min, 7kg/cm^2	2	2.24	1								
3	Mobile welding set	1	1.79			1	5.15	5.15	1	5.15		
4	M.G. welding set (450-500 amp)	1	0.63			1	0.89	0.89	1	0.89		
5	Transformer welding set 400A	1	0.26			1	0.61	0.61	1	0.61		
6	Oxy-acetelene gas cutting & brazing set	2	0.46			2	0.22	0.44	1	0.22	1	0.22
7	Washing equipment	1	3.40			1	3.27	3.27	1	3.27		
8	Greasing & other lubricating equipment	1	0.03			1	1.19	1.19	1	1.19		
9	Hydraulic Jack, 50 Te.	1	0.33			1	0.68	0.68	1	0.68		
10	Hydraulic Jack 25 Te	2	0.27			2	0.53	1.06	1	0.53	1	0.53
11	Mobile workshop van	1	12.18			1	18.51	18.51	1	18.51		
12	Misc. tools, gauges etc.	LS	0.25			LS		0.33	LS	0.33		

परियोजना प्रतिवेदन

केन्द्रीयकृत परियोजना

APPENDIX-A.3.3

ESTIMATED PHASED CAPITAL EXPENDITURE ON P&M- WORKSHOP

COAL & OB DEPARTMENTAL

(Amt. in Rs. Lakhs)

Sl. No.	Particulars	As per RPR Sept'99		Existing as on 31.03.09		Balance Provision			Phasing			
		No.	Amt.	No.	Amt.	No.	Unit cost	Total cost	1st year		2nd year	
E	**Stores & common facilities**											
1	Stationary Fuel station	1	4.28			1	6.63	6.63	1	6.63		
2	Fork lift truck 3 Te	1	8.02			1	12.78	12.78	1	12.78		
3	Tyre mounted mobile crane cap.: 8 Te	1	13.77			1	10.04	10.04	1	10.04		
4	Electric siren, 5 km. range	1	0.10			1	0.18	0.18	1	0.18		
5	Electric clock	2	0.20			2	0.16	0.32	1	0.16	1	0.16
6	Ventilation fan	LS	1.00			LS		1.30	LS	1.00		0.30
7	Cleaning equipment for w/s shed and iloc	LS	2.50			LS		3.25	LS	3.00		0.25
	sub-total							**246.32**		**234.08**		**12.24**
	Miscellaneous											
	Installation charges	LS				LS		36.95	LS	35.11		1.84
	Electricals, Illumination, Communication e	LS				LS		24.63	LS	23.41		1.22
	Contigency	LS						12.32	LS	11.70		0.61
	TOTAL							**320.22**		**304.30**		**15.92**
	E &M workshop											
1	Centre Lathe CH-260 mm. DBC-2000 mm	1	8.63			1	12.27	12.27	1	12.27		
2	Centre Lathe CH-200 mm. DBC-1000 mm	1	1.87			1	6.00	6.00	1	6.00		
3	Power Hacksaw (to cut upto 300 mm)	1	0.95			1	1.64	1.64	1	1.64		
4	Shaping m/c stroke- 630 mm	1	3.49			1	2.33	2.33	1	2.33		
5	Pillar drill 25mm	1	0.21			1	1.58	1.58	1	1.58		
6	Bench Drill, cap. In steel 13mm	1	0.41			1	0.23	0.23	1	0.23		
7	Portable Hand Drill 13mm	1	0.07			1	0.10	0.10	1	0.10		
8	Flexible shaft grinder 100mm	1	0.07			1	0.27	0.27	1	0.27		
9	Double ended pedestal grinder 250 mm	1	0.58			1	0.31	0.31	1	0.31		
10	Valve grinding & lapping m/c	1	0.62			1	0.16	0.16	1	0.16		
11	M.G. welding set (450-500 amp)	1	0.33			1	0.69	0.89				
12	Transformer welding set 450 amp.	2	0.28	2								
13	Oxy-acetelene gas cutting & brazing set	2	0.46			2	0.22	0.44	1	0.22	1	0.22
14	Air compressor 2.5 m3/min, 7kg/cm2	2	1.50	1								
15	Battery charging set (6V-72V)	1	0.03	1								
16	Distilled water plant	1	0.22			1	0.10	0.10	1	0.10		
17	Hydraulic Jack 25 te	3	0.72			3	0.30	0.90	2	0.60	1	0.30
18	Armature winding m/c	1	0.15			1	1.53	1.53	1	1.53		
19	Motor drying chamber with temp. control	1	0.92			1	4.63	4.63	1	4.63		
20	Smithy hearth with electric blower motor	1	0.36			1	0.49	0.49	1	0.49		
21	Anvil tools for blacksmithy works	LS	0.50			LS		0.65	LS	0.65		
22	Greasing & other lubricating equipment	1	0.91			1	1.19	1.19	1	1.19		
23	Washing equipment	1	3.18			1	3.27	3.27	1	3.27		
24	Misc tools, gauges, spl.purpose tools etc.	LS	0.50			LS		0.65	LS	0.50		0.15
25	Working tables, benches, cabinets, racks	LS	0.50			LS		0.65	LS	0.50		0.15
26	Electrical hoist cap. 5 Te, lift- 10m.	1	1.65			1	1.91	1.91	1	1.91		
	SUB-TOTAL							**42.19**		**40.48**		**1.71**
	Miscellaneous											
	Installation charges	LS				LS		6.33	LS	6.07		0.26
	Electricals, Illumination, Communication e	LS				LS		4.22	LS	4.05		0.17
	Contigency	LS				LS		2.11	LS	2.02		0.09
	TOTAL				230.47			**54.85**		**52.62**		**2.23**

परियोजना प्रबंधक
केडीहेसालोंग परियोजना

b No 340911

APPENDIX - A.3.3

EXPANSION PROJECT REPORT FOR K.D.HESALONG OCP [4.5 MTY]

ONLY RUNNING MAINTENANCE

ESTIMATED PHASED CAPITAL EXPENDITURE ON P&M - FIELD W ORKSHOP

(AMOUNT IN Rs.'000)

SL. NO.	ITEM CODE	DESCRIPTION	UNIT COST	TOTAL QTY.	TOTAL COST	1ST YR QTY	1ST YR COST	2ND. YR QTY	2ND. YR COST
FIELD W ORKSHOP									
1	505	AUTOMATIC BATTERY CHARGING SET WITH CONTROL DEVICE 144 VOLTS	67.00	1	67.00	1	67.00		
2	506	AUTOMATIC BATTERY CHARGING SET WITH CONTROL DEVICE 72 VOLTS	33.00	1	33.00	1	33.00		
3	507	DISTILLED WATER PLANT CAPACITY 15 LITRE/HR.	49.00	1	49.00	1	49.00		
4	510	SET OF ELECTRICAL MEASURING AND TESTING INSTRUMENTS		LS	40.00		20.00		20.00
5	303	BENCH DRILL, DRILLING CAPACITY IN STEEL-13mm. POWER-0.55kw	22.00	1	22.00	1	22.00		
6	902	M.G.WELDING SET 400A	88.00	1	88.00	1	88.00		
7	904	TRANSFORMER WELDING SET 400A.	60.00	2	120.00	1	60.00	1	60.00
8	906	OXY-ACETYLENE GAS CUTTING AND BRAZING SET	21.00	2	42.00	1	21.00	1	21.00
9	1501	HYDRAULIC JACK WITH PULLER ATTACHMENT, CAPACITY-100 Te.	102.00	1	102.00	1	102.00		
10	1505	HYDRAULIC JACK, CAPACITY- 50 Te.	42.00	1	42.00	1	42.00		
11	305	PORTABLE HAND DRILL-13mm. POWER-0.55 kw	10.00	2	20.00	1	10.00	1	10.00
12	304	PORTABLE HAND DRILL 25 mm. POWER-0.55 kw	36.00	1	36.00	1	36.00		
13	404	FLEXIBLE SHAFT GRINDER	27.00	1	27.00	1	27.00		

APPENDIX - A.3.3

EXPANSION PROJECT REPORT FOR K.D.HESALONG OCP [4.5 MTY]

ONLY RUNNING MAINTENANCE

ESTIMATED PHASED CAPITAL EXPENDITURE ON P&M - FIELD WORKSHOP

(AMOUNT IN Rs.'000)

SL. NO	ITEM CODE	DESCRIPTION	UNIT COST	TOTAL QTY.	TOTAL COST	1ST YR QTY	1ST YR COST	2ND. YR QTY	2ND. YR COST
14	1001	AIR-COMPRESSOR 3.39 Cu.M./Min. WORKING PRESSURE - 7Kg./Sq. Cm., POWER - 30 hp.	162.00	1	162.00	1	162.00		
15	1005	HEAVY DUTY IMPACT SOCKETS(IN SETS)	89.00	1	89.00	1	89.00		
16	1101	PRESSURISED LUBRICATION SYSTEM	672.00	1	672.00	1	672.00		
17	1102	ARTICULATED MOBILE TANKS WITH TELESCOPIC FUNNEL FOR COLLECTION OF WASTE		LS	75.00		75.00		
18	1004	MASTER TOOL KIT (IN SETS)	51.00	2	102.00	1	51.00	1	51.00
19	1304	HIGH PRESSURE MULTIJET WASHING UNIT (14 NOZZLES) FOR	664.00	1	664.00	1	664.00		
20	1302	HIGH PRESSURE WATER AND STEAM JET WASHING UNIT FOR DOZER	324.00	1	324.00	1	324.00		
21	1804	FIRE FIGHTING		LS	250.00		150.00		100.00
22		EOT CRANE, 30 T SPAN - 18 M. (FOR DUMPER REPAIR SHOP)	3270.00	1	3270.00	1	3270.00		
23	1602	EOT CRANE, 20 / 5 T SPAN - 18 M. (FOR DUMPER REPAIR SHOP)	2648.00	1	2648.00	1	2648.00		
24	1617	EOT CRANE FOR DOZER REPAIR SHOP, CAP.- 10/5 T.	1155.00	1	1155.00	1	1155.00		
25	1806	EXHAUST / VENTILATION FAN/AC/AIR COOLER		LS	200.00		100.00		100.00

Job No 340911

APPENDIX - A.3.3

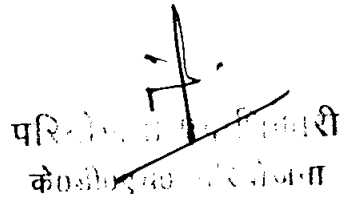
EXPANSION PROJECT REPORT FOR K.D.HESALONG OCP [4.5 MTY]

ONLY RUNNING MAINTENANCE

ESTIMATED PHASED CAPITAL EXPENDITURE ON P&M - FIELD WORKSHOP

(AMOUNT IN Rs '000)

SL. NO	ITEM CODE	DESCRIPTION	UNIT COST	TOTAL QTY.	TOTAL COST	1ST YR QTY	1ST YR COST	2ND. YR QTY	2ND. YR COST
26	1805	FUELLING STATION	657.00	1	657.00	1	657.00		
27	1807	TIME CLOCK AND CARD PUNCHING M/C	16.00	1	16.00	1	16.00		
28	1808	ELECTRIC SIREN, RANGE-5 Km	17.00	1	17.00	1	17.00		
29	1809	FURNITURE AND FITTING		LS	100.00		50.00		50.00
30	1810	CLEANING EQUIPMENT FOR W/S.,SHED/ FLOOR.		LS	100.00		100.00		
SUB-TOTAL					11190.00		10778.00		412.00
MISCELLANEOUS									
1		ELECTRICAL(15%)		LS	1678.50		1616.70		61.80
2		INSTALLATION(10%)		LS	1119.00		1077.80		41.20
3		CONTINGENCIES(5%)		LS	559.50		538.90		20.60
SUB-TOTAL					3357.00		3233.40		123.60
TOTAL					14547.00		14011.40		535.60



EXPANSION PROJECT REPORT FOR KD HESALONG OCP [4.50 MTY]

ESTIMATED CAPITAL EXPENDITURE ON P&M - PUMPS, PIPES & FITTINGS

(Amount in Rs lakh)

Sl. No.	PARTICULARS	PROVISION AS PER SANCTIONED R P R (4.5 MTY)		Existing as on 31.3.09		ADDITIONAL PROVISION			PHASING					
									1st yr		2nd yr		3rd yr	
		QTY	TOTAL AMOUNT	QTY	TOTAL AMOUNT	QTY	UNIT COST	TOTAL AMOUNT	QTY	COST	QTY	COST	QTY	COST
A.	**PUMPS (Nos.)**													
1	540 CUM/HR X 240 M HEAD,NFLP,625 KW, TEFC - 6.6 KV, WITH MOTOR & STARTER & ELECTRICAL					4.0	35.00	140.00	1	35.00	1.0	35.00	2.0	70.00
	540 CUM/HR X 150 M HEAD,NFLP, 350 KW, TEFC - 3.3/ 6.6 KV, WITH MOTOR & STARTER & ELECTRICAL			3.0		0.0		0.00	0	0.00	0.0	0.00	0.0	0.00
2	300 CUM/HR X 240 M HEAD,NFLP, 275 KW, TEFC - 6.6 KV, WITH MOTOR & STARTER & ELECTRICAL	0.0		0.0		3.0	25.00	75.00	1	25.00	2.0	50.00	0.0	0.00
3	300 CUM/HR X 150 M HEAD,NFLP, 200 KW, TEFC - 6.6 KV, WITH MOTOR & STARTER & ELECTRICAL	9.0		4.0		0.0		0.00		0.00	0.0	0.00	0.0	0.00
4	300 CUM/HR X 100 M HEAD,NFLP, 110 KW, TEFC - 550/440 V, WITH MOTOR, STARTER & ELECTRICAL			5.0		0.0		0.00	0.0	0.00	0.0	0.00		0.00
5	150 CUM/HR X 60 M HEAD,NFLP,37 KW, TEFC - 550/415V, WITH MOTOR, STARTER & ELECTRICAL			2.0		0.0		0.00	0.0	0.00	0.0	0.00	0.0	0.00
6	300 CUM/HR X 240 M HEAD WITH ALL ACCESSORIES (DIESEL DRIVEN)					1.0	15.60	15.60	1.0	15.60		0.00	0.0	0.00
7	80 CUM/HR X 25/ 45 M HEAD,NFLP,55 KW, TEFC - 415 V, WITH MOTOR, STARTER & ELECTRICAL (SLURRY PUMP)	4.0		2.0		0.0		0.00	0.0	0.00	0.0	0.00		0.00
8	50 CUM/HR X 45/25 M HEAD,NFLP,16-22.5 KW, TEFC - 440 V WITH ELECTRICAL(FACE PUMP)	8.0		4.0		0.0		0.00	0.0	0.00	0.0	0.00	0.0	0.00
	Sub Total ' A'							**230.60**		**75.60**		**85.00**		**70.00**

EXPANSION PROJECT REPORT FOR KDH OCP [4.50 MTY]

ESTIMATED CAPITAL EXPENDITURE ON P&M - PUMPS, PIPES & FITTINGS

(Amount in Rs lakh)

Sl. No.	PARTICULARS	PROVISION AS PER SANCTIONED P R (1.0 MTY)		Existing as on 31.3.09		ADDITIONAL PROVISION UP TO TARGET YEAR			PHASING					
									Up to Target Year					
									1		2		3	
		QTY	UNIT COST	QTY	UNIT COST	QTY	UNIT COST	TOTAL AMOUNT	QTY	COST	QTY	COST	QTY	COST
B.	**PIPES (in KM.) & FITTINGS**													
9	STEEL PIPE OF NOMINAL DIAMETER 300 MM (IN KM)					0.00	25.50	0.00		0.00	0.00	0.00	0.00	0.00
10	STEEL PIPE OF NOMINAL DIAMETER 250 MM (IN KM)					2.50	20.45	51.13	1.00	20.45	0.50	10.23	1.00	20.45
11	STEEL PIPE OF NOMINAL DIAMETER 200 MM (IN KM)					2.00	12.96	25.92	0.50	6.48	1.00	12.96	0.50	6.48
12	STEEL PIPE OF NOMINAL DIAMETER 150 MM (IN KM)					1.50	7.25	10.88	0.50	3.63	1.00	7.25	0.00	0.00
13	GI PIPE OF NOMINAL DIAMETER 100 MM (IN KM)					0.75	5.96	4.47	0.50	2.98	0.25	1.49	0.00	0.00
14	MISCELLANEOUS ITEMS,VALVES, FITTINGS, BENDS,ARMOURED SUCTION AND DELIVERY HOSES ETC.					LS		9.24		3.35		3.19		2.69
	Sub Total ' B'							101.63		36.89		35.12		29.62
	Installation Charges					LS		49.83		16.97		18.02		14.94
	GRAND TOTAL(A+B)				**189.80**			**382.06**		**129.36**		**138.14**		**114.57**

Appendix : A.3. 4. 0

EXTENSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

SUMMARY STATEMENT OF CAPITAL EXPENDITURE ESTIMATE FOR P&M

COAL HANDLING PLANT

[CRUSHING OF COAL UP TO (-) 200 MM]

[Amount in Rs.Lakhs]

Sl. No.	PARTICULARS	Provision as per sanctioned PR	Existing as on 31-3-2009	Additional Provision (COST)	PHASING		
					1	2	3
A	Mechanical System						
	i) P & M / Equipment			3562.80	10.40	1127.40	2425.00
	ii) Conveyors			864.00	133.60	518.40	212.00
	iii) Belting						
	a) Nylon Nylon Belting			197.00	0.00	99.00	98.00
	b) Steel Cord Belting			0.00	0.00	0.00	0.00
1	**Total of ' A'**			4623.80	144.00	1744.80	2735.00
2	Electrical System			756.52	23.38	279.84	453.30
3	Erection and Commissioning			538.03	16.74	202.46	318.83
4	Civil & Structral Works (Including Over Head construction cost and design & Engg.)			2741.00	965.50	1234.50	541.00
5	Design & Engineering			295.92	9.21	111.36	175.36
6	Over Head Construction Cost			887.75	27.62	334.07	526.07
7	Insurance			67.16	8.69	26.80	31.68
8	**Sub Total (1) to (7)**			9910.19	1195.13	3933.82	4781.23
9	Contingency			297.31	35.85	118.01	143.44
10	**Sub Total (8) to (9)**			10207.49	1230.99	4051.84	4924.67
11	Training of O&M Staff			5.10		2.64	2.46
12	Spares			161.41			161.41
13	**Sub Total (10) + (12)**			10374.01	1230.99	4054.48	5088.54
14	Misc.& tax etc.			634.89	75.34	248.13	311.42
15	**Grand Total (13) to (14)**	**1183.00**	**1368.26**	**11008.90**	**1306.32**	**4302.61**	**5399.96**

Appendix : A.3.5.2

EXPANSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

STATEMENT SHOWING THE PHASED CAPITAL EXPENDITURE ON P&M :CHP

[CONVEYOR]

[Amount in Rs.'000']

SL. No.	PARTICULARS		DETAILS	TOTAL QTY	UNIT COST	TOTAL COST	PHASING		
							1	2	3
1	Conveyor Dgn.	:	1C	1	7800	7800	1560	4680	1560
	Width in mm	:	1400						
	Length in 'm'	:	215						
	Power in kW	:	2x90						
2	Conveyor Dgn.	:	2C	1	7400	7400	1480	4440	1480
	Width in mm	:	1400						
	Length in 'm'	:	175						
	Power in kW	:	1x90						
3	Conveyor Dgn	:	3C & 4C	2	16000	32000	6400	19200	6400
	Width in mm	:	1800						
	Length in 'm'	:	225						
	Power in kW	:	2x150						
4	Conveyor Dgn.	:	5C & 6C	2	19600	39200	3920	23520	11760
	Width in mm	:	1800						
	Length in 'm'	:	320						
	Power in kW	:	2x400						
	TOTAL	:				86400	13360	51840	21200

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Appendix : A.3.5.3

EXPANSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

STATEMENT SHOWING THE PHASED CAPITAL EXPENDITURE ON P&M :CHP

[BELTING]

[Amount in Rs.'000']

SL. No.	PARTICULARS		TOTAL QTY. (In 'm')	UNIT COST	TOTAL COST	PHASING		
						1	2	3
1	Width of Belt (in mm) : 1400 Type of Belt : NN Type of Carcass : 800/4		820	2.15	1760		900	860
2	Width of Belt (in mm) : 1800 Type of Belt : NN Type of Carcass : 1250/4		2300	7.80	17940		9000	8940
	TOTAL	::	3120		19700	9900		9800

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Appendix : A.3.5.4

EXPANSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

STATEMENT SHOWING THE PHASED CAPITAL EXPENDITURE ON P&M :CHP

[CIVIL & STRUCTURALS]

[Amount in Rs.'000']

SL. No.	PARTICULARS	TOTAL QTY	UNIT COST	TOTAL COST	PHASING		
					1	2	3
1	Conveyor Gantries Inclined Roof Type	LS	---	52000	20800	26000	5200
2	Loading Hopper Capacity 400/500 Te. For Sampler & rapid loadout	1	10000	10000	3500	4000	2500
3	Receiving Pit-cum-Hoppers for sizers, Ramp,Pavement etc.	LS	---	45000	11250	20250	13500
4	Ground Bunker , Cap.- 15000 Te.	1	125000	125000	50000	56250	18750
5	Drive / Transfer House	LS	---	8000	2000	3600	2400
6	Civil cost for other P&M equipments	LS	---	8600	0	2700	5900
7	General Development in CHP Area	LS	---	3000	1500	900	600
8	Survey,Soil Investigation & Hydrogeological Data etc.	LS	---	2500	1500	750	250
9	CHP Office Building,road, Water supply,drain, Sanitation etc.	LS	---	20000	6000	9000	5000
TOTAL				**274100**	**96550**	**123450**	**54100**

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Appendix-A.3.6

Estimated Capital Investment on other P&M

BOTH DEPARTMENTAL

(Amt in Rs. Lakh.)

Sl. No.	Description	Total			Capital Phasing till Target year of coal production							
		No	Unit Cost	Cost	1		2		3		4	
					No.	Amt.	No.	Amt.	No.	Amt.	No.	Amt.
1	Exploder with continuity tester for 200 shots	6	0.07	0.42	3	0.21	3	0.21				
2	Survey instrument incluiding printing machine	LS		15.00	LS	7.50	LS	7.50				
	Tipping Truck	4	19.52	78.08	2	39.04	2	39.04				
3	Boom Truck	1	8.50	8.50	1	8.50						
4	Misc. Equipment	LS		8.00	LS	5.00	LS	3.00				
5	Jack hammer	3	0.15	0.45	1	0.15	2	0.30				
6	Compressor (400-450)	1	3.74	3.74	1	3.74						
Total				**114.19**		**64.14**		**50.05**				

APPENDIX –A.3.7

ESTIMATED PHASED CAPITAL EXPENDITURE ON COMMUNICATION SYSTEM

Amount in Rs.'000

Sl.No.	Particular	Qty	Unit Cost	Total Cost	Year Wise Phasing					
					1st Year		2nd Year		3rd Year	
					Qty	Cost	Qty	Cost	Qty	Cost
1	2	3	4	5	6	7	8	9	10	11
1	Surface Mine Communication									
	a. IPPBX 400 lines with accessoires	LS		2000	LS	1500	LS	250	LS	250
	b. BSNL fixed lines	30	4	120	20	80	10	40		
	c. BSNL Cellone Mobile Connection with sets	20	2.5	50	15	37.5	5	12.5		
2	TETRA System with Transreceiver, Mobile sets with all accessories	LS		20000			LS	10000	LS	10000
3	Plant Comm. System, Digital Clock, etc.	LS		600	LS	300	LS	300		
4	2 Mbps leased line	LS		50	LS	50				
5	Internet & LAN, Hardware and Software	LS		1500			LS	1000	LS	500
6	48 Port L2 Switch		400	400			LS	400		
7	Cables & accessories etc. including CFC	LS		1000	LS	600	LS	200	LS	200
8	Testing & Measuring Equipment	LS		300	LS	100	LS	100	LS	100
Sub Total				**26020**		**2667.5**		**12302.5**		**11050**

Appendix-A.4

Estimated Investment On Furniture & Fittings

(Amount in Rs. Lakhs)

BOTH DEPARTMENTAL

Particulars	Total amount	Existing as on 31.03.2009	Total Addl. amount	Yearwise Phasing			
				1	2	3	4
General furnitures, Air conditioner, Dispansary, Hospital & other equipment including personal computers.	79.21	19.21	60.00	15.00	15.00	15.00	15.00

APPENDIX - A.5

EXPANSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

STATEMENT SHOWING THE ESTIMATED CAPITAL EXPENDITURE ON RAILWAY SIDING

(Amount in Rs. Lakhs)

SL. No.	PARTICULARS	Provision as per sanctioned PR	Existing as on 31-3-2009	Additional Provision (COST)	PHASING		
					1	2	3
1	Preliminary cost of survey			5.00	4.00	1.00	0.00
2	Civil Engineering cost for proposed additional line, 2.0 Km.Approx			900.00	320.00	450.00	130.00
3	Signalling and Telecommunication			80.00	10.00	20.00	50.00
4	EMP Measures, Rail weigh bridge, Ligthting & Misc.			50.00	10.00	10.00	30.00
TOTAL		**776.00**	**790.81**	**1035.00**	**344.00**	**481.00**	**210.00**

EPR FOR KDH OCP (4.50 MTY)

Appendix- A.6

Estimated Capital requirement on Vehicles

BOTH DEPARTMENTAL

Sl. No.	Description	TOTAL AS PER PR FOR 4.50 MTY		Existing as on 31.03.2009		Additional Provision			Yearwise Phasing			
				No.	Total Cost	No.	Unit Cost	Total Cost	1		2	
		No.	Amt						No.	Amt.	No.	Amt.
1	Car	2		1		1	4.51	4.51	1	5		
2	Jeep	8		5		3	4.45	13.36	1	4	2	9
3	Deisel Truck	6		3		3	8.59	25.77	1	9	2	17
4	Explosive Van	1		1			12.34					
5	Cash Van	1				1	7.20	7.20	1	7		
6	Pick Up Van	2		1		1	12.86	12.86	1	13		
7	Ambulance	2		1		1	8.11	8.11	1	8		
8	School Bus	2		2			16.73					
9	Shift Bus	2		1		1	9.51	9.51	1	10		
10	Tractor With Trailor	1				1	4.22	4.22	1	4		
11	Tractor with 4 Trailors for Garbage cleaning	1				1	5.40	5.40	1	5		
12	Trailor for Jeep	2				2	0.51	1.03	2	1		
13	Line Truck	1				1	12.60	12.60	1	13		
	Total		**178.89**		**74.33**			**104.56**		**78.47**		**26.09**

Appendix A.7

Statement showing Investment on Prospecting & Boring

BOTH DEPARTMENTAL (Amt. In Rs. Lakhs)

Sl. No.	Existing			Additional		Yearwise Phasing	
	Boreholes	Meterage	Amount	Meerage	Amount	1	2
1	123.30	2688.00	103.90	500.00	19.40	5.00	14.40

Extension Project Report FOR KDH OCP (4.50 MTY)

Appendix-A.8.1

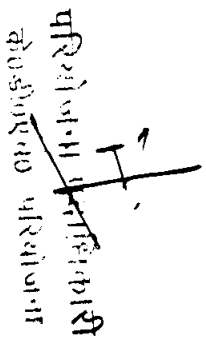
ESTIMATED CAPITAL OUTLAY IN MINES

Coal & OB Both Departmental (Amount in Rs. Lakhs)

Sl.No	Particulars	Total Amt	Phasing			Beyond target year
			1st. Yr.	2nd Yr.	3rd yr	
1	Village rehabilitation for 800 families including cost of houses	800.00	160.00	160.00	160.00	320.00
2	Compensatory afforestation	1128.27	-	-	112.83	1015.44
3	Biological reclamation of OB dump	56.89	-	-	-	56.89
4	Arboriculture	12.00	-	-	1.20	10.80
5	Rain water harvesting	7.00	-	-	2.00	5.00
6	Baseline environmental data generation	12.00	12.00			
7	Cost of land development in colony area at CI 2082	74.22	18.56	18.56	18.56	18.56
8	Cost of land development in mine & Industrial area at CI 2082	164.58	41.15	41.15	24.69	57.60
	Total	**2254.96**	**231.70**	**219.70**	**319.27**	**1484.29**

Appendix-A.8.2

SUMMARY OF THE CAPITAL INVESTMENT ON ROADS & CULVERTS.



Sl. NO.	PARTICULARS.	TOTAL PROV.	Phasing		
			I st Yr.	2 nd Yr.	3rd Yr.
1	DIVERSION ROAD REQUIRED	432.43	108.11	216.22	108.11
2	ADDITIONAL COLONY ROADS FOR BALANCE B - TYPE QUARTERS.	47.46	11.87	23.73	11.87
3	HAUL ROAD	380.11	95.03	190 06	95.03
4	APPROACH ROAD TO MAGAZINE	41.89	10.47	20.94	10.47
5	ROAD FROM GM OFFICE TO WORKSHOP	306.90	80.00	150.00	76.90
	T O T A L	**1208.79**	**305.47**	**600.95**	**302.37**

APPENDIX-A.8.2.1.

EXPANSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

STATEMENT SHOWING THE ESTIMATED CAPITAL INVESTMENT ON DIVERSION ROAD

(AMOUNT IN Rs.'000')

SL. NO.	PARTICULARS	LENGTH KM/NO.	COST AT 100 CI	COST AT 2082 CI	TOTAL COST
1.	**DIVERSION ROAD**				
	7.50 mt wide 225 mm boulder soling				
	7.50 mt wide 75 mm W.B.M.(50-63 mm)				
	7.50 mt wide 75 mm W.B.M.(40 50 mm)				
	7.50 mt. wide 40 mm premix carpet	5.00	290.00	6037.80	30189.00
2.	**CULVERTS**				
	4.57 mt. span R.C.C. culvert	5	34.00	707.88	3539.40
	3.05 mt. span R.C.C culvert	6	29.00	603.78	3622.68
	1.83 mt. span R.C.C. culvert	6	15.00	312.30	1873.80
	1.0 mt.dia hume pipe culvert	17	11.00	229.02	3893.34
3.	**TREE GUARDS (@ 40 /KM)**	200	0.03	0.62	124.92
	TOTAL				43243.14
	TOTAL AMOUNT IN Rs. LAKHS.				**432.43**

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EXPANSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

APPENDIX-A.8.2.2.

STATEMENT SHOWING THE ESTIMATED CAPITAL INVESTMENT ON COLONY ROADS.

(AMOUNT IN Rs.'000')

Sl. No.	Particulars	Length Km/No.	Cost At 100 CI	Cost At 2082 CI	Total Cost
1.	**COLONY ROADS**				
	3.75 mt wide 75 mm sand/moorum				
	3.75 mt wide 150 mm boulder soling				
	3.75 mt. wide 150 mm W.B.M.				
	3.75 mt. wide 20 mm premix carpet	1.50	132.00	2748.24	4122.36
2.	**CULVERTS.**				
	4.57 mt. span R.C.C. culvert	0.0	17.00	353.94	0.00
	3.05 mt. span R.C.C. culvert	0.0	16.00	333.12	0.00
	1.83 mt. span R.C.C. culvert	1.0	9.20	191.54	191.54
	1.0 mt.dia hume pipe culvert	2.0	8.60	179.05	358.10
3.	**TREE GUARDS (@ 40/Km.)**	60	0.03	0.62	37.48
4.	**R.C.C. DRAIN CROSSING SLABS**				
	40% of the total nos. of quarters.	59	0.03	0.62	36.73
5.	TOTAL				4746.21
6.	**TOTAL AMOUNT IN Rs. LAKHS.**				**47.46**

Job No 340911

35X

परियोजना अधिकारी
केoडीoएचo परियोजना

EXPANSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

APPENDIX A.8.2.3.

ESTIMATED CAPITAL INVESTMENT ON HAUL ROAD (LW 100 T)

(AMOUNT IN Rs.'000')

Sl. No.	P A R T I C U L A R S	LENGTH NO./KM	COST AT 100 CI	COST AT 2082 CI	TOTAL COST
A.	HAUL ROAD				
1.	20 mt wide 330 mm moorum				
2.	20 mt wide 300 mm moorum + sand				
3.	20 mt wide 300 mm w.b.m.	2.00	1216.75	25332.74	50665.47
4.	20 mt wide 200 mm w.b.m.				
5.	17.5 mt wide 100 mm bituminous macadam.				
	Less 30% for providing moorum instead of 100 mm bituminous macadam.				15199.64
	SUB-TOTAL				35465.83
B.	CULVERTS & BRIDGES				
1.	Cost of 4.57 mt span R.C.C culvert	1	64.91	1351.34	1351.34
2.	Cost of 3.05 mt span R.C.C culvert	1	37.74	785.66	785.66
3.	Cost of 1.50 mt span R.C.C culvert	1	19.62	408.54	408.54
	SUB- T O T A L				2545.54
	T O T A L				38011.37
	TOTAL AMOUNT IN Rs. LAKHS				**380.11**

STATEMENT SHOWING THE ESTIMATED CAPITAL INVESTMENT ON APPROACH ROAD TO MAGAZINE.

(AMOUNT IN Rs.'000')

Sl. No.	PARTICULARS	Length Km/No.	Cost At 100 CI	Cost At 2082 CI	Total Cost
1.	**APPROACH ROAD TO MAGAZINE**				
	3.75 mt wide 75 mm sand/moorum				
	3.75 mt wide 150 mm boulder soling				
	3.75 mt. wide 150 mm W.B.M.				
	3.75 mt. wide 20 mm premix carpet	1.00	132.00	2748.24	2748.24
2.	**CULVERTS.**				
	4.57 mt. span R.C.C. culvert	1	17.00	353.94	353.94
	3.05 mt. span R.C.C. culvert	1	16.00	333.12	333.12
	1.83 mt. span R.C.C. culvert	1	9.20	191.54	191.54
	1.0 mt.dia hume pipe culvert	3	8.60	179.05	537.16
3.	**TREE GUARDS (@ 40/Km.)**	40	0.03	0.62	24.98
4.	TOTAL				4188.98
5.	**TOTAL AMOUNT IN Rs. LAKHS.**				**41.89**

APPENDIX-A.8.3.

SUMMARY OF THE CAPITAL INVESTMENT ON WATER SUPPLY & SEWERAGE

(AMOUNT IN Rs.LAKHS)

Sl. NO.	PARTICULARS.	TOTAL PROV.	Phasing			REFERENCE
			lst year	2nd year	3rd year	
1	COLONY WATER SUPPLY	51.48	12.87	25.74	12.87	APP.A.8.3.1.
2	COLONY SEWERAGE	127.79	31.95	63.89	31.95	APP.A.8.3.2.
3	INDUSTRIAL WATER SUPPLY	138.44	34.61	69.22	34.61	APP.A.8.3.3.
4	INDUSTRIAL SEWERAGE	100.17	25.04	50.08	25.04	APP.A.8.3 4.
	T O T A L	**417.88**	**25.04**	**50.08**	**25.04**	

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કેડીએચ પરિયોજના

EXPANSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

APPENDIX - A.8.3.1.

STATEMENT SHOWING THE ESTIMATED CAPITAL INVESTMENT ON COLONY WATER SUPPLY SCHEME.

(AMOUNT IN Rs.'000')

SL. NO.	PARTICULARS	UNIT OF MEASURE	UNIT COST (RS)	QUANTITY	COST AT 100 CI	COST AT 2082 CI
1.	GROUND RESERVOIR 0.15 LAKHS GALLON CAPACITY	GALLON	3.00	14700	44.10	918.16
2.	OVERHEAD TANK 0.07 LAKHS GALLON CAPACITY	GALLON	5.00	7350	36.75	765.13
3.	1 No.,PUMP HOUSE 20.00 SQ.METER	SQ.METER	260.00	20	5.20	108.26
4.	PUMPS & MOTORS	L.S.				248.00
5.	1200 M PIPE LINE					
a.	180 M (DIA. 200 MM.)	R.M.	83.75	180	15.08	313.86
b.	240 M (DIA. 150 MM.)	R M.	57.35	240	13.76	286.57
c.	780 M (DIA. 100 MM)	R.M	35.32	780	27.55	573.58
6.	VALVES & SPECIALS (15%OF THE ABOVE ITEM)					176.10
7.	COLONY DISTRIBUTION SYSTEM(@ RS.150/UNIT)		150.00	563	84.45	1758.25
	TOTAL COST					5147.92
	GRAND TOTAL (IN Rs.LAKHS.)					**51.48**

EXPANSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

APPENDIX - A.8.3.2.

STATEMENT SHOWING THE ESTIMATED CAPITAL INVESTMENT ON COLONY SEWERAGE

(AMOUNT IN Rs.'000')

SL. NO.	PARTICULARS	UNIT OF MEASURE	UNIT COST (RS)	QUANTITY	COST AT 100 CI	COST AT 2082 CI
1.	COMBINED OPEN SURFACE DRAIN					
	a)MAIN DRAIN (60CMx90CM)	R.M.	104.00	563	58.50	1217.97
	b)CONNECTING DRAIN (30CMx45CM)	R.M.	57.00	563	32.06	667.54
2.	SEPTIC TANK,SOAKPIT &INSPECTION CHAMBER @RS 700/UNIT		700.00	563	394.10	8205.16
3.	S.W. PIPE & PROVIDING CEMENT CONCRETE @Rs. 89 /UNIT		89.00	563	50.11	1043.23
4.	CLOSED CIRCUIT WASTE WATER TREAT MENT & RECIRCULATION SYSTEM	NO.	L.S.	1		1644.99
	TOTAL COST					12778.89
	GRAND TOTAL (IN Rs.LAKHS.)					**127.79**

APPENDIX - A.8.3.3

STATEMENT SHOWING THE ESTIMATED CAPITAL INVESTMENT ON INDUSTRIAL WATER SUPPLY SCHEME.

(AMOUNT IN Rs.'000')

SL. NO.	PARTICULARS	UNIT OF MEASURE	UNIT COST(RS)	QUANTITY	COST AT 100 CI	COST AT 2082 CI
1.	GROUND RESERVOIR					
a.	0.42 LAKHS GALLON CAPACITY	GALLON	3.00	42350	127.05	2645.18
b.	1.13 LAKHS GALLON CAPACITY	GALLON	3.00	112500	337.50	7026.75
2.	PUMP HOUSE,2 NOS.					
a.	20.00 SQ.METER X 2	SQ.METER	260.00	20	10.40	216.53
3.	OVER HEAD TANK					
a.	0.17 LAKHS GALLON CAPACITY	GALLON	5.00	16940	84.70	1763.45
b.	0.17 LAKHS GALLON CAPACITY (FOR POTABLE WATER)	GALLON	5.00	16940	84.70	1763.45
4.	PUMPS & MOTORS	NO.			L.S.	62.08
5.	200 M PIPE LINE					
	100 M (DIA. 150 MM.)	R.M.	83.00	100	8.30	172.81
	100 M (DIA. 80 MM.)	R.M.	70.00	100	7.00	145.74
6. a. b.	VALVES & SPECIALS (15%OF THE ABOVE ITEM)					47.78
	TOTAL COST					13843.77
	GRAND TOTAL (IN Rs.LAKHS.)					**138.44**

EXPANSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

APPENDIX - A.8.3.4.

STATEMENT SHOWING THE ESTIMATED CAPITAL INVESTMENT ON INDUSTRIAL SEWARAGE.

(AMOUNT IN Rs.'000')

SL. NO.	PARTICULARS	UNIT OF MEASURE	UNIT COST(RS)	QUANTITY	COST AT 100 CI	COST AT 2082 CI
1.	COMBINED OPEN SURFACE DRAIN					
a.	60 CM. X 90 CM.	METER	104.00	320	33.28	692.89
b.	SURFACE DRAIN 30 CM. X 45 CM.	METER	57.00	320	18.24	379.76
2.						
a.	200 MM DIA S.W.PIPE OF GRADE A	METER	32.85	160	5.26	109.43
b.	200 MM DIA C.I. PIPE FOR INDUSTRIAL COMPLEX	METER	196.80	160	31.49	655.58
3.	PROVIDING & LAYING CEMENT CONC. (1:5:10) UP TO HUNCHES OF S.W. PIPE					
	FOR 200 MM. S.W. PIPE	METER	14.05	170	2.39	49.73
4.	MANHOLE					
a.	CIRCULAR TYPE MANHOLE	NO.	597.50	5	2.99	62.20
b.	INSPECTION CHAMBER	NO.	25.30	10	0.25	5.27
5.	SEPTIC TANK		L.S.			62.08
6	EFFLUENT TREATMENT PLANT		L.S.			8000.00
	TOTAL COST					10016.93
	GRAND TOTAL (IN Rs.LAKHS.)					**100.17**

EPR FOR KDH OCP (4.50 MTY)

Appendix A.9

Statement Showing Estimated Revenue Expenses Capitalised

BOTH DEPARTMENTAL (Fig in Rs Lakhs)

S. No.	Particulars	Phasing					Total
		Y1	Y2	Y3	Y4	Y5	
1	Salaries & wages	4046.96	4046.96	4047.67	4181.48	4183.15	
2	Stores	5375.18	5509.48	5599.67	5654.63	5654.63	5654.63
3	Power	920.17	920.17	920.17	920.17	920.17	920.17
4	Misc.Expenses	882.31	948.79	993.57	998.21	998.25	998.25
5	Cost of incident corpus	309.79	309.79	309.79	309.79	309.79	45.00
6	Admn. Expences	3375.00	3375.00	3375.00	3375.00	3375.00	3375.00
7	Interest in working capital	720.62	730.33	736.88	746.23	746.31	531.33
	Revenue Expenditure in cash (a)	15630.02	15840.51	15982.76	16185.50	16187.30	11524.38
8	Depreciation	3797.68	4059.91	4277.03	4306.54	4307.54	4308.54
9	Interest on Loan capital						
10	Total Revenue Expenditure (b)	19427.71	19900.42	20259.78	20492.04	20494.84	15832.92
11	Less sales Realisation	34785.00	34785.00	34785.00	34785.00	34785.00	34785.00
12	TOTAL REVENUE EXPENDITURE Capitalised net sales						
13	Less depreciation						
14	Net Revenue expenditure Capitalised						

EPR FOR KDH OCP (4.5 MTY)

MANPOWER

APPENDIX-B

COAL AND OB BOTH DEPARTMENTAL

Particulars	Category	Total (Max)	YEAR WISE PHASING OF MANPOWER																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OB																											
OB Direct Manpower																											
Shovel Operator	A	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Shovel Operator	B	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	6	6
Dumper Operator	A	15	15	15	15	15	20	20	20	20	20	20	20	20	20	20	20	20	20	20	21	22	23	24	25	26	27
Dumper Operator	B	59	59	59	59	59	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	53	52	51	47	44	27	1
Drill Operator	A	5	3	3	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Drill Operator	B	7	9	9	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	3	3
Drill Helper	III	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	9	9
Dozer Operator	A	3	2	2	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Dozer Operator	B	19	20	20	19	19	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	15	15
Pitman/Dumpman/Topman	5662-8644	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Mining Sardar	6724-10360	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Mazdoor (Including Blasting)	I	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Mazdoor (Including Blasting)	II	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Total for OB		168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	165	163	134	109	
COAL																											
Coal Direct																											
Shovel Operator	B	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6	6
Dumper Operator	B	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	33	16	
Drill Operator	B	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	9	9	
Drill Helper	III	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	9	9	
Dozer Operator	B	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	8	8	
Pitman/Dumpman/Topman	5662-8644	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Mining Sardar	6724-10360	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Sub Total of Coal Direct		103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103	98	75	58		
COAL HANDLING PLANT																											
S.E.(E&M)	17500-22300	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
EE(E&M)	13750-18700	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
Engr.(E&M)	10750-16750	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Forman Incharge (E&M)	7824-12054	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Foreman (E&M)	7260-11184	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Sr.PA	7824-12054	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
S.K.	7260-11184	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
CONTROL ROOM ATTENDENT	V	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
SUB-STATION ATTENDENT	IV	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
FITTER [ELECT.]	V	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
FITTER [ELECT.]	VI	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
FITTER [MECH.]	V	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
FITTER [MECH]	VI	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
FITTER [HELPER]	II	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	
CRUSHER / APRON / PLOUGH FEEDER ATTENDANT	IV	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	
RAPID LOADING OPERATOR	V	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
PLANT ATTENDENT	III	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	
WELDER / GAS CUTTER	V	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
GENERAL MAZDOOR	I	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
GENERAL MAZDOOR	II	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
PEON	5691-8247	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Sub-Total of CHP		110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	
Total for Coal		213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	208	185	168		
COMMON																											
EXCAVATION SUPERVISION																											
SE (EXCV)	17500-22300	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
EE (EXCV)	13750-18700	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
ENGR (EXCV)	10750-16750	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
FOREMAN INCHARGE	7824-12054	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
FOREMAN	7260-11184	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
PA	7260-11184	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
UDC	6724-10360	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
ESTIMATING / PROGRESS ASSTT.	7260-11184	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
ASST SK	6219-9009	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
MTK	6219-9009	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
PEON	5691-8247	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Sub-Total of EXCAVATION SUPERVISION		27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	

EPR FOR KDH OCP (4.5 MTY)

MANPOWER

APPENDIX-8

COAL AND OB BOTH DEPARTMENTAL

Particulars	Category	Total (Max)	YEAR WISE PHASING OF MANPOWER																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
EXCAVATION MAINTENANCE																											
EXCAVATION P&M MAINTENANCE																											
Mechanic	B	16	14	14	14	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	14	14
Fitter	B	6	4	4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Fitter	C	20	16	16	16	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Fitter	D	15	12	12	12	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Electrician	B	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Electrician	C	8	6	6	6	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7
Electrician	D	6	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5
Welder	C	5	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4
Welder	D	5	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4
Turner	C	5	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	3
Turner	D	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Machinist	C	5	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	3
Machinist	D	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Blacksmith	V	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Hammerman	IV	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Carpenter	V	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EOT Crane OP	C	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Washing M/c OP	C	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Helper/Greaser	I	25	20	20	20	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Mazdoor	III	28	22	22	22	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
Sub-Total of EXCN P&M MAINTENANCE		163	134	134	134	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	150	150
E&M SUPERVISION																											
S.E. (E&M)	17500-22300	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Engr. (E&M)	10750-16750	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Foreman Incharge (Elect.)	7824-12054	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Foreman (Elect.)	7260-11184	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Foreman (Mech.)	7260-11184	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
PA	7260-11184	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
LDC/Typist	6219-9009	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Peon	5691-8247	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sub-Total of E&M Supervision		13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
E&M MAINTENANCE																											
Fitter (Mech.)	V	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Fitter (Mech.)	VI	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Fitter (Elect.)	V	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Fitter (Elect.)	VI	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Helper (E&M)	III	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Electrician	V	3	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Electrician	VI	3	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Welder/Gas Cutter	V	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Blacksmith	V	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Hammerman	III	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Auto Electrician	III	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Tyndal/Jamadar	V	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Tyndal	III	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Tyndal	IV	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mazdoor	I	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Sub-Total of E&M Maintenance		39	37	37	37	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39
OTHER OPERATIONS																											
Crane Operator	B	7	5	5	5	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	5
Shovel Operator	B	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Drill Operator	B	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
FE Loader operator	B	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Water Sprinkler Operator	B	12	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	9
Grader Operator	C	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Wheel Dozer Operator	B	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Tyre Handler Operator	C	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Fire Fighting Van Driver	6219-9009	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Fire Fighting Van Mazdoor	III	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Truck Driver	B	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Vibratory Compactor Operator	C	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Cable Handler Operator	C	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Pump Khalasi	III	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
S/S Attendant	III	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Mazdoor	II	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Sub-Total of Other Operations		96	91	91	91	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	91

EPR FOR KDH OCP (4.5 MTY)

MANPOWER

APPENDIX-B

COAL AND OB BOTH DEPARTMENTAL

Particulars	Category	Total (Max)	YEAR WISE PHASING OF MANPOWER																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
PROJECT OFFICE																											
DY. CME	18500-23800	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Dy CE(Ex)	18500-23801	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Dy CE(E&M)	18500-23802	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DY. PM	16300-20820	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
FM	16000-20800	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Colliery Manager/ Sales Manager	16000-20800	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
REVENUE OFFICER	10750-16750	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
O S	7824-12054	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
SR. CLERK	7260-11184	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
UDC	6724-10360	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
LDC	6219-9009	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
SR. CASHIER	7260-11184	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
PEON	5691-8247	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
PAY CLERK	6724-10360	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Sub-Total of Project Office		21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
TRAINING CENTRE																											
Traing Officer/C.M.	16000-20800	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Instructor/OVERMAN	7260-11184	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
LDC/Typist	6219-9009	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Peon	5691-8247	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sub-Total of Training Centre		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
SAFETY, PRODUCTION & QUALITY CONTROL																											
Supdt. Of Mines	17500-22300	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Colliery Manager/Safety Officer	16000-20800	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Asst Colliery Manager	13750-18700	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Under Manager	10750-16750	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Sr. Overman	7824-12054	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Overman	7260-11184	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Fire fighting Supervisor	7260-11184	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Blasting Overman	7260-11184	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
O S	7824-12054	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
P A	7260-11184	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
LDC/Typist	6219-9009	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mining Sirdar	6724-10360	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Peon	5691-8247	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fire fighting Mazdoor	II	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Sub-Total of Safety Deptt. & Quality Contro		41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
COMMUNICATIONS																											
EE (Communication)	13750-18700	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Foreman (Communication)	7260-11184	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Exchange Operator	V	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Lineman	V	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Lineman Helper	II	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3
Sub-Total of Communications		9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
ACCOUNTS																											
Finance Manager	17500-22300	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sr Finance Officer	13750-18700	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Accountant	7824-12054	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Accounts Clerk	6724-10360	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
LDC/Typist	6219-9009	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sr. Cashier	7260-11184	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Sub-Total of Accounts		9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
PERSONNEL/WELFARE																											
Sr Personnel Officer	13750-18700	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
LDC/Typist	6219-9009	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Recreation Club Attendant	II	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pit Head Bath Attendant	I	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Sub-Total of Personnel/Welfare		7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
STORES																											
Material Manager	17500-22300	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sr. Store Keeper	7824-12054	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Asstt. S.K.'S.K	6219-9009	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
LDC/Typist	6219-9009	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Magazine Clerk	6219-9009	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Tyndal	IV	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Store Mazdoor	I	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Sub-Total of Stores		20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20

EPR FOR KDH OCP (4.5 MTY)

MANPOWER

APPENDIX-B

COAL AND OB BOTH DEPARTMENTAL

Particulars	Category	Total (Max)	YEAR WISE PHASING OF MANPOWER																							
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
CIVIL & WATER SUPPLY																											
S.E. (Civil)	17500-22300	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
E.E. (Civil)	13750-16700	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Overseer (Civil)	6219-9009	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Estimator	7260-11164	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
D/Man	6724-10300	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
UDC/Typist	6219-9009	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Carpenter	V	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Plumber	V	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mason	V	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mason Mazdoor	II	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Pump Operator	III	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Pumper Helper	II	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Filter Plant Attendant	IV	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Valve Man	II	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Sub-Total of Civil & Water Supply		40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
MEDICAL & SANITATION																											
Sr. Medical Officer	13750-16700	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
M.O (Male)	10750-16749	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
M.O (Lady)	10750-16750	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Compounder	6219-9009	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Dresser	5962-8644	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Nurse	6219-9009	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Ayahward boy	5691-8247	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Ayahward attendant (Female)	5691-8248	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Store Keeper (Medical)	6724-10360	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Peon	5691-8247	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sweeper	I	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	20
Sub-Total of Medical & Sanitation		39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	19	39
SURVEY																											
Dy.Chief Survey Officer	16000-20800	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sr. Survey Officer	13750-16701	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Head Surveyor	7824-12054	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Surveyor (Incl Revenue)	6724-10360	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
D-Man	6724-10360	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Ferro Printer / Xerox Operator	5890-8542	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Chainman	5890-8542	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Mazdoor	I	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Sub-Total of Survey		23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
TRANSPORT																											
Foreman-Incharge (Automobile)	7824-12054	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-
H.V. Driver	6219-9009	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
L.V. Driver	5962-8644	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Auto Electrician	V	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Auto Mechanic	V	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Fitter (Mech.)	V	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Cleaner/Greaser	II	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Sub-Total of Transport		45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
WATCH & WARD																											
Security Officer	10750-16750	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Watch & Watch Inspector	5896-8542	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Armed Guard	5896-8542	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Security Guard	5811-8424	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Sub-Total of Watch & Ward		18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
TOTAL FOR COMMON		615	579	579	579	615	615	615	615	615	615	615	615	615	615	615	615	615	615	615	615	615	615	615	602	597	
RECLAMATION & ENVIRONMENT																											
Environment & Reclamation Officer	16000-20800	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Water Sprinkler Operator	B	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Dozer Operator	B	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Dumper Operator	B	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
F.E. Loader Operator	B	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Reclamation Mazdoor	I	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Sub-Total of Reclamation & Environment		27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
TOTAL FOR RECLAMATION & ENVIRONMENT		27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
GRAND TOTAL		1023	987	987	987	1023	1023	1023	1023	1023	1023	1023	1023	1023	1023	1023	1023	1023	1023	1023	1023	1023	1023	1020	1013	948	901

EXPANSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

STATEMENT SHOWING YEAR-WISE MANPOWER AND SALARY & WAGES

| Sl.No | Category | Unit wage | YEARWISE PHASING OF MANPOWER | | |

S.No.	EQUIPMENTS	QTY.	UNIT COST	TOTAL COST	PHASING		
					1	2	
1	Twin Shaft Sizer, Nominal capacity 1200 tph, Product size 200mm	2	60000	120000		60000	
2	Apron Feeder, Capacity 1200 TPH attached with Sizers	2	21000	42000		21000	
3	Rough Feeder (3600 tph)	4	22500	90000		22500	
4	Rapid Loadout System with Preweigh Hopper & auto sampler	1	65000	65000		0	
5	Mobile Rock Breaker	1	9500	9500		0	
6	Belt Weighing Scale	1	390	390		0	
7	Magnetic separator (1400 mm belt)	1	2050	2050		0	
8	Metal Dectector (1400 mm belt)	1	390	390		0	
9	Dust Extraction	LS		2500			
10	Dust Suppresion	LS		3500			
11	Plant Safety and Fire Fighting System	LS		2500			
12	Wear Resistant Liners	LS		3500			
13	EOT Crane, 30 te	1	3050	3050		3050	
14	Motorised Hoist, 5 / 10 Te	2	760	1520		1520	
15	Misc. tools & tackles	LS		10380	1040	4970	
	TOTAL			356280	1040	112740	2

Job No 340911 22X

परियोजना अधिकारी
के०डी०एच० परियोजना

EXTENSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

Appendix C

COAL AND OB BOTH DEPARTMENTAL

ESTIMATED COST OF PRODUCTION AT 100% CAPACITY UTILISATION

(Amount in Rs lakh)

Year	Salaries & Wages	Stores cost	Power cost	Misc. cost	Final Mine Closure Cost	Administrative Expenses	Interest on working capital	Total Cash cost	Depreciation	Total Cost (in lakh Rs.)	Production (in lakh te)	Cost per tonne (In Rs.)	Selling Price (In Rs.)	Profit/Loss Per Tonne (In Rs.)
1	4046.96	5378.54	920.17	936.08	47.03	5400.00	808.56	17537.44	3808.25	21345.68	45.00	474.35	849.00	374.65
2	4046.96	5523.95	920.17	1008.31	51.85	5400.00	819.31	17770.54	4098.74	21869.28	45.00	485.98	849.00	363.02
3	4047.67	5636.45	920.17	1060.20	54.44	5400.00	827.42	17940.35	4366.70	22313.05	45.00	495.85	849.00	353.15
4	4181.48	5691.41	920.17	1064.84	57.17	5400.00	836.89	18151.95	4396.21	22548.16	45.00	501.07	849.00	347.93
5	4183.15	5691.41	920.17	1064.88	60.02	5400.00	837.12	18156.74	4397.21	22553.95	45.00	501.20	849.00	347.80
6	4183.15	5691.41	920.17	1064.88	63.03	5400.00	837.26	18159.88	4398.21	22558.10	45.00	501.29	849.00	347.71
7	4183.15	5691.41	920.17	1064.88	66.18	5400.00	837.41	18163.19	4399.21	22562.40	45.00	501.39	849.00	347.61
8	4183.15	5691.41	920.17	1064.88	69.49	5400.00	837.57	18166.66	4400.21	22566.87	45.00	501.49	849.00	347.51
9	4183.15	5683.31	920.17	1064.88	72.96	5400.00	837.35	18161.81	4401.21	22563.02	45.00	501.40	849.00	347.60
10	4183.15	5683.95	906.00	1065.04	76.61	5400.00	836.88	18151.62	4403.50	22555.12	45.00	501.22	849.00	347.78
11	4183.15	5684.49	906.00	1065.17	80.44	5400.00	837.10	18156.35	4405.58	22561.92	45.00	501.38	849.00	347.62
12	4183.15	5684.49	906.00	1065.17	84.46	5400.00	837.29	18160.56	4406.58	22567.14	45.00	501.49	849.00	347.51
13	4183.15	5684.49	906.00	1065.17	88.68	5400.00	837.50	18164.99	4407.58	22572.56	45.00	501.61	849.00	347.39
14	4183.15	5684.49	906.00	1065.17	93.12	5400.00	837.71	18169.64	4408.58	22578.21	45.00	501.74	849.00	347.26
15	4183.15	5684.49	906.00	1065.17	97.77	5400.00	837.93	18174.52	4409.58	22584.09	45.00	501.87	849.00	347.13
16	4183.15	5684.49	906.00	1065.17	102.66	5400.00	838.17	18179.64	4410.58	22590.22	45.00	502.00	849.00	347.00
17	4183.15	5684.49	906.00	1065.17	107.79	5400.00	838.42	18185.02	4411.58	22596.60	45.00	502.15	849.00	346.85
18	4183.15	5684.49	906.00	1065.17	113.18	5400.00	838.68	18190.67	4412.58	22603.25	45.00	502.29	849.00	346.71
19	4183.39	5684.49	906.00	1065.18	118.84	5400.00	838.97	18196.86	4413.58	22610.44	45.00	502.45	849.00	346.55
20	4183.63	5684.49	906.00	1065.19	124.79	5400.00	839.26	18203.35	4414.58	22617.93	45.00	502.62	849.00	346.38
21	4183.87	5681.79	901.26	1065.19	131.02	5400.00	839.22	18202.37	4415.58	22617.94	45.00	502.62	849.00	346.38
22	4171.80	5656.45	882.40	1064.89	137.58	5400.00	835.80	18149.91	4380.24	22530.15	45.00	500.67	849.00	348.33
23	4143.31	5447.45	842.27	996.75	144.45	4800.00	791.42	17165.66	4284.80	21450.47	40.00	536.26	849.00	312.74
24	3885.17	4717.94	632.65	855.45	151.68	3600.00	669.07	14511.96	3585.52	18097.48	30.00	603.25	849.00	245.75
25	3692.56	3609.21	244.70	601.16	159.26	1380.00	468.20	10155.09	3025.39	13180.47	11.50	1146.13	849.00	-297.13
Total	103330.87	138321.02	21750.83	25694.06	2354.50	128580.00	20301.51	440332.80	106861.74	547194.54	1071.50	510.57	849.00	338.43
AVR. COST Rs./TONNE	96.44	129.09	20.30	23.98	2.20	120.00	18.84	410.84	99.73	510.57			849.00	338.43

EXTENSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

Appendix C.1

COAL AND OB BOTH DEPARTMENTAL

ESTIMATED COST OF PRODUCTION AT 85% CAPACITY UTILISATION

(Amount in Rs lakh)

Year	Salaries & Wages	Stores cost	Power cost	Misc. cost	Final Mine Closure Cost	Adminstrative Expenses	Interest on working capital	Total Cash cost	Depreciation	Total Cost (in lakh Rs.)	Production (in lakh te)	Cost per tonne (In Rs.)	Selling Price (In Rs.)	Profit/Loss Per Tonne (In Rs.)
1	4046.96	5055.92	885.66	851.83	47.03	5400.00	787.22	17074.63	3808.25	20982.87	38.25	545.96	849.00	303.04
2	4046.96	5192.51	885.66	917.56	51.85	5400.00	797.24	17291.78	4098.74	21390.52	38.25	559.23	849.00	289.77
3	4047.67	5298.26	885.66	964.78	54.44	5400.00	804.79	17455.62	4366.70	21822.32	38.25	570.52	849.00	278.48
4	4181.48	5349.92	885.66	969.00	57.17	5400.00	814.09	17657.32	4396.21	22053.53	38.25	576.56	849.00	272.44
5	4183.15	5349.92	885.66	969.04	60.02	5400.00	814.31	17662.11	4397.21	22059.32	38.25	576.71	849.00	272.29
6	4183.15	5349.92	885.66	969.04	63.03	5400.00	814.46	17665.25	4398.21	22063.47	38.25	576.82	849.00	272.18
7	4183.15	5349.92	885.66	969.04	66.18	5400.00	814.61	17668.56	4399.21	22067.77	38.25	576.94	849.00	272.06
8	4183.15	5349.92	885.66	969.04	69.49	5400.00	814.77	17672.03	4400.21	22072.24	38.25	577.05	849.00	271.95
9	4183.15	5342.31	885.66	969.04	72.96	5400.00	814.57	17667.69	4401.21	22068.90	38.25	576.96	849.00	272.04
10	4183.15	5342.91	872.03	969.19	76.61	5400.00	814.12	17658.00	4403.50	22061.49	38.25	576.77	849.00	272.23
11	4183.15	5343.42	872.03	969.31	80.44	5400.00	814.34	17662.67	4405.58	22068.25	38.25	576.95	849.00	272.05
12	4183.15	5343.42	872.03	969.31	84.46	5400.00	814.53	17666.89	4406.58	22073.47	38.25	577.08	849.00	271.92
13	4183.15	5343.42	872.03	969.31	88.68	5400.00	814.73	17671.32	4407.58	22078.89	38.25	577.23	849.00	271.77
14	4183.15	5343.42	872.03	969.31	93.12	5400.00	814.95	17675.97	4408.58	22084.54	38.25	577.37	849.00	271.63
15	4183.15	5343.42	872.03	969.31	97.77	5400.00	815.17	17680.85	4409.58	22090.42	38.25	577.53	849.00	271.47
16	4183.15	5343.42	872.03	969.31	102.66	5400.00	815.41	17685.97	4410.58	22096.55	38.25	577.69	849.00	271.31
17	4183.15	5343.42	872.03	969.31	107.79	5400.00	815.66	17691.35	4411.58	22102.93	38.25	577.85	849.00	271.15
18	4183.15	5343.42	872.03	969.31	113.18	5400.00	815.92	17697.00	4412.58	22109.58	38.25	578.03	849.00	270.97
19	4183.39	5343.42	872.03	969.31	118.84	5400.00	816.20	17703.19	4413.58	22116.77	38.25	578.22	849.00	270.78
20	4183.63	5343.42	872.03	969.32	124.79	5400.00	816.50	17709.68	4414.58	22124.25	38.25	578.41	849.00	270.59
21	4183.87	5340.88	867.48	969.32	131.02	5400.00	816.47	17709.05	4415.58	22124.63	38.25	578.42	849.00	270.58
22	4171.80	5317.07	849.31	969.05	137.58	5400.00	814.17	17658.96	4380.24	22039.20	38.25	576.19	849.00	272.81
23	4143.31	5120.61	810.68	907.05	144.45	4800.00	769.76	16695.86	4284.80	20980.67	34.00	617.08	849.00	231.92
24	3885.17	4434.86	608.93	778.46	151.68	3600.00	650.52	14109.62	3585.52	17695.14	25.50	693.93	849.00	155.07
25	3692.56	3392.65	235.52	547.06	159.26	1380.00	454.67	9861.73	3025.39	12887.11	9.78	1318.37	849.00	-469.37
Total	103330.87	130021.76	20935.17	23381.60	2354.50	128580.00	19749.19	428353.09	106861.74	535214.84	910.78	587.52	849.00	261.48
AVR. COST Rs./TONNE	113.45	142.76	22.99	25.67	2.59	141.18	21.56	470.19	117.33	587.52			849.00	261.48

EXTENSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

Appendix D

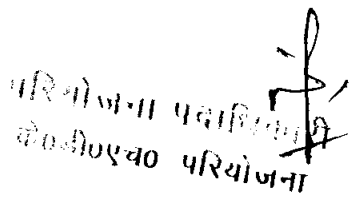
STATEMENT SHOWING CASHFLOWS FOR FINANCIAL ANALYSIS AT 100 % CAPACITY UTILISATION.

BOTH DEPARTMENTAL

(fig. In Rs. Lakhs)

Year	CAPITAL OUTFLOW		OPERATING COST	INT. ON WORKING CAPITAL	TOTAL CASH OUTFLOW	Total Production (In lakh tonne)	ANNUAL SALES	NET CASHFLOWS
	ORIGINAL	REPLACEMENT						
Existing	26803.10				26803.10			-26803.10
1	7142.86	15747.62	16728.87	808.56	40427.92	45.00	38205.00	-2222.92
2	7380.40	2305.51	16951.23	819.31	27456.45	45.00	38205.00	10748.55
3	7170.58	2064.53	17118.94	827.42	27181.46	45.00	38205.00	11023.54
4	297.05	284.39	17315.05	836.89	18733.40	45.00	38205.00	19471.60
5	1484.29	593.32	17319.63	837.12	20234.35	45.00	38205.00	17970.65
6		1026.76	17322.63	837.26	19186.65	45.00	38205.00	19018.35
7		1249.35	17325.78	837.41	19412.54	45.00	38205.00	18792.46
8		5824.79	17329.09	837.57	23991.46	45.00	38205.00	14213.54
9		4601.99	17324.46	837.35	22763.80	45.00	38205.00	15441.20
10	32.08	17919.31	17314.74	836.88	36103.01	45.00	38205.00	2101.99
11	27.01	2870.19	17319.25	837.10	21053.54	45.00	38205.00	17151.46
12		851.57	17323.27	837.29	19012.14	45.00	38205.00	19192.86
13		2556.56	17327.49	837.50	20721.55	45.00	38205.00	17483.45
14		527.54	17331.93	837.71	18697.18	45.00	38205.00	19507.82
15		8272.34	17336.58	837.93	26446.85	45.00	38205.00	11758.15
16		793.09	17341.47	838.17	18972.73	45.00	38205.00	19232.27
17		484.49	17346.60	838.42	18669.52	45.00	38205.00	19535.48
18		1455.71	17351.99	838.68	19646.38	45.00	38205.00	18558.62
19		11023.15	17357.90	838.97	29220.01	45.00	38205.00	8984.99
20		2061.11	17364.09	839.26	20264.46	45.00	38205.00	17940.54
21		1399.07	17363.15	839.22	19601.44	45.00	38205.00	18603.56
22		4861.53	17313.11	836.80	23011.45	45.00	38205.00	15193.55
23			16374.24	791.42	17165.66	40.00	33960.00	16794.34
24			13842.89	669.07	14511.96	30.00	25470.00	10958.04
25		-45501.23	9686.89	468.20	-35346.15	11.50	9763.50	45109.65
Total	50337.37	43272.69	420031.28	20301.51	533942.85	1071.50	909703.50	375760.65

Internal Rate of Return 36.96%



EXTENSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

Appendix D.1

STATEMENT SHOWING CASHFLOWS FOR FINANCIAL ANALYSIS AT 85 % CAPACITY UTILISATION.

BOTH DEPARTMENTAL

(Fig. In Rs. Lakhs)

Year	CAPITAL OUTFLOW		OPERATING COST	INT. ON WORKING CAPITAL	TOTAL CASH OUTFLOW	Total Production MTY	ANNUAL SALES	NET CASHFLOWS
	ORIGINAL	REPLACEMENT						
Existing	26803.10				26803.10			-26803.10
1	7142.86	15747.62	16287.40	787.22	39965.11	38.25	32474.25	-7490.86
2	7380.40	2305.51	16494.54	797.24	26977.69	38.25	32474.25	5496.56
3	7170.58	2064.53	16650.83	804.79	26690.72	38.25	32474.25	5783.53
4	297.05	284.39	16843.23	814.09	18238.77	38.25	32474.25	14235.48
5	1484.29	593.32	16847.80	814.31	19739.72	38.25	32474.25	12734.53
6		1026.76	16850.80	814.46	18692.01	38.25	32474.25	13782.24
7		1249.35	16853.95	814.61	18917.90	38.25	32474.25	13556.35
8		5824.79	16857.26	814.77	23496.82	38.25	32474.25	8977.43
9		4601.99	16853.12	814.57	22269.67	38.25	32474.25	10204.58
10	32.08	17919.31	16843.88	814.12	35609.38	38.25	32474.25	-3135.13
11	27.01	2870.19	16848.34	814.34	20559.87	38.25	32474.25	11914.38
12		851.57	16852.36	814.53	18518.47	38.25	32474.25	13955.78
13		2556.56	16856.58	814.73	20227.88	38.25	32474.25	12246.37
14		527.54	16861.02	814.95	18203.51	38.25	32474.25	14270.74
15		8272.34	16865.67	815.17	25953.18	38.25	32474.25	6521.07
16		793.09	16870.56	815.41	18479.06	38.25	32474.25	13995.19
17		484.49	16875.69	815.66	18175.85	38.25	32474.25	14298.40
18		1455.71	16881.08	815.92	19152.71	38.25	32474.25	13321.54
19		11023.15	16886.99	816.20	28726.34	38.25	32474.25	3747.91
20		2061.11	16893.17	816.50	19770.79	38.25	32474.25	12703.46
21		1399.07	16892.58	816.47	19108.12	38.25	32474.25	13366.13
22		4861.53	16844.80	814.17	22520.49	38.25	32474.25	9953.76
23			15926.10	769.76	16695.86	34.00	28866.00	12170.14
24			13459.10	650.52	14109.62	25.50	21649.50	7539.88
25		-45501.23	9407.05	454.67	-35639.50	9.78	8298.98	43938.48
Total	50337.37	43272.69	408603.90	19749.19	521963.14	910.78	773247.98	251284.83

Internal Rate of Return **23.66%**

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EXTENSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

Appendix D.2

STATEMENT SHOWING CASHFLOWS FOR ECONOMIC ANALYSIS AT 100 % CAPACITY UTILISATION.

BOTH DEPARTMENTAL

(fig. In Rs. Lakhs)

Year	CAPITAL OUTFLOW		OPERATING COST	INT. ON WORKING CAPITAL	TOTAL OUTFLOW	Total Production MTY	ANNUAL SALES	NET CASHFLOWS
	ORIGINAL	REPLACEMENT						
Existing	26803.10				26803.10			-26803.10
1	5857.15	12913.05	15223.28	735.79	34729.26	45.00	38205.00	3475.74
2	6051.92	1890.52	15425.62	745.57	24113.64	45.00	38205.00	14091.36
3	5879.87	1692.92	15578.23	752.95	23903.97	45.00	38205.00	14301.03
4	243.58	233.20	15756.70	761.57	16995.06	45.00	38205.00	21209.94
5	1217.12	486.52	15760.86	761.77	18226.28	45.00	38205.00	19978.72
6		841.94	15763.59	761.91	17367.44	45.00	38205.00	20837.56
7		1024.46	15766.46	762.05	17552.97	45.00	38205.00	20652.03
8		4776.33	15769.47	762.19	21307.99	45.00	38205.00	16897.01
9		3773.63	15765.26	761.99	20300.88	45.00	38205.00	17904.12
10	26.30	14693.83	15756.42	761.56	31238.11	45.00	38205.00	6966.89
11	22.15	2353.55	15760.52	761.76	18897.96	45.00	38205.00	19307.02
12		698.29	15764.18	761.94	17224.40	45.00	38205.00	20980.60
13		2096.38	15768.02	762.12	18626.52	45.00	38205.00	19578.48
14		432.59	15772.05	762.32	16966.96	45.00	38205.00	21238.04
15		6783.32	15776.29	762.52	23322.13	45.00	38205.00	14882.87
16		650.33	15780.74	762.74	17193.80	45.00	38205.00	21011.20
17		397.28	15785.41	762.96	16945.66	45.00	38205.00	21259.34
18		1193.68	15790.31	763.20	17747.19	45.00	38205.00	20457.81
19		9038.98	15795.69	763.46	25598.13	45.00	38205.00	12606.87
20		1690.11	15801.32	763.73	18255.16	45.00	38205.00	19949.84
21		1147.24	15800.47	763.69	17711.40	45.00	38205.00	20493.60
22		3986.46	15754.93	761.49	20502.88	45.00	38205.00	17702.12
23			14900.56	720.19	15620.75	40.00	33960.00	18339.25
24			12597.03	608.86	13205.88	30.00	25470.00	12264.12
25		-37311.01	8815.07	426.06	-28069.88	11.50	9763.50	37833.38
Total	46101.20	35483.60	382228.47	18474.38	482287.65	1071.50	909703.50	427415.85

Internal Rate of Return	46.81%

Note :- Existing assets value has been taken as book value since HEMM wise break-up value is not available

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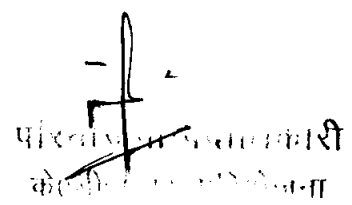
STATEMENT SHOWING CASHFLOWS FOR ECONOMIC ANALYSIS AT 85 % CAPACITY UTILISATION.

BOTH DEPARTMENTAL (fig. In Rs. Lakhs)

Year	CAPITAL OUTFLOW		OPERATING COST	INT. ON WORKING	TOTAL OUTFLOW	Total Production	ANNUAL SALES	NET CASHFLOWS
	ORIGINAL	REPLACEMENT						
Existing	26803.10				26803.10			-26803.10
1	5857.15	12913.05	14821.54	716.37	34308.11	38.25	32474.25	-1833.86
2	6051.92	1890.52	15010.03	725.49	23677.96	38.25	32474.25	8796.29
3	5879.87	1692.92	15152.25	732.36	23457.40	38.25	32474.25	9016.85
4	243.58	233.20	15327.34	740.82	16544.95	38.25	32474.25	15929.30
5	1217.12	486.52	15331.50	741.02	17776.16	38.25	32474.25	14698.09
6		841.94	15334.23	741.15	16917.32	38.25	32474.25	15556.93
7		1024.46	15337.09	741.29	17102.85	38.25	32474.25	15371.40
8		4776.33	15340.11	741.44	20857.87	38.25	32474.25	11616.38
9		3773.63	15336.34	741.26	19851.23	38.25	32474.25	12623.02
10	26.30	14693.63	15327.93	740.85	30788.91	38.25	32474.25	1685.34
11	22.15	2353.55	15331.99	741.05	18448.74	38.25	32474.25	14025.51
12		698.29	15335.65	741.22	16775.16	38.25	32474.25	15699.09
13		2096.38	15339.49	741.41	18177.28	38.25	32474.25	14296.97
14		432.59	15343.53	741.60	16517.71	38.25	32474.25	15956.54
15		6783.32	15347.76	741.81	22872.89	38.25	32474.25	9601.36
16		650.33	15352.21	742.02	16744.56	38.25	32474.25	15729.69
17		397.28	15356.88	742.25	16496.42	38.25	32474.25	15977.83
18		1193.68	15361.79	742.49	17297.95	38.25	32474.25	15176.30
19		9038.98	15367.16	742.75	25148.89	38.25	32474.25	7325.36
20		1690.11	15372.79	743.02	17805.92	38.25	32474.25	14668.33
21		1147.24	15372.25	742.99	17262.48	38.25	32474.25	15211.77
22		3986.46	15328.77	740.89	20056.11	38.25	32474.25	12418.14
23			14492.75	700.48	15193.24	34.00	28866.00	13672.76
24			12247.78	591.98	12839.75	25.50	21649.50	8809.75
25		-37311.01	8560.42	413.75	-28336.84	9.78	8298.98	36635.81
Total	46101.20	35483.60	371829.55	17971.76	471386.11	910.78	773247.98	301861.86

Internal Rate of Return	31.99%

Note :- Existing assets value has been taken as book value since HEMM wise break-up value is not available



EXPANSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

Appendix D.4

STATEMENT SHOWING CASHFLOWS FOR FINANCIAL ANALYSIS AT 100 % CAPACITY UTILISATION.

BOTH DEPARTMENTAL

(fig. in Rs. Lakhs)

Year	CAPITAL OUTFLOW		OPERATING COST	INT. ON WORKING CAPITAL	TOTAL CASH OUTFLOW	Total Production MTY	ANNUAL SALES	NET CASHFLOWS
	ORIGINAL	REPLACEMENT						
Existing	26803.10				26803.10			-26803.10
1	7828.19	15747.62	16728.87	808.56	41113.25	45.00	38205.00	-2908.25
2	8799.73	2305.51	16951.23	819.31	28875.79	45.00	38205.00	9329.21
3	9156.09	2064.53	17118.94	827.42	29166.98	45.00	38205.00	9038.02
4	404.03	284.39	17315.05	836.89	18840.38	45.00	38205.00	19364.62
5	1484.29	593.32	17319.63	837.12	20234.35	45.00	38205.00	17970.65
6	0.00	1026.76	17322.63	837.26	19186.65	45.00	38205.00	19018.35
7	0.00	1249.35	17325.78	837.41	19412.54	45.00	38205.00	18792.46
8	0.00	5824.79	17329.09	837.57	23991.46	45.00	38205.00	14213.54
9	0.00	4601.99	17324.46	837.35	22763.80	45.00	38205.00	15441.20
10	32.08	17919.31	17314.74	836.88	36103.01	45.00	38205.00	2101.99
11	27.01	2870.19	17319.25	837.10	21053.54	45.00	38205.00	17151.46
12	0.00	851.57	17323.27	837.29	19012.14	45.00	38205.00	19192.86
13	0.00	2556.56	17327.49	837.50	20721.55	45.00	38205.00	17483.45
14	0.00	527.54	17331.93	837.71	18697.18	45.00	38205.00	19507.82
15	0.00	8272.34	17336.58	837.93	26446.85	45.00	38205.00	11758.15
16	0.00	793.09	17341.47	838.17	18972.73	45.00	38205.00	19232.27
17	0.00	484.49	17346.60	838.42	18669.52	45.00	38205.00	19535.48
18	0.00	1455.71	17351.99	838.68	19646.38	45.00	38205.00	18558.62
19	0.00	11023.15	17357.90	838.97	29220.01	45.00	38205.00	8984.99
20	0.00	2061.11	17364.09	839.26	20264.46	45.00	38205.00	17940.54
21	0.00	1399.07	17363.15	839.22	19601.44	45.00	38205.00	18603.56
22	0.00	4861.53	17313.11	836.80	23011.45	45.00	38205.00	15193.55
23	0.00	0.00	16374.24	791.42	17165.66	40.00	33960.00	16794.34
24	0.00	0.00	13842.89	669.07	14511.96	30.00	25470.00	10958.04
25	0.00	-45501.23	9686.89	468.20	-35346.15	11.50	9763.50	45109.65
Total	54534.53	43272.69	420031.28	20301.51	538140.01	1071.50	909703.50	371563.49

Internal Rate of Return	35.01%

Note :- Existing assets value has been taken as book value since HEMM wise break-up value is not available

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EXPANSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

Appendix D.5

STATEMENT SHOWING CASHFLOWS FOR FINANCIAL ANALYSIS AT 85 % CAPACITY UTILISATION.

BOTH DEPARTMENTAL

(fig. In Rs. Lakhs)

Year	CAPITAL OUTFLOW		OPERATING COST	INT. ON WORKING	TOTAL CASH OUTFLOW	Total Production	ANNUAL SALES	NET CASHFLOWS
	ORIGINAL	REPLACEMENT						
Existing	26803.10	0.00			26803.10			-26803.10
1	7828.19	15747.62	16287.40	787.22	40650.44	38.25	32474.25	-8176.19
2	8799.73	2305.51	16494.54	797.24	28397.02	38.25	32474.25	4077.23
3	9156.09	2064.53	16650.83	804.79	28676.24	38.25	32474.25	3798.01
4	404.03	284.39	16843.23	814.09	18345.75	38.25	32474.25	14128.50
5	1484.29	593.32	16847.80	814.31	19739.72	38.25	32474.25	12734.53
6	0.00	1026.76	16850.80	814.46	18692.01	38.25	32474.25	13782.24
7	0.00	1249.35	16853.95	814.61	18917.90	38.25	32474.25	13556.35
8	0.00	5824.79	16857.26	814.77	23496.82	38.25	32474.25	8977.43
9	0.00	4601.99	16853.12	814.57	22269.67	38.25	32474.25	10204.58
10	32.08	17919.31	16843.88	814.12	35609.38	38.25	32474.25	-3135.13
11	27.01	2870.19	16848.34	814.34	20559.87	38.25	32474.25	11914.38
12	0.00	851.57	16852.36	814.53	18518.47	38.25	32474.25	13955.78
13	0.00	2556.56	16856.58	814.73	20227.88	38.25	32474.25	12246.37
14	0.00	527.54	16861.02	814.95	18203.51	38.25	32474.25	14270.74
15	0.00	8272.34	16865.67	815.17	25953.18	38.25	32474.25	6521.07
16	0.00	793.09	16870.56	815.41	18479.06	38.25	32474.25	13995.19
17	0.00	484.49	16875.69	815.66	18175.85	38.25	32474.25	14298.40
18	0.00	1455.71	16881.08	815.92	19152.71	38.25	32474.25	13321.54
19	0.00	11023.15	16886.99	816.20	28726.34	38.25	32474.25	3747.91
20	0.00	2061.11	16893.17	816.50	19770.79	38.25	32474.25	12703.46
21	0.00	1399.07	16892.58	816.47	19108.12	38.25	32474.25	13366.13
22	0.00	4861.53	16844.80	814.17	22520.49	38.25	32474.25	9953.76
23	0.00	0.00	15926.10	769.76	16695.86	34.00	28866.00	12170.14
24	0.00	0.00	13459.10	650.52	14109.62	25.50	21649.50	7539.88
25	0.00	-45501.23	9407.05	454.67	-35639.50	9.78	8298.98	43938.48
Total	54534.53	43272.69	408603.90	19749.19	526160.31	910.78	773247.98	247087.67

Internal Rate of Return	22.21%

Note :- Existing assets value has been taken as book value since IIEMM wise break-up value is not available

STATEMENT SHOWING CASHFLOWS FOR FINANCIAL ANALYSIS AT 100 % CAPACITY UTILISATION.

BOTH DEPARTMENTAL

(lig. In Rs. Lakhs)

Year	CAPITAL OUTFLOW		OPERATING COST	INT. ON WORKING CAPITAL	TOTAL CASH OUTFLOW	Total Production MTY	ANNUAL SALES	NET CASHFLOWS
	ORIGINAL	REPLACEMENT						
Existing	26803.10				26803.10			-26803.10
1	6419.12	12913.05	15223.28	735.79	35291.24	45.00	38205.00	2913.76
2	7215.78	1890.52	15425.62	745.57	25277.50	45.00	38205.00	12927.50
3	7508.00	1692.92	15578.23	752.95	25532.09	45.00	38205.00	12672.91
4	331.31	233.20	15756.70	761.57	17082.78	45.00	38205.00	21122.22
5	1217.12	486.52	15760.86	761.77	18226.28	45.00	38205.00	19978.72
6	0.00	841.94	15763.59	761.91	17367.44	45.00	38205.00	20837.56
7	0.00	1024.46	15766.46	762.05	17552.97	45.00	38205.00	20652.03
8	0.00	4776.33	15769.47	762.19	21307.99	45.00	38205.00	16897.01
9	0.00	3773.63	15765.26	761.99	20300.88	45.00	38205.00	17904.12
10	26.30	14693.83	15756.42	761.56	31238.11	45.00	38205.00	6966.89
11	22.15	2353.55	15760.52	761.76	18897.98	45.00	38205.00	19307.02
12	0.00	698.29	15764.18	761.94	17224.40	45.00	38205.00	20980.60
13	0.00	2096.38	15768.02	762.12	18626.52	45.00	38205.00	19578.48
14	0.00	432.59	15772.05	762.32	16966.96	45.00	38205.00	21238.04
15	0.00	6783.32	15776.29	762.52	23322.13	45.00	38205.00	14882.87
16	0.00	650.33	15780.74	762.74	17193.80	45.00	38205.00	21011.20
17	0.00	397.28	15785.41	762.96	16945.66	45.00	38205.00	21259.34
18	0.00	1193.68	15790.31	763.20	17747.19	45.00	38205.00	20457.81
19	0.00	9038.98	15795.69	763.46	25598.13	45.00	38205.00	12606.87
20	0.00	1690.11	15801.32	763.73	18255.16	45.00	38205.00	19949.84
21	0.00	1147.24	15800.47	763.69	17711.40	45.00	38205.00	20493.60
22	0.00	3986.46	15754.93	761.49	20502.88	45.00	38205.00	17702.12
23	0.00	0.00	14900.56	720.19	15620.75	40.00	33960.00	18339.25
24	0.00	0.00	12597.03	608.86	13205.88	30.00	25470.00	12264.12
25	0.00	-37311.01	8815.07	426.06	-28069.88	11.50	9763.50	37833.38
Total	49542.87	35483.60	382228.47	18474.38	485729.32	1071.50	909703.50	423974.18

Internal Rate of Return	44.88%

ote :- Existing assets value has been taken as book value since HEMM wise break-up value is not availat

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EXPANSION PROJECT REPORT FOR K D HESALONG OCP [4.50 MTY]

Appendix D.7

STATEMENT SHOWING CASHFLOWS FOR FINANCIAL ANALYSIS AT 85 % CAPACITY UTILISATION.

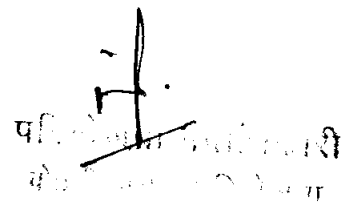
BOTH DEPARTMENTAL

(f.g. In Rs. Lakhs)

Year	CAPITAL OUTFLOW		OPERATING COST	INT. ON WORKING	TOTAL CASH	Total Production	ANNUAL SALES	NET CASHFLOWS
	ORIGINAL	REPLACEMENT						
Existing	26803.10	0.00			26803.10			-26803.10
1	6419.12	12913.05	14821.54	716.37	34870.08	38.25	32474.25	-2395.83
2	7215.78	1890.52	15010.03	725.49	24841.82	38.25	32474.25	7632.43
3	7508.00	1692.92	15152.25	732.36	25085.52	38.25	32474.25	7388.73
4	331.31	233.20	15327.34	740.82	16632.67	38.25	32474.25	15841.58
5	1217.12	486.52	15331.50	741.02	17776.16	38.25	32474.25	14698.09
6	0.00	841.94	15334.23	741.15	16917.32	38.25	32474.25	15556.93
7	0.00	1024.46	15337.09	741.29	17102.85	38.25	32474.25	15371.40
8	0.00	4776.33	15340.11	741.44	20857.87	38.25	32474.25	11616.38
9	0.00	3773.63	15336.34	741.26	19851.23	38.25	32474.25	12623.02
10	26.30	14693.83	15327.93	740.85	30788.91	38.25	32474.25	1685.34
11	22.15	2353.55	15331.99	741.05	18448.74	38.25	32474.25	14025.51
12	0.00	698.29	15335.65	741.22	16775.16	38.25	32474.25	15699.09
13	0.00	2096.38	15339.49	741.41	18177.28	38.25	32474.25	14296.97
14	0.00	432.59	15343.53	741.60	16517.71	38.25	32474.25	15956.54
15	0.00	6783.32	15347.76	741.81	22872.89	38.25	32474.25	9601.36
16	0.00	650.33	15352.21	742.02	16744.56	38.25	32474.25	15729.69
17	0.00	397.28	15356.88	742.25	16496.42	38.25	32474.25	15977.83
18	0.00	1193.68	15361.79	742.49	17297.95	38.25	32474.25	15176.30
19	0.00	9038.98	15367.16	742.75	25148.89	38.25	32474.25	7325.36
20	0.00	1690.11	15372.79	743.02	17805.92	38.25	32474.25	14668.33
21	0.00	1147.24	15372.25	742.99	17262.48	38.25	32474.25	15211.77
22	0.00	3986.46	15328.77	740.89	20056.11	38.25	32474.25	12418.14
23	0.00	0.00	14492.75	700.48	15193.24	34.00	28866.00	13672.76
24	0.00	0.00	12247.78	591.98	12839.75	25.50	21649.50	8809.75
25	0.00	-37311.01	8560.42	413.75	-28336.84	9.78	8298.98	36635.81
Total	49542.87	35483.60	371829.55	17971.76	474827.79	910.78	773247.98	298420.19
	0.00	0.00						

Internal Rate of Return	30.44%

Note : Existing assets value has been taken as book value since HEMM wise break-up value is not available



APPENDIX - E

EPR for KDH OCP (4.50 Mty.)

STATEMENT SHOWING ESTIMATED INVESTMENT ON LAND

S.N.	Particulars	Capacity/ Size	Total Provision for PR 4.50 MTY	
			Nos.	Amount
A	Capital Investment			
1	F E Loader	5-6Cum	1	119.45
2	Water Sprinkler (wide spray system)	28 KL	2	164.60
3	Dozer	410 HP	2	439.58
4	Dumper	35T	2	191.88
5	Float engine			78.93
6	Contingency			49.72
	Total			**1044.16**

Scanned with CamScanner

Particulars	Unit	Amount

				Total

Scanned with CamScanner

REGISTERED OFFICE

Gondwana Place, Kanke Road
Ranchi -834 031
(Jharkhand)

REGIONAL INSTITUTES

क्षेत्रीय संस्थान I
वेस्ट एंड, जी.टी.रोड
आसनसोल 713 301
(पश्चिम बंगाल)

Regional Institute - I
West End, G.T Road
Asansol - 713 301
(West Bengal)

क्षेत्रीय संस्थान-II
कोयला भवन, कोयला नगर
धनबाद 826 005
(झारखंड)

Regional Institute - II
Koyla Bhawan, Koyla Nagar
Dhanbad - 826 005
(Jharkhand)

क्षेत्रीय संस्थान-III
गोंडवाना प्लेस,कांके रोड
रांची - 834 031
(झारखंड)

Regional Institute - III
Gondwana Place, Kanke Road
Ranchi- 834 031
(Jharkhand)

क्षेत्रीय संस्थान-IV
जरीपटका, कस्तूरबा नगर
नागपुर 440 014
(महाराष्ट्र)

Regional Institute - IV
Jaripathka, Kasturba Nagar
Nagpur - 440 014
(Maharashtra)

क्षेत्रीय संस्थान-V
सीपत रोड
बिलासपुर 495 001
(छत्तीसगढ़)

Regional Institute - V
Seepat Road
Bilaspur - 495 001
(Chattisgarh)

क्षेत्रीय संस्थान-VI
पोस्ट :जयंत कलियरी,
जिला : सिंगरौली
पिन नं0 486 890
(मध्य प्रदेश)

Regional Institute - VI
P.O Jayant Colliery
Dist. - Singrauli
PIN - 486 890
Madhya Pradesh

क्षेत्रीय संस्थान-VII
गृह निर्माण भवन
सचिवालय मार्ग
भुवनेश्वर- 751001
(उड़ीसा)

Regional Institute - VII
Grih Nirman Bhawan
Sachivalaya Marg
Bhubneswar - 751 001
(Orissa)

Annexure – III

Pg.No. 1

कार्यालय, प्रधान मुख्य वन संरक्षक–सह–कार्यकारी निदेशक, बंजर भूमि विकास बोर्ड, झारखंड, राँची ।

वन भवन, डोरण्डा, राँची, झारखंड, पिन–834002. Email ID-pccf-ednodal@gov.in

पत्रांक :– 224 राँची, दिनांक :– 09.3.2022

सेवा में,

अपर मुख्य सचिव,
वन, पर्यावरण एवं जलवायु परिवर्तन विभाग,
झारखण्ड सरकार, राँची।

विषय :– **सी0सी0एल0 के नया प्रस्ताव के0डी0एच0 परियोजना हेतु 126.72 हे0 वनभूमि (84.35 हे0 अधिसूचित वनभूमि तथा 42.37 हे0 जंगल–झाड़ वनभूमि) अपयोजन प्रस्ताव के संबंध में।**

प्रसंग:–

1. **भारत सरकार, पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, नई दिल्ली का पत्रांक F.No. 8-62/2018-FC-DFA-I दिनांक 22.08.2019**
2. **भारत सरकार, पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, नई दिल्ली का पत्रांक F.No. 8-62/2018-FC-DFA-II दिनांक 22.08.2019**
3. **क्षेत्रीय मुख्य वन संरक्षक, राँची का पत्रांक 1284 दिनांक 26.07.2021, 1526 दिनांक 24.08.2021 एवं 314 दिनांक 22.02.2022**
4. **इस कार्यालय का पत्रांक 1272 दिनांक 21.10.2021**

महाशय,

उपर्युक्त विषयक संदर्भ में सूचित करना है कि सी0सी0एल0 के नया प्रस्ताव के0डी0एच0 परियोजना हेतु 126.72 हे0 वनभूमि (84.35 हे0 अधिसूचित वनभूमि तथा 42.37 हे0 जंगल–झाड़ वनभूमि) अपयोजन प्रस्ताव पर भारत सरकार के प्रसंगाधीन पत्र– 1 एवं 2 के द्वारा की गयी पृच्छाएँ का निराकरण प्रतिवेदन क्षेत्रीय मुख्य वन संरक्षक, राँची के पत्रांक 1284 दिनांक 26.07.2021 एवं संशोधित प्रतिवेदन पत्रांक 1526 दिनांक 24.08.2021 द्वारा प्राप्त हुई। उक्त अनुपालन में कतिपय त्रुटियाँ रहने के कारण इस कार्यालय के पत्रांक 1272 दिनांक 21.10.2021 (छायाप्रति संलग्न) द्वारा पृच्छा की गयी, जिसका निराकरण प्रतिवेदन क्षेत्रीय मुख्य वन संरक्षक, राँची के पत्रांक 314 दिनांक 22.02.2022 (छायाप्रति संलग्न) द्वारा प्राप्त हुआ है।

प्रतिवेदनानुसार निराकरण निम्नवत् प्रतिवेदित किया जाता है :–

(क) भारत सरकार, पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, नई दिल्ली के पत्रांक F.No. 8-62/2018-FC-DFA-I दिनांक 22.08.2019 द्वारा 8 बिन्दुओं का निराकरण :–

S.No.	GoI Query	Reply
1	State Govt. shall attach necessary certificate that the area is free from encroachment & encumbrance.	इस संबंध में सूचित करना है कि प्रस्तावित वन भूमि (84.35 हे0) free from encroachment & encumbrance है एवं 42.37 हे0 जंगल–झाड़ी के संबंध में अंचल अधिकारी, खेलारी के पत्रांक 48(11) दिनांक 21.01.2022 द्वारा free from encroachment & encumbrance प्राप्त है **(अनु0–1)** पूर्व में प्रस्तावित क्षतिपूरक वनरोपण हेतु चयनित स्थल की विवरणी निम्नवत् था :–

क्र0सं0	ग्राम/मौजा	रकवा
1.	नवाडीह	60 हे0
2.	हेसालोंग	40 हे0
3.	करकट्टा	40 हे0
4.	चेलिया	60 हे0
5.	तरगा	55 हे0

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		जिसे परिवर्तन करते हुए नया स्थल प्रस्तावित किया गया है। संशोधित नया प्रस्तावित क्षतिपूरक वनरोपण की विवरणी निम्नवत् है :– क्र0सं0 / ग्राम/मौजा / रकवा 1. हातमा 70 हे0 2. कोटारी 103.50 हे0 3. मायापुर 80 हे0 कुल:– 253.50 हे0 संशोधित स्थल का क्षतिपूरक वनरोपण हेतु 10 वर्षीय प्राक्कलन (Annex-A3) एवं उपयुक्तता प्रमाण पत्र (Annex-A4) DGPS (Annex-A1) एवं KML (Annex-A2) की प्रति संलग्न है।
II	State Govt. shall submit necessary certificate to confirm whether the site selected for non forest use land also compensatory afforestation is important from Religious/ Archological point of view or not	इस संबंध में प्रयोक्ता अभिकरण से सक्षम पदाधिकारी से निर्गत प्रयोक्ता अभिकरण द्वारा Archological Survey of India की प्रति संलग्न की गई है। **अनुलग्नक–B** प्रयोक्ता अभिकरण द्वारा अंचल अधिकारी, खेलारी ब्लॉक द्वारा निर्गत site selected for non forest use land also compensatory afforestation is important from Religious point of view से संबंधित पत्र संलग्न किया है। **अनुलग्नक–C**
III	Status of safety zone may be clarified by State Govt.	प्रयोक्ता अभिकरण द्वारा अनुपालन किया गया है। **अनुलग्नक–D**
IV	Cost Benefit Ratio shall be calculated as per MoEF&CC guideline dated 01.08.2017.	प्रयोक्ता अभिकारण द्वारा अनुपालन किया गया है। **अनुलग्नक–E**
V	State Govt. shall provide details about the gaps/shortfall observed in the process of reclamation of the mined area by CCL in other mines within the State.	प्रयोक्ता अभिकारण द्वारा अनुपालन किया गया है। **अनुलग्नक–F**
VI	State Govt. shall furnish status of areas for which as reported there are approvals of forest area obtained in 1996 & 2009.	1996 से 2009 तक अपयोजित वनभूमि की विवरणी निम्नवत् है :– 1. के0डी0एच0 101.41 हे0 जिसकी स्वीकृति भारत सरकार के पत्रांक 8–79/90 एफ0सी0 (Vol-i) दिनांक 01.07.1996 द्वारा प्राप्त है। 2. के0डी0एच0 28.95 हे0 जिसकी स्वीकृति भारत सरकार के पत्रांक 8–79/90 एफ0सी0 (Vol-i) दिनांक 26.10.2009 द्वारा प्राप्त है। जो प्रयोक्ता अभिकरण का पत्रांक 199 दिनांक 04.01.2021 के कंडिका संख्या–6 में वर्णित है।
VII	State Govt. may further clarify if \the user agency had paid NPV for entire forest area within the project/lease area as per different guidelines of MoEF&CC or not	प्रयोक्ता अभिकरण द्वारा entire forest area के लिए एन0पी0भी समर्पित किया गया है। प्रयोक्ता अभिकरण द्वारा के0डी0एच0 126.72 हे0 के लिए कुल 79326720.00 रु0 समर्पित किया गया है। जो प्रयोक्ता अभिकरण का पत्रांक 199 दिनांक 04.01.2021 के कंडिका संख्या–7 में वर्णित है।
VIII	State Government shall prepare a comprehensive proposal for diversion of entire forestland under the provisions of FCA 1980 within the project/lease area	Comprehensive proposal for version of entire forest land की प्रति संलग्न की गई है। **अनुलग्नक–H**

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(ख) भारत सरकार, पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, नई दिल्ली के पत्रांक F.No. 8-62/2018-FC-DFA-II दिनांक 22.08.2019 द्वारा की गयी पृच्छा का निराकरण प्रतिवेदन प्राप्त हुआ है, परन्तु वह satisfactory नहीं है। अधोहस्ताक्षरी द्वारा Coal Bearing Areas (Acquisition and Development) Act, 1957, Indian Forest Act, 1927 तथा Forest Conservation Act, 1980 के संबंध में व्याख्या की गयी है, जो कि निम्नवत् है :–

Sl .No	Query	Reply
1	2	3
1	Is there any provision of lease area in CBA 1957?	MMDR Act के तहत् किसी भी खनिज के खनन् पट्टा देने हेतु खान एवं भूतत्व विभाग, झारखण्ड सरकार सक्षम प्राधिकार है। खान एवं भूतत्व विभाग, झारखण्ड सरकार के पत्रांक 2542 दिनांक 24.08.2006 (छायाप्रति संलग्न, अनुलग्नक– क) उप सचिव, वन एवं पर्यावरण विभाग को निम्नवत् प्रतिवेदित किया गया है :– 1. राष्ट्रीयकरण अधिनियम 1972/73 एवं Coal Bearing Areas (Acquisition and Development) Act, 1957 के अन्तर्गत अधिग्रहीत भूमि पर सी0सी0एल0 को खान एवं भूतत्व विभाग, झारखण्ड से खनन पट्टा लेने की आवश्यकता नहीं है, प्रस्तुत उक्त अधिनियमों के अंतर्गत सी0सी0एल0 (Deemed Lessee) है। 2. दि मिनरल कन्सेशन रूल्स 1960 के नियम 24(A)(6) के अनुसार यदि सी0सी0एल0 का नवीकरण आवेदन लम्बित है तो खनन पट्टे की अवधि विस्तारित की गई समझी जायेगी। पुनः खान एवं भूतत्व विभाग झारखण्ड सरकार द्वारा निर्गत पत्रांक खा0नि0 (विविध)–195/2012–2438/एम0 दिनांक 27.11.2012 (छायाप्रति संलग्न, अनुलग्नक– ख) द्वारा निम्नांकित प्रतिवेदित है जो स्वतः स्पष्ट है :– "विभागीय पत्रांक–ख0 नि0 विविध/11/2011–127/एम0, राँची दिनांक 31.01.2011 द्वारा सरकार के उप सचिव, वन एवं पर्यावरण विभाग, झारखण्ड, राँची को सूचित किया गया है कि Coal Bearing Areas (Acquisition and Development) Act, 1957 के तहत् अधिग्रहीत भूमि पर कोयला का खनन पट्टा की स्वीकृति हेतु आवेदन देने की आवश्यकता नहीं है। विभागीय पत्रांक–ख0नि0(विविध) 80/2012–1696/एम0, दिनांक 25.08.2012 द्वारा सदस्य सचिव, झारखण्ड राज्य प्रदूषण नियंत्रण पर्षद, राँची को सूचित किया गया है कि Coal Bearing Areas (Acquisition and Development) Act, 1957 के अन्तर्गत अधिग्रहीत क्षेत्र के लिए अलग से खनन पट्टा स्वीकृत/नवीकृत किये जाने का कोई प्रावधान नहीं है।" खान एवं भूतत्व विभाग को उपरोक्त पत्रों से यह स्पष्ट है कि Coal Bearing Areas (Acquisition and Development) Act, 1957 के तहत् अधिग्रहित भूमि के लिये खनन् पट्टे की आवश्यकता नहीं है।
2	Can project area for which mining plan is approved by competent authority shall be taken as single lease area to analyse the fait accomplii situation as reffered by Hon'ble supreme court in their Lafarge Umiam v/s union of India case in 2011.	Yes, the whole project area for which mining plan is approved by competent authority shall be taken as single lease area to analyse the fait accomplii situation as reffered by Hon'ble Supreme Court in their Lafarge Umiam v/s Union of india case in 2011 but with following all the guidelines / orders/explanations issued by Government of India/ Hon'ble Supreme Court in the matter related to Forest Conservation Act 1980.

परियोजना पदाधिकारी
के0डी0ए0च0 परियोजना

3	Can forest land be acquired under CBA 1957?	The Land Acquisition Act was enacted in 1894 for acquiring surface right for any public purpose or for a company. Later on in 1957 in order of economic interest of India greater public control over the Coal Mining industry and its development by providing for the acquisition by the State of unworked land containing or likely to contain coal deposits or rights in or over such land by enacting special Land Acquisition Act called "The Coal Bearing Areas (Acquisition and Development) Act, 1957". Indian Forest Act was enacted in 1927 to manage and control forest in the country. Both of the above mentioned acts are Special Acts. No where in the Coal Bearing Areas (Acquisition and Development) Act, 1957, it is mentioned that forest land as notified in Indian Forest Act, 1927 can be acquired. More over Coal Bearing Areas (Acquisition and Development) Act, 1957 is to gain control over coal bearing areas and to acquire surface rights which does not include forest. Government of India enacted Forest Conservation in 1980 which provide special provision for regulating Non forestry use of Forest land. Before 1980 Forest land diversion was under the purview of State Government and after 25th Oct, 1980 it came under the perview of Central Government Hence it is very clear that Coal Bearing Areas (Acquisition and Development) Act, 1957 does not have any provision far acquiring right over forest. All land acquisition acts were enacted to aquire surface rights after duly compensating rights of the person/persons having interest over the land. Under any Land Acquisition Act Government aquires rights of private individual except Government land or forest land, for which Government has propriotory rights. Government having soverign rights on such lands, is not required to determine their own rights. In 1971, to make this provision clear, Government of India amended Coal Bearing Areas (Acquisition and Development) Act, 1957 and a new clause 18-A was inserted which reads as below :- "Not withstanding anything contained in this Act, where any land or any rights in or over land belonging to a State Government (other than the rights under a mining lease granted or deemed to have been granted by the State Government to any person) vest in the Central Government under section 10 or in a Government Company under section 11, the Central Government or the Company, as the case mey be, may pay to the State Government such sum of money as would have been payable as royalty by a lessee had such land or rights been under a mining lease granted by the State Government." After insertion of above mentioned clause in Coal Bearing Areas (Acquisition and Development) Act, 1957, it has been absolutely clear that if Government land is acquired then they have to compensated on the similar pattern of private land. Even this amendment does not talk about Forest land.
4	What procedure shall be adopted legally to restore back the reclaimed forest land after completion of mining (which was acquired through CBA 1957) to forest department for uniform management.	As power of denotifying Forest Land before the enactment of Forest Conservation Act, 1980 vested with the State Government hence any land denotified by the State Government can not be taken back. But if any land diverted by the State Government before 1980 but not broken till 25th Oct 1980 then its use will attract provisions of Forest Conservation Act, 1980. Any Forest Land diverted before 1980 and broken before 1980 shall attract provisions of Forest Conservation Act, 1980 after its lease period as envisaged in Mines and Minerals (Development and Regulation) Act is over. All such Forest land which attracts provisions of Forest Conservation Act, 1980 shall be handed over to Forest Department after completion of period of Mining Plan as approved by the Competent Authority and reclamation as envisaged in the Reclamation Plan. This Forest land shall remain as forest land in revenue records as well as in Forest records and a separate document shall be maintained where such diverted lands are recorded along with period of diversion.

परियोजना प्रबन्धिकारी
परियोजना
के०डी०ए०ए०

अतः क्षेत्रीय मुख्य वन संरक्षक, राँची से प्राप्त निराकरण प्रतिवेदन की 3 प्रतियाँ संलग्न कर अग्रतर कार्रवाई हेतु भेजी जा रही है।

संचिका पर प्रधान मुख्य वन संरक्षक, झारखण्ड, राँची का अनुमोदन प्राप्त है।

अनुलग्नक :– अनुपालन प्रतिवेदन 3 प्रतियों में

विश्वासभाजन

8/2

प्रधान मुख्य वन संरक्षक-सह-कार्यकारी निदेशक,
बंजर भूमि विकास बोर्ड, झारखण्ड, राँची।

8-3-22

परियोजना पदाधिकारी
के0डी0एच0 परियोजना

कार्यालय :- वन प्रमण्डल पदाधिकारी, राँची वन प्रमंडल, राँची।
वन भवन, डोरण्डा, रांची- 834002 (झारखंड)
E-mail : dfo-ranchi@gov.in Ph. No. 0651-2480265 (O), FAX 0651-2482386

पत्रांकः- 2513 दिनांकः- 06.07.23

सेवा में,

मुख्य महाप्रबंधक (पर्या0 एवं वन),
सी0सी0एल0, दरभंगा हाउस।

विषयः- **Compensatory levies in proposal for non-forestry use of 126.72 ha. (84.35 ha. PF and 42.37 ha. Jungle Jhari) of forest land for KDH open cast mine in favour of M/S central coal fields limited (CCL) in Ranchi district, Jharkhand- reg.**

प्रसंगः- भारत सरकार, पर्यावरण, वन एवं जलवायु परिवर्त्तन मंत्रालय, क्षेत्रीय कार्यालय, राँची का पत्र सं0- 8/62/2018-FC दिनांक-27.02.2023, इस कार्यालय का पत्रांक-1081 दिनांक-23.03.2023, महाप्रबंधक, नार्थकर्णपुरा एरिया डकरा का पत्रांक-374 दिनांक-24.03.2023, इस कार्यालय का पत्रांक-1121 दिनांक-27.03.2023, महाप्रबंधक, नार्थ कर्णपुरा एरिया डकरा के परियोजना पदाधिकारी KDH OCP का पत्रांक- 47 दिनांक-15.06.2023.

महाशय,

उपर्युक्त विषयक प्रसांगिक पत्रों के संदर्भ में सूचित करना है कि भारत सरकार पर्यावरण, वन एवं जलवायु परिवर्त्तन मंत्रालय, क्षेत्रीय कार्यालय, राँची के पत्र सं0- 8/62/2018-FC दिनांक-27.02.2023 से स्टेज-I के शर्त्त A(3), A(4) के अनुपालनार्थ इस कार्यालय द्वारा क्रमशः क्षतिपूरक वनरोपण की राशि (253.50 हे0) - 5,88,47,687 रूपया तथा निवर्त्तमान मूल्य की राशि - रूपये 12,13,69,882 कुल राशि मात्र की गणना कर मांग की गई है। परन्तु महाप्रबंधक, नार्थ कर्णपुरा एरिया, डकरा द्वारा उनके कार्यालय पत्रांक-374 दिनांक-24.03.2023 से इसमें सी0सी0एल0 द्वारा पूर्व में निवर्त्तमान मूल्य जमा राशि रूपया- 7,93,26,720 जो कि KDH OCP 126.72 ha. के विरूद्ध जमा हुई है, उसका प्रसंग देते हुए उसे स्टेज-I KDH OCP के मांग पत्र में समायोजित करने का अनुरोध किया गया है।

तदोपरांत, इस कार्यालय द्वारा पत्रांक-1121 दिनांक-27.03.2023 के माध्यम से सूचित कर दिया गया था कि "यदि आपके द्वारा पूर्व में निवर्त्तमान मूल्य के रूप में रूपया- 7,93,26,720 (सात करोड़ तिरान्बे लाख छब्बीस हजार सात सौ बीस रूपया मात्र) जमा किया जा चुका है, तो शेष अंतर राशि रूपया- 10,08,90,849 (दस करोड़ आठ लाख नब्बे हजार आठ सौ उनचास मात्र)" ऑनलाईन चालान जेनरेट करते हुए जमा करने की सूचना CA levies format कुल रूपया- 18,02,17,569 (अठारह करोड़ दो लाख सतरह हजार पाँच सौ उनहत्तर मात्र) में भरकर समर्पित करने को कहा गया था। तत्पश्चात महाप्रबंधक, नार्थ कर्णपुरा एरिया के कार्यालय पत्रांक-47 दिनांक-15.06.2023 द्वारा सूचित किया गया है कि उन्हें प्रधान मुख्य वन संरक्षक-सह-कार्यकारी निदेशक, बंजर भूमि विकास बोर्ड, झारखण्ड, राँची, कार्यालय के द्वारा क्षतिपूरक वनरोपण के नवीनत्तम SoR एवं अद्यतन मजदूरी दर के आधार पर संशोधित कर भेजने का निदेश प्राप्त हुआ।

परियोजना पदाधिकारी
के0डी0एच0 परियोजना

इस आलोक में महाप्रबंधक, नार्थ कर्णपुरा एरिया के अनुरोध पर क्षतिपूरक वनरोपण के न्यूनत्तम दर के आधार पर जो गणना की गई है वह निम्नवत है :–

(1) क्षतिपूरक वनरोपण (CA) – रूपया– 5,99,65,530 मात्र

(2) निवर्त्तमान मूल्य (NPV) – रूपया– 12,13,69,882 मात्र

कुल– रूपया– 18,13,35,412 (रूपया– अठारह करोड़ तेरह लाख पैंतीस हजार चार सौ बारह मात्र)

चूँकि इस कार्यालय द्वारा पत्रांक–1121 दिनांक–27.03.2023 से आपको पूर्व में सूचित किया गया है कि यदि रूपये 7,93,26,720 (सात करोड़ तिरान्बे लाख छब्बीस हजार सात सौ बीस रूपया मात्र) सी0सी0एल0 द्वारा निवर्त्तमान मूल्य के रूप में जमा किया गया है तो सक्षम पदाधिकारी के सत्यापन के पश्चात ही, आप शेष राशि रूपया– 10,20,08,692 (दस करोड़ बीस लाख आठ हजार छः सौ बानबे मात्र) ऑनलाईन चालान जेनरेट करते हुए जमा करने की सूचना CA levies format (कुल रूपया– 18,13,35,412 अठारह करोड़ तेरह लाख पैंतीस हजार चार सौ बारह मात्र) में भरकर सूचित करना सुनिश्चित करें। अतः इस विषय में अनुपालन करना सुनिश्चित किया जाए।

अनु0–

1. भारत सरकार पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, IPO रांची का पत्र 08/62/2018–FC दिनांक 27.02.2023
2. वन प्रमण्डल रांची का पत्रांक 1081 दिनांक 23.03.2023 एवं 1121 दिनांक 27.03.2023
3. महाप्रबंधक, नार्थ कर्णपुरा एरिया डकरा का पत्रांक 374 दिनांक 24.03.2023 एवं 47 दिनांक 15.06.2023
4. महाप्रबंधक, नार्थ कर्णपुरा एरिया डकरा द्वारा M/s CCL Darbhanga House को बैंक द्वारा दिनांक 12.04.2016 का लिखा पत्र तथा पूर्व मे जमा संचिका विवरण।

आपका विश्वासी

वन प्रमण्डल पदाधिकारी,
रांची, वन प्रमण्डल, रांची।

परियोजना पदाधिकारी
के0डी0एच0 परियोजना

Annexure- IV

66

Pg. No. 1

ICICI Bank

Date-25-07-2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that CENTRAL COALFIELDS LIMITED has made the below mentioned payment from their current account 017505009227 with our Bank:-

Sr. No.	Beneficiary Name	Amount	Beneficiary accout no	Bene IFSC	UTR	Date
1	JHARKHAND CAMPA	102008692.00	150725883740745	UBIN0996335	ICICR22023072500010030	25/07/2023

It is clarified that this information is furnished in strict confidence and without any risk and responsibility on our part or on the part of any Bank's officials in any respect more particularly either as guarantor or otherwise.

This certificate is issued at the specific request of the said customer.

Regards

Autrorised Signatory

ICICI Bank-Ltd

Ratu Road Ranchi -834001

Divisional Forest Officer
Ranchi Forest Division, Ranchi

C.M. (M) /Project Officer
KDH Project

परियोजना पदाधिकारी
केoडीएचo परियोजना

7/ 23, 11:23 AM

AGENCY COPY

यूनियन बैंक Union Bank

NEFT / RTGS CHALLAN for CAMPA Funds

Date : 22-07-2023

Agency Name.	HOD/DGM(E&F)
Application No.	5883740745
MoEF/SG File No.	8-62/2018-FC
Location.	JHARKHAND
Address.	E&F DEPTT, DAMODAR BUILDING, DARBHANGA HOUSE, CCL, RANCHIRanchi
Amount(in Rs)	102008692/-

Amount in Words :Ten Crore Twenty Lakh Eight Thousand Six Hundred and Ninety-Two Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	JHARKHAND CAMPA
IFSC Code:	UBIN0996335
Pay to Account No.	150725883740745 Valid only for this challan amount.
Bank Name & Address:	Union Bank Of India FCS Centre,21/1, III Floor, Jelitta Towers, Mission Road, Bengaluru-560027

- This Challan is strictly to be used for making payment to CAMPA by NEFT/RTGS only

BANK COPY

यूनियन बैंक Union Bank

NEFT / RTGS CHALLAN for CAMPA Funds

Date : 22-07-2023

Agency Name.	HOD/DGM(E&F)
Application No.	5883740745
MoEF/SG File No.	8-62/2018-FC
Location.	JHARKHAND
Address:	E&F DEPTT, DAMODAR BUILDING, DARBHANGA HOUSE, CCL, RANCHI Ranchi
Amount(in Rs)	102008692/-

Amount in Words :Ten Crore Twenty Lakh Eight Thousand Six Hundred and Ninety-Two Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	JHARKHAND CAMPA
IFSC Code:	UBIN0996335
Pay to Account No.	150725883740745 Valid only for this challan amount.
Bank Name & Address:	Union Bank Of India FCS Centre, 21/1, III Floor, Jelitta Towers, Mission Road, Bengaluru-560027

- This Challan is strictly to be used for making payment to CAMPA by NEFT/RTGS only

Note:After making the required payment through challan, if the payment status has not been updated even after 7 working days, then kindly mail a copy of your challan with transaction date and reference id to Email: fcsblr@unionbankofindia.bank , epurse@unionbankofindia.bank, ubin0903710@unionbankofindia.bank

Divisional Forest Officer
Ranchi Forest Division, Ranchi

C.M. (M) /Project Officer
KDH Project

परियोजना पदाधिकारी
के0डी0ए0च0 परियोजना

Annexure-V.

कार्यालय :- वन प्रमण्डल पदाधिकारी, राँची वन प्रमंडल, राँची।
वन भवन, डोरण्डा, रांची- 834002 (झारखंड)
E-mail : dfo-ranchi@gov.in Ph. No. 0651-2480265 (O), FAX 0651-2482386

पत्रांकः- 2573 दिनांकः- 06.07.23

सेवा में,

मुख्य महाप्रबंधक (पर्या0 एवं वन),
सी0सी0एल0, दरभंगा हाउस।

विषयः- **Compensatory levies in proposal for non-forestry use of 126.72 ha. (84.35 ha. PF and 42.37 ha. Junglé Jhari) of forest land for KDH open cast mine in favour of M/S central coal fields limited (CCL) in Ranchi district, Jharkhand- reg.**

प्रसंगः- भारत सरकार, पर्यावरण, वन एवं जलवायु परिवर्त्तन मंत्रालय, क्षेत्रीय कार्यालय, राँची का पत्र सं0- 8/62/2018-FC दिनांक-27.02.2023, इस कार्यालय का पत्रांक-1081 दिनांक-23.03.2023, महाप्रबंधक, नार्थकर्णपुरा एरिया डकरा का पत्रांक-374 दिनांक-24.03.2023, इस कार्यालय का पत्रांक-1121 दिनांक-27.03.2023, महाप्रबंधक, नार्थ कर्णपुरा एरिया डकरा के परियोजना पदाधिकारी KDH OCP का पत्रांक- 47 दिनांक-15.06.2023.

महाशय,

उपर्युक्त विषयक प्रसांगिक पत्रों के संदर्भ में सूचित करना है कि भारत सरकार पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, क्षेत्रीय कार्यालय, राँची के पत्र सं0- 8/62/2018-FC दिनांक-27.02.2023 से स्टेज-I के शर्त A(3), A(4) के अनुपालनार्थ इस कार्यालय द्वारा क्रमशः अतिपूरक वनरोपण की राशि (253.50 हे0) - 5,88,47,687 रूपया तथा निवर्त्तमान मूल्य की राशि - रूपये 12,05,69,882 कुल राशि मात्र की गणना कर मांग की गई है। परन्तु महाप्रबंधक, नार्थ कर्णपुरा एरिया, डकरा द्वारा उनके कार्यालय पत्रांक-374 दिनांक-24.03.2023 से इसमें सी0सी0एल0 द्वारा पूर्व में निवर्तमान मूल्य जमा राशि रूपया- 7,93,26,720 जो कि KDH OCP 126.72 ha. के विरूद्ध जमा हुई है, उसका प्रसंग देते हुए उसे स्टेज-I KDH OCP के मांग पत्र में समायोजित करने का अनुरोध किया गया है।

तदोपरांत, इस कार्यालय द्वारा पत्रांक-1121 दिनांक-27.03.2023 के माध्यम से सूचित कर दिया गया था कि "यदि आपके द्वारा पूर्व में निवर्त्तमान मूल्य के रूप में रूपया- 7,93,26,720 (सात करोड़ तिरान्बे लाख छब्बीस हजार सात सौ बीस रूपया मात्र) जमा किया जा चुका है, तो शेष अंतर राशि रूपया- 10,08,90,849 (दस करोड़ आठ लाख नब्बे हजार आठ सौ उनचास मात्र)" ऑनलाईन चालान जेनरेट करते हुए जमा करने की सूचना CA levies for the कुल रूपया- 18,02,17,569 (अठारह करोड़ दो लाख सतरह हजार पाँच सौ उनहत्तर मात्र) में भरकर समर्पित करने को कहा गया था। तत्पश्चात महाप्रबंधक, नार्थ कर्णपुरा एरिया के कार्यालय पत्रांक-47 दिनांक-15.06.2023 द्वारा सूचित किया गया है कि उन्हें प्रधान मुख्य वन संरक्षक-सह-कार्यकारी निदेशक, बंजर भूमि विकास बोर्ड, झारखण्ड, राँची, कार्यालय के द्वारा अतिपूरक वनरोपण के नवीनतम SoR एवं अद्यतन मजदूरी दर के आधार पर संशोधित कर भेजने का निदेश प्राप्त हुआ।

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इस आलोक में महाप्रबंधक, नार्थ कर्णपुरा एरिया के अनुरोध पर क्षतिपूरक वनरोपण के न्यूनत्तम दर के आधार पर जो गणना की गई है वह निम्नवत है :–

(1) क्षतिपूरक वनरोपण (CA) – रूपया– 5,99,65,530 मात्र

(2) निवर्त्तमान मूल्य (NPV) – रूपया– 12,13,69,882 मात्र

कुल– रूपया– 18,13,35,412 (रूपया– अठारह करोड़ तेरह लाख पैंतीस हजार चार सौ बारह मात्र)

चूँकि इस कार्यालय द्वारा पत्रांक–1121 दिनांक–27.03.2023 से आपको पूर्व में सूचित किया गया है कि यदि रूपये 7,93,26,720 (सात करोड़ तिरान्बे लाख छब्बीस हजार सात सौ बीस रूपया मात्र) सी0सी0एल0 द्वारा निवर्त्तमान मूल्य के रूप में जमा किया गया है तो सक्षम पदाधिकारी के सत्यापन के पश्चात ही, आप शेष राशि रूपया– 10,20,08,692 (दस करोड़ बीस लाख आठ हजार छः सौ बानबे मात्र) ऑनलाईन चालान जेनरेट करते हुए जमा करने की सूचना CA levies format (कुल रूपया– 18,13,35,412 अठारह करोड़ तेरह लाख पैंतीस हजार चार सौ बारह मात्र) में भरकर सूचित करना सुनिश्चित करें। अतः इस विषय में अनुपालन करना सुनिश्चित किया जाए।

अनु0–

1. भारत सरकार पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, IPO रांची का पत्र 08/62/2018–FC दिनांक 27.02.2023
2. वन प्रमण्डल रांची का पत्रांक 1081 दिनांक 23.03.2023 एवं 1121 दिनांक 27.03.2023
3. महाप्रबंधक, नार्थ कर्णपुरा एरिया डकरा का पत्रांक 374 दिनांक 24.03.2023 एवं 47 दिनांक 15.06.2023
4. महाप्रबंधक, नार्थ कर्णपुरा एरिया डकरा द्वारा M/s CCL Darbhanga House को बैंक द्वारा दिनांक 12.04.2016 का लिखा पत्र तथा चूक मे जमा संचिका विवरण।

आपका विश्वासी

वन प्रमण्डल पदाधिकारी,
रांची, वन प्रमण्डल, रांची।

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Annexure-V.

सेन्ट्रल कोलफील्डस लिमिटेड
(भारत सरकार का एक उपक्रम)
(दरभंगा हाउस, राँची-834029)
CENTRAL COALFIELDS LIMITED
(Govt of India Undertaking)
Darbhanga House, Ranchi- 834 029
फोन/Phone: (0651) 2360184 फैक्स/Fax: (0651) 2360184
वेबसाइट/Website: http://www.ccl.gov.in

CCL

(Administrative Unit of Company)

Date: 12.04.2016

Ref. no.: CCL/DGM/HOD (E&F)/2016/ 15

To
The DFO,
Bokaro, Hazaribagh, Ramgarh, Ranchi, Chatra(S),
Govt. of Jharkhand,

Sub: Information reg. payment of NPV of CCL-Projects as per circular of MoEF&CC, F.No.11-599 /2014-FC dated 1st April 2015 of Govt. of India as well as demanded by State Forest Deptt.

Dear Sir,

As per the subject above, NPV of the following Projects of CCL (Enclosed in Annex.-A) has been deposited in CAMPA A/C of Jharkhand in Corporation Bank, CGO Complex New Delhi an amount of Rs.220,50,41,439.00 on 31.03.2016 through RTGS/NEFT

If any NPV is left for the Projects of CCL, as the period of one year stipulated in the said guidelines issued vide letter no. 11-599/2014-FC dated 1st April 2015 is extended for a further period of six months i.e., till 30th September 2016 as per circular of MoEF&CC, F.No.11-85-20159-Fc dated 31st March 2016, will be paid within the stipulated period mentioned above.

This is for your kind information please.

Thanking you,

Yours faithfully,

Dy. GM (HOD (Env. & Forest),
Env. & Forest Dept.,CCL

Encl: As Above.

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Annexure-V.

1) This is a proposal for approval towards payment of NPV and other forest compensation as per circular of MOEF & CCF No.II-599/2014-FC dated 01/04/2015 of Government of India as well as demand raised by State Forest Department.

2) The total referred land of 3106.479 Ha as per Annexure-'A' covering 13 (thirteen) number of Projects for which NPV payment proposed by Forest & Environment Department HQ is Rs.2205041439/-. In addition to above, compensatory aforestation payment of Rs.15 Crores in respect of 5 mines has also been proposed as per enclosed statement duly vetted by HOD(E&F).

3) Stage I clearance of the above referred land (Forest) is yet to be obtained.

4) Due to non-availability of stage I clearance, density of Forest on these land as per Annexure – 'A' has been taken from the adjacent land for which stage II clearance obtained and payment has also been made.

5) The present rates of NPV according to density of the forest as per notes of HOD(E&F), CCL at page N/8 is as follows.

	Density	NPV
(i)	0.3 and below	Rs.6.26 Lakh/Hectre
(ii)	More than 0.3 and less than 0.7	Rs.8.03 Lakh/Hectre

Accordingly the amount of NPV has been derived & proposed by E&F Department to be paid as follows:

	Name of the Project	Forest Area applied / Ha	Density	Rate in Lakhs/Ha	Amount payable
1	Rajrappa	562.900	0.3	6.26	352375400
2	Urimari OCP	202.470	0.3	6.26	126746220
3	Amlo	39.664	0.7	6.26	24829664
4	Tarmi	97.440	0.1	6.26	60997440
5	Govindpur	10.520	0.4	8.03	6585520
6	Pundi Exp OCP	595.530	0.4	8.03	478210590
7	KDH	526.730	0.3	6.26	329726720
8	Konar	93.580	0.4	8.03	75144740
9	Churi Benti Pr	195.150	0.6	8.03	156722480
10	Kuju	106.650	0.2	6.26	66762900
11	Topa	489.010	0.3	6.26	306120260
12	Amrapali	432.590	0.3	6.26	270769750
13	Churi UGP	51.245 (50% of 102.49)	0.6	8.03	12449735
		3106.479			2205041439

Note: (i) As per Annexure 'A' Sl. No.5 rate considered Rs.6.26 Lakh/Ha instead of Rs.8.03 Lakh/Ha

(ii) Sl. No.13 only 50% amount has been considered

6) As mentioned at point No.1, In reference to letter of Shri H.C. Chaudhary, Director, Govt. of India, Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Aliganj, Jorbagh Road, New Delhi vide F. No.11-599/2014-FC dated 1st April 2015 informed the Principal Secretary (Forests), All State/Union Territory Governments regarding guidelines for

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Annexure-V.

punjab national bank
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S N GANGULI ROAD, RANCHI

Tel 0651 - 2204755/ 2205599
FAX: 0651 - 2205601
E-mail: bo0404@pnb.co.in

M/S CCL DARBHANGA HOUSE
DARBHANGA HOUSE

RANCHI JHARKHAND
834001 INDIA

12.04.2016

DEAR SIR/MADAM,

REG: CONFIRMATION OF YOUR RTGS FOR RS.220,50,00,000 &NEFT FOR RS. 41,439/-

This IS TO CERTIFY THAT WE HAVE MADE THE RTGS FOR RS.220,50,00,000/- TO CAF AC JHARKHAND ACCOUNT NO 0371001010252 12, IFSC CODE CORP0000371 AND NEFT FOR RS. 41,439/ TO CAF AC JHARKHAND. ACCOUNT NO. 0371001010252 12, IFSC CODE CORP0000371 ON 31.03.2016. WHICH STATUS SHOWS AS SETTLED.

THIS IS FOR YOUR INFORMATION PLEASE.

MANAGER

परियोजना पदाधिकारी
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Annexure-VI.

कार्यालय : प्रधान मुख्य वन संरक्षक–सह–कार्यकारी निदेशक, बंजर भूमि विकास बोर्ड, झारखंड, राँची।

वन भवन, डोरंडा, राँची, झारखंड, पिन–834002. Email ID-pccf-cdaod-jh@gov.in

पत्रांक :– दिनांक :–

सेवा में,

सचिव,
वन, पर्यावरण एवं जलवायु परिवर्तन विभाग,
झारखण्ड सरकार, राँची।

विषय :– सी0सी0एल0 के के0डी0एच0 परियोजना हेतु 126.72 हे0 वनभूमि (84.35 हे0 अधिसूचित वनभूमि तथा 42.37 हे0 जी0एम0 जंगल–झाड़ वनभूमि) अपयोजन का प्रस्ताव।

प्रसंग :–
1. भारत सरकार, पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, नई दिल्ली का पत्रांक 8/62/2018-FC दिनांक 27.02.2023
2. अपर प्रधान मुख्य वन संरक्षक, राँची रीजन, राँची के पत्रांक 1239 दिनांक 02.08.2024, 208 दिनांक 25.02.2025 एवं 434 दिनांक 27.03.2025

महाशय,

उपर्युक्त विषयक संदर्भ में सूचित करना है कि भारत सरकार, पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, नई दिल्ली के प्रासंगिक पत्र–1 द्वारा सी0सी0एल0 के के0डी0एच0 खुली खदान परियोजना हेतु 126.72 हे0 वनभूमि अपयोजन प्रस्ताव में स्टेज–I की स्वीकृति कुल 32 शर्तों के साथ प्रदान की गयी है। उक्त स्टेज–I की स्वीकृति में लगाये गये शर्तों का बिन्दुवार अनुपालन प्रतिवेदन क्षेत्रीय मुख्य वन संरक्षक, राँची के पत्रांक 1239 दिनांक 02.08.2024 द्वारा प्राप्त हुआ था। स्टेज–I के कतिपय शर्तों का अनुपालन अपूर्ण रहने के कारण इस कार्यालय के पत्रांक 741 दिनांक 13.08.2024 द्वारा पृच्छा की गयी, जिसका अनुपालन प्रतिवेदन अपर प्रधान मुख्य वन संरक्षक, राँची रीजन, राँची के पत्रांक 208 दिनांक 25.02.2025 एवं 434 दिनांक 27.03.2025 (छायाप्रति संलग्न) द्वारा प्राप्त हुआ है।

अपर प्रधान मुख्य वन संरक्षक, राँची रीजन, राँची से प्राप्त प्रतिवेदनानुसार विषयगत परियोजना के स्टेज–I का अनुपालन की स्थिति निम्नवत् प्रतिवेदित किया जाता है :–

A ; Conditions which need to be complied prior to handing over of forest land by the State Forest Department and compliance is to be submitted prior to State-II approval :-

Sl No.	Stage-I Condition	Compliance Status
1	As per the approved Mining plan, an additional forest area of 135.91 ha. is required for the expansion of the project. However, the instant proposal has been submitted for 126.72 ha. only, excluding the area of 9.19 ha. forest land which as per approved mining plan is earmarked as safety zone. The State Government shall either revise the Mining plan or seek the diversion of the 9.19 ha. for the purpose of safety zone.	In this regard the user agency has informed that 9.19 Hectare forest land which was earmarked for safety zone has been excluded from the revised mining plan approved by CCL Board. (Annex.-A of Folder-I) User Agency has also submitted as per revised mine plan an area of 2.89 Hectare has been earmarked for safety zone and green belt which is to be maintained inside mine boundary (1.77 Ha forest land in Safety zone inside 126.72 ha proposed forest land and 1.12 Ha Non forest land in Green Belt) The revised land requirement is as below.

S. no.	Particulars	Area(Ha) Before Revision of Mine Plan	Area(Ha) After Revision of Mine Plan
1	Tenancy Land	69.24	69.24
2	GMB Land	25.66	Nil
3	GMJ Land	Nil	42.37

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<table>
<tr><th>SI No.</th><th>Stage-I Condition</th><th colspan="4">Compliance Status</th></tr>
<tr><td></td><td></td><td>4</td><td>Notified Forest Land</td><td>101.06</td><td>84.35</td></tr>
<tr><td></td><td></td><td>5</td><td>safety Zone and Green Belt</td><td>9.19(To be maintained outside the boundary)</td><td>1.77 Ha forest land (Safety zone maintained inside mine boundary)+ 1.12 Ha Non forest land (Green Belt maintained inside mine boundary)</td></tr>
<tr><td></td><td></td><td>6.</td><td>Total Forest Land requires for expansion</td><td>135.91 Ha (101.06+25.66+9.19)</td><td>126.72 Ha (84.35+42.37)</td></tr>
<tr><td>2</td><td>The State Govt. shall submit a detailed status report of the approvals under FCA, 1980 of the forest land involved in the entire lease area. The forest areas for which a valid approval under FCA, 1980 is not available shall not be used before a valid approval under FCA, 1980 for the same is obtained;</td><td colspan="4">The details regarding the status report of approvals under FCA, 1980 of the forest land involved in the entire lease area has been given as under:-
<table>
<tr><th>SL No</th><th>Proposal area (in ha.)</th><th>Diversion Details</th><th>Validity Period</th><th>Remarks</th></tr>
<tr><td>1</td><td>KDH OCP (101.41 ha.)</td><td>No. 8-79/90-FC dt. 01.07. 1996</td><td>10</td><td>No Mining activity is under process on said land. Renewal application will be done as per future requirement.</td></tr>
<tr><td>2</td><td>KDH OCP (28.95 ha.)</td><td>No. 8-79/90-FC dt. 14.09. 2006</td><td>20</td><td>Mining is under process as per Mine Plan and other statutory clearances</td></tr>
</table>
(Annex- R&C of Folder-I).</td></tr>
<tr><td>3</td><td>The cost of compensatory afforestation at the prevailing wage rates as per compensatory afforestation scheme and the cost of survey, demarcation and erection of permanent pillars, it required on the CA land, shall be deposited in advance with the Forest Department by the user agency. The CA will be maintained for 10 years. The scheme may include afforestation of indigenous species
with appropriate provision for anticipated cost increase for works scheduled for subsequent years;</td><td colspan="4">As per the estimate prepared by Ranchi Forest Division, Ranchi, a total of 5,[illegible]65,530.00 has been deposited by the user agency for compensatory afforestation.
(Annex-D of Folder-I)</td></tr>
<tr><td>4</td><td>The User Agency shall transfer the funds towards the cost of Net Present Value (NPV) of the forest land being diverted under this proposal in accordance with the MoEF&CC guidelines dated 06.01.2022 read with guidelines dated 19.01.2022;</td><td colspan="4">A total of 12,15,79,852.00 has been deposited as NPV by the user agency.
(Annex-E of Folder-I)</td></tr>
</table>

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Annexure-VI.

SI No.	Stage-I Condition	Compliance Status
5	Compensatory levies to be realized from the User Agency under the project shall be transferred/deposited, through e-challan, in to the account of CAMPA pertaining in the State concerned though e-portal (https://parivesh.nic.in/).	Compensatory levies format has been submitted by the user agency. (Annex.- F&G of Folder-I)
6	The State Government shall complete settlement of rights, in term of the Scheduled Tribes and Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, if any on the forest land to be diverted and submit the documentary evidence along with compliance of Stage-I approval, as prescribed by this Ministry's letter No. 11-9/1998-FC (Pt.) dated 03.08.2009 read with 05.07.2013, in support thereof.	FRA NOC has been submitted by the user agency. (Annex.-H of Folder-I)
7	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 de-silting of these village tanks and other water bodies so as to mitigate the impact of siltation of such tanks/water bodies. A detailed plan for de-silting of identified ponds and water bodies prepared in consultation with forest department shall be submitted.	APCCF, Ranchi reported vide letter no. 208 dated 25.01.2025 that for compliance of De-silting plan by the user agency, GPS Co-ordinates of the village falling within five KM of the mining lease have been attached, which is verified by DFO, Ranchi Forest Division. The scheme submitted by the user agency has been approved by the office order no.89 dated 05.07.2024, memo no. 1717 dated 05.07.2023 of the Principal Chief Conservator of Forests, Jharkhand, Ranchi. (Annex.-B of Folder-II) User Agency has been directed to pay the amount as per the plan approved by DFO, Ranchi office letter no 2847 dated 10.07.2024. (Annex.-I & II of Folder-I) User Agency has given an undertaking to deposit the amount in the CAMPA account before handing over the forest land. (Annex- C of Folder-II)
8	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 Stage II approval.	In this regard, the details have been uploaded on e-Green Watch portal by DFO, Ranchi Forest Division. (Annex- C1 of Folder-II).
9	The compliance report shall be uploaded on e portal (https://parivesh.nic.in/).	The compliance report has been uploaded online by the user agency.

B: Conditions which need to be complied on field after handing over of forest land to the user agency by the State Forest Department but the compliance in form of undertaking shall be submitted prior to Stage-II approval :-

SI No.	Stage I Condition	Compliance Status
1	Legal status of the diverted forest land shall remain unchanged.	Undertaking certificate has been submitted by the user agency. (Annex.-J of Folder-I)
2	Wildlife Management plan shall be prepared and implemented at the cost of the user agency. The approved Wildlife management plan shall be submitted and the applicable cost shall be deposited as per the guidelines issued by the Ministry in this regard.	The wildlife management plan prepared by the user agency has been approved by the office order no. 14 dated 30.01.2024, memorandum no. 134 dated 30.01.2024 of the Principal Chief Conservator of Forests, Jharkhand, Ranchi. (Annex.-H of Folder-I) User agency has been directed to pay the amount as per the plan approved by Ranchi Forest Division, Ranchi office letter no. 495

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Annexure-VI.

SI No.	Stage-I Condition	Compliance Status
		dated 06.02.2023 and letter no. 1477 dated 29.04.2024. (Annex.-III of Folder-I) User Agency has given an undertaking to deposit the amount in the CAMPA account before handing over the forest land. (Annex-D of Folder-II).
3	Compensatory afforestation over degraded forest land, Double in extent to the forest land being diverted, shall be raised by the State Forest Department at the project cost within three years from the date of grant of Stage-II approval;	Undertaking certificate has been submitted by the user agency. (Annex.-III of Folder-I)
4	At the time of payment of the Net Present Undertaking certificate has been submitted Value (NPV) at the present rate, the 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.	Undertaking certificate has been submitted by the user agency. (Annex.-IV of Folder-I)
5	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;	Undertaking certificate has been submitted by the user agency (Annex.-V of Folder-I)
6	Trees should be felled in phased manner as Undertaking certificate has been submitted per the requirement in the approved Mining Plan with prior permission of concerned DFO.	Undertaking certificate has been submitted by the user agency. (Annex.-VI of Folder-I)
7	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	Undertaking certificate has been submitted by the user agency. (Annex.-VII of Folder-I)
8	The User Agency shall comply with the Hon'ble Supreme Court order on re-assessing 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 timely manner;	Undertaking certificate has been submitted by the user agency (Annex.-VIII of Folder-I)
9	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,	Undertaking certificate has been submitted by the user agency. (Annex.-IX of Folder-I)
10	The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;	Undertaking certificate has been submitted by the user agency. (Annex.-X of Folder-I)
11	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;	Undertaking certificate has been submitted by the user agency (Annex.-XI of Folder-I)

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Annexure-VI.

Sl No.	Stage-I Condition	Compliance Status
12	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;	User Agency has given an undertaking that the Pillaring of mining lease, forest land and safety zone is under process and will be completed before handover of the forest land (Annex-E of Folder-II)
13	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 Stage-I approval;	User agency has informed vide his letter no.36 dt-11.09.2024 that the condition 313 is part of conditions which need to be complied on fiel after handing over of forest land to the user agency by the the state forest Department but the compliance in form of undertaking shall be submitted prior of stage-II approval. User Agency has given an undertaking that the Plans/schemes will be submitted before handover of the forest land. (Annex-F of Folder-II).
i.	Mitigative measures to minimize soil erosion and choking of stream shall be implemented within a period of three year with effect from the issue of Stage-II clearance in accordance with the approved Plan in consultation with the State Forest Department;	
ii.	Planting of adequate dense of 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;	
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;	
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 28°; and	
v.	No damage shall be caused to the top soil and the user agency will follow the top soil management plan.	
14	The User agency either himself or through the State Forest Department shall undertake gap planting and soil & 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 shall be prepared and submitted to MoEF&CC;	The Soil & Moisture Conservation Plan prepared by the user agency has been approved by the office order no. 90 dated 05.07.2024, memorandum no. 1918 dated 05.07.2024 of the Principal Chief Conservator of Forests, Jharkhand, Ranchi. (Annex.-XIVof Folder-I) Ranchi Forest Division, Ranchi has directed the User Agency via his office letter no. 2346 dated 10.07.24 to submit the Amount as per the approved plan (Annex- XIV(i) of Folder-I) User Agency has given an undertaking that the SMCP amount Rs.3000.30 lakhs in CAMPA account, before handover of the forest land. (Annex-F of Folder-II).
15	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.	User agency has informed vide his letter no.36 dt-11.09.2024 that the condition 315 is part of conditions which need to be complied on fiel after handing over of forest land to the user agency by the the state forest Department but the compliance in form of undertaking shall be submitted prior of stage-II approval. User Agency has given an undertaking that the Pillaring of mining lease, forest land and safety zone is under process and will be completed before handover of the forest land. (Annex-F of Folder-II).
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 barbed of 6 feet	Undertaking certificate has been submitted by the user agency (Annex.-XV of Folder-I)

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Annexure-VI.

Sl No.	Stage-I Condition	Compliance Status
	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;	
ii.	Boundary of the safety zone of the mining lease, adjacent to habitation/roads, should be properly fenced by the user agency;	Undertaking certificate has been submitted by the user agency (Annex.-XV of Folder-I)
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.	Undertaking certificate has been submitted by the user agency (Annex.-XV of Folder-I)
iv.	Afforestation on degraded forest land to be selected elsewhere, measuring one and a half times the area under safety zone, shall also be done at the project cost under the supervisions of the State Forest Department. The degraded forest land parcels selected will be informed to the MoEF&CC with shape files before Stage-II approval and afforestation will be done within three years from the date of Stage-II clearance and maintained thereafter in accordance with the approved Plan in consultation with the State Forest Department; and	Undertaking certificate has been submitted by the user agency (Annex.-XV of Folder-I)
v.	The State Government and the user agency shall ensure that safety zone is maintained as per the prescribed norms;	Undertaking certificate has been submitted by the user agency. (Annex.-XV of Folder-I)
16	The cost of felling of trees shall be deposited by the User Agency with the State Forest Department;	Undertaking certificate has been submitted by the user agency. (Annex.-XVI of Folder-I)
17	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;	Undertaking certificate has been submitted by the user agency. (Annex.-XVII of Folder-I)
18	The forest land proposed to be converted shall under no circumstances be transferred to any other agency, department or person without prior approval of the Central Government	Undertaking certificate has been submitted by the user agency. (Annex.-XVIII of Folder-I)
19	No damage to the flora and fauna of the adjoining area shall be caused;	Undertaking certificate has been submitted by the user agency (Annex.-XIX of Folder-I)
20	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;	Undertaking certificate has been submitted by the user agency. (Annex.-XX of Folder-I)
21	Any other condition that the concerned Regional Office of this Ministry may stipulate with the approval of competent authority for the purpose of conservation, protection and development of forest & wildlife;	Undertaking certificate has been submitted by the user agency. (Annex.-XXI of Folder-I)
22	The user agency shall comply with the provisions of the all Acts, Rules, Regulations, Guidelines, Hon'ble Court Order (s) and other directions pertaining to this project, if any, for the time being in force as applicable to the project; and	Undertaking certificate has been submitted by the user agency (Annex.-XXII of Folder-I)
23	Violation of any of these conditions will amounts to violation of Forest (Conservation) Act, 1980 and action would be taken as per para 1.2 of Chapter-1 of the guidelines comprehensive guidelines of Forest (Conservation) Act, 1980 as issued by this Ministry vide F.No.2017-FC dated 28.03.2019.	Undertaking certificate has been submitted by the user agency (Annex.-XXIII of Folder-I)

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Annexure-VI.

अतः विषयगत परियोजना से संबंधित प्रधान मुख्य वन संरक्षक, राँची क्षेत्र, राँची से **स्टेज–I का प्राप्त अनुपालन प्रतिवेदन** तीन–तीन प्रतियों में इस पत्र के साथ संलग्न कर आवश्यक कार्रवाई हेतु **भेजी जा रही है।**

संचिका में प्रधान मुख्य वन संरक्षक (HoFF), झारखण्ड का अनुमोदन प्राप्त है।

अनु0:– यथोक्त।

विश्वासभाजन,

-/-
प्रधान मुख्य वन संरक्षक सह–कार्यकारी निदेशक,
रंजन मृदा विकास बोर्ड, झारखण्ड, राँची।

ज्ञापांक :– 361 दिनांक :– 06/5/2025

प्रतिलिपि:– अपर प्रधान मुख्य वन संरक्षक, राँची क्षेत्र, राँची/वन संरक्षक **प्रादेशिक अंचल**, राँची/वन प्रमण्डल पदाधिकारी, राँची वन प्रमण्डल, महाप्रबंधक (प्रशासन एवं वन), सी0सी0एल0 **दरभंगा** हाउस, राँची को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

06/5/25
प्रधान मुख्य वन संरक्षक सह–कार्यकारी निदेशक,
रंजन मृदा विकास बोर्ड, झारखण्ड, राँची।

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Annexure-VII

Central Coalfields Limited (CCL)

WILDLIFE MANAGEMENT PLAN OF KDH (Karanpura Dewalkhand Hesalong)OPENCAST COAL MINES OF CENTRAL COALFIELDS LIMITED

UNDER RANCHI FOREST DIVISION

Prepared in compliance of FC Stage – I condition no. (B) 2

Prepared by:

Avantika Green Waves Private Limited, Ranchi

Conservator of Forests
Territorial Circle, Ranchi

Project Officer

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CHAPTER – I

INTRODUCTION & HISTORY

Karanpura Dewalkhand Hesalong Opencast Mine is situated in the North Karanpura Coalfield of Jharkhand. Presently, it is a part of North Karanpura Area of CCL. The mine was nationalised in 1973, when it was producing about 0.2 Mte of coal per annum. The Project Report for KD Hesalong opencast project (Expansion) was prepared in March'87 for a rated capacity of 4.5 MTPA of coal at an average stripping ratio of 1.19m3/te. The project was expanded to 4.50 MTPA based on PR approved in July, 1987. The EMP was also approved for matching capacity on 27.10.1993. The sanctioned project area will exhaust in ~4 years so extension of quarry is planned in dip side. The project is proposed to be extended in dip side for the same rated capacity with increase in lease area. Extension Project Report for KDH OCP (capacity 4.50/5.00 MTPA Normative/Peak capacity) was approved by CCL Board on 19th Aug. 2010. The revised mining plan of KDH Extension OCP within the project area of 489.30 Ha(Nominal Capacity 4.5 MTPA, Peak Capacity 5.00 MTPA) was prepared by CMPDI and approved by CCL board in its 411th meeting held on 04.11.2014.

Location & Communication

KDH Extension OCP falls within Hesalong and KD South geological blocks. It is located in the south central part of North Karanpura Coalfields and is included in Survey of India toposheet no. 73 E/2 and 73 A/14 in Ranchi district of Jharkhand. KDH Opencast project is bounded between latitudes 23°39' 21" to 23°42'0" and longitudes 84°59'15" to 85°00'24".

The area is connected to Ranchi by State Highway no 7. The distance between Ranchi and the Project is around 65km. The Khalari railway station on the Gomoh-Dehri-on-Sone loop line of the Eastern Railway is about 1 km from the southern extremity of the KD South block.

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Nature and size of the project

The project area of present working as per approved mining plan is 489.30 Ha. No change in the project area has been proposed. The life of the project will increase to 5 years after extension in lease area. The normative capacity will remain at 4.5 MTPA, however peak capacity of 5.00 MTPA has also been proposed, which may be achieved in one or more years during project life.

The importance of this Project to the country & region

Benefits at national level:

Central Coalfields Limited is facing increasing demand of coal because of increased demand from industry and power sector. Continuing and augmentation of coal production from the mines of CCL will help to bridge the gap of demand and supply of coal in India. To meet the growing demand of coal, especially in power and steel sectors, CCL has planned to increase its production capacity by the end of XI plan (2011-12) from the present production level of 47.52 MTPA to 78.00 MTPA.

Benefits at local level:

The proposed expansion will also bring about enhanced socio-economic benefits to local population due to expenditure on CSR activities, direct and indirect employment opportunities, improvement in infrastructure and growth of ancillary facilities.

Project Related Information:

Details of various previous approvals, capacity of mines, etc, have been furnished below:

KDH coal block is located in the north eastern part of the North Karanpura Coal Block and falls within the administrative jurisdiction of Ranchi district. The North Karanpura Coalfield is an area rich in coal seams having about 60 identified coal blocks. It is elliptical in shape, 64 kms in east – west and 32 kms in north – south. The coalfields are in upper

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Damodar valley lying between Ranchi plateau in the south and Hazaribag plateau in the north. This area overlaps the parts of districts of Ranchi, Hazaribag, Chatra and Latehar. It contains about 9% of India's total coal reserve, thus being the largest coal reserve and extends over 1230 sq. kms. While being rich in coal deposits this area supports good forests also with a variety of wild life both resident and migrant. For winning the coal, a vital mineral resource required for development projects, these forests have to be sacrificed. At the time of granting approval for diversion of forest land for non-forestry purpose, Govt. of India imposes conditions on the user agencies for minimizing the negative impact of diversion and for ensuring mitigative measures for compensating the loss of forests. This Site-Specific Wildlife Management Plan is the outcome of one of such imposed conditions.

Envisaging the imminent diversions of forest land in North Karanpura Coal Block, the Govt. of Jharkhand constituted an expert committee vide notification number 4359 dated 26.11.2010 for carrying out studies in the area and suggesting mitigation measures in the form of an integrated management plan, for the entire North Karapura valley aiming at minimizing the adverse effect of ongoing and future mining activities. The main object was prescriptions for green coal mining which takes care of various pollutants, minimizes the bio-diversity loss and enhances the socio-economic condition of the local communities. Apart from being rich in bio-diversity this belt also contains traditional paths used by wild elephants for migration from one forest area to another which were to be identified with suitable prescriptions for their conservation & development so that these corridors remain intact in healthy condition, which will, in turn, help in reducing the man – animal conflict, an issue of grave concern due to the potential of huge loss to both the sides. The report of the committee was submitted in July 2017 in the form of Integrated Wildlife

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Management Plan, IWMP, for North Karanpura Coal Block. In February 2019 a committee of senior officers of the forest department scrutinized the recommendations made in this integrated plan and they were adopted with certain modifications. It was also held that on the basis of these recommendations site specific wild-life management plan will be prepared for each mining block and the concerned user agency will deposit funds for implementation of the same @ Rs. 3.786 lac per hectare of the total lease area. Thus, the recommendations of the IWMP are the basic frame upon which this wild-life management plan has been prepared for KDH Coal Block.

I-a. Location of the project:

The project is located just South of Damodar river in Burmu block, Ranchi district of Jharkhand State. It lies between latitudes 23°39' 21" to 23°42'0" and longitudes 84°59'15" to 85°00'24".

It falls under Burmu Forest Range of Ranchi Forest Division. More specifically it is under Khelari Forest Beat and Nawadih Sub-beat.

Access to the project from Ranchi is via Dakra - Khalari- Bijupara, which is on Ranchi - Daltonganj Road (NH-75). The project is also connected to Hazaribagh via Tandwa and Barkagaon with black top road. It is directly connected to Khalari town.

The instant Stage-I FC approval of KDH coal block, the details of diversion of 126.72 Ha of forest land is as under:

1. Protected Forest - 84.35 Ha.
2. Jungle Jhari - 42.37 Ha.

Total - 126.72 Ha.

On three sides, North, West and East – KDH coal block is surrounded by coal blocks. Purnadih block lies in its north while in east and north-east it is surrounded by Churi block, Rohini block lies in its south - west and in

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the south are Khalari Township. Damodar River flows through northern boundary of KDH coal block, flowing from East to West direction. There are other coal blocks also, in the impact zone of KDH coal block.

The location map of the project is attached as Annexure in Chapter VI.

I-b. The Project and Project Impact Area:

The KDH OCP project area is spread over only one village which is considered as core area. The village falling under the core area is – Bishrampur. In this village Sal (*Shorea robusta)* is the dominating species with its associates like Asan, Mahua, Kend, Dhaura, Chiraunji, Salai, Bahera, Palash etc. These Sal forests are well stocked having very small degraded patches.

As there are no industries in the area the work force of this village is mainly divided in two categories – Cultivators and Workers. As the area supports fertile agricultural land, agriculture is the sector which provides employment to both the categories. During lean period, good amount of employment is generated in forestry activities. Rice is the main crop of the area but due to irrigation facilities and good soil fertility the fields are never vacant. This belt is famous for vegetables and every crop right from wheat to pulses to oil seeds are grown. On an average the farmers are able to harvest three crops in one year. About 45% of the entire population are workers.

As coal is available abundantly for cooking purpose the dependency on forests for firewood is very limited which is one of the causes for less degradation of forests. Requirement of small timber and poles is met from the forests. The forests provide various Non-Timber Forest Produce, NTFP, which provide employment as well as additional income to the households. The most important NTFP is mahua flowers and fruits which plays a very important role in the village economy and every household is

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engaged in its collection during March – April. Next comes the Kendu – leaves or *Bidi Patta*, which are succulent leaves from the bushes of *Diospyros melanoxylon*. From April to mid-June, they provide huge employment opportunity to the marginal workers. In addition to these, Sal seeds, Kusum seeds, Amla, Harre, Bahera, Karanj seeds, Mahulan leaves, Sal leaves and various edible fungus in the rainy season are the main Non-Timber Forest Produce, NTFP, which have their fair share in the village economy.

LIST OF VILLAGES FALLING WITHIN 10KM RADIUS OF BUFFER ZONE OF KDH OCP, RANCHI FOREST DIVISION

Sl. No.	Name of Village	Sl. No.	Name of Village
1.	Urwa Pahari	15.	Bakuliadnar
2.	Mayapur	16.	Larbedhwa
3.	Nawatoli	17.	Retpet
4.	Maundtoli	18.	Barsimar
5.	Bosriyatoli	19.	Dundu
6.	Konka	20.	Tahra
7.	Nindra	21.	Babhane
8.	Mcluskiganj	22.	Tahra
9.	Hesalong	23.	Dakra
10.	Siyartoli	24.	Kherari
11.	Mahuadnar	25.	Nawadih
12.	Kolpara	26.	Sarna
13.	Ganjhutoli	27.	Dhamdhamia
14.	Jobhiya	28.	Hutap

Traditionally the villagers are in the habit of keeping large herds of cattle, though they are less productive. A household having 15 cows may be getting only 2 litres of milk from that many numbers. Similarly, bullocks are also kept in large numbers. These cattle are simply left to graze in the adjoining forests sometimes without any supervision. Practice of stall feeding is almost absent and sometimes fodder from the forest is brought for goats. For the upkeep of cattle population, the villagers are totally dependent on forests.

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The project impact area is spread over 10-kilometre radius from the project area. It is estimates that the mining and allied activities carried out in the project area will have some affect in this zone.

Rural Economy & its dependence on Forest:

Alternate source of fuel are available for cooking purpose, hence the dependency on forests for firewood is very limited which is one of the causes for less degradation of forests. Requirement of small timber and poles is met from the forests. The forests provide various Non-Timber Forest Produce, NTFP, which provide employment as well as additional income to the households. The most important NTFP is mahua flowers and fruits which plays a very important role in the village economy and every household is engaged in its collection during March – April. Next comes the Kendu – leaves or *Bidi Patta,* which are succulent leaves from the bushes of *Diospyros melanoxylon.* From April to mid-June, they provide huge employment opportunity to the marginal workers. In addition to these, Sal seeds, Kusum seeds, Amla, Harre, Bahera, Karanj seeds, Mahulan leaves, Sal leaves and various edible fungus in the rainy season are the main Non-Timber Forest Produce, NTFP, which have their fair share in the village economy.

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carried out in the project area will have adverse effect in this zone. This area comprises of total 43 villages, 1 of them are falling in Core Zone and rest 42 in Buffer Zone. All villages fall under Burmu block and Burmu Forest Range, while the rest villages falls under geographical boundary of **Chatra South Division** and **Latehar Forest Division. Study area is restricted to the jurisdiction of Ranchi Forest Division only.**

The organizational set up of Burmu Range is given in the below :

Name of the Range	Name of the Beat	Name of Sub beat
Burmu Forest Range, Mandar	1. Burmu	1. Burmu 2. Makka 3. Siram 4. Koijam 5. Umedanda 6. Chaingarha 7. Binja 8. Haindag 9.Korabar
	2. Khelari	1.Khelari 2. Ray 3. Murupiri 4. Chama 5. Dulhi 6. Konka 7. Nawadih 8. Hesalong 9. Ramadaga 10. Marwa 11. Hutup

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The cropping pattern in the entire zone is almost same. Due to good fertility of the soil, farmers can choose from the wide variety of crops which they prefer to grow

The dependence on forests is directly proportional to the forest area available in the village. In nearby villages forest cover is abundant; people are more dependent on forests. The cattle population has the same trend as of villages in core area. The number of cattle heads is high having low productivity and the entire cattle population is dependent on forest for grazing and survival. As stated in the case of core area villages, the practice of stall feeding is not followed in the villages of impact zone also. For feeding the goats only some fodder is brought, that too from forest.

Agriculture is the main employment providing sector. Nearly half of the population falls in the category of cultivators which means that the working force of their families are engaged on the farms owned by the family. Most of the remaining workers find employment with the families having large holdings. Workers from villages which are close to Dakra, Khelari and Tandwa town find engagement in the town also as labourers. In the months of March to mid-June, the seasonal work of collection of kendu leaves provides large scale employment opportunities. With the opening of mines in these areas new employment opportunities will be generated both for skilled and unskilled work force, as mining and allied activities will require huge man power for various operations. Due to better remuneration to the workers engaged in these activities the socio-economic condition of these villages is bound to improve.

EXPECTED IMPACT ON FOREST & WILDLIFE DUE TO COAL MINING AND ALLIED ACTIVITIES:

Predicting the exact loss of wildlife habitat due to coal mining in the KDH Coal Block in Ranchi District would require detailed site-specific studies and assessments that consider various factors, including the type of

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habitat, the species present, the mining methods used, and the mitigation measures in place. Some general insights into the potential impacts of coal mining on wildlife and its habitat are enlisted below:

(i) **Habitat Destruction:** Coal mining often involves clearing vegetation and altering the landscape, which can lead to the direct loss of habitat for plants and animals. This can disrupt ecosystems and lead to a decline in species that rely on specific habitats.

(ii) **Water Pollution:** Coal mining can result in the release of pollutants into nearby water bodies, impacting aquatic ecosystems and the species that inhabit them. Contaminants such as heavy metals and sedimentation can degrade water quality and harm aquatic life.

(iii) **Air Pollution:** Coal mining and processing can release pollutants into the air, affecting both plant and animal species. Airborne pollutants can harm vegetation and compromise the health of animals that rely on clean air.

(iv) **Noise and Vibration:** Mining operations generate noise and vibrations that can disturb wildlife, affecting their behaviour, communication, and overall well-being.

(v) **Fragmentation and Isolation:** Mining activities can fragment habitats, creating isolated patches of habitat that are challenging for species to navigate. This can lead to reduced gene flow and increased vulnerability to extinction.

(vi) **Invasive Species:** Mining operations can introduce invasive species that outcompete native species, disrupting local ecosystems and leading to declines in native biodiversity.

(vii) **Disruption of Ecosystem Services:** Biodiversity loss can impact the ecosystem services that the area provides, such as pollination, soil fertility, and water purification, which can have cascading effects on both natural and human systems.

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(viii)**Indirect Effects:** The infrastructure and human activities associated with mining, such as road construction and increased human presence, can further fragment and disturb habitats.

To accurately mitigate the expected habitat loss in the KDH Coal Block, it's important to adopt prescriptions made in environmental impact assessments (EIAs) and biodiversity surveys specific to the region. These assessments would consider factors like the local species present, their distribution, their ecological requirements, and potential mitigation measures to minimize negative impacts. Local conservation organizations, research institutions, and government agencies may be involved in conducting these assessments and providing more accurate predictions based on the current conditions in the area.

I-c. Topography, Natural drainage lines, Presence of water bodies.

KDH coal block is situated in the south -central part of North Karanpura coalfield and is spread over forest as well as non-forest land. The vegetative cover in the forested area is adequate. The coal block represents an undulating topography with some hilly portion in the western part and river Damodar flowing towards the north. A hill range runs along the eastern part of the block. Hills are moderate with good vegetative cover indicating presence of sufficient nutritious soil and the highest point of elevation is about 510 Mts. from MSL. The entire area is part of plateau and the difference in elevation from foot hills to the peak is maximum 80 meters. The river bed of Damodar river represents the minimum elevation in the coal block which is about 400 Mts above MSL. Apart from the hill range few isolated hillocks are also present on either side of Damodar River.

The Damodar River which flows in southward direction through the coal block's northern part is the main drainage channel of the area. At many

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places it was observed that the river flows on solid rock which adds to the natural beauty. Many rivulets originate from the hill range or from the isolated hillocks and drain into the Damodar River. This river is the perennial source of water in the region.

In the core area a good number of ponds are also available which provide water for daily use. Uncovered wells and hand pumps are the main source of drinking water but overall, river Damodar is the main perennial source of water in this region.

Rainfall data (in mm) of KDH Coal field and nearby coal field during 2022 are shown below:

Month	Name of Coal Mines				
	Purnadih	Dakra	Rohini	KDH	Churi
January	31	33	33	33	34
February	70	71	70	67	71
March	0	0	0	0	0
April	0	0	0	0	0
May	67	68	68	67	68
June	213	211	213	211	213
July	141	142	145	139	145
August	375	371	376	368	377
September	547	543	549	526	550
October	95	95	99	80	99
November	0	0	0	0	0
December	0	0	0	0	0
Total	1539	1534	1553	1491	1557

(Source: Central Coalfields Limited)

In the drainage system, role of seasonal nalas is of great importance as they are the channels through which the excess run-off is channelised into the drainage system of the area. In every village such seasonal nalas are found which form the initial framework of drainage system. Some of the nalas met in the villages during survey are – Kanodia, Safi and so on. The buffer area has good number of ponds and as per the survey about 22 ponds are scattered over the impact zone. More than 12 check dams are

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also constructed in the buffer zone which is used by local villagers and wild animals both.

A map showing the drainage lines and water bodies in the study area is annexed in Chapter VI.

I-d. Linear infrastructure – Roads, Rail lines, Waterways, Canals:

Access to the project from Ranchi is via Piparwar Khalari- Bijupara, which is on Ranchi - Daltenganj Road (NH-75). The project is also connected to Hazaribagh via Tandwa and Barkagaon with black top road. It is connected directly to Khalari town. Approximate distance of important places from the mine area by road is as below:

- Khalari Town : 03 KM
- Bijupara : 30 KM
- Ranchi City : 55 KM
- Hazaribagh Town : 90 KM

The nearest Airport is Ranchi located at a distance of about 65 Km from the block.

Means of Communication:

Road: Ranchi, the headquarters of Ranchi district is at a distance of about 55 km from the block and is connected by an all-weather metalled road going from Ranchi to KDH OCP via Mandar - Bijupara. Alternately it can be reached by Hazaribagh via Barkagaon- Tandwa.

Rail: Gomoh – Dehri-on-Sone loop line (Eastern Railwy) runs on Southern side of the project. Nearest Railway station is Khelari Rly Station which is about 5 Km away from the project. Presently there is railway communication on northern side of the river Damodar. A railway siding has been planned to serve Ashoka East OCP,

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Piparwar OCP and this project, which would run on northern side of the project. This siding will take-off from Mcluskeganj. However presently this siding would not serve this project. Coal would be transported across the Damodar to either Churi siding or K.D.Hesalong siding.

Airport: Ranchi, the state capital of Jharkhand is located about 65 km from the block.

In the block and buffer area there are no such waterbodies where any mode of transport can be operated. The area lacks the presence of canals also.

The means of communication mentioned above have developed in a phased and gradual manner under the development schemes of the state and they don't pose a threat or cause hindrance in the movement of wild animals. Among the mega fauna the area is regularly visited by migratory elephants and as the area of KDH coal block does not fall in any of the routes recognised for movement of elephants in the North Karanpura Valley, the traditional routes of elephant migration will remain undisturbed.

I-e. Description of Flora and Fauna in core and buffer:

One village, Bishrampur in Burmu Block falling under the core area of KDH OCP.

In Buffer Zone 42 villages and one Township are situated.

FLORA:

According to Harry. G. Champion and S. K. Seth the main forest types met within this tract are:

1. Northern Tropical Moist Deciduous Forest. -- 3B/C, (B2a)
2. Northern tropical dry deciduous forest -- B/C_2

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The following distinct types of forests are noticeable in different parts of this division.

1. Sal Forests.
2. Miscellaneous Forests.
3. Scrub with Lantana.

General composition of forest in Ranchi Forest Division are as below:

SAL FORESTS: **Sal is the climax species in Ranchi Forest division.** In some patches of narrow valley the crop tends to be moist. This forest is found in the eastern, southern, central and northern zones but they have suffered badly from over- exploitation. Due to repeated cutting the crop is severely destroyed and has reached to sapling and rooted waste stage. In the central zone the topography is plain and the forests have reduced in several places to patches of few acres by the intense pressure of population and cultivation. Commonly the crop consists of Sal saplings. The quality of Sal is IV of seedling origin and 'C' of coppice origin.

The associates of Sal are *Terminalia tomentosa, Diospyros melanoxylon. Buchanania latifolia, Anogeissues latifolia, Adina cordifolia, Butea frondosa, Albizzia spp. Lannea grandis, Boswelia serrata. Aegle marmelos, Ougenia dalbergoides. Legerstromia parviflora, Emblica Officenalis, Terminalia Chebula, Terminalia belerica Schleichera trijuga* etc.

The common shrubs are — *Flemingia chhapar, Croton indigofera, Wedlandia excerta, Woodfordia floribunda. Symploces racemosa and antidysentrica etc. Amongst the climbers the following are prominent: - Bauhinia vahlli, Centilag adraspetana, Mullatia auriculata, Combretum decandrurn, Spatholobus roxburghii Acacia pinnata* etc. The devastation of forests has been heavy and some of the hill groups either bare or having only few poles over a bed of lantana and other thorny species.

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MISCELLANEOUS FORESTS

There is a great impact of geology on the distribution of the miscellaneous forests. Mostly dry deciduous miscellaneous species are found in quartzite and Gondawana formation alongwith Sal. The relative compositions of crop are found according to aspect, biotic factors and topography. Miscellaneous forests occur in all the zones. Somewhere it is confined to a small patch; else where it forms a continuous belt. In the eastern and southern zones i.e Tamar thana the forests are driest in the division and miscellaneous species are prominent. In upper storey are *Terminalia tomentosa, Anogeissus latifolia, Terminalia belerica, Terminalia chebula, Adina cordifolia, Lannea grandis, Madhuca latifolia, Butea frondosa, Diospyros melanoxylon, Hymenodictyon excelsum, Cassia fistula, Bursera serrata, Lagerstromia parviflora, Emblica officinalis, Schleichdra trijuga, Sterculia urens, Albizzia Spp., Buchnania latifolia, Aegle marmelos* etc.

In the under story the spcies found are : *Holahhrina antidysentrica, Croton oblongifolius, Nycranthes arbortrists, Gardenia Spp. Zizyphus Spp. Acacia pinnata.* Invasion of Lantana is almost menacing in the plains. The commonest climbers are *Bauhinia vahlii, Milletia auriculata and Combretum decandrum* etc.

THORNY SCRUB WITH LANTANA

This is the deciduous scrub forest falling under group 2S/2 of Champion-Seth's classification. In miscellaneous forest, a distinct category of thorny scrub on bare hills can be recognized. In the Central zone of Ranchi Forest Division due to intensive pressure of population and cultivation, consequently hills are either bare or are seriously invaded by thick growth of thorny scrub , mostly by lantana. The eastern and Southern Zones have also suffered considerably from over felling as well as from shifting cultivation in the past. In Sonahatu thana nothing but bare hills occur.

Floristic Composition:

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The tree species present in the tract belong to several families. The prominent families are listed below:

- Dipterocarpaceae
- Ebenaceae .ie. Fabaceae
- Anacardiaceae
- Flacourtiaceae
- Lythraceae
- Mimosaceae
- Rubiaceae
- Sapindaceae, ie. Tiliaceae
- Arecaceae
- Bombacaceae .ie. Buthidae
- Combretaceae
- Moraceae
- Meliaceae
- Guttiferae
- Euphorbiaceae

There are several other families are also present in the tract. The important species found in these forests are given below.

Top Canopy : *Shorea robusta, Terminalia tomentosa, Terminalia arjuna, Buchanania latifolia, Butea monosperma, Lagerostroemia parviflora, Pongamia glabra, Lannea grandis, Ficus religiosa, Syzygium cumini, Azadirachta indica, Acacia catechu, Artocarpus integrifolia, Boswellia serrata, Bombax ceiba*, etc

Middle Canopy : This tier consists of the younger members of the top canopy and other species like *Diospyros melanoxylon, Carisa spinarum, Croton oblongifolius, Cleistanthus collinus*, etc.

Lower Canopy : It comprises the pole crop of the species found in the upper canopies and other shade-tolerant or shade-loving species, calamus.

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Phoenix species are also seen. In certain localities *Holarrhena antidysenterica* & lantana are found growing gregariously.

Ground Vegetation : The forest floor is patchy covered by growth of many shade-loving species, specific to this type of tract. They include many medicinal plants widely used in the indigenous system of treatments like *Asparagus racemosa, Carisa, spinarum, Mimosa Pudica, Hemidesmus indicus, Curcuma aromatica, Ocimum sanctum, Croton oblongifolius, Urginea indica, Cynodon dactylon,* ferns, orchids, aroids and mosses.

Climbers : The climbers commonly found are *Acacia pinnata, Bauhinia vahlii, Butea parviflora, Casytha spp, Cryptolepsis Buchanani, Smilax prolifera, Smilax zeylanica, Pogonia spp, Pueraria tuberose, Vitis repanda, Ichnocarpus* etc .

A map showing the forest cover in the study area is annexed as Annexure-XII.

FAUNA:

Introduction :-

The term 'wild life' with respect to a tract will denote the entire animal community therein, covering all forms of life. The natural fauna in a locality is characterized by the habitat conditions that were created and influenced by the Vegetation types met with in that locality. Some part of this tract are geographically shows the presence of different regional, climatic and edaphic climaxes and offers a wide range of habitat types which favours wild life but due to heavy biotic pressure, illegal felling, drought condition and some cultural activity they are influenced negatively.

The glimpses of status of wild life in the past in old Hazaribag district, which also covered the carved out present districts of Giridih (1976), Koderma (1999), Chatra (1999) and Ramgarh (2007), can be seen in

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district gazetteer of 1917. It states that – ***"There has been no zoological survey of this district and very little has been recorded with special reference to Hazaribag. It is, however, possible that the wild animals found there are practically the same as those in the rest of Chotanagpur. There is no reason to believe that tigers are especially numerous in number, in spite of the large number of victims reportedly claiming to be attacked by them in the district. In a year not more than five or six tiger skins are brought to the court for the customary reward of Rs. 25. .... The larger number of deaths caused by tigers in 1915 was due to a single animal near Katkamsandi for whom a special reward has been offered. The great increase in the rewards distributed was due to the special rate of Rs. 50/- paid for wolves until the end of March 1915."***

From the above description it is evident that tigers, leopards and wolves were fairly abundant in the whole district. As per the present working plan records, the present status of wildlife in Ranchi Forest Division is rather very gloomy. Hazaribag Wild Life Sanctuary, which is situated in the nearby area of the division is almost like an oasis where wild animals are found in abundance. Outside the sanctuary the occurrence of the wild animals is rather very rare, but obviously not restricted within the sanctuary area. The wild animals found in the larger tract are generally – Common Langur, Rhesus monkey, Leopards, Jungle cat, Sambhar, Blue bull, Spotted deer, Barking deer, Wild boar, Sloth bear, Hog badger, Ratel, Smooth Indian Otter, Common mongoose, Indian civet, Indian Fox, Jackal, Wild dog, Hyena etc.

Elephants are not resident of the study area but are frequently seen in the area in course of migration from one habitat to another, especially during the season of crop maturity.

In the project impact area, sighting of Deer, Fox, Hyena, Jackal, Barking deer, Jungle cat, Porcupine, Wild boar, Snakes – Karait, Gehuwan,

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Dhamin, Python, Horhorwa etc., Languor, Monkey, Peacock, Blue bull, Pangolin, Common mongoose, Wild hare has been reported in the field survey. Apart from this, seasonal visit of elephants in the area is quite common and is of the greatest concern due to the damages inflicted by them. Though no identified traditional elephant movement corridor passes through the core and a very small portion passes through fringe buffer area in the south, still elephants visit many of the villages in these areas almost regularly, especially during the seasons of crop harvesting. Lately it has been observed that the movement of elephants is no more restricted to the crop harvesting months but they visit the villages whenever they need food and get the same by breaking into the houses.

Apart from the terrestrial wild animals, avifauna and aquatic animals are also found which include – Koel, Myna, Jungle crow, Eagle, Egret, Titar, Bater, Woodpecker, Sparrow, Parrot, Vultures, Teal, Stork, King fisher, Kite, Ibis, Hornbill, Heron, Flycatcher, Jungle fowl, Munia, Weaver bird, Parakeet, Bulbul in avifauna and fishes like – Rohu, Mrigal, Katla, Mangur, Garai etc., Tortoise, Snails, Water snake, Crabs, Frogs are found in water bodies.

A tabular list of Flora and Fauna of the study area is annexed in Chapter - VI.

INJURIES TO WHICH THE FAUNA IS LIABLE

The chief agencies causing injuries to the fauna are the man, epidemics and atmospheric influences. The fauna has suffered at the hand of men, both directly and indirectly since time immemorial. The direct injuries to the fauna are caused by human activities of hunting, poaching, snaring, capturing and poisoning. With the development of motorable roads, increase in fire-arm licenses, extension of cultivation upto the edge of forests the open nature of the country and due to the army camps poaching has been on an

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increase. Chasing sambhar and other deer species by dogs and then killing by lathi blows when the animal is at bay is another example. In this Division certain species like tiger, panther, sambhar, cheetal, hog dear, kotra, jungle fowls and red spur fowl have already become quite rare and unless stringent measures are adopted against the poachers or law breakers and existing resources tightened up, the wild life is likely to suffer further decline to extinct.

Among the indirect injuries caused by man is disforestation which reduces the area of habitat of the fauna and also their food supply, overgrazing and heavy incidence of fires in the forests for both of which man is responsible are the other factors responsible for causing a decline in the fauna. Extensive overgrazing results into exhaustion of natural food and cover for the herbivores. Fires also destroy the natural food supply, including the insects, the eggs and the forest areas.

I-f. Description of forest and habitat conditions. Census results if any:

As discussed in the foregoing paras, the average Forest cover in the core and buffer area is nearly double the state average. The forests are of two types as per Champion and Seth's classification of forests. The Northern Dry Deciduous Sal bearing forests – type $5B/C_1$, where almost pure Sal was found to be thriving well on a completely rocky terrain. In these forest *Shorea robusta* (Sal) is the main species with associates like *Terminalia spp., Anogeisus latifolia, Pterocarpus marsupium, Diospyros melenoxylon* etc. in the top canopy. The detailed crop composition has been delt with in preceding topic. The crop of almost of entire area is of coppice origin. The general quality of Sal forests is coppice quality 'B' but localized patches having crop of quality 'A' are also found. The purity of Sal varies widely depending upon various locality factors like – climatic, topographic,

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edaphic and biotic factors. The best Sal forests are found on the coarse sandstone of Mahudi and adjoining hills which belong to the Upper Gondwana system. Extensive patches of almost pure Sal Forest of better quality are found on these hills. Natural regeneration in whippy seedling stage is generally adequate in this type of crop.

The second type is Northern Dry Mixed Deciduous forests – type $5B/C_2$, which occurs on drier tracts and are situated on the warmer aspects on hill slopes & hill tops having relatively poor soil and moisture conditions. They occur on comparatively more degraded areas. The crop is generally open. The trees in the top storey are *Boswellia serrata, Anogeissus latifolia, Lagerstroemia parviflora, Diospyros melanoxylon, Pterocarpus marsupium, Adina cordifolia, Mitragyna parviflora, Buchnania lanzan, Sterculia urens, Madhuca indica, Emblica officinales, Aegle marmelos*. In middle storey, where biotic pressure is less, scattered bamboo clumps are occasionally seen. The shrubs consist of *Woodfordia fructifosa, Nyctanthus arboratus, Zizyphus spp.* etc. Climbers are generally absent and ground cover is very sparse. Khair trees are found in scattered patches, generally on lower slopes of hilly and eroded lands in both Sal and miscellaneous forests.

Due to high density of vegetative cover and less biotic interference in most of the areas it makes a good habitat for wild animals. The absence of predator species makes the habitat further lucrative for herbivores but due to very sparse population of the species present in the study zone, no remarkable rise in their population or sighting is noted. Probably the availability of resources needs some managemental intervention. Most common and vital resource is availability of water which becomes scarce in the summer season.

Records of wild animals' census in the villages falling under core and buffer area are not available separately. A census carried out for wild

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animals in the protected areas of the adjoining district in the year 2020-21 gives an idea about the various species which are found in the same type of forests. According to this census the species and their number was as follows: Chital – 108, Sambhar – 69, Blue bull – 81, Barking deer – 141, Wild boar – 313, Langur – 37, Monkey – 414, Wolf – 36, Hyena – 26, Jackal – 155, Bear – 41, Wild hare – 203, Peacock – 186, Vulture – 26, Wild fowl – 318, Mongoose – 109, Wild cat – 12, Pangolin – 4. Interestingly, though the district always faces cases of depredation by wild elephants in substantial quantity, not a single elephant was found in the entire district. *Source Wild Life Division Hazaribag.*

I-g. Movement of mega wild life in the impact area for last 3 years

The absence of elephants in the census report proves that elephants are not resident of this district and in course of migration from one place to other they cross the district and during the journey the cases of depredation occur. A small patch in the south west portion of the buffer area is identified as portion of one of the elephant movement path which passes through Hutap, Duli, Chama etc. villages, which are at the fringes of project impact zone.. Though the identified elephant path passes through the fringe area of impact zone, the movement of elephants – the only mega wild animal in the area – is experienced in almost every village of the study area. The most acceptable explanation of this movement is stray movement of elephants in search of food. As stated earlier the villages of Burmu Range are famous for their good forest and in many pockets fertile land and variety of crop grown, elephants also find it difficult to resist the temptation of savouring the variety of delicious food spread before them and they stray from their fixed path, roaming as per the availability of their favoured food or as per their mood. Sometimes, the operation carried out driving out the elephants from one village leads them to a new village

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and new agricultural fields. The movement of elephants in the study area does not follow any fixed path. Sometimes some villages are regularly visited while some villages see their arrival after a gap of few years.

A map showing the identified movement pattern of elephant is annexed in chapter VI.

I-h. Man, animal conflict and depredation in the study area

Except for the seasonal visits of the migratory elephants, no conflict has been reported or observed in the study area between the local populace and wild animals. Abundant forest cover and relatively thin population in the study area, of wild animals and humans both, supports this peaceful coexistence. During summer season due to lack of water resources in their natural habitat, wild animals sometimes resort to visit habitations in search of water which can not be categorised as conflict and can be easily redressed by applying suitable managemental interventions.

Movement of mega fauna, i.e. – Elephant is the only animal which causes, conflict between man and animal in the study area that too seasonally. Their sighting has been recorded in almost every village of the study area. The possible cause of their wandering in the area has been discussed in the preceding para. The most common result of this conflict results in the form of crop and house damage. During the last 5 years some cases of human kills/injury and cattle kills have also been reported but they seem more like accidental incidents where either the confrontation happened accidently and in the resulting chaos the damage happened or under the influence of intoxicants the man went dangerously near the elephant and then was unable to take suitable steps. The local populace treats elephants as incarnation of Lord Ganesh and this sometimes leads to difficult situation when they try to give offerings to them and in this exercise reach dangerously near them. In each case of depredation, there is provision of suitable compensation from the Forest Department, and the same is paid

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after fulfilling the desired formalities. However, in cases of human death by elephant, immediate relief at the spot by the local forest officials is provided for cremation etc. which is adjusted in the final compensation payment.

Details of compensation paid due to damage caused by wild animals has been attached in Chapter – VI.

After implementation of the project the movement of elephants in the villages of core area is bound to decrease due to the continuous movement of large machinery, mining operations and allied activities. However, in the impact zone their movements will continue unrestricted except for the places which will experience heavy vehicular traffic of coal dumpers transporting coal from the mine site to the railway dumping yard.

The current provision of compensation fixed by the state government for different types of damages caused by wild animals is annexed in Chapter- VI.

I-i. Survey of working plan prescriptions for Forests and Wild-life in the study area.

The current working plan of Ranchi Forest Division is effective from 2015-16 and will remain in force up to 2024-25. This working plan was prepared by Mr. Y.K. Das, IFS, the then conservator of forests, Territorial Circle, Ranchi. In order to manage the forests scientifically with an aim to achieve the objectives of management,

Ranchi East Forest Division was constituted as Ranchi Forest Division in the year 2004 vide Govt.of Jharkhand notification no 1/2003-248 dt. 17.1.2004. The total forest area of this Division is about **715.67** sq.km. Ranchi Forest Division had got 7 Ranges namely Ranchi Afforestation Range, Bero, Burmu Range', Ranchi West Forest Range, Kanke and Ranchi East Forest Range, Mahilong, Depot Range, Ranchi Afforestation Range, Ranchi and Ranchi Beautification Range. The forests of this division are fit to the Mixed Dry Deciduous and

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Peninsular Sal forest types as per Champion and Seth's classification. The newly created Ranchi Forest Division came in to existence from April 2013.

The last working plan was prepared by Mr. K.P.Panday, IFS which expired in the year 2013. In the year 2011-12 and 2012-13, budgetary allotments received and the field work started. After collection of primary and secondary data, considerable efforts were made to analyze the collected data to write the Working Plan..

OBJECTIVES OF MANAGEMENT.

The General Objects of management are:

(i) Maintenance, protection and amelioration of the forest cover and the environment.

(ii) Conservation of soil, efficient harvest of water , regulation of its supply and to protect the hill top and steep slopes to minimize soil erosion.

(iii) To associate the local population in the protection and scientific management of the forests and to promote a sense of community ownership.

(iv) To meet the bonafide requirements of the right holders for timber, fuel, fodder and other forests produce to the extent possible and to market the surplus for consumption of non-right holders and export if possible.

(v) To generate maximum annual revenue without damaging the productive capacity of forests and interest of the local people.

(vi) Afforestation in blanks, failed and exploited plantation areas.

(vii) Rehabilitation of the degraded forest areas by planting suitable species.

(viii) Improvement in the population of wild animals and their habitat.

(ix) Effective fire control and grazing regulation.

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(x) And consistent with the above, to have sustained yield of timber, fuel and other forests produce in perpetuity.

Involvement of committees in protection, conservation and management of the forests can be achieved by the development of the protected forests and sharing of the produce with the villagers. The undivided Govt. of Bihar in its department of Forests and Environment has made a resolution no. 5244 dt. 08.11.90 named as 'संयुक्त ग्राम वन प्रबन्धन एवं संरक्षण समिति' for this purpose. After the creation of Jharkhand State, the resolution was modified in 2001 by the Govt. of Jharkhand.

METHOD OF TREATMENT:-

To attain the above objectives the forests of this Forest Division have been divided into different Working Circles (W.C) based on the composition, density, situation and silvicultural needs of the forests.

The Working Circles are :-

(1) Coppice Selection Working Circle.
(2) Rehabilitation Cum Soil conservation Working Circle.
(3) Plantation Working Circle.
(4) Protection Overlapping Working Circle
(5) NTFP Overlapping Working Circle
(6) JFM Overlapping Working Circle
(7) Wildlife Overlapping Working Circle.
(8) Eco-tourism Overlapping Working Circle

CONSTITUTION AND DISTRIBUTION OF AREAS OF EACH WORKING CIRCLE

COPPICE SELECTION WORKING CIRCLE :

The Sal forests of Ranchi Forest Division have fairly good composition with ocular density of above 0.4, the forest with adequate root stock having capacity to regenerate naturally have been

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kept in this Working Circle. Some of the forests of previous Working Plan of different Working Circles which have improved to the above description will be kept in this Working Circle.

The fundamental objective of this Working Circle is to harvest poles and timber of suitable size required by all stake holders in a sustained basis.

Range wise area allotted under this Working Circle is given below :

	Name of Range	Area under Coppice Selection Working Circle.	
		Ac.	Ha.
1	Bero	7213.24	2920.34
2	Burmu	14036.50	5682.79
3	Kanke	6955.37	2815.94
4	Mahilong	15613.54	6321.27
	Total	**43818.65**	**17740.34**

REHABILITATION WORKING CIRCLE

Most of the forests of Ranchi Forest Division have rooted wastes in varying proportion because of excess biotic pressure during the last few decades. Unregulated felling, uncontrolled grazing and fires have resulted in deterioration of the forest vegetation. The density and quality of vegetation in these forests is generally poor. In some of the forests, the density of vegetation is reasonably high but trees are crooked, branched and/or dead & moribund. The soil is hard and compact due to excessive grazing and excessive soil erosion. Also, soil depth is very low and barely support natural regeneration. Such degraded areas with scattered blank patches have been included under Rehabilitation Working Circle in the proposed plan. The major objective is to improve the quality of vegetation and to rehabilitate the ecosystem. The approach is to treat them by fencing of areas, coppicing of high stumps, cleaning of dead and moribund trees,

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singling, taking up soil moisture conservation works on large scale, gully plugging, and regulated grazing etc. to augment and establish natural regeneration.The main emphasis will be to improve the habitat through soil moisture conservation and to improve the crop through proper silvicultural measures.

Range wise area allotted under this Working Circle is given below :

	Name of Range	Area under Rehabilitation Working Circle.	
		Ac.	Ha.
1	Bero	11181.79	4527.04
2	Burmu	33109.61	13404.70
3	Kanke	11768.69	4764.65
4	Mahilong	27935.45	11309.90
	Total	**83995.54**	**34006.29**

PLANTATION WORKING CIRCLE :

Some forests of Ranchi Forest Division have large scattered blank further devoid of trees and vegetation. The soil depth varies depending on the slope and vegetation cover. There are some small hillocks which are bare and exposed which require special treatment. Such blank areas are included in this Working Circle to be planted with the local and indigenous as well as other species which survive in such conditions. The approach will be to take up special intensive Soil Moisture Conservation measures in the bare and exposed hillocks. In relatively plain areas, planting of hardy tree species will be done. In the blanks, adequate care will be taken by fencing the area to protect the plantation. Soil and moisture conservation measures will be undertaken in such blanks to not only check soil erosion but also to improve the soil moisture.

Range wise area proposed under this Working Circle are as below :

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SL.No.	Name of Range	Area Plantation Working Circle.	
		Planted Forest (Ha.)	Area fit for plantation (Ha.)
1	Afforestation Range,Bero	931.920	1967.287
2	Burmu	2113.340	4704.730
3	Ranchi West Range, Kanke	2439.660	1094.690
4	Ranchi East Range, Mahilong	3417.102	3151.730
	Total	**8902.022**	**10918.437**

PROTECTION OVERLAPPING WORKING CIRCLE

This Working Circle has been proposed for entire area of the Ranchi Forest Division. The forests of Ranchi Forest Division are prone to illegal felling, illegal mining, encroachment, grazing and fire etc. These problems need to be redressed. In this Working Circle, measures have been prescribed to protect the forests from illegal felling, illegal mining, encroachment, grazing and fire etc.

NTFP OVERLAPPING WORKING CIRCLE

This Working Circle covers entire forest area of Ranchi Forest Division. There is a fair demand of Non Timber Forest Produce (NTFPs) in the market. The objective of this Working Circle is to improve the yield of existing NTFP species and to induce the concept of sustainable yield and encourage the development and growth of NTFP species by means of protection and scientific management .The forests of the Division are rich in NTFPs. The major NTFPs of the Division are Kendu Leaves, Mahua Seeds and Flowers, Karanj seed, Sal seed and Sal leaf and Kend etc.

The villagers in and around the Division grow lac in Kusum, Ber and Palash trees in the forests as well as outside the forests. Similarly the

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villagers in and around the forest of Ranchi East Range, Mahilong grow tassar insect in the Arjun and Ashan trees in the forests as well as non forest land. The Forest Department is encouraging the lac cultivation whereas the Industry Department is encouraging tassar cultivation The collection and marketing of Kendu leaves is controlled and managed by Jharkhand Forest Development Corporation. The other NTFPs are not regulated by the state government. These are collected by the villagers and locally marketed in haats. Hence, the estimated value of production of these NTFPs is not available in records. There is a need to asses the potential of the NTFPs . Increase in production of NTFPs, skill up gradation and value addition of NTFPs, improving the marketing network will go a long way in improving the economic condition of the people by augmenting the division livelihood opportunities. This will definitely reduce the direct and indirect pressures on forests.

JOINT FOREST MANAGEMENT OVERLAPPING WORKING CIRCLE

This Working Circle overlaps entire forest area of Ranchi Forest Division. The objective of this Working Circle is to involve local people in protection and management of forests. The benefit obtained out of effective protection and management of forests by the local people can be shared between Government and members of Joint Forest Management Committees as per prevailing JFM resolution of the state.

WILD LIFE MANAGEMENT OVERLAPPING WORKING CIRCLE:

This Working Circle covers the entire forest area of Ranchi Forest Division. This Working Circle is constituted to protect and conserve the biodiversity of Ranchi Forest Division and to promote the ecotourism in the potential areas in order to augment/ diversify the livelihood option of the local people living in and around forests. Special attention is to be

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given to rare and endangered species and to take proper measures to improve habitat conditions in term of shelter, food, forage, water and refuse.

ECOTOURISM OVERLAPPING WORKING CIRCLE:

This Working Circle covers the entire forest area of Ranchi Forest Division. This Working Circle is constituted to conserve Forests of Ranchi Forest Division and to promote the ecotourism in the potential areas in order to augment/ diversify the livelihood option of the local people living in and around forests.

I-j. Indicative plan showing location of other projects utilizing forest land in the zone of impact:

As stated earlier in the sub-topic of location, on three sides, North, South-east and West – KDH coal block is surrounded by coal blocks. There are number of operational coal mines within the study area. They are as follow:

(1) Piparwar OCP
(2) Ashoka OCP
(3) Purnadih OCP
(4) Churi UGP
(5) Dakra OCP etc.

Map showing other operational Coal Blocks in the adjoining area is enclosed in Chapter - VI

I-k. List of experts involved in the study and details of their visit in the area. Methodology and sampling procedure adopted in arriving at the facts/findings: Superannuated Forest officers having in depth knowledge of the area and procedure to be followed for preparation of such site-specific wild life management plan were engaged by the consultant firm executing this work who surveyed the area extensively. These retired officers were further supported by local villagers working

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with the JFM committees. The survey teams worked in close association of the local forest officials who were very helpful during the entire field work. The names of the experts and the dates of their visit in the study area is as follows:

1. Sri Premjit Anand, IFS Retd. – A superannuated Indian Forest Service officer, having more than 32 years of field experience. He served in various capacities dealing with core Forestry which included wildlife management, forestry research & extension, agro forestry, plantation, protection, management of forests and extraction & marketing of timber & M.F.P. under Forest Development Corporation.. He has extensive field experience having served as Divisional Forest Officer for divisions like Palamau Tiger Project, Pakur, and Deoghar. He has worked in Indian Council of Forestry Research & Education for seven years which includes implementation of Community Based Agro forestry Project in Bihar. He also has extensive experience in preparation of working plan, wildlife management plan and soil & moisture conservation plan. He has graduated in Endangered Species Management from Durrell Wildlife Conservation Trust, University of Kent, U.K.
2. Sri Sitaram Bhagat, JFS Retd. - Superannuated Assistant Conservator of Forests having more than 32 years of field experience in forestry management and allied issues.
3. Dr. Harishankar Prasad – Ph.D. in Botany, actively associated with Jharkhand State Bio-Diversity Board. An experienced taxonomist having special interest in Ethno botany.

From the very beginning both the forestry experts visited the study area both extensively and intensively. The first visit in the month of June'2023 was for doing a preliminary survey to access the quantum of inputs

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required in the field work. After award of the work, both again visited the area on 14th July'23 when preliminary discussions with the project officials were held for obtaining the required information. Mobilization of the survey teams and detailed discussion with local forest officials was also done. On 22nd September'23 both the experts visited the area again to monitor the progress of survey and to check the primary data collection in the field. A discussion with the project officers was also held. All three experts visited the study area, interacted with the local villagers and visited the sites of importance mentioned in the IWMP of North Karanpura area. The forestry experts again visited the area on 10th October'23 when the final survey work was reported to be concluded for random field verification and for discussing the draft format with the project officers. Meanwhile meetings with Range Officer Burmu and DFO, Ranchi Forest Division were also held for obtaining information and guidance.

For preparation of the desired site-specific wild life management plan, data on various parameters like Forest & its status, Status of wild life, Socio- economic profile of the study area, Demographic details, Land use pattern, Effect on environmental services due to proposed mining activities, Enumeration of man animal conflict in the area, proposed corrective measures and requirement of villagers were needed. The data was collected from both primary and secondary sources. Primary data was collected by visiting the concerned villages by survey teams which constituted of local villagers, mostly active members of JFM committee accompanied by local forest officials in many cases. These surveys were randomly checked in the field by experts. Work of primary data collection was done in all the 3 villages of core area and in 33 villages in the buffer area. Areas rich in forest cover, wild life and having incidents of depredation by wild animals were selected for this purpose.

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For secondary data, many documents were referred to. First and foremost, for deciding the framework, recommendations made in the IWMP of North Karanpura area along with the recommendations regarding the same in the meeting of senior forest officers on 19th February 2019 were studied. Mining plan of KDH coal block, its EIA document and plan prepared for Soil Conservation inside the project area provided useful insight of the environmental components going to be affected by the mining operations as well as the proposed activities to minimize these ill effects. District Census handbook 2011 was the source of data for various demographic parameters and total area of the villages, Working Plan of Ranchi Forest Division was the source of data and information regarding Forest types and cover, Different working circles in the area, Wild life in the area, Cases of depredation by wild animals etc. The GIS cell of the forest department provided the data of elephant movement in the area. Data from the JSAC was the source for depicting forest cover, natural drainage lines etc. on the map. From wild life wing the data of wild animal's census was procured. Analysis of all this data was needed for preparation of this wild life management plan.

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CHAPTER- II

II-a. Impact of project on the environment in general and on Soil, Vegetation, Water regime and Air quality of the area in specific:

This aspect has been examined in detail in the Environment Impact Analysis exercise and the outcome is documented in detail in the EIA/EMP plan prepared by **Central Mine Planning & Design Institute, Ranchi in 2011**. According to this document, as per approved mining plan baseline data had been generated for pre-monsoon season for different components of environment. Various secondary data were collected from different Government Offices. On the basis of collected data and information, environmental impact assessment was evaluated through computer simulation and modelling of different environmental parameters. From the EIA result Environmental Management Plan had been prepared for implementation in the respective areas for eco-friendly mining at KDH Coal Block. For air environment the topographical information of the study area had been collected. Different air pollutants, namely RPM, SPM, SO2, NO2, Pb and CO were identified as related to the project activities for representing baseline status of ambient air quality within the study area. Hourly micro-meteorological parameters, viz. wind speed, wind direction, temperature, rainfall, barometric pressure, relative humidity and solar radiation had also been measured.

II-b. Quantum of pollutants estimated to be produced and its effect on Soil, Water, Air, Vegetation and Animals:

Air Environment

Operation of this mine will generate a series of activities which will impact on air quality. Sources of air pollutants will be due to mining

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activities and non mining activities. There are number of operational coal mines within the study area. They are as follow:

(1) Piparwar OCP

(2) Ashoka OCP

(3) Purnadih OCP

(4) Churi UGP

(5) Dakra OCP etc.

Air pollution includes one or more contaminants (pollutants); in the outdoor atmosphere in such quantities and of such duration that may be injurious to human, plant or animal life. Once these contaminants enter in the atmosphere, either in gaseous form or as particulate matter, these cannot escape and keep circulating and deteriorating the air quality. Air pollution effects encompass those that are health related as well as those associated with damage to property or which cause decrease in atmospheric aesthetic feature. Examples of air pollution effects on human health include eye irritation, headaches and aggravation of respiratory problems. Plants and crops have been subjected to the undesirable consequences of air pollution, including abnormal growth pattern, leaf decolouration and death. Dispersion of air pollutants from the source depends on micro-meteorological parameters of the area. Micro-meteorological parameter is essential to assess the pollution level in the area as well as helpful in taking precautionary measures to control,

Most of the mining source activities generate air pollution and affect air quality due to Drilling, Blasting, and Loading & unloading of coal and OB, Transportation, coal crushing and coal handling plant etc.

Non mining source include road & rail traffic, other industries, domestic fuel etc.

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Most of the sources generate dust. Sources of NOx and SO_2 are operation of diesel/petrol based machinery, locomotives, vehicles and burning of coal. The mining operations result in generation of Sulphur Dioxide, Oxides of Nitrogen, Carbon Monoxide and volatile organic carbon. At present SO_2 emission has been measured at 212.5 kg/day (due to burning of 25000 litres of diesel per day) and NO_2 emission 892.5 kg/day.

Water Environment: The operation of mining and allied activities of this mine would have impact on water quality through generation of waste water in the surrounding areas in the form of Municipal effluents, Industrial effluents, Mine drainage effluent, depiction of various types of surface run off from lease hold area, Surface runoff from OB dump, run off from coal stack area, run off from built up areas etc.

- **Municipal effluents** from residential and service buildings cannot be discharged on either land or inland water sources without proper treatment because it can pollute land and streams. Pollution composition of municipal wastewater of nearby areas are indicated below:

Sl. No.	Parameters	Value
1.	pH	7.0 – 8.0
2.	Total Solid (mg/l)	650 – 750
3.	Suspended Solid (mg/l)	250 – 350
4.	Chloride (mg/l)	100 – 150
5.	BOD 5 day (mg/l)	150 – 200
6.	COD (mg/l)	300 – 500

- **Industrial Effluents**: From the mines workshop of the project washing and repairing of all the Heavy Earth Moving

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Machines, mechanical and electrical equipments, liquid effluents are generated at washing stations and workshops with high concentration of suspended solid, oil and grease, These effluents cannot be allowed to discharge outside.

- **Mine Drain Effluents:** Mine pit would collect water from direct precipitation, surface run off from surrounding areas and seepage from various deep seated strata. This water will be polluted with suspended solid and some oil and grease. If it is discharged in surface water source, it will pollute it.
- **Different types of Surface run off:** Surface run off is generated in core zone, OB dump, Coal Stack Area and built up areas, generally caused by heavy precipitation and passes over various dirty and clean areas and that makes surface run off polluted.

Hydrology: Impact of Coal Mining on ground water system can be

Except rainy season there is very less or no problem of surface runs off.

- **Ground Water:** As per EIA report depth of ground water ranges from 3 m to 12 m in post monsoon period, whereas it goes down to 4 m to15 m during summer.
- **Ground Water Recharge:** Drainage study of the area shows that in the northern and western boundary consists of forest and hill and act as water divide, Topography of the area indicates that the drainage system in the area is separately developed and mainly first, second and third order of stream are abruptly disappearing. This indicates low infiltration of rainfall, which is calculated as 13%, and

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quantum of which has been calculated at 38.15 M Cum/year.

- **Ground Water Movement:** Major area of the coal block is covered with forest. EIA studies shows that water table for the top aquifer is sloping towards southeast, which is general topographic slope of the block. It was observed that water levels of top aquifer fluctuate from 3 m to 5 m.

Noise Environment

Mining activities always associated with occupational health hazards. Exposure of high noise levels is one of them. With high mechanization of coal mines in India, the noise hazards is gradually increasing. Again blasting of coal and O.B. in coal mines is not only a source of noise hazards but also a major safety hazards to man and material. In order to carry out mining operation in an environmental friendly manner, it is essential to adopt noise abetment and blasting vibration control plan.

Land Environment: The proposed mining and allied activities will alter the land use pattern in and around the mining complex in various ways. Topography and land scenario will change completely due to digging of open pits and overburden in the form of large heap. Soil characteristics such as erosion aspects, soil fertility etc have direct bearing on the environment.

Mitigation of Land Environment

In the adjoining areas, soil type is silty, sandy, loamy, clay followed by sandy loam with medium percolation. However, every precaution will be taken to avoid spillages on soil during construction phase to protect groundwater quality and soil microbiology along the rail route.

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Excavated top soil will be preserved at suitable location and it will be used during reclamation. Temporary drainage channels will be provided to minimize soil erosion. Exposure of soil susceptible to wind and water erosion and sediment build up in natural drainage courses along the rail route will be minimized by adoption of erosion control measures such as raising shrubs and grasses. .

Biological Environment

The mining activities in a region directly and indirectly affect the living beings surrounding the area. The limited resources available in the region are faced with the exploitation due to competition among different species creating an impact in the habitat of the various fauna of the region. However, mining is a temporary land use because the mineral deposit is finite and eventually exhausted. The social and legislative context of mining in many parts of the world today means that some form of land rehabilitation goals will have to be set for the pre operation and post closure situation. Also, various infrastructure to facilitate the livelihood and sustenance of the local people are effectively implemented through various projects under CSR which also provide alternate resources to the humans which makes the exploitation of previous resources to reduce to a much lower level, hence various fauna of the region will remain free from the competition. There are no endangered species in the Core Zone, which is the mining lease area, but has some species listed in Schedule II of the WPA,1972 and whose conservation should not be ignored. In the buffer zone, it can be seen that there is presence of Elephants during their migration. Though the buffer zone is not an Elephant Corridor *(Ref. Right of Passage, Elephant Corridors of India, Wildlife Trust of India)* but is occasionally visited by Elephant and thus should be conserved. The

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core zone is at distant location from the possible zone of occurrence of the elephant thus no loss of resources such as food, water and shelter are expected from the operations which are confined to the core zone. Also, creation of green belt in the core zone as sustainable initiative will act as an add on to the setup of a suitable habitat ecosystem development for species in the core zone.

Coal mining is involved a range of disturbing activities including excavation, civil works, road and infrastructure development. Nuisance related impact will include dust, noise and vibration. These impacts may be local on species for long period and these effects are likely to result in more than temporary, making nuisance to sensitive species near to proposed mine, road/rail route, other possible impacts during construction phase like bush fires, road and open trench, hunting etc. were also studied and mitigation measures provided accordingly.

- Prevent littering of work site with waste, especially plastic and hazardous wastes
- Awareness among the drivers in order to regulate speeding and avoid road kills.
- Policy for road safety which sets speed limits for vehicle operating for mining and allied operations.
- Compensatory afforestation needs to carry out in association with forest department

II-c. Degradation anticipated due to project implementation with Qualitative changes in the wild-life habitat pattern in the study area.

Opencast mining operations involve the removal of huge quantities of overburden, dumping, and backfilling of the excavated area. These overburden deposits of waste material containing low-

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grade ores are represented as mine spoil dumps. The degraded land due to mining activities and overburden of stockpiling of mine discards results not only in the formation of the unsightly landscape but also is associated with the pollution of terrestrial and aquatic ecosystems. The gradual increase in such landscapes created due to extensive mining activities may endanger the agro-forest productivity of the country as well as the ecological balance.

Mining activities generate a large number of waste rocks and tailings which get deposited at the surface. The land surface is damaged and the waste rocks and tailings are often very unstable and will become sources of pollution. Land degradation due to mining may reach alarming proportions mainly due to over-exploitation and mismanagement of natural resources. One of the consequences of the ever-increasing human population, supported by accelerated land degradation is the lowering of the man to land ratio. Therefore, there is an urgent need to address the major environmental issues which are the outcome of the mining activities. The issues include the destruction of habitat and biodiversity at the mine site, ecosystem/habitat/biodiversity protection in adjacent land, landscape/visual impact/loss of land-use, site stabilization and rehabilitation, mine waste/tailings disposal, air emissions, dust, climate change, siltation and changes in river regimes, effluent discharges and acid drainage, groundwater alteration or contamination, workplace health and safety, the impact of metals toxicity and settlement issues around mines. Considering all these issues, the overall reclamation of overburdened/wasteland is a challenging task. The main challenge in the restoration of these degraded/wastelands are sustainable biodiversity and management of the mine spoils dumps and the adjoining area.

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II-d. Various threats to the flora and fauna due to project implementation and increased biotic pressure:

Threats to flora:

Mining usually requires blasting and the removal of trees and plants in the mining area. Coal mining increases the risk of loosening top soils into streams and waterways and the sediments pollute our water and can smother plant life downstream and even kill fish. Coal has traces of sulphur and nitrogen.

Threats to Fauna:

Coal mining has serious, lasting negative impacts on wildlife. In the short term, species can be killed or displaced from their habitat. In the long term, many wildlife species face severe impacts resulting from their habitat being destroyed.

Mining tends to have its biggest impact to animals in destroying animals' ecological habitats. However, if the mine is reclaimed at the end of its life, these habitats can be restored through proper reclamation. Most mines last somewhere between 20-100 years.

Mines that are not closely regulated can also produce a lot of local air pollution that can impact wildlife (trucks and shovels burning diesel). Runoff from mines can also contaminate local water supplies such as rivers, creeks and lakes. This contamination can cause the death of wildlife and/or cause genetic mutations in offspring.

II-e. Probable increase in the vehicular traffic and its impact:

The transport of coal represents one component of the complete coal cycle—from exploration and extraction of the fuel, through

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beneficiation, storage, and finally, its conversion to an end-use product for consumers. Like all components of the cycle, environmental impacts result from the transport of coal. Coal transportation is executed by rail, truck, water, and slurry pipeline or conveyer belt. Environmental impacts of coal transport occur during loading, en route, or during unloading. The impacts are likely to affect "natural" systems, including agriculture, forestry, horticulture, and aquaculture, buildings and installations, and involve death or injury to humans in an occupational capacity, or to the public. The environmental impacts of coal transportation on humans has always been a matter of grave concern. All forms of transport of coal, exhibit certain common environmental impact features. The transport of coal in all its forms necessarily involves fugitive dusts, even though precautionary measures are taken. It is necessary to keep estimates of the environmental impacts of coal transport in perspective to other components of the coal fuel cycle, other means of electricity generation, and the hazards experienced by human beings in everyday life

II-f. Water, Air, Noise and Underground pollutions and its impact on flora and fauna.

The expected impacts are described below:

1. Removal of almost all the vegetation and thereby fauna from the area required for mining & other purposes.
2. Reduced water availability from underground sources in the surrounding areas as in both the underground as well as opencast mining, in sedimentary deposits the aquifers over the deposit being mined are disturbed.
3. Water of the surface water bodies gets polluted due to leaches from dumps and other effluent discharges from mines and other activities.

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4. Noise and vibrations from blasting and other mining and associated activities disturb peace and tranquillity of wildlife and birds. As a result, the wildlife migrates to the surrounding forest areas.

5. Dust in atmosphere, contributed by mining and associated activities, when deposited on the leaves of the plant retard the plants progress. The pollution of water in the surrounding water bodies.

6. Loss of forest and other ecological services.

Impact on Insect Fauna

Since mining activities in KDH OCP area will include drilling, blasting, excavation, in-pits transportation and disposing of overburden, it can affect the biodiversity of the area as a result of;

- Large scale natural habitat destruction of ground insects through open cast mining.
- Pollution of river and ground water
- Overburden from the mining faces

The mining activities will affect the food chain ultimately disturbing the ecological balance. First and foremost, the deforestation of the area will affect the insect fauna particularly Hemipteran bugs which feed upon the plant sap and the largest order Coleopteran which are maximum scavengers and aerator of soil. The shrubs and grasses will be lost and land will get directly exposed to the sunlight decreasing the moisture content of the soil ultimately affecting the ground dwellers and terrestrial insects

During drilling direct mortality of various insects which are ground dwellers acting as scavengers and helping in the aeration of soil is predicted. Due to this there will be the indirect impact over the fertility of soil decreasing the nutritive value of that particular site

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Blasting and excavation will affect directly the ground dwellers since they would get exposed due to disturbance of their major habitat. The microbes, birds and their predators would be indirectly affected due to the mortality of the ground insects since many insects, birds and microbes feed upon them. The plants will also have affected if these natural scavengers get disturbs of their work of scavenging the dead and decaying material to simple from helping microorganisms and decomposing it and providing nutrition to the plants through soil. If the plants productivity is disturbed, the entire food chain will be affected ultimately disturbing the ecological balance.

II-g. Study techniques adopted and observations of the experts in the field giving details of visit, area visited, observations, records referred to, adopted sampling method and justification of extrapolation.

The detail of field visits has been given in the chapter I. For the subject matter of this chapter the EIA/EMP prepared by CMPDIL, Ranchi in June'2011 has been largely relied upon along with the mining plan. As per EIA report of KDH OCP it has been discussed that coal mining is one of the core industries that contribute to the economic development of a country but deteriorate the environment. Being the primary source of energy coal has become essential to meet the energy demand of a country. It is excavated by both opencast and underground mining methods and affects the environment, especially water resources, by discharging huge amounts of mine water. The mine water may be acidic or neutral depending upon the pyrite content in the coal as inorganic impurities. Acid mine drainage occurs in those mines in which sulphur content is found in the range of 1–5% in the form of Pyrite (FeS_2). It degrades the water quality of the region in terms of

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lowering the pH of the surrounding water resources and increasing the level of total suspended solids, total dissolved solids and some heavy metals. In non-acidic mines, water quality shows high hardness, TSS and bacterial contaminants. The leachate water from overburden dump is found enriched in metal concentration especially Fe, Cu, Mn and Ni. High values of hardness of mine water reduces its utility in domestic purposes. Pollutants such as TSS, TDS, oil and grease and heavy metal are found in the coal mining waste effluents. Management of these liquid waste at the primary level and secondary level have also been suggested to control the pollution level at the source

According to the findings of EIA report, opencast coal mining creates more air pollution problem in respect of dust and the fines contain coal particles, benzene soluble matters etc. To maintain the energy demand, opencast mining has been growing at a phenomenon rate in India. There is no well-defined method for assessing the impacts on air quality due to mining projects. An investigation was conducted to evaluate the impacts on air quality and the characteristics of the air-borne dust due to opencast coal mining in Indian context. The study area has been described and the sources of air pollution were identified. Methodology adopted for the selection of air monitoring stations and air pollution monitoring to evaluate the impacts on air environment due to coal mining activities have been discussed. Impacts on air quality have been assessed on the basis upwind and downwind concentrations of air pollutants. SPM and RPM concentrations were found to be very high in work zone as well as surrounding locations. The SPM was subjected to particle size analysis using different techniques. It was observed that the particulates were more respirable in nature and the

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median diameter was around 20 w. Variation of weight percentages for different size ranges has been discussed as a function of mining activity. Benzene soluble matters and anions in SPM were found to be high in comparison to other areas. Settleable dust and its compositions were also analysed using suitable methods.

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CHAPTER – III

This chapter deals with the objective of management and various strategies prescribed for encountering the same, especially in the case of wild-life. The effect of mining and allied activities over the area with respect to the base line data and the envisaged scenario with and without the mitigative measures, for various environmental parameters, have been discussed in the previous chapter. In this chapter the focus is on wild life, identification of the issues related to its protection, conservation and development specifically in the study area. Ways & means of reducing man – animal conflict and to manipulate the ecosystem by such interventions that the result is beneficial for all the stakeholders.

Some of the issues related directly to wild-life safety and well being due to mining and ancillary activities are:

a. ***Loss of habitat its Fragmentation and Degradation:*** The very first activity in the course of starting a mine is clearing of the entire vegetation from the area proposed for mining. This removal of vegetal cover breaks the continuity of forest cover from the adjoining areas which results in fragmentation. The subsequent activities act as catalyst in causing further degradation of the habitat.

b. ***Threat of physical harm to the wild animals:*** The various activities of mining including blasting, digging, transporting inside the project and to the railway dump yard involve the risk of causing physical damage to wild animals due to their very nature of operation. They can sustain injuries from flying boulders or can be run over by careless drivers operating heavy trucks loaded with coal.

c) ***Negative impact on the availability of Food, Shelter and Water in the zone of impact:*** The activities of the coal mine adversely

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affect the basic requirements of wild animals. Due to fragmentation and degradation of habitat added with disturbance in aquifers results in less availability of these basic requirements.

d. ***Increased biotic pressure:*** With the opening of a mine all activities in that area are increased many folds. The requirement of huge manpower in operating open cast mine creates numerous job opportunities. The influx of people to fulfil this requirement in turn gives rise to many service requirements which in turn create new job avenues. All this results in exponential growth in the population of that area and the already strained ecosystem is under additional pressure of catering the ecological services to the entire population.

e. ***Increased risk of fire hazard:*** Due to increased population the activities are also increased in the area which used to be tranquil in the past. Increased biotic pressure also increases the risk of fire hazard in the forests during fire season.

III-a. Objectives of management for addressing Wild-life conservation issues due to project implementation:

Formulation of this site-specific Wildlife Management Plan has been done while keeping in mind the following objectives for redressal of the environmental issues, which are bound to come up due to the side effect of mining and allied operations.

- To compensate the loss of vegetal cover in the core area due to complete removal of vegetation from the mine area.
- Habitat improvement in the buffer area aiming at betterment of food, water and shelter conditions in the area.
- To check the accelerated soil erosion bound to happen due to mining activities in the core area.

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- Implementation of soil and moisture conservation measures in the buffer area.
- To keep the air pollutants under permissible limits by using appropriate techniques.
- To minimise the water pollution and ensure measures for improving the ground water availability in the area.
- Measures for dampening the effects of noise pollution due to heavy machinery.
- Removal of undesirable species from the area and to promote the conservation of important indigenous species.
- To reduce the fire hazard in the area by adopting both preventive and protective measures.
- To minimize the chances of any physical injury to wild animals due to mining or any allied activity.
- To ensure measures for fulfilling the requirement of salt and other essential elements to wild animals.
- Capacity enhancement of local villagers for increasing their income from NTFP and also by improved agricultural practices.
- Creation of awareness among local people about Environment and environmental issues, especially Forestry and Wild-life for their voluntary involvement in the redressal strategies.
- Creation of an additional source of income for the members of Joint Forest Management and Protection committees.
- Creation of large water bodies in the buffer area to be used by villagers and wild animals both.
- To prescribe measures for reducing the Man- Animal conflict in the area by avoiding confrontation.
- Capacity enhancement of the local forest officials for effective patrolling and control of crimes against forest and wild-life.

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- Capacity building of forest department personnel by imparting appropriate training.

The instant Wildlife Management Plan aims at maintenance of optimal habitats in proper stage of productivity and to ensure repair of already sustained damages or which may be inflicted on the habitat through mining and ancillary activities. Managing an ecosystem which is about to face the operational hazards due to a opencast mine in such a way that the ecosystem services are barely effected is a huge task for which the co-operation of all concerned parties – the forest department, the user agency – CCL KDH OCP in this case and the local people is extremely important. To attain this synergy, various measures have been prescribed in the plan which are dealt in detail under Chapter IV (the activities to be ensured by the project itself) and Chapter V (activities to be implemented by the forest department). However, a gist of measures prescribed to counter the envisaged negative impact is given in fore coming paras.

III-b. Strategies to mitigate and minimize the anticipated adverse impacts:

The strategies to combat the anticipated negative impacts of mining and ancillary activities are dealt in detail under two different chapters. The first part comprises of the activities to be undertaken by the project proponent for mitigating the envisaged effects by appropriate measures in the project area. These measures are enumerated in the Mining Plan, Environment Management Plan, Soil Conservation Plan and in the conditions imposed by Govt. of India, MoEF&CC, at the time of granting environmental clearance to the project. A summary of the activities to be undertaken by the project proponent is listed below.

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List of activities to be undertaken by project proponent in the project area:

1. Proper Mitigative measure to minimize soil erosion and choking of streams shall be prepared and implemented.
2. Construction of check dams, retention/toe walls to arrest sliding down of the excavated material along the contour.
3. No damage shall be caused to top soil and user agency will follow the top soil management plan.
4. Proper Garland drains shall be made before every monsoon at the periphery of active edge of quarry and around dumps to prevent the surface rain water to enter the quarry.
5. In order to minimize the land requirement for external dumping, internal dumping has been prescribed. The minimum required external dump is to be treated for afforestation and for minimizing the soil erosion.
6. Reclamation of land will be carried out by landscaping, soil amelioration and re-vegetation. For re-vegetation, the native plants and saplings suitable for the existing soils and site conditions will be considered.
7. Appropriate measures for checking the air and noise pollution are to be ensured like sprinkling of water on the roads and use of sound dampeners in heavy machinery.
8. The haulage roads are to be flanked by trees on either side which will reduce the noise as well as air pollution.
9. A belt of trees with thick canopy will be created along the mine boundary to intercept dust, gaseous pollutants and noise.
10. The water discharge from the area is to be separated into two categories – clean and dirty. The clean water will be allowed to flow into natural drainage lines, whereas, the dirty water will be sent in a

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course of treatment. After removal of pollutants this water will be put to different use or allowed to flow in natural drains.

11. Runoff from OB Dump, Construction Site, Coal Dump and built-up areas will be channelized to sedimentation lagoon. The clear overflow water from lagoon will flow out to nearby natural streams.

12. Trees would be planted all around the administrative buildings, infrastructure buildings, coal storage site. Avenue plantation and strip plantation will be done all along the roads and in the colony area. All the drainage system will be cleaned regularly and more frequently in monsoon season

13. A Gabion wall of 1.5 m height will be constructed all around the OB dumps. It would prevent the dump materials from spreading outside the Gabion wall. A garland drain of size 1.5m x 1.0m will be constructed all around the gabion wall.

14. A separate Environment Management Cell with suitable qualified personnel has to be set up under the control of a senior executive who will report directly to the head of company.

The above listed activities are not exhaustive and they indicate that every possible step has been incorporated in the EMP, Soil conservation plan and in the awarded environmental clearance to safeguard the environmental interest and will result in positive change of 9 EIU of the area.

Interventions by Forest Department:

All interventions proposed in the chapter V of this Wildlife Management Plan are for buffer area and have to be implemented by DFO, Ranchi Forest Division as the entire zone of impact falls under his jurisdiction only. For implementation of these measures CCL will deposit the fund demanded by the department as per approved budget of the instant Plan in the CAMPA account.

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Following are the broad fields in which suitable schemes have been proposed for attainment of the objectives of this plan.

1. ***Wildlife habitat protection and development*** – Under this broad head schemes for Forest restoration by Water Conservation cum Plantation Scheme for Rehabilitation of degraded forests, Decongestion of Bamboo forest are to be implemented in consonance with the prescriptions of the current working plans. Further provision of Salt licks, Digging of new waterholes and their maintenance along with eradication of invasive weeds are also prescribed.
2. ***Improvement of water regime and its maintenance*** – Schemes of Contour cutting and Soil & moisture conservation as per departmental norms will be undertaken. Other measures like Construction of Pucca (Masonry) Check-dams and desilting of existing ponds/check-dams have been proposed in the Soil & Moisture Conservation Plan of KDH OCP for attainment of the objective.
3. ***Measures for anti-depredation and Wildlife protection*** – Aiming at the reduction in man – animal conflict and facilitating the field staff for quick and effective action measures like Early warning system for elephant movement, Provision for 10 motorcycles for field staff and its running cost and Incentive for members of JFM engaged in anti-depredation tasks, construction of watch tower for monitoring and procurement of rechargeable torches, cracker, kerosene oil etc., installation of solar street light and high mast light have been prescribed here. In addition to it establishment of Wildlife Monitoring and anti depredation cell has been proposed to monitor and mitigate human-wildlife conflict issues.

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4. ***Fire prevention and protection of habitat*** – These include procurement of fire fighting tools, GPS and other equipments and scope for engagement of JFMC members in fire fighting exercise.
5. ***Livelihood & Capacity building and training of local people*** – Under this category schemes for empowering the local populace in the fields of Value addition to NTFPs, Improved farming practices and for reducing their dependency on forests are prescribed which will on one hand improve the socio-economic condition of the villagers and will also result in better health of forests, on the other, due to reduction in biotic pressure.
6. ***Capacity building of Forest Department personnel*** – This part contains training programme for forest personnel aiming at resolution of man – animal conflict and on the subject of Forest and Wildlife conservation so they are aware of the latest techniques and concepts.
7. ***Supervision at division level*** – Provision for purchase of two patrolling vehicles and its maintenance for 10 years has been made in the plan to facilitate the management interventions and their close monitoring. In addition to it procurement of night vision camera, binocular, range finder and drone have been proposed for better monitoring.
8. ***Awareness generation and Documentation*** –Awareness among the local people about the importance of forests and wildlife and educating them about the desired behaviour is of crucial importance for the success of the proposed schemes. In addition to that, proper documentation of the progress made is equally important. For these objectives provision for organizing Awareness camps, Printing of booklets/pamphlets/banners, Fixing of awareness signage and

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documentation of the undertaken activities have been done under this section.

Expected Pollution due to Coal Transportation by Hyva

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CHAPTER – IV

Proposed management strategies within the project area to be implemented by the project proponent

Impacts of mine area on environment, biodiversity and social aspects:

Mining activities in KDH OCP area will include drilling, blasting, excavation, in-pits transportation, disposing of overburden and transportation of coal to railway siding. Impact of mining on Flora and Fauna is clearly envisaged in terms of Fragmentation of Habitat, Removal of entire natural fauna from mining area, loss of tranquillity in habitation of wildlife due to blasting (Noise and Vibration), dust deposit on the leaves of the plant that retards the plants growth, mortality of ground dwellers and terrestrial insects, Change in soil quality, disturbance to natural scavengers, shortage of food resources for wildlife, Migration of wildlife, loss of water bodies, Depletion of Ground water sources due to disturbance of sedimentary aquifers. Increased anthropogenic activities will increase the risk of forest fires. Approximately 450 times/day trucks will make rounds for transportation of coal. In this challenging situation works aiming at habitat improvement and protection have to be implemented. Proper mitigative actions to address these issues have been prescribed in the Soil Conservation plan and Environment Management Plan of KDH Coal Block.

Proposed management strategies:

A holistic approach has been attempted in the conservation plan for conservation of endangered fauna and flora of medicinal and other importance towards minimizing the ill effects of mining by creating awareness in the local people, empowering the forest department and engaging the user agency as a partner in entering to an era of sustainable development, which is ecologically bearable, economically viable and socially equitable.

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A. Activities to be undertaken in compliance of FC Stage-I condition no. (A) 7, and (B)13 (ii, iii, iv & v):

1. **Planting of Draught Hardy Species:** CCL authorities will undertake planting of draught hardy species within the mining lease area to arrest soil erosion under the guidance of state forest department. It has also been prescribed in EIA & EMP report of KDH OCP in detail. Adopting various suitable preventive measures against the soil erosion and air polluting activities arising due to mining operation, it is also necessary to use some suppressive measures to mitigate any residual effect of pollution. Summary of same have been enlisted below:

   - **Green Belt**: Various preventive measures have been proposed in the plan to be implemented by the Forest Department. The Project Proponent will undertake green belt development within mining lease area to suppress and mitigate air pollution, soil erosion, water pollution and it will also have effect in carbon sequestration. Green belts provide much needed fodder, food, MFP and non wood forest produce. Different types of green belt will be created in the project area at strategic locations.

   - **Avenue Plantation:** It will cover trees/hedges on both sides of different roads i.e. Haul road, Link road to mine, township and township roads. Objectives of avenue plantation are:
     - To act as wind shield and thus break wind speed. It will help in prevention of dust at road surface from getting air borne.
     - Will provide shade
     - To absorb air borne dust

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- To absorb noise energy and thus reduce noise pollution

➢ **Strip Plantation**: Strip plantation is single/multiple row linear plantation around the area likely to generate air pollution. It is proposed to be done around mine pit and around service buildings. Basic objective of Strip Plantations are to

- Act as wind shelter and prevent air pollution
- Act as natural sink to absorb dust and sequester carbon
- Act as a medium to reduce noise pollution and absorb noise energy

➢ **Block Plantation**: There are some plots of land within the project area and the township for which no specific use has been identified. It is proposed to use them for mixed plantation @ 2500 plants per ha. as per existing norms/scheme prevalent in the Forest Department. It will be undertaken in Township, Mining Area and Interface Area. Broad objective of Block Plantation are:

- Improvement of general environment
- Improvement of aesthetic view
- Checking of Soil Erosion
- Control of Air Pollution
- Provide visual barrier between mining area and villages
- May provide MFP and NWFP

Selection of Species: A great attention is required for selection of species for above plantations. **In any case monoculture will never be adopted**. Following aspects would be considered for species selection:

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- Economic importance
- Ecologically sound
- Use indigenous species so far as possible
- Draught hardy
- Suitable to local climate
- Able to survive in high pollution areas
- Aesthetic value

Suggested Species: A list of species suggested for plantation of mixed species is given in following table according to situation and needs:

For Avenue and Strip Plantation	For Block Plantation	For Block Plantation in Township & Village side
Zizyphus mauritiana	*Emblica officinalis*	*Emblica officinalis*
Acacia auriculaeformis	*Buchanania latifolia*	*Buchanania latifolia*
Syzygium cumunii	*Tamrindus indica*	*Tamrindus indica*
Hardmikia binata	*Atrocarpus lakoocha*	*Atrocarpus lakoocha*
Ficus religiosa	*Ficus religiosa*	*Ficus religiosa*
Acacia nilotica	*Ricinus communis*	*Ricinus communis*
Azadirachta indica	*Terminalia belerica*	*Terminalia belerica*
Terminalia arjuna	*Terminalia arjuna*	*Terminalia arjuna*
Delonix regia	*Delbergia sisoo*	*Delbergia sisoo*
Millettia pinnata	*Albizia lebbeck*	*Terminalia tomentosa*
Neolamarcka cadamba	*Schleichera oleosa*	*Albezia lebbeck*
Ficus benghalensis	*Millettia pinnata*	*Atrocarpus integrifolia*
Pithecellobium duice	*Ficus benghalensis*	*Mangifera indica*
Albizia procera	*Madhuca indica*	*Aegla marmelis*
Jacaranda mimosifolia	*Pterocarpus marsupium*	*Pterocarpus marsupium*

2. Construction check dams, retention / toe walls to arrest sliding down of the excavated material along the contour:

Drainage:

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1. Contour trench of dimension 5m X 50cm X 50cm will be dug / created along the river side of Damodar River, nala and sloppy areas in the staggered manner along the contour.
2. Series of check dams will be constructed at suitable locations at an interval of 150M to 300M. These check dams will be desilted in every 2 years.
3. Gully plugging with loose boulder and vegetative methods will be undertaken in the areas susceptible to soil erosion.
4. Proper Garland drains shall be made before every monsoon at the periphery of active edge of quarry and around dumps to prevent the surface rain water to enter the quarry.
5. Suitable drainage gradients will be provided for mine benches.
6. Sumps of adequate capacity will be provided on the quarry floor
7. The coal excavation and transport machinery will be organized to be situated over the coal bench top and will not be affected by water accumulation from rains or strata seepage.

Desiltation of Ponds/ water bodies within lease area:

The presence of silt in water bodies and ponds in coal mine areas can be attributed to various factors, often related to mining activities and the surrounding environment. Here are some common causes of siltation in water bodies and ponds in coal mine areas:

Soil Erosion:

During coal mining operations, the removal of vegetation and topsoil can lead to increased soil erosion. Rainfall and surface runoff can carry eroded soil particles into nearby water bodies, causing siltation.

Overburden Handling:

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The disposal of overburden (the soil and rock layers removed to access coal seams) can create large piles of loose material. Wind and water erosion can transport fine particles from these piles into water bodies.

Mining Activities:

The excavation and blasting associated with coal mining can disturb the ground, causing soil particles to become suspended in nearby water bodies.

Road Construction:

The construction of access roads and haulage routes in coal mine areas can expose bare soil. Rainwater runoff from these surfaces can transport soil particles into water bodies.

Waste Disposal:

Improper disposal of waste materials, including coal dust and slurry, can result in the release of fine particles into water bodies, leading to siltation.

Lack of Vegetation:

The removal of vegetation during mining activities reduces the natural filtration capacity of the land. Vegetation helps stabilize soil and prevent erosion.

Storm water Runoff:

Heavy rainfall events can wash sediment from exposed surfaces and mining areas into water bodies through storm water runoff.

Poor Erosion Control Measures:

Inadequate erosion control measures, such as silt fences, sediment ponds, and revegetation efforts, can fail to prevent soil from entering water bodies.

Infrastructure Development: Infrastructure construction associated with mining operations, such as settling ponds and dams, can disturb natural drainage patterns and contribute to siltation.

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Illegal Mining:

Unregulated or illegal mining activities may not implement proper erosion control and environmental management practices, exacerbating siltation problems.

Natural Geology:

The geological characteristics of the area, including soil types and sedimentary formations, can influence the natural presence of silt in water bodies.

Climate Conditions:

Extreme weather events, such as heavy rainfall or storms, can lead to rapid sediment transport into water bodies.

Inadequate Water Management:

Poorly designed or maintained water management structures can fail to control sediment runoff effectively.

To mitigate siltation in water bodies and ponds in coal mine areas, it is essential to implement proper environmental management practices, erosion control measures, sediment control structures, and revegetation efforts. Additionally, adequate measures will be undertaken by the CCL authorities for desiltation of ponds and other water bodies falling within the lease boundary of KDH OCP at an interval of every 2 years.

3. Stabilization of overburden dumps by appropriate grading / benching:

- Dumping of top soil will be avoided at the bottom of the cut as it leads to in stability. Dumping of soil and clayey material will be done away from the working area, which is on farther end of the dump so that formation of weak planes is avoided.
- Afforestation by planting trees will help a lot in improving stability of dumps by preventing erosion.

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Reclamation of overburden dumps:

- Stabilization of overburden dumps
- Construction of retaining walls
- Construction of drain for drainage
- Provision of jute mesh for facilitating grass or vegetative growth on slopes
- Provision of good soil mixed with manure and subsequent irrigation for growth of grass for anchorage on slopes. Plantation mixed with indigenous and fast-growing plant species
- The degraded area will be reclaimed and rehabilitated with local species of plantation in a phased manner;
- Plantation will be carried out on waste dumps;
- The haulage roads will be flanked by trees on either side; and
- A belt of trees with thick canopy will be created along the mine boundary to intercept dust, gaseous pollutants and noise.

1. Top Soil Management:

Managing topsoil in an open-cast coal mine requires careful planning and execution to minimize environmental impact and support reclamation efforts. Here is a general method and process for topsoil management in open-cast coal mines:

Topsoil Stripping: Before mining operations begin, the topsoil in the mining area must be carefully removed and stockpiled separately. This topsoil contains valuable organic matter and nutrients necessary for plant growth.

Stockpiling Topsoil: Create designated topsoil stockpiles near the mining area to store the stripped topsoil. These stockpiles should be protected from erosion and contamination.

Mining Operations: Begin the coal mining operations, following all safety and environmental regulations.

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Overburden Handling: Overburden (the soil and rock layers above the coal seam) should be removed and stored separately from topsoil to facilitate reclamation.

Topsoil Protection: Throughout the mining process, take measures to protect the stored topsoil from erosion, contamination, and compaction. Covering it with mulch or erosion control mats can help.

Reclamation Planning: Develop a reclamation plan that outlines how and when the topsoil will be used to restore the mined-out areas.

Reclamation Process: After coal extraction, reclamation begins. The process may include reshaping the land, amending soil, and planting native vegetation.

Topsoil Application: The topsoil stockpiles are spread evenly over the reclaimed area to reintroduce the valuable organic material and nutrients. Proper grading and compaction are essential.

Vegetation Establishment: Plant native vegetation suitable for the local ecosystem. This helps stabilize the soil, prevent erosion, and restore the natural habitat.

Monitoring and Maintenance: Continuously monitor the reclaimed area for vegetation growth, soil stability, and any signs of erosion. Make adjustments as necessary to ensure successful reclamation.

Involve local communities and stakeholders in the reclamation process, ensuring their concerns are addressed and that the reclaimed land serves their interests. It is essential to work closely with local authorities, environmental agencies, and experts to tailor the topsoil management and reclamation process to the unique characteristics of the area and the coal mine operation.

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Prescriptions of Mine Closure Plan in this regard may be followed strictly.

2. Steps Taken by CCL for Environmental Protection:

(i) Dust Suppression

Water sprinkling system is provided at crushers and siding to check the fugitive emission of dust. Water sprinkling by mobile water tankers is also done at roads.

23 Fixed water sprinklers have been installed at siding.

Adequate number of dust mask are been distributed to the personnels working in dusty areas.

(ii)Rain water harvesting

Mine Sumps (~ 150 million gal capacity) are used for rain water harvesting purposes. Also rooftop rainwater harvesting system has been created in project office building Rain water harvesting pit construction has been completed at ATC, NK area.

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Three Sedimentation tanks are provided to treat water. The water from these sedimentation tanks is used in water sprinkling

(iii)OB Stabilization

Dense plantation on OB dumps has been done to prevent any overflow of OB into the river or nallah . Also there are no agricultural fields near KDH mine.

Construction of toe wall to prevent overflow of OB

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All the OB generated during mining operation is being dumped in the decoaled quarry area. Also once the active dumps reached required height from the mine floor biological reclamation of the same is done.

The details of reclamation is as follows

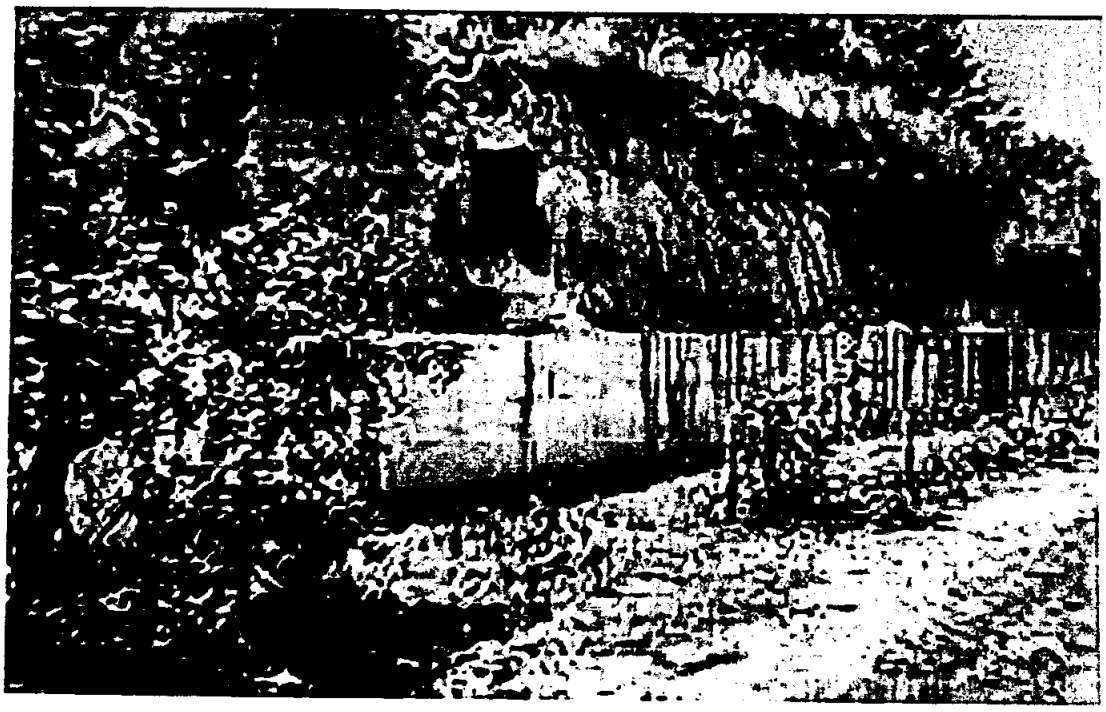
Land Broken = 353 ha

Land used in infrastructure = 179.82 Ha

Technically Reclaimed area = 198 Ha (approximately)

Biologically reclaimed area = 185.88 Ha

Plantation in an area of 4.00 ha has been done in 2018-19



(iv)Catch drains and siltation ponds

Catch drains are constructed near the OB dumps .The drains are regularly cleaned Catch drains are being constructed and siltation ponds are provided. 1 mine sumps with a combined capacity of about 70 million gallon and high water retention time have been developed in the mines. The project has also constructed 3 artificial sedimentation tanks for

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treatment of wastewater. The treated water is then used in water sprinkling system in the railway siding

(v) Plantation

Progressive plantations in consultation with forest department of Jharkhand is carried out. However more plantations will be done throughout the life of the mine . Plantation around 6.6 km roads have been done in the project. . Plantation over embankment has been done. Length of embankment is about 1.2 km.

(vi) Air quality monitoring

Monitoring of environmental parameters are done every fortnightly by CMPDIL. Monitoring stations at PO office, Bhooth Nagar Colony, Water Tanker Filling Station, Karkatta Village, Bishrampur Village and KDH siding colony has been established. Fortnightly analysis of environmental parameters is done at these points

(vii)Noise Pollution

Adequate measures for control of noise pollution have been taken. Ear muffs are continuously been distributed to the personals.

Also Noise level data is being monitored in the core zone.

(viii) Groundwater Monitoring

Regular monitoring of the underground water level is being carried out by a network of existing wells and peizometers

New peizometers are being installed as required in and around the core and buffer zone.

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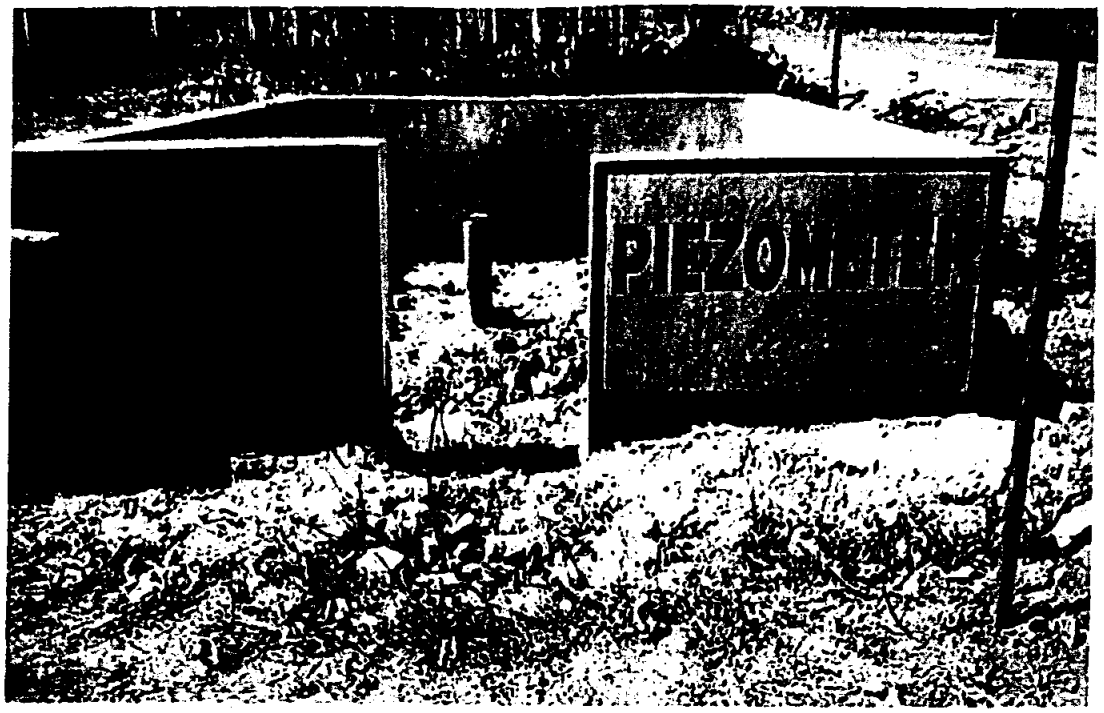

(ix) Compensatory Afforestation

Plantation is done on the area through out the life of mine. Also project has submitted CA and NPV amount to state government for restoration of waste lands

The cost of Compensatory afforestation has been deposited s per details below:

Item	Amount
Compensatory Afforestation	Rs 1449300.36
Compensatory Afforestation	Rs 42,83,572 DD no 079234 dated 23.10.2006
Cost of Forest Produce	Rs 4,22,961 DD no 593513 dated 23.10.2006

The non forest land has been given in Gumla district by CCL as compensatory land. The land has already been notified as forest land vide forest office order no 7E dated 3.01.97.

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The cost of afforestation on degraded forest land including Fencing, Protection and regeneration of safety zone area has been deposited as per details below

Item	Amount	Details
Regeneration and fencing, protection of safety zone.	Rs 1215000 + Rs 521,416.47 Total Rs 1736416.47	Cheque no 989961 dated 27.11.1993 and cheque no 450876 dated 21.05.1996
NPV	Rs 14704450	

(x) Occupational Health

Health checkup is being done by Central Hospital Dakra and Gandinagar Hospital Ranchi.

PME for all the work force at regular intervals are being done at central hospital Dakra. In the year 2022, PME of 743 employees of NK Area had been done in calendar year 2022.

(xi) Industrial wastewater

An ETP has been constructed in workshop for treatment of effluents. The ETP has a closed water circuit. The treated water is recycled for washing of HEMMs in the workshop.

(xii) Vehicular Emission

Vehicular emissions are kept under control. The mineral transporting vehicles are optimally loaded and covered with tarpaulins.To prevent dust emission 3 mobile water tankers of 28 kl are deployed in KDH mine. Also16 static water sprinklers have been installed in the siding

Proposed interventions by Project Proponent for to mitigate adverse impact in Project Area by CCL

Mitigation Measures for soil erosion in slop of embankment by planting grass:

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Mitigation Measures for water pollution:

1. The sewage will be treated appropriately
2. Effluents will be suitably treated from before let out.
3. No disposals of cut spoils into gullies or watercourses.
4. A waste disposal site should be away from water bodies.

Mitigation measures for Noise Pollution:

Machinery and vehicles are maintained regularly with particular attention paid to silencers and mufflers to keep noise levels to minimum.

Mitigation Measures for ground vibration:

1. Noise and vibration should be taken to minimize to pose negative impacts on avian and amphibian.
2. The vibrations can be reduced considerably by ensuring and keeping correct road geometry by advanced measurement.
3. Effective maintenance programs are essential for controlling ground borne vibrations.

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4. Controlling noise vibration at the source.
5. Proper maintenance of excavation equipments.

Mitigation Measures for Air Pollution:

1. All coal transport vehicles should be maintained to minimise toxic emissions.
2. Placing of dust arresters and water sprinklers surrounding the mining area will prevent dispersion of the dust to a great extent.
3. Spray water on the stones while unloading from the truck/dumper.
4. Spray water at the transfer points from one belt conveyor to another
5. Regular cleaning and wetting of the ground should be facilitating.
6. Mulched green wastes temporarily laid over the stockpile and removed when required and retained for later landscaping purposes.

IV-a. Interventions inside the project area by the project authorities with justification.

Coverage of Soil Conservation plan:

The plan has been prepared on the basis of purpose for which Forest area has been diverted towards this coal mining project, as follows:

I. P.F. – 84.34 Ha

II. Jungle Jhari - 42.37 Ha

As per the mining plan and mine closure plan total mine lease area the land will be excavated. There will green belt, roads, settling ponds, etc. The disturbed area within ML will comprise excavated land, area occupied by infrastructure, roads etc.

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Control measures for topography and drainage:

(a) Topography

The impact on the topography due to creation of dumps and voids will be minimized by adopting following control measures:

1. Plantation will be carried on all the backfilled and OB dump area. The topsoil will be used for spreading over the OB dump and the Backfill dump for plantation. The area of topsoil stack after removal of topsoil for spreading on dumps will be afforested. The OB dump will be afforested with the local species of trees for stabilization. After plantation, the dump will merge with the surrounding as there are some hills in the adjoining area of the proposed dump site. A total of 221 Ha area will be excavated by mining, which will be backfilled till the end of life.

(b) Drainage

- Proper Garland drains shall be made before every monsoon at the periphery of active edge of quarry and around dumps to prevent the surface rain water to enter the quarry.
- Suitable drainage gradients will be provided for mine benches.
- Sumps of adequate capacity will be provided on the quarry floor
- The coal excavation and transport machinery will be organized to be situated over the coal bench top and will not be affected by water accumulation from rains or strata seepage.

Waste Management plan in line with approved mine closure plan:

In order to minimize the land requirement for external dumping, internal dumping has been suggested which can only be commenced after sufficient void has been created within the mining pit. Internal dumping can only commence from Year-5 when

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sufficient internal dumping space is available within the pit. The gradient of 70-80 of quarry floor appreciably limits the internal dump quantity which can be accommodated within the pit.

Sites for external dumps have been carefully identified after studying the nature of coal deposition and to cause minimum disruption in the nearby vicinity.

The top soil is proposed to be dumped separately on the down dip side within the western part of the block. The top soil shall be reclaimed and spread over consolidated external & internal dumps during later stages of mine operation.

Management of solid wastes:

External OB dumps will be created with appropriate slope, never more than the angle of repose and of limited height.

The area of ground disturbance will be minimized by progressively rehabilitating disturbed land;

- Efforts will be made to put the land to productive uses such as agriculture, forestry, water reservoir etc. after reclamation; and
- Efforts will be made to restore the aesthetic beauty of the area.

Reclamation of land will be carried out by landscaping, soil amelioration and re-vegetation. As far as possible the reclamation activities will be taken up concurrently with the mining operations. For re-vegetation, the native plants and saplings suitable for the existing soils and site conditions will be considered.

Steps to be taken to avoid Dump Slides:

- Dumping of top soil will be avoided at the bottom of the cut as it leads to in stability. Dumping of soil and clayey material will be done away from the working area, that is on farther end of the dump so that formation of weak planes is avoided.

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- Afforestation by planting trees will help a lot in improving stability of dumps by preventing erosion.

Reclamation of overburden dumps:

- Stabilization of overburden dumps
- Construction of retaining walls
- Construction of drain for drainage
- Provision of jute mesh for facilitating grass or vegetative growth on slopes
- Provision of good soil mixed with manure and subsequent irrigation for growth of grass for anchorage on slopes. Plantation mixed with indigenous and fast-growing plant species
- The degraded area will be reclaimed and rehabilitated with local species of plantation in a phased manner;
- Plantation will be carried out on waste dumps;
- The haulage roads will be flanked by trees on either side; and
- A belt of trees with thick canopy will be created along the mine boundary to intercept dust, gaseous pollutants and noise.

Sludge from oil/water separator:

Effluent from workshops, vehicle washing etc will be passed through impermeable drains and will be treated in the oil/water separator. The oil & grease thus collected will be sold to the recycling vendors. The treated effluent will be re-circulated in the workshop.

Sludge created by mine water in settling pond:

Sludge from the mine water settling pond will be removed periodically and will be backfilled along with the OB.

Sludge from domestic waste:

Sludge from the domestic waste will be utilized as manure for the plantation in the mine lease area and on dump.

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Municipal solid waste:

The municipal solid waste e.g. from canteen, etc will be composted and used as manure for plantation along with the domestic sludge.

Topsoil Management:

Topsoil is often the most important factor in successful re-vegetation process where the objective is to restore the negative ecosystem. The topsoil contains the majority of the seeds and other plant propagules, soil microorganisms, organic matter and much of the more labile plant nutrients. Sustainable practices applied to soil management and replacements are vital to establishing a self-sustaining cover of vegetation in reclaimed areas.

The following step for preservation and utilization of top soil are:

- Adequate space has been earmarked for safe storage of top soil within the mine lease area
- Topsoil will be used for spreading over the backfilled area or after reclaiming the dump-sites. Topsoil spreading will provide better conditions for plant growth. Due weightage will be given to restoration of specific root zone properties that were disrupted during mining and reclamation process.
- Optimum minimum thickness for spreading of topsoil cover should be restricted to 10 cm.

If the topsoil is required to be stacked for longer period, deterioration of stacked area would be prevented by planting species, which will, not only bind the soil but also contribute towards enrichment of soil. The species recommended are grasses of leguminous crops like Cajanus, Cowpea etc. These plants will help to prevent erosion.

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General Concept of Control measures for:

1) **Water Pollution**
2) **Soil Erosion**
   a. Soil erosion due to surface runoff
   b. Soil erosion due to blowing wind

General Concept of Control measures for Water Pollution:

Opencast mining has various type of water pollution source which degrade the quality of water of nearby river/nala and underground water reserve.

a) **Basic approach** to control the surface runoff water is to differentiate the mine into "clean" area and "dirty" area zone for the purpose of surface runoff. "Dirty" area run-off is water coming from stockpile, reclamation area, open cut mining areas etc. and therefore normally it requires treatment prior to discharge. "Clean" areas run-off is water, which passes through the undisturbed areas & green belt areas and it is prevented from entry to "dirty" areas through the use of diversions, drains and allowed to discharge the water into nearest natural drain directly because it does not need treatment. Regular monitoring is done to check the pollution level.

b) **All the industrial unit** would be designed on the basis of zero discharge system. The liquid effluent generated at different industrial sites such as washing stations, workshop, CHP, stock yard, etc. would have the high concentration of suspended solid, oil & grease. These effluents will be treated inside the individual unit treatment plants. Treated water will be used at suitable places. No effluent is left to go outside.

c) **Municipal effluents** are not allowed to discharge on either land or inland water sources without proper treatment because it can pollute land & other stream. Every housing unit or in group will be

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provided with septic tank and the outflow is led to soak pit. Other municipal effluent will be routed through sedimentation tank.

The quality of effluents should conform to standards laid down in IS 4764(Tolerance limit for sewage effluents discharged into inland surface water &IS 2490 — tolerance limit for industrial effluents discharged into inland surface water). All effluent shall be tested on quarterly basis.

d) **Improper water availability**: The less the soil is covered with vegetation, mulches, crop residues, etc., the more the soil is exposed to the impact of raindrops. When a raindrop hits bare soil, its Kinetic energy detaches individual soil particles from soil clods. These particles can clog surface pores and form many thin, rather impermeable layers of sediment at the surface, referred to as surface crusts. They can range from a few millimetres to one cm or more; and they are usually made up of sandy or silty particles. These surface crusts obstruct the passage of rainwater into the ground reservoir and reduce the water holding capacity of the earth with the consequence surface runoff increases and causes more soil erosion. This eroded soil is transported and settles at depressed land, pond, stream/nala, etc, and reduce the water holding capacity of the soil. Moreover, due to low infiltration rate ground water reservoir does not get full recharge. So overall water holding capacity of the area get reduced to large extent and resulting in the shortage of water in the region during the dry time.

e) **Chocking of Streams**: Rainfall water which does not infiltrate into the soil starts to flow downhill under the action of gravity. Initially, run-off moves down the slope as a thin diffused film of water which has lost virtually all the kinetic energy which it possessed as falling rain. Thus, it moves only slowly, has a low flow power, and is

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generally incapable of detaching or transporting soil particles. If rain continues, the force of water will eventually increase. Overland flow that is released in this way is likely to flow downhill more quickly and in greater quantities (i.e. it possess more flow power as a result of its kinetic energy), and so it may be able to begin transporting and even detaching and picking up the soil particles. When speed of runoff is decreased, the carrying capacity of the runoff get reduced, subsequently sedimentation take place, causing the chocking the stream. Following are the main area where maximum soil erosion takes place:

a) Runoff from OB Dump

b) Runoff from Construction Site

c) Runoff from Coal Dump

d) Runoff from built up Areas

General Concept of Control measures for Soil Erosion:

Soil erosion occurs when wind or water washes away the topsoil from an area of land. Soil erosion is natural phenomena, but it quickly becomes problematic when people begin construction works and cutting down the vegetation cover. So, it is very important to prevent soil erosion. Erosion of soil basically depends upon the speed of surface flow, wind speed and vegetation and others type of covers.

Appropriate soil erosion control measures of different sources are recommended below to limit the soil erosion to a minimum extent.

Soil erosion due to surface runoff

List of sources that are responsible for soil erosion, their characteristic and volume have been discussed above. Overland flow that is released is likely to flow downhill more quickly and in

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greater quantities (i.e. possess more flow power as a result of its kinetic energy), and so this flow of water become able to begin transporting and even detaching soil particles. Where it does so, the soil surface is lowered slightly. Lowered areas form preferential flow paths for subsequent flow, and these flow paths are in turn eroded further and transported up to a location where the speed of flow down to carrying capacity. These depositions create the obstacle in the way of spontaneous water flow causing large area submergence, cutting of sides of channel besides the degradation of water quality in the surrounding nala / river.

In view of the above, basic approach in deciding the appropriate soil erosion control measures, are as follows —

The amount of soil erosion that occurs in an area depends upon two factors: the speed with which water and wind travel across it, and the abundance of plant life that is growing there. Since we have no control over the speed of the wind, how heavily it rains, or the currents of the nala / river, so we need to concentrate on the factor we can control are:

a. Surface cover (vegetation cover and other) and

b. Breaking the speed of surface flow.

Plant life protects topsoil in many ways. It prevents heavy rains from beating down on land and knocking the topsoil loose. It prevents the soil from drying out as quickly, thereby protecting it from being blown away by strong winds. The roots of the plants hold the soil in place, so it is not washed away as easily. Soil erosion is inversely proportionate to soil cover and the speed of the runoff. A 60 % of land cover would result in 85% reduction in soil erosion and further breaking the speed of surface runoff up to scouring speed by baffle wall and any other means would result in

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further reduction of soil erosion by 45%. So, in this combination 94% reduction in soil erosion can be achieved.

i) **Soil Erosion from Construction site:** Presently no major civil or any other type of construction works is going on in the project. In future, if any construction work would start, the following preventive measures would be taken up to reduce the opportunity of soil erosion/water contamination at construction site.

- Site to be taken for construction at different time horizon should be clearly marked
- Vegetation removal and breaking of earth would be controlled and confined to site which is immediately required for construction.
- Catch Drain will be provided around the township/construction sites during construction period to intercept water flowing out.
- Surface Run off from construction site would be channelized to sedimentation lagoon. The clear overflow water from lagoon will flow out to nearby natural streams
- Site for storage of rubbish, excavated earth etc. would be identified and drainage arrangements will be provided around these and connected to sedimentation lagoon to avoid pollution of natural streams.
- As soon as construction is over, all sites would be vegetated & planted with trees.

ii) **Soil erosion from OB Dumps**-Newly formed and barren OB dumps are the main culprit for the soil erosion particularly active and new OB dumps. Soil of the OB dump is easily eroded by both wind and water because it is in un-vegetated and in loose

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conditions. Following preventive measures would be taken up to reduce the opportunity of soil erosion/water contamination from overburden sites.

- First of all, a Gabion wall of 1.25 m to 1.75 m height, depending upon the prevailing condition, of stone boulders all around the OB dump of would be constructed. This measure will check the OB dump from the spreading beyond the Gabion wall.
- Garland Drains will be provided around the retaining wall of size 1.5m (width) x1.0m (depth) to check the surface run -off flowing out or into the OB dump. This drain is to channelize the intercepted run-off water into sedimentation lagoon. This measure will prevent the surface run-off from carrying out the eroded soil beyond the sedimentation tank.
- A sedimentation tank of sufficient size will be constructed so as having at least one hour detention period most of the time. This act will arrest at least 90% of suspended soil particles that flow out with surface runoff.
- Over flow effluent from the sedimentation tank would be allowed to discharge in the nearby natural stream. A series of gully plug will be provided if speed of discharge water is above the scouring speed of soil. This will protect the stream bed and side from being scoured. Thus, there could be more than 95% reduction in soil erosion.
- Quick growing grass and vegetation cover would be planted on the part of inactive dump all along the inclined and top portion of the dump. This will protect the soil particle from being detached due to action of rain fall and hard wind blowing. Thus, there would be reduction in soil erosion.

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- Quick growing grass and vegetation would be planted on the route of water ways. This will provide extra space for flowing of water and thus will prevent spreading of water.
- Trees will be planted in three rows all around the OB dump. First row trees will be of short height, second row trees will be of medium height while third row trees will be of long height. These measures will break the velocity of wind and will prevent the soil erosion and spreading of dust.
- Garland drains and all flow channels should be cleaned regularly specially before the onset of the monsoon.

iii) **Run off from Coal Dumps:** The project has been so planned that coal dumps would not be created. If unavoidable, baffle walls and garland drains would be provided around the coal dump to intercept the surface runoff flowing out from it and also to collect runoff from the surrounding of dump site. This drain will channelize the intercepted water into sedimentation lagoon. Over flow from the sedimentation lagoon will be discharged into the natural drainage system. A series of gully plug will be provided if speed of discharge water is above the scouring speed (>1.5km/hr in this condition) of soil.

iv) **Run off from built up areas:** Open drains would be provided along the roads, workshop, township and other service buildings. These drains will collect the water from built up area which is not much polluted except the normal suspended particles, garbage, silt and sand. This water would be diverted into sedimentation tank and from there to natural. A series of gully plug will be provided if speed of discharge water is above the scouring speed of soil.

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v) **Mitigation Measures for remaining area:** Area is divided in two zone, clean area zone and dirty area zone. Clean area zone comprises the un-broken zone where is not any type of activities are earmarked and having green land. In dirty area zone, all infrastructures and activities are located. Both the area would be separated by storm drain or water guide channel so that water flowing out from each zone could not mixed-up.

If speed of water, passes through these areas is more than scouring speed than series of small baffle wall would be constructed. Height of baffle wall will be 5.0 to 10.0 cm, more than the depth of the overland flow and width should be equal or more than the width of surface run-off. When surface run-off will pass over these baffle walls, the speed of flow will be reduced and would resulting in the settling down of suspended particles. This water coming out from the clean zone area will be allowed to pass through the nearby natural streams directly after breaking down the speed less than the scouring speed of soil with the help of use of series of gully plug.

Dirty area zone is further divided into aggressive and nonaggressive zone. Aggressive zone contains completely broken area such as quarry area, coal stockyard area, CHP area and other industrial area. Non-aggressive zone comprises of all administrative buildings, industrial buildings, road, etc.

Water flowing out from the non-aggressive zone will be guided to sedimentation tank. Effluent from here will be allowed to meet the natural local streams after breaking down the speed of the scouring speed of soil with the help of series of gully plugs. Surface run-off coming out form the aggressive zone should be treated individually. Over flow effluent from these

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sedimentation tanks would be sent into the large sedimentation pond. Effluent from here will be allowed to meet the natural local streams after reducing the speed below scouring speed with the help of series of gully plugs.

Final effluent will be checked regularly as per monitoring program. If any deficiency is found then suitable rectification will be done.

All the vacant land would be vegetated with quick growing grass, bushes and small and medium size trees. Medium size trees would be planted all around the administrative buildings, infrastructures buildings, coal storage site. Avenue plantation and strip plantation will be done all along the roads and in the colony area. Finally, all the drainage system will be cleaned regularly and more frequently in monsoon season. All sedimentation tanks must be cleaned before the onset of rainy season.

(B) Control Measures for Soil Erosion by wind:

Damage from wind erosion is of numerous types. The dust storms resulting are very disagreeable and the land is robbed of its long-term productivity. Crop damage, particularly in the seedling stage, by blowing soil is often a major concern. Subsequent yield and quality losses are incurred and, in the extreme, tender seedlings may be completely killed. Often sufficient soil is removed to expose the plant roots or un-germinated seeds, and these results in complete crop failure. Sands begin to drift and form unstable dunes which encroach on better surrounding lands

Wind erosion depends upon the type of storm, speed, duration and type of vegetation covers. It is studied that wind speed less than 20km/h has not much impact on soil erosion.

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In above attributes, we can only control the speed of wind and vegetation cover. Wind speed can be reduced by erecting some obstacles in the path of wind. Planting of trees would be most suitable obstacle for breaking the wind speed and it also enhance the vegetation cover upon the soil. These plantations also reduce the evaporation by 20% and help to maintain the soil moisture contents. Bonding affect between the soil particles increased due to increase in moisture contents and it resist the erosion force.

So, the best arrangement would be two rows of tall trees surrounded by two rows of low trees, making up a 10-metre strip. Vegetation cover, grass or crop would be increased. It is particularly important to repair breaches in a hedge to keep the wind from pouring through at these points (the Venturi effect) because it considerably reducing effectiveness.

Soil erosion by wind becomes significant when speed of wind increases to 20km/h means 6m/sec. In our region, wind speed hardily (3or 4 times per year) increases to above limit. So there is no major problem of soil erosion caused by wind blow.

Mitigation Measures for River Nala:

Only treated water would be allowed to enter the river/nala. One wire mesh / check dam of 2.0 m height would be constructed in the downstream (10m to 200m) side of the external dump. These weir/ check dam will serve many purposes: firstly, it will prevent the flowing out the soil erosion further down side, secondly it will serve as rainwater harvesting lagoon and finally and most importantly it will serve as the storage of water for the villagers during the lean season for domestic and agricultural purposes.

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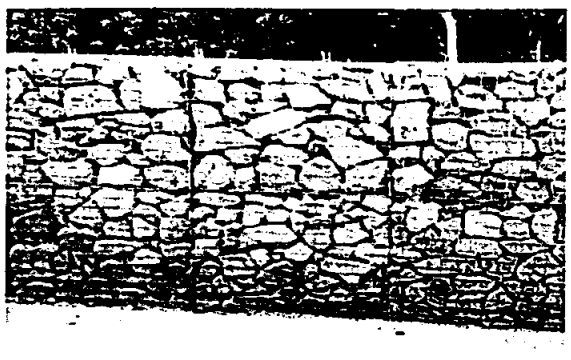
All of the general Control measures shall be taken care during the execution of the project on need bases or as advised by the DFO Chatra South Forest Division.

Mine Specific measures:

OB Dump: A Gabion wall of 1.5 m height will be constructed all around the OB dumps. It would prevent the dump materials from spreading outside the Gabion wall. A garland drain of size 1.5m x 1.0m will be constructed all around the gabion wall. It would intercept all the surface water coming out from dump. Retrieve drain will be provided at inclined face of the dump at every 100m.Top surface of OB dump will have transverse and longitudinal slope of 1:50spreading outward side so as rain water can be evacuated easily. Berm of 15 to 20 cm will be provided all-round the OB dump.



This will prevent the water form spillage on inclined face of dump. Five sedimentation tanks/ponds of 8.0m x 6.0m x 1 .6m size will be constructed. This lagoon would store all the water coming from garland drain for an hour in normal condition.

Industrial Area: Garland drains of size 1.0mx0.75m will be constructed all round of the industrial area i.e. Workshop, CHP, Coal stock, etc. This drain will intercept all the runoff coming from the area and lead to sedimentation tank lagoon as shown in the drawing of size (6.0m x 3.0m x1.5m). Overflow from this lagoon would be allowed to meet the local stream after providing three or four gully-plugs.

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Remaining Area: External OB dump for KDH OCP coal mining project is proposed at North of the project and colony is outside the mining lease area. Quarry is located at the central part of the lease hold area.

Surface runoff generated from the clean zone would be allowed to pass in the local stream after providing three or four Gully plug in the stream.

Surface run-off from dirty zone will be guided to sedimentation lagoons. Sedimentation tanks/ponds of 8.0m x 6.0m x 1.6m size will be constructed as shown in the plan. Over flow from this tank would be allowed to meet the nearby natural streams. Two or three Gully plugs would be provided in the stream.

River / Nala: A weir/ check dam of 1.5 m height would be constructed in the upstream of the existing river / nala. This weir/ check dam will serve many purposes: firstly, it will prevent the flowing out the soil erosion further down side, secondly it will serve as rainwater harvesting lagoon and finally and most importantly it will serve as the storage of water for the villagers during the lean season for domestic and agricultural purposes.

IV-b. Location, with GPS coordinates, of the proposed interventions and maps overlaid in the proposed land use plan map:

As per the prescription given in the approved Mining Plan and EIA report of KDH OCP the location and their GPS coordinates regarding proposed interventions will be identified by the CCL authorities.

IV-c. Relevant provisions of Environment Management Plan for the project and the overlapping interventions:

As per EIA / EMP report of KDH OCP the Environmental management approach includes action to protect environment by using instruments, direct regulatory instruments or technological

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instruments. It provides the remedial solutions of the problem which is assessed by the data collected from the environmental impact evaluations and base line data. It also takes into account the existing scenario of the future scenario due to industrial activities. Thus environmental management plan is essential for sustainable development of the region.

Majority of the areas of environmental management planning requires multidisciplinary approach. The measures envisaged in the EMP report are based on the information revealed from data bank of base line environmental status, mining methodology and environmental impact assessment. Therefore, these measures are regarded as guidelines and depending upon the continuing advice to be taken from experts of relevant field like; forestry, hydrology, geochemistry etc. the suggested schemes are to be detailed. If necessary, it will be modified from time to time to meet statutory requirements.

To mitigate the adverse impacts caused due to coal mining operation at KDH OCP and for overall scientific development of local habitat, the Environmental Management Plan (EMP) has been formulated. The EMP is based on the base line environmental status, mining methodology and environmental impact assessment. The EMP has prescribed environmental monitoring and implementation of environmental protection measures during and after mining operations. In the EIA / EMP report all technical, biological and socioeconomic aspects are covered and likely control measures are suggested under the following headings:

- Air Environment
- Water Environment
- Noise Environment

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- Land and Biological Environment
- Socio-Economic Measures
- EMP Implementation and Monitoring

IV-d. Plan period, initially for 10 years with scope for interim reviews and required modifications will be undertaken with joint review by KDH OCP authorities and Forest Department. Review report will be communicated to the Chief Wildlife Warden, Jharkhand.

Approach and Work Carried Out-

A detailed study was done. The conservation plan for endangered Fauna and flora of medicinal and other importance has been prepared for Area, which are within the geographical boundary of Ranchi Forest Division and in the radius of 10 km of the lease area of M/S KDH OCP. It Included -Selection of appropriate satellite imagery and procurement, Development of a GIS with available map information, conducting discussion and interaction meeting with the forest officers for including the forestry information. Study of the project plans and EIA of the present lease, Inclusion of the mine maps into the GIS and determination of the buffer zone. To study the present status of the flora and fauna, a survey was done by Sri Hari Shankar Lal (Botanist), and other team members under supervision of Mr. Premjit Anand, Retd. IFS (Forestry & Wildlife) and Mr. Sitaram Bhagat, Retd. Assistant Conservator of Forest. Various field visits were done by the DFO, Ranchi Forest Division and RFO, Burmu to analyze the scope of mitigation measures to be implemented. The Period of Field study was limited to Mid- June to Mid - August 2023 but various teams carried exhaustive and parallel study.

The KDH Opencast coal mine is located in Burmu range of Ranchi Forest Division, which has forest area contiguous to Chatra South,

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Hazaribagh West and Latehar Forest Division and this is the only area, which has dense Sal forest and connects different wildlife habitats. However, there is no choice of options for selection of mining site with suitable ecological setting, biological and chemical characteristics, mineral composition, or grade as coal deposits have fixed locations and due to unique physical conditions associated with their locations.

Photograph of KDH mining area

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CHAPTER – V

Proposed Management Strategies within the identified project impact zone (Buffer area)

Approach and Work Carried Out-

A detailed study was carried out in the area, which are within the geographical boundary of Ranchi Forest Division and in the radius of 10 km of the lease area of KDH coal block. It Included - Selection of appropriate satellite imagery and procurement, development desired maps with appropriate GIS tools, determination of buffer zone, conducting discussion and interaction meeting with the forest officers for including the forestry information and with project officers for information regarding mining. Study of the project plans, Soil conservation and EIA-EMP of the KDH coal block along with scrutiny of the Working Plan of the Ranchi Division. To study the present status of the flora a survey was done by Dr. Hari Shankar Lal (Botanist) and his team members under supervision of Mr. Premjit Anand, Retd. IFS and Mr. Sitaram Bhagat, Retd. Assistant Conservator of Forest. Teams were constituted for doing detailed village survey on various parameters and sample survey of 21 villages, 1 in the core and 20 in the buffer area, was carried out. Field visits were done by the DFO, Ranchi Forest Division and with RFO, Burmu to analyse the scope and suitability of mitigation measures to be implemented. The Period of Field study was limited to Mid- July to Mid - August 2023 during which various teams carried exhaustive and parallel study.

V-a. Interventions in the project impact area by the forest department:

Objectives of the proposals made in the Conservation Plan for the project impact zone:

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- To provide a relatively stress-free habitat to wildlife in the Impact Area that would be capable of meeting the basic needs of resident wildlife.
- To provide habitat supplement to spill over population of wild animals from Project Area to the Impact Area.
- To provide safe spill over path for wildlife from Impact Area to relatively rich neighbouring forest areas.
- To provide measures to safe-guard and protect the wildlife from unsavoury elements.
- To protect and conserve the flora and fauna.
- To ensure the health of water resources and encourage fire protection measures.
- To reduce dependency of local people on forest resources.
- Control depredation by wild animals and generate public goodwill for conservation strategies and build up synergy in conjunction with regular protection set up.

Mitigation Strategies:

Environmental management approach includes action to protect environment by implementing time tested and suitable forestry and allied schemes. It provides the remedial solutions of the problem, which is assessed by the data collected from the environmental impact evaluations and primary data collected by survey conducted in the villages of impact area. It also takes into account the existing scenario before implementation of the project vis-à-vis of the future scenario due to industrial activities. The proposed interventions are based on the following assumptions:

a. For all measures discussed in this chapter, interventions are to be implemented by the DFO, Ranchi Forest Division.. The financial requirement of various interventions suggested in the plan as per

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current costs is given in flowing table, attached at the end of this chapter. for the plan period of 10 years.

b. Location of the proposed interventions will be decided by the DFO, Ranchi Forest Division.

c. Total Project cost of KDH OCP as per approved Mine Plan is Rs. 210.98 crore. 2% amount admissible for Wildlife Management Plan as per MoEF&CC letter no. FC-11/43/2021-FC dated 07.06.2023 works out to Rs. 4.2196 crores.

Also as per decision of senior officer's committee it was decided to deposit Rs. 3.786 lakhs per hectare for Wildlife Management plan for mines located in North Karnpura Coalfields. Based on this decision for total mine area of 717.17 ha. (as per authenticated land schedule by C.O.) of KDH OCP, works out to Rs. 27.15 crore. But the instant FC Stage-I approval has been granted for 126.72 ha only.

Field visit by experts

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Financial outlay of works proposed in KDH Coal Block

(Components of work)

Sl. No.	Components	Total (Rs in Lakhs)
1.	Forest and Wildlife habitat protection and development	1769.82
2.	Improvement of water regime and its maintenance	242.20
3.	Measures for anti-depredation and wildlife protection	475.00
4.	Fire prevention and protection of habitat	135.50
5.	Livelihood improvement and capacity building to local people	101.24
6.	Capacity building of forest department for monitoring and supervision of Conservation plan	65.00
7.	Supervision at Division & Range level	223.97
8.	Awareness generation and documentation	251.00
	Total Cost	**3263.73**
	Escalation @20% over 10 year plan period	**652.99**
	Contingency	20.00
	Grand Total	**3936.72**

5.1 Measures for Wildlife Habitat Protection & Development:

5.1.1 Forest Restoration:

(a) **Advance Work:** In the blank / degraded patches restoration of forests will be undertaken by implementing Water Conservation cum Plantation scheme already in practice in Jharkhand Forest Department as per the SOR notified by the APCCF Development. Under this

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component 200 ha plantation will be undertaken each year in 1st and 2nd year of plan period with 6-year maintenance. A budget of **Rs. 485.13 lakhs** has been proposed for advance work. DFO will select the suitable site and intervention technique to be adopted.

(b) **Completion/Maintenance of Soil Conservation cum plantation scheme**: For this component **Rs. 392.00** lakhs have been proposed.

5.1.2 Creation of drinking water facilities for wild animals:

Ponds & earthen Check dams: Due to mining activities it is likely to reduce water table. During the field survey also, it has been reported that water scarcity prevails during summer. It may result in straying of wild animals outside the forest area. To combat this situation, it has been proposed to dig/ create 44 small ponds @ 2,50,000/-each and 13 earthen check dams @ 8,00,000/- each). **Rs. 214.00 lakhs** have been proposed for this component. Year wise physical target has been proposed as under:

Year	No. of ponds @ 2,50,000/- each	No. of check dams @ 8,00,000/- each	Amount (in lakhs)
1st yr	10	02	41.00
2nd yr	10	02	41.00
3rd yr	10	02	41.00
4th yr	02	01	13.00
5th yr	02	01	13.00
6th yr	02	01	13.00
7th yr	02	01	13.00
8th yr	02	01	13.00
9th yr	02	01	13.00
10th yr	02	01	13.00
Total	**44**	**13**	**214.00**

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5.1.3 (a) Decongestion of Bamboo clumps:

Bamboo is the most preferred food species for elephant, wild boar, porcupine and other herbivores. Presence / movement of these herbivores have been reported during the field survey. Elephants only pass through the buffer area of KDH OCP during its migration. For wildlife habitat enrichment, Decongestion of Bamboo clump scheme prevalent in the Forest Department will be implemented. During first 4 years of Plan period, every year 100 hectare bamboo bearing areas will be treated with its maintenance as per SOR issued by APPCF Development. **Rs. 142.90 lakhs** has been proposed for this work. It will be taken up in the forest areas falling along the elephant migration route.

(b)Completion / maintenance of Bamboo Clump decongestion scheme: Rs. 40.80 lakhs have been proposed for this component.

5.1.4 Construction of Pucca Check Dams: Pucca Check Dam is a type of small-scale hydraulic structure built across a seasonal stream or a small river to harvest and conserve rainwater. Its primary objective is to control erosion, recharge groundwater, provide water to Wild animals, and enhance agricultural productivity in semi-arid and arid regions. It has been proposed to create 5 check dams every year for first 4 years of Plan period @ Rs 17,00,000/- per check dam. A provision of **Rs. 340.00 lakhs** have been made in the plan for this component.

A tentative list of ponds / earthen check dams / pucca check dams with GPS coordinates have been enclosed in chapter- VI.

5.1.5 Deployment of Gaj Mitra: It has been proposed to deploy 6 Gaj Mitras in the nearby elephant affected villages to aware local people about elephant movement and tell them about Dos and Dont,s at the time of probable confrontation with elephants. A

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sum of Rs. 7.50 lakhs per year (6 Gaj Mitra @ Rs. 1.25 lakh per Gaj Mitra) has been proposed for this component every year. In 10 year Plan period total **Rs. 75.00 lakhs** have been proposed in the budget.

5.1.6 **Broadcasting of bulk messages to the people living in vicinity of elephant prone areas:** By using mobile network this action will be operated. Forest staffs, local villagers, Gaj Mitras and JFMC members will be attached to the network and by advance bulk messaging about elephant movement, local people will b on alert to face the situation in advance. It will enable to minimise human-elephant conflict. Every year Rs. 5.00 lakhs will be spent for entire Plan period of 10 years. Total **Rs. 50.00 lakhs** have been proposed in the budget for this component.

5.1.7 **Procurement of snake rescue kit/equipment and wages of rescue team:**

A snake rescue team typically involves several key responsibilities aimed at the safe capture, relocation, and sometimes rehabilitation of snakes. While specifics can vary based on the organization or region, here are some common elements:

Snake Removal and Relocation: The primary task is to respond to calls from the public or authorities regarding the presence of snakes in residential or public areas. The team safely captures and relocates the snake to a more suitable habitat, away from human-populated zones.

Education and Awareness: Snake rescue teams often engage in educational programs for communities, schools, or institutions to raise awareness about snake behaviour, safety measures, and the

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importance of snakes in the ecosystem. This helps dispel myths and fear surrounding snakes.

Assessment and Identification: They are trained to assess the situation, identify the species of the snake, and determine if the snake poses a threat to humans or pets. This knowledge helps in making informed decisions regarding the appropriate handling and relocation.

Overall, the primary goal of a snake rescue team is to ensure the safety of both humans and snakes while fostering coexistence between humans and these important members of the ecosystem. Every year Rs. 3.00 lakhs will be spent for entire Plan period of 10 years. A budget of **Rs. 30.00 lakhs** have been proposed for this component.

5.2 Improvement of water regime & its maintenance:

5.2.1 Soil and water conservation measures by contour cutting will be implemented in 700 ha of forest land as per letter no. 36 dated 18.08.2019 of the PCCF Development Jharkhand. As per SOR 100 mandays per hectare has been allowed for this work. At present wage rate of Rs. 346.01, 700 hectare of forest land will be treated in first 5 years of plan period at a **total expenditure of Rs. 242.20 lakhs**. Year wise target has been proposed below:

First year	200 hectare
Second year	200 hectare
Third year	100 hectare
Fourth year	100 hectare
Fifth year	100 hectare

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5.3 Measures for anti-depredation and its maintenance:

5.3.1 Installation of early warning system for elephant movement: Elephant movement has been reported throughout the buffer zone of KDH OCP. Elephant movement route has been shown in Elephant Movement map in Chapter VI. During the course of movement, elephant causes damage to life and property and in most cases of deaths or injury; it is the sudden confrontation between man and animal which results in such loss. If people of the area could be warned in advance about the presence of elephants in the vicinity, they will be alert and take necessary precautions. The model has been successfully implemented in the Valparai plateau forest area of Tamilnadu and now also being established in Odisha.

Installation of early warning system: It is proposed to install Visual Elephant Alert System consisting of a red LED flashing light fitted over a 10-meter-long pole at strategic locations in the villages falling along elephant movement path. This light is visible for about 1 kilometre. In first 2 years **total Rs. 50.00** lakhs will be spent (first year 25 lakhs and second year Rs. 25.00 lakhs) for installation of alert towers in and around elephant affected villages.

5.3.2 Maintenance of early warning system: Every year Rs. 1.00 lakhs will be spent for 10 years towards operation and maintenance of warning alert system and mobile recharge of anti depredation team members. Total budget provided for this purpose is **Rs. 1.00 lakhs x 10 years = Rs. 10.00 lakhs.**

5.3.3 Purchase of motorcycles for patrolling by frontline staffs & its operation and maintenance: The Field staffs are required to move fast in very narrow path / Forest terrain in course of forest & wildlife management related duties. To facilitate this and enhance their capabilities, it is proposed to provide 10 number of motor

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cycles in the Burmu range at a cost of **Rs 20.00 lakhs** @ 2.00 lakhs per motor cycle.

5.3.4 **POL & Maintenance cost of Motorcycles**: The cost for Operation and Maintenance cost of Motorcycles will be incurred based on requirement. The amount estimated for the purpose is Rs. 3.00 Lakh per year @ Rs. 30,000/- per motorcycle. For the plan period of ten years, the total expenditure incurred would be **Rs 30.00 Lakh.**

5.3.5 **Deployment of JFMC members for anti-depredation measures:**

Wild animals generally come out of their safe zone during wee hours to nearby water bodies and fringes of villages in search of food. This makes them susceptible to have confrontation with humans and result in subsequent man-animal conflict. To avoid such conflict, there is provision of Anti- depredation squad to drive back the animals into the forest areas. The persons will be selected from local JFMCs well conversant with animal behaviours, particularly, elephants. The job of the JFMC members will be primarily to gather data on number of animals seen, their location, their direction of movement and the quantum and nature of depredation being done.

It is proposed to deploy, as and when required, an anti-depredation squad consisting of JFMC members during elephant movement period. It will be stationed at Burmu Range. The total Cost of wages to JFMC members would be Rs. 6.25 lakhs per year X 10 years = **Rs. 62.50 lakhs.**

5.3.6. **Procurement of rechargeable torch, crackers, kerosene oil, burnt Mobil etc. for distribution among villagers in elephant affected areas:**

In order to drive elephants from village areas and farmlands during their migration it has been proposed to distribute rechargeable torch, crackers, kerosene oil and burnt Mobil

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among villagers residing in the villages falling along the elephant movement path. It till enable to reduce human- elephant conflict. Every year Rs.5.00 lakhs will be spent on this component for entire plan period of 10 years. **Rs. 50.00 lakhs** have been proposed for this purpose.

5.3.7. Procurement and installation of Solar Street light: It has been proposed to procure and install 200 solar street lights in the elephant affected villages as anti depredation measure. Total 200 Solar Street lights will be installed (1st year 100, 2nd year 50 and 3rd year 50 light). Total **Rs. 66.00 lakhs** has been proposed for this component @ Rs. 33,000/- per piece. Site for installation of lights will be decided by D.F.O. Ranchi in consultation with R.F.O. Burmu Forest Range. Quotation has been attached in **Chapter – VI.**

5.3.8. Procurement & installation of Solar High Mast Light: It has been proposed to install Solar High Mast Light in elephant affected large villages. Total 10 Solar High Mast lights will be installed (1st year 5 and 2nd year 5 light). Total **Rs. 26.50 lakhs** has been proposed for this component @ Rs. 2,65,000/- per piece. Site for installation of lights will be decided by D.F.O. Ranchi in consultation with R.F.O. Burmu Forest Range. Quotation has been attached in **Chapter – VI.**

5.3.9. Construction & Establishment of Wildlife Monitoring Cell: Area around KDH OCP is affected by elephant movement and in the process the wild elephant damage crop and property. This area is surrounded by Hazaribagh, Charta and Latehar districts where plenty of elephants move during crop season. To monitor the elephant movement in the area and take preventive measures, it has been proposed to construct and establish a Wildlife

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Monitoring Cell at suitable place. This cell will be equipped computer, software, communication system, furniture and technical person. It has been proposed to spend **Rs. 85.00 lakhs** on this component (1st year 30.00, 2nd year 10.00, 3rd year 10.00, and 4th to 10th year 5.00 lakhs every year). First year's budget will be utilised for construction and infrastructure development. D.F.O. Ranchi Forest Division will decide suitable location for construction and establishment of Wildlife Monitoring Cell.

5.3.10. Construction of watch towers:

A watch tower in forest areas serves several important purposes:

- **Surveillance and Monitoring**: Watch towers provide an elevated vantage point, allowing forest personnel and authorities to monitor large areas of forest more effectively. This helps in detecting any unusual activities such as illegal logging, poaching, or forest fires.
- **Prevention of Illegal Activities**: The presence of a watch tower acts as a deterrent to illegal activities in the forest. Knowing that there is a vantage point from which forest staffs can observe the area, potential offenders are less likely to engage in unlawful activities.
- **Early Detection of Forest Fires**: Forest fires can spread rapidly and cause extensive damage. Watch towers are strategically located to provide a wide field of view, enabling early detection of smoke or flames. This allows for a quicker response to contain and extinguish the fire.
- **Wildlife Monitoring**: Watch towers are also used for wildlife monitoring purposes. They provide facility for forest staffs to study elephant movement & its behaviour, population dynamics, and habitat use patterns.

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Overall, watch towers play a vital role in protecting and managing forest ecosystems, ensuring the sustainability of these natural resources for future generations. It has been proposed to 5 watch towers at a cost of Rs. 15.00 lakhs each. **Total Rs. 75.00** lakhs have been proposed for this component. Location and target of watch towers are as below:

Plan Year	Number of Watch Towers	Amount (in lakhs)
1st Year	02	30.00
3rd Year	01	15.00
5th Year	01	15.00
7th Year	01	15.00

5.4 Fire prevention & protection of habitat:

5.4.1 Fire fighting tools: During summer season forest areas are prone to ground fire causing severe damage to wildlife habitat and ground flora including herbs and shrubs. In order to prevent forest fire, it has been proposed to procure modern fire fighting tools and equipments to monitor, prevent and control of forest fire.

(a) Procurement of fire fighting tools, blowers and kit: Occurrence of forest fire is a regular phenomenon and every year it needs to be prevented by control measures. It has been proposed to procure necessary tools and kit for effective fore fire prevention and control measures. For total plan period total budget of **Rs. 85.00 lakhs** have been proposed. Year wise financial target is furnished below:

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Plan Years	Amount (Rs. In lakhs)
1st year	20.00
2nd year	20.00
3rd year	20.00
4th year	5.00
5th year	5.00
6th year	5.00
7th year	2.50
8th year	2.50
9th year	2.50
10th year	2.50
Total:	**85.00**

(b) **Procurement of G.P.S. and other equipments for reporting fire incidences:** For this component **Rs. 25.50 lakhs** have been proposed in the Plan. During first three year of plan period, every year Rs. 5.00 lakhs will be spent. Thereafter from 4th year to 10th year, every year Rs. 1.50 lakhs have been proposed.

5.4.2 (a) Fire fighting squad: JFMC members will be engaged for four months, from mid – February to mid – June, every year during fire season to combat fire occurrence in the forest areas. Each year Rs. 2.50 lakhs will be spent for this purpose for 10 years. Total budget of Rs. **25.00 lakhs** have been proposed for its implementation.

5.5 Livelihood & capacity building training of local people:

a. Set up of NTFP based micro enterprise and handholding:

Non-Timber Forest Products (NTFPs) refer to various goods obtained from forests other than timber. These products can include medicinal plants, herbs, fruits, nuts, resins, honey, and various other forest resources. Establishing micro-enterprises around NTFPs can be a sustainable way to utilize forest resources while promoting local economic development. Handholding in this context typically refers to providing support,

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guidance, and assistance to individuals or groups interested in starting or improving micro-enterprises based on NTFPs. The goal of handholding in NTFP-based micro-enterprises is to empower communities, promote sustainable practices, generate income, and ensure the conservation of forest resources. This support is essential in enabling individuals or groups to leverage NTFPs effectively while contributing to local economies and environmental preservation. The main NTFP species being collected & marketed are Sal seeds, Mahua flowers, Mahua seeds, Karanj, Palas seeds, medicinal plants/herbs, Bahera, Amla, Chiraunji, Kendu leaves and Gums. Local people will be involved in this activity to have better returns of their produces.

First year Rs. 18.00 lakhs and 2nd year Rs. 10.00 lakhs will be spent for this purpose. Total budget of **Rs. 28.00 lakhs** have been proposed for its implementation.

b. **Training on minimising dependence on forest resources:** Local people will be imparted training on alternate livelihood options like piggery, poultry, plumbing, automobile repairing, tube well repairing etc. to reduce their dependence on forest. In first 3 years Rs. 5.00 lakh will be spent every year, thereafter from 4th to 10th year Rs. 2.50 lakhs will be spent every year. Total budget of **Rs. 32.50 lakhs** have been proposed for its implementation.

c. **Procurement & distribution of smokeless chullahs:**

Smokeless chullahs, also known as smokeless stoves or improved cookstoves, offer several significant utilities and benefits compared to traditional open-fire cooking methods. These stoves are designed to reduce or eliminate the emission of smoke during cooking, providing various advantages:

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Health Benefits: Traditional cooking methods, especially using open fires indoors, can produce high levels of indoor air pollution due to smoke and soot. Smokeless chullahs significantly reduce indoor air pollution, minimizing the health risks associated with respiratory diseases, eye irritation, and cardiovascular problems, especially among women and children who are often exposed to these fumes for extended periods.

Environmental Impact: Smokeless chullahs are more fuel-efficient, requiring less wood, charcoal, or other biomass fuels. This reduces deforestation and environmental degradation caused by excessive wood fuel consumption. Additionally, their cleaner combustion results in reduced emissions of greenhouse gases and black carbon, contributing to mitigating climate change.

Fuel Efficiency: Improved stoves are designed to burn fuel more efficiently, generating higher temperatures while using less fuel. This efficiency translates to cost savings for households as they require less fuelwood or other biomass fuels, ultimately reducing expenses for families dependent on these resources.

Time-saving: Some smokeless chullahs are designed to heat up faster and cook more efficiently than traditional methods, which can save time for people responsible for cooking in households. This can be particularly beneficial in areas where women spend a significant portion of their day cooking.

Safety: The contained design of smokeless chullahs reduces the risk of accidental fires compared to open fires, making them safer for households, especially in crowded or confined spaces.

Community and Economic Benefits: Improved cookstoves can lead to community-level benefits such as improved indoor air

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quality, reduced deforestation pressure, and potentially contribute to local economic development .Smokeless chullahs have the potential to significantly improve the quality of life for individuals and communities, especially in rural areas where traditional cooking methods are prevalent.

It has been proposed to procure and distribute 500 improved smokeless chullhas among villagers to reduce their dependence on firewood. **Rs. 40.74 lakhs** have been proposed for this purpose (unit price is Rs. 8148/-). Quotation of same has been attached in **Chapter – VI.**

5.6 Capacity building of forest department personnel

5.6.1 Training on man – animal conflict: Objective of this training is to acquaint the frontline staffs to address field related issues of human – wildlife conflict and administrative & legal action to be adopted. Rs. 5.00 lakhs will be spent every year for entire Plan period of 10 years. Total budget of **Rs. 50.00 lakhs** have been proposed for imparting the training programme.

5.6.2 Training of frontline staffs on Wildlife / Forest conservation: Objective of this training is to acquaint the frontline staffs regarding Wildlife & Forest conservation. Each year Rs. 1.50 lakh will be spent for this purpose for 10 years. Total budget of **Rs. 15.00 lakhs** have been proposed in the budget for imparting the training programme.

5.7 Supervision at Division level:

5.7.1 Purchase of two field vehicles for anti-depredation, monitoring and patrolling purpose will be made based as per the requirement of DFO Ranchi Forest Division. The vehicle will be equipped with special facilities. The amount estimated for the purpose is **Rs. 45.00 lakhs,** which have been proposed for this purpose.

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5.7.2 **Operation & Maintenance of patrolling vehicle:** Every year Rs. 3.00 lakhs have been proposed for 10 years for operation & maintenance of vehicle. Total amount of Rs. **30.00 lakhs** have been proposed for this purpose.

5.7.3 **Wages for 2 drivers of patrolling vehicle:** Wages for 2 drivers for patrolling cum anti depredation vehicle for 10 years have been calculated at current wage rate with expected enhancement in wage rate every year. **Rs. 50.77 lakhs** have been proposed in the Plan for this purpose.

5.7.4 **Hiring/engagement of one full time Wildlife/Forestry expert:** It has been proposed to engage Forestry/Wildlife expert for regular monitoring and documentation of various interventions proposed in the instant plan. Every year Rs. 6.12 lakhs (Remuneration @ Rs. 51000/- per month) will be spent for entire Plan period of 10 years. Provision of **Rs. 61.20 lakhs** have been made in the budget for this component.

5.7.5 **Procurement of equipments for monitoring:** It has been proposed to procure modern equipments like Night Vision Camera, binocular, Rang Finder, Drone etc. to facilitate proper and better monitoring. For this component **Rs. 37.00 lakhs** have been proposed in the Plan. Year wise proposed budget is as below:

Plan Year	Amount (Rs. In lakhs)
1st year	32.00
2nd year	2.00
3rd year	2.00
4th year	1.00
Total:	**37.00**

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5.8 Awareness generation & Documentation

5.8.1 Organising awareness camps: At village level Awareness Programme will be organised in Ranchi District to address Human – Elephant conflict and it will also include protection & conservation of Biodiversity, forest & wildlife with active participation of local people. For this purpose, village level camps / meetings / Nukkad – Natak will be organised. Every year Rs. 10.00 lakhs will be incurred during first two years, thereafter Rs. 2.50 lakhs will be spent every year from 3rd year to 10th year. Total amount of **Rs. 40.00 lakhs** have been proposed for this activity.

5.8.2 Printing of publicity materials regarding forest & wildlife conservation: Printing and distribution of pamphlets /booklets related to forest, wildlife, environment, water conservation and NTFP uses are proposed. **Rs. 1.50 Lakhs** will be incurred annually for 10 years. Total amount of **Rs. 15.00 lakhs** have been proposed for this purpose.

5.8.3 Fixing of signage at vulnerable locations: Signage, wall painting, slogan, poster etc. related to forest & wildlife conservation, prevention of forest fire are proposed to be fixed at vulnerable locations. It will generate awareness among local people. **Rs. 25.00 Lakhs** will be incurred in 1st year and Rs. 25.00 lakhs in 5th year of plan period. Total amount of **Rs. 50.00 lakhs** have been proposed for this purpose.

5.8.4 Photography & documentation: Photograph of all the components of the plan will be taken before commencement of work and after their completion. It will be documented with GPS coordinates in the form of booklet and copy of the same will be submitted to the Chief Wildlife Warden, Additional PCCF CAMPA, Regional CCF Hazaribagh and Conservator of Forest, Territorial Circle, Chatra.

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Every year Rs.2.00 lakh will be spent for this purpose. **Rs. 20.00 lakhs** have been proposed for this component.

5.8.5 **Engagement of experts/research scholars/intern for study of Biodiversity of the area:** The area is rich in biodiversity. It is proposed to engage technical expert to carry out study of the biodiversity and based on the findings, necessary action will be take for protection and conservation of the biodiversity. Rs. 21.00 lakhs have been proposed in the Plan for this purpose. Year wise cost break up is as below:

Plan Year	Amount (Rs. In lakhs)
1st year	5.00
2nd year	5.00
3rd year	5.00
5th year	2.00
7th year	2.00
9th year	2.00
Total:	**21.00**

5.8.6 **Construction of Nature Interpretation Centre:**

Nature Interpretation Centre aims to bridge the gap between people and nature, fostering a sense of wonder, understanding, and responsibility toward the environment. It plays a crucial role in promoting conservation and environmental stewardship in the community and beyond. Primary objectives of a Nature Interpretation Centre are:

- **Environmental Education:** To provide educational programs and exhibits that enhances the public's understanding of the biodiversity, environment, ecosystems, wildlife, and natural processes.

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- **Awareness and Appreciation**: To foster an appreciation and respect for nature's beauty, diversity, and ecological importance among visitors.
- **Conservation Advocacy**: To raise awareness about environmental issues and conservation challenges, encouraging visitors to become advocates for the protection and preservation of natural resources.
- **Connecting People with Nature**: To connect people with the natural world by creating opportunities for visitors to interact with and experience nature firsthand through guided tours, outdoor activities, and observation.
- **Scientific Understanding**: To provide a platform for scientific research, facilitating the study of local ecosystems and wildlife, which can contribute to broader scientific knowledge.
- **Recreation and Enjoyment**: To offer recreational opportunities such as hiking trails, bird watching, and nature photography, making the natural world accessible and enjoyable for visitors. To ensure that the Nature Interpretation Centre is accessible to people of all ages, backgrounds, and abilities, promoting inclusivity and diversity in environmental education.
- **Inspiration and Motivation**: To inspire individuals to take action in their own lives to protect and conserve the natural world, whether through sustainable lifestyle choices, volunteering, or supporting conservation organizations.
- **Research and Documentation**: To document and monitor changes in local biodiversity, ecosystems and wildlife,

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contributing to long-term conservation efforts and scientific research.

For construction of Nature Interpretation Centre an amount of **Rs. 55.00 lakhs** have been proposed, Rs. 50.00 lakhs in the 1st year and Rs. 5.00 lakhs in 6th year of Plan period will be spent. DFO Ranchi Forest Division will decide suitable place for its construction.

5.8.7 **Procurement of furniture and equipments for Nature Interpretation Centre:** To equip the Nature interpretation centre scientifically it is proposed to procure necessary furniture and equipments. For this purpose Rs. 25.00 lakhs will be spent on each year in 2nd and 3rd year of Plan period. Total **Rs. 50.00 lakhs** have been proposed in the Plan for this purpose.

Escalation of Budget:

The total amount proposed in the plan is likely to vary due to inflation rate, revision of wage rates and other factors. The overall escalation is estimated 20% of total amount proposed for the intervention. **Rs. 652.99 lakhs** have been proposed in the budget as 20% escalation in cost.

Contingency Fund:

To meet unforeseen expenses a contingency fund of **Rs. 20.00 Lakhs** (@ Rs. 2.00 lakh per year) are proposed. Its expenditure will be incurred by DFO Ranchi Division as per management and implementation requirements of this plan.

V-b. Location, with GPS coordinates, and maps of the areas of proposed interventions along with the location of man-made infrastructure:

Location with GPS coordinates of manmade infrastructures to be created under this plan has been annexed in Chapter – VI.

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V-c. **Monitoring and evaluation arrangement for the activities undertaken**: It will be undertaken as per CAMPA guidelines and as per the direction of Chief Wildlife Warden, Additional PCCF Campa, Regional CCF Ranchi and Conservator of Forest, Territorial Circle, Ranchi.

V-d. **Plan period, initially for 10 years with scope for interim reviews and required modifications.**

Financial forecast and financial outlay for the plan period to be broken into annual work plans and annual financial outlay in tabular form for each component. **This plan has a scope for its interim review after 5 years under the guidance of Chief Wildlife Warden.**

This chapter has a separate single table at the end showing cumulative total of interventions proposed for both the project area and project impact area.

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FINANCIAL FORECAST OF THE ACTIVITIES TO BE IMPLEMENTATED BY FOREST DEPARTMENT UNDER WILDLIFE MANAGEMENT PLAN OF KDH OCP IN RANCHI FOREST DIVISION

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
5.1	Wildlife Habitat protection and development											
5.1.1. (a)	Forest Restoration Advance Work: Water Conservation cum Plantation Scheme / technique prevalent in forest department) 200 ha. every year in first 2 years as per SOR for RDF issued by O/O No. 36 dt. 26.04.2023 of APCCF Development	242.56	242.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	485.13
(b)	Completion / maintenance works of plantation	0.00	88.26	128.10	74.87	60.32	29.08	7.58	3.79	0.00	0.00	392.00
5.1.2	Creation of drinking water facility for wild animals (@Rs. 2,50,000/- per small pond x 10 ponds & Rs. 8,00,000/- for two checkdam) per year during first 3 years, then one check dam and 2 ponds per year from 4th year to 10th year	41.00	41.00	41.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	214.00
5.1.3 (a)	Decongestion of Bamboo Clumps, 400 Ha (100 Ha each for first 4 yrs) as per SOR dated 26.04.23	35.72	35.72	35.72	35.72	0.00	0.00	0.00	0.00	0.00	0.00	142.90
(b)	Completion / maintenance works of bamboo clump decongestion work	0.00	5.10	10.20	10.20	10.20	5.10	0.00	0.00	0.00	0.00	40.80
5.1.4	Construction of 20 pucca checkdams for provisioning of water @ 17 Lac each (5 check dams every year in1st, 2nd, 3rd & 4th year)	85.00	85.00	85.00	85.00	0.00	0.00	0.00	0.00	0.00	0.00	340.00
5.1.5	Deployment of 6 Gaj Mitra for awareness of elephant movement @ 1.25 lakhs each per year	7.50	7.50	7.50	7.50	7.70	7.50	7.50	7.50	7.50	7.50	75.00
5.1.6	Broadcasting of bulk messages to the people living in vicinity of elephant prone areas	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	50.00
5.1.7	Procurement of snake rescue kit / equipments and wages of rescue team	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	30.00
	Sub-total	419.78	513.15	316.53	234.29	99.22	62.68	36.08	32.29	28.50	28.50	1769.82
5.2	Improvement of water regime and its maintenance											
5.2.1.	Contour cutting + Soil Water conservation as per the PCCF Development order 36 date 18.8.2019 having 100 man-days per hectare for a total area of 700 ha (@Rs. 346.01 x 100 MD x 700 ha), 200 ha every yr. in 1st & 2nd yr and 100 ha every yr. in 3rd, 4th & 5th yr.	69.20	69.20	34.60	34.60	34.60	0.00	0.00	0.00	0.00	0.00	242.20
	Sub-total	69.20	69.20	34.60	34.60	34.60	0.00	0.00	0.00	0.00	0.00	242.20
5.3	Anti-depredation and wildlife protection measures											
5.3.1.	Installation of early warning system for elephant movement (in villages falling in elephant movement path)	25.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00
5.3.2.	Operation & Maintenance of elephant warning system / mobile recharge of anti depredation team members	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
5.3.3	Purchase of 10 motorcycles for patrolling by frontline staff @ 2.00 each	20.00	–	–	–	–	–	–	–	–	–	20.00
5.3.4	POL & maintenance of 10 motorcycles @ Rs. 30000 per motorcycle per year	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	30.00

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ANNEXURE-I

5.3.5	Engagement of JFMC members for anti depredation measures & for watch towers	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	62.50
5.3.6	Procurement of rechargeable torch, crackers, kerosene oil, burnt Mobil for distribution among villagers in elephant effected areas	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	50.00
5.3.7	Procurement & Installation of solarstreet light in elephant affected villages @ Rs.33,000/- each. (100 lights 1st year ,50 lights 2nd & 3rd year)	33.00	16.50	16.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	66.00
5.3.8	Procurement & Installation of solar high mast light in elephant affected villages @ Rs.2,65,000/- each. (5 lights 1st year & 5 lights 2nd year)	13.25	13.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.50
5.3.9	Construction and establishment of wildlife monitoring cell with provision of computer, software, communucation system, furniture and its operation cost	30.00	10.00	10.00	6.00	5.00	5.00	5.00	5.00	5.00	5.00	85.00
5.3.10	Construction of 5 watch towers in PFs near Hesalong for monitoring of elephant movement @ 15 lakhs each	30.00	0.00	15.00	0.00	15.00	0.00	15.00	0.00	0.00	0.00	75.00
	Sub-total	166.00	90.00	66.75	36.25	36.25	20.25	36.25	20.25	20.25	20.25	475.00
5.4.	Fire prevention and protection of habitat											
5.4.1.	Fire Fighting tools:											
a.	Procurement of fire fighting tools, blowers, kit etc. and their recurring expenditure	20.00	20.00	20.00	5.00	5.00	5.00	2.50	2.50	2.50	2.50	85.00
b.	Procurement of G.P.S. & other equipments for reporting of fire incidences	5.00	5.00	5.00	1.50	1.50	1.50	1.50	1.50	1.50	1.50	25.50
5.4.2.	Fire fighting squad											
a.	Engagement of JFMC members for fire fighting & preventive measures	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	25.00
	Sub-total	27.50	27.50	27.50	9.00	9.00	9.00	6.50	6.50	6.50	6.50	135.50
5.5.	Livelihood and Capacity Building & Training of local people and to [illegible]											
a.	Set up of NTFP based micro enterprise and handholding	18.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.00
b.	Training on minimizing dependence on Forest Resources	5.00	5.00	5.00	2.50	2.50	2.50	2.50	2.50	2.50	2.50	32.50
c.	Procurement & distribution of improved 500 smokeless chullah among villagers to reduce their dependece on firewood @ Rs. 8148/- per piece	40.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.74
	Sub-total	63.74	15.00	5.00	2.50	2.50	2.50	2.50	2.50	2.50	2.50	101.24
5.6.	Capacity Building of forest department personnel for Monitoring											
5.6.1.	Training on man-animal conflict resolution for general masses /inhabitants of the area	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	50.00
5.6.2.	Training of frontline staffs on Wildlife / Forest conservation	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	15.00
	Sub-total	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	65.00
5.7.	Procurement of vehicle											
5.7.1	Purchase of two field vehicles for patrolling & monitoring + supervision of activities under the Wildlife Conservation Plan	45.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45.00
5.7.2	Operation / maintenance of vehicle including cost of POL	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	30.00

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5.7.3	Wages for 2 drivers for patrolling vehicle	3 19	3 51	3 86	4 25	4 67	5 13	5 64	6 20	6 82	7 50	50.77
5.7.4	Hiring/engagement of one full time Wildlife/Forestry expert for regular monitoring and documentation of various interventions proposed in the Plan @ Rs. 51,000/-per month	6 12	6 12	6 12	6 12	6 12	6 12	6 12	6 12	6 12	6 12	61.20
5.7.5	Procurement of Night Vision camera, binocular, range finder, drones etc for monitoring	32 00	2 00	2 00	1 00	0 00	0 00	0 00	0 00	0 00	0 00	37.00
	Sub-total	53.31	14.63	14.98	12.37	13.79	14.25	14.76	15.32	15.94	16.62	225.97
5.8	Wildlife Conservation, Research & Documentation											
5.8.1	Organizing awareness camps in Ranchi District to address man animal conflict	10 00	10 00	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	40.00
5.8.2	Printing of booklets, pamphlets & banners regarding Forest & Wildlife conservation	1 50	1 50	1 50	1.50	1 50	1 50	1 50	1 50	1 50	1 50	15.00
5.8.3	Fixing of Wildlife & Forest Awareness Signage at vulnerable locations	25.00	0 00	0 00	0 00	25.00	0 00	0 00	0 00	0 00	0 00	50.00
5.8.4	Photography, documentation & third party evaluation of activities to be undertaken under the Wildlife Conservation Plan	2.00	2 00	2.00	2.00	2.00	2 00	2 00	2 00	2 00	2 00	20.00
5.8.5	Engagement of experts/ research scholars/ intern for study of biodiversity conservation of the area	5.00	5.00	5.00	0.00	2.00	0.00	2 00	0 00	2.00	0 00	21.00
5.8.6	Construction & maintenance of Nature Interpretation-cum Training centre	50.00	0.00	0 00	0.00	0.00	5 00	0 00	0 00	0.00	0.00	55.00
5.8.7	Procurement of furniture and equipments for Nature Interpretation Centre	0.00	25 00	25.00	0.00	0.00	0 00	0.00	0 00	0.00	0 00	50.00
	Sub-total	93.50	43.50	36.00	6.50	33.50	11.00	8.00	6.00	8.00	6.00	251.00
		936.04	788.48	496.86	327.51	233.86	128.18	109.59	89.36	88.19	86.87	3283.73
	Escalation @20%	1123.25	923.38	596.23	393.01	280.63	151.42	131.51	107.23	105.83	104.24	3916.72
	Contingency (L.S.) for unforeseen expenses @ Rs 2.00 lakhs per year	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
	Grand Total year wise	1125.25	925.38	598.23	395.01	282.63	153.42	133.51	109.23	107.83	106.24	3936.72
											Grand Total (Rupees in Lakhs)	

Note:
(i)D.F.O.will obtain technical sanction of item of works to be implemented from the competent authority.
(ii)If any item of work is sanctioned from any other scheme of State Plan or C.S.S., expenditure will be made from only one scheme.
(iii)After 5 years of Plan period, the instant Plan will be reviewed and it will be modified according to field requirements under the guidance of PCCF Wildlife and RCCF Ranchi. The User Agency will deposit the difference amount, if any, in CAMPA Account.

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For Avantika Green W

Divisional Forest Officer
Ranchi Forest Division, Ranchi

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FLORA OF RANCHI FOREST DIVISION

S.NO	LOCAL NAME	BOTANICAL NAME	FAMILY	HABIT
1.	Babul	*Acacia Arabica*	Mimosaceae	Tree
2.	Khair	*Acacia catechu*	Mimosaceae	Tree
3.	Arar	*Acacia pennata*	Mimosaceae	Climber
4.	Chirchiri	*Achyranthus aspera*	Amaranthaceae	Shrub
5.	Karam (Haldu)	*Adina cordifolia*	Rubiaceae	Tree
6.	Bel	*Aegle inarmelos*	Rutaceae	Tree
7.	Murabba	*Agava species*	Agavaceae	Shrub
8.	Mahaneem	*Ailanthus excelsa*	Simarubaceae	Tree
9.	Dhela	*Alangium salvifolium*	Alangiaceae	Shrub
10.	Kala siris	*Albizia lebbek*	Mimosaceae	Tree
11.	Jhang siris	*Albizzia odoratissima*	Mimosaceae	Tree
12.	Safed siris	*Albizzia procera*	Mimosaceae	Tree
13.	Kalmegh	*Andrographis paniculata*	Acanthaceae	Herb
14.	Dhaunta	*Anogeissus latifolia*	Combretaceae	Tree
15.	Amti	*Antidesma diandrum*	Phyllanthaceae	Shrub
16.	Dudhia sauri	*Apluda varia*	Phyllanthaceae	Grass
17.	Kathal	*Artocarpus integrifolia*	Moraceae	Tree
18.	Satawar	*Asparagus racemosus*	Liliaceae	Shrub
19.	Neem	*Azadirachia indica*	Meliaceae	Tree
20.	Bara bans	*Bambusa arundinacea*	Poaceae	Bamboo
21.	Konar	*Bauhinia purpurea*	Caesalpiniaceae	Tree
22.	kathmouli	*Bauhinia racemosa*	Caesalpiniaceae	Tree

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S.NO	LOCAL NAME	BOTANICAL NAME	FAMILY	HABIT
23.	Kathmahuli	*Bauhinia retusa*	Caesalpiniaceae	Tree
24.	Mahulan	*Bauhinia vahlii*	Caesalpiniaceae	Climber
25.	Kachnar	*Bauhinia variegate*	Caesalpiniaceae	Tree
26.	Kashmoi	*Berberis arista*	Berberidaceae	Shrub
27.	Semal	*Bombax ceiba*	Bombaceae	Tree
28.	Salai	*Boswellia serrata*	Palmae	Tree
29.	Kajh (Kaji)	*Bridelia retusa*	Euphorbiaceae	Tree
30.	Piar	*Buchanania lanzen*	Anacardiaceae	Tree
31.	Palas	*Butea monosperma*	Fabaceae	Tree
32.	Cihut	*Butea parviflora*	Fabaceae	Climber
33.	Latpalas	*Butea superba*	Papilionaceae	Climber
34.	Akwan	*Calotropis gigantea*	Asclepiadaceae	Shrub
35.	Kumbhi	*Careya arborea*	Barringtoniaceae	Tree
36.	Kanwar	*Carissa carandas*	Apocynaceae	Shrub
37.	Jungli karonda	*Carissa spinarum*	Apocynaceae	Shrub
38.	Amerbel	*Cascuta reflexa*	Convolvulaceae	Climber
39.	Beri	*Casearia tomentosa*	Flacourtiaceae	Shrub
40.	Amaltas	*Cassia fistula*	Caesalpiniaceae	Tree
41.	Chakod	*Cassia tora*	Caesalpinaceae	Herb
42.	Bharhul	*Chloroxylon swietenia*	Rutaceae	Tree
43.	Chorkanta	*Chrysopogon aciculatus*	Poaceae	Grass
44.	Kargali	*Cleistanthes collinus*	Euphorbiaceae	Shrub
45.	Galgal	*Cochlospernnum religiosum*	Cochlospermaceae	Shrub
46.	Bahuar	*Cordia myxa*	Boraginaceae	Tree

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S.NO	LOCAL NAME	BOTANICAL NAME	FAMILY	HABIT
47.	Putrid	*Croton oblongfolius*	Rubiaceae	Shrub
48.	Dudhlar	*Cryptolepis buchanani*	Asclepiadaceae	Climber
49.	Dudhegras	*Cymbopogon martini*	Poaceae	Grass
50.	Doob	*Cynodon dactylon*	Poaceae	Grass
51.	Sissoo (Shsisham)	*Dalbergia sissoo*	Fabaceae	Tree
52.	Hardi	*Dalbergia lanceolaria*	Fabaceae	Tree
53.	Satsar	*Dalbergia latifolia*	Fabaceae	Tree
54.	Bans	*Dandrocalamus strictus*	Graminae	Bamboo
55.	Rai	*Dillenia pentagyna*	Dillenaceae	Tree
56.	Madarkend	*Diospyrous embryopteris*	Ebenaceae	Tree
57.	Kendu (Tend)	*Diospyrous melanoxylon*	Ebenaceae	Tree
58.	Chamror	*Ehretia laevis*	Ehretiaceae	Tree
59.	Ratangarur	*Elaeodendron mukorossi*	Mimosaceae	Tree
60.	Amla	*Emblica officinalis*	Euphorbiaceae	Tree
61.	Baborang	*Emblica robusta*	Euphorbiaceae	Herb
62.	Kathjamun	*Eugenia heyneana*	Myrtaceae	Tree
63.	Jamun	*Eugenia jambo*	Myrtaceae	
64.	Sabai.	*Eulaliopsis binata*	Gramineae	Grass
65.	Dudhi	*Euphorbia hirta*	Euphorbiaceae	Herb
66.	Bargad	*Ficus benghalensis*	Moraceae	Tree
67.	Parho	*Ficus cunia*	Moraceae	Tree
68.	Dumar	*Ficus hispida*	Moraceae	Tree
69.	Pipal	*Ficus religiosa*	Moraceae	Tree
70.	Barun	*Ficus tomentosa*	Moraceae	Tree

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S.NO	LOCAL NAME	BOTANICAL NAME	FAMILY	HABIT
71.	Katahi	*Flacourtia ramontchi*	Flacourtiaceae	Shrub
72.	Galfuli	*Flemingia scaber*	Fabaceae	Shrub
73.	Karhar	*Gardenia turgid*	Rubiaceae	Shrub
74.	Papra	*Gardinia latifolia*	Rubiaceae	Tree
75.	Gamhar	*Gmelina arborea*	Verbenaceae	Tree
76.	Patdhaman	*Grewia asiatica*	Tiliaceae	Tree
77.	Orchid	*Habenaria susannae*	Orchidiceae	Orchid
78.	Aintha	*Helicteres isora*	Sterculiaceae	Shrub
79.	Choranth	*Heteropogon contortos*	Gramineae	Grass
80.	Koraiya	*Holarrhena antidysenterica*	Apocynaceae	Shrub
81.	Chilbil	*Holoptelia integrifolia*	Lameaceae	Tree
82.	Bhurkund	*Hymenodictyon excelsum*	Rubiaceae	Tree
83.	Gaithi	*Hypericum gaitii*	Clusiaceae	Herb
84.	Dudhlata	*Ichnocarpus frustescens*	Apocynaceae	Creeper
85.	cherogras	*Imperata arundinacea*	Poaceae	Grass
86.	Ulu	*Imperata cylindirca*	Poaceae	Grass
87.	Jirhul	*Indigofrea pulchela*	Fabaceae	Shrub
88.	Puta	*Kadia calycina*	Malvaceae	Tree
89.	Sidha	*Lagerstroemia parvflora*	Lythraceae	Tree
90.	Doka	*Lannea grandis*	Anacardiaceae	Tree
91.	Putus	*Lantana camara*	Verbenaceae	Shrub
92.	Banda	*Loranthus species*	Loranthaceae	Shrub
93.	Mahua	*Madhuca indica*	Sapotaceae	Tree
94.	Rori (Sinduri)	*Mallotus philippinensis*	Euphorbiaceae	Shrub

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S.NO	LOCAL NAME	BOTANICAL NAME	FAMILY	HABIT
95.	Aam	*Mangifera indica*	Anacardiaceae	Tree
96.	Bakain	*Melia azadirachta*	Mckiaceae	Tree
97.	Kari	*Miliusa velutina*	Annonaceae	Tree
98.	Lajwanti	*Mimosa pudica*	Mimosaceae	Herb
99.	Gurikaram	*Mityragyna parviflora*	Rubiaceae	Tree
100.	Tut	*Morus alba*	Moraceae	Tree
101.	Alkusi	*Mucuna prurita*	Fabaceae	Climber
102.	Harsingar	*Nyctanthes arbotristis*	Oleaceae	Shrub
103.	Pandan (Sandan)	*Ougeinia oojeinensis*	Fabaceae	Tree
104.	Khrj	*Panicum montana*	Poaceae	Grass
105.	Khajur	*Phoenix acaulis*	Palmaceae	Shrub
106.	Orchid	*Pogonia species*	Orchidaceae	Orchid
107.	Kudmi	*Polyalthia cerasioides*	Annonaceae	Tree
108.	Karanj	*Pongamia pinnata*	Papilionaceae	Tree
109.	Bhidialar	*Porana paniculata*	Convolvulaceae	Climber
110.	Bijasal	*Pterocarpus marsupium*	Fabaceae	Tree
111.	Patalkonhra	*Pueraria tuberose*	Fabaceae	Climber
112.	Manfal (Porto)	*Randia dumetorun*	Rubiaceae	Shrub
113.	Chandra	*Rouwolfia species*	Apocynaceae	Shrub
114.	Jotsingh	*Rubia cordifolia*	Rubiaceae	Tree
115.	Munj	*Saccharum munj*	Poaceae	Grass
116.	Kusum	*Schleichera oleosa*	Sapindaceae	Tree
117.	Eksira	*Schrebera swietinoides*	Oleaceae	Tree
118.	Bhelwa	*Semacarpus anacardium*	Aracardiaceae	Tree
119.	Sal	*Shorea robusta*	Dipterocarpaceae	Tree

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S.NO	LOCAL NAME	BOTANICAL NAME	FAMILY	HABIT
120.	Ramdatawan	*Smilax macrophyla*	Smilacaceae	Climber
121.	Ramdatawan	*Smilax prolifera*	Smilacaceae	Climber
122.	Makoi	*Solanum nigrum*	Solanaceae	Herb
123.	Rengni	*Solanum xanthocarpum*	Solanaceae	Shrub
124.	Birja	*Sophora bakeri*	Fabaceae	Herb
125.	Rohan	*Soymida febrifuga*	Meliaceae	Tree
126.	Amra	*Spondias pinnata*	Anacardiaceae	Tree
127.	Keonjhi	*Sterculia urens*	Sterculiaceae	Tree
128.	Pader	*Sterospermum suaveolens*	Bignoniaceae	Tree
129.	Gond	*Storobilanthus auriculatus*	Acanthaceae	Shrub
130.	Chiretta	*Swertia pulchella*	Gentianaceae	Herb
131.	Lodh	*Symplocas racemosa*	Symplocaceae	Shrub
132.	Imli	*Tamarindus indica*	Caesalpiniaceae	Tree
133.	Sagwan(Teak)	*Tectona grandis*	Verbenaceae	Tree
134.	Arjun	*Teiminalia arjuna*	Combretaceae	Tree
135.	Asan	*Teiminalia tomentosa*	Combretaceae	Tree
136.	Sarpuka	*Tephrosia purpurea*	Fabaceae	Shrub
137.	Behera	*Terminalia bellerica*	Combretaceae	Tree
138.	Harra	*Terminalia chebula*	Combretaceae	Tree
139.	Kapasi	*Thespesia lampas*	Malvaceae	Shrub
140.	Jharugras	*Thysanolaena agrostis*	Poaceae	Grass
141.	Jangli piaz	*Urginea indica*	Liliaceae	Herb
142.	Orchid	*Vanda species*	Orchidaceae	Orchid
143.	Katai	*Vangueria pubescens*	Rubiaceae	Tree
144.	Keoti	*Ventilago madrasatana*	Rhamnaceae	Climber

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S.NO	LOCAL NAME	BOTANICAL NAME	FAMILY	HABIT
145.	Khus-Khus	*Vetiveria zizanioides*	Graminae	Grass
146.	Banda	*Viscum species*	Viscaceae	Parasite
147.	Sinduar	*Vitex negundo*	Verbenaceae	Shrub
148.	Harjorwa	*Vitis repanda*	Vitaceae	Climber
149.	Tilai	*Wendlandia excreta*	Rubiaceae	Tree
150.	Dhawai	*Woodfordia frutescens*	Lythraceae	Shrub
151.	Adhkapar	*Wrightia tinctoria*	Apocynaceae	Shrub
152.	Ber	*Zizyphus mauritiana*	Rhamnaceae	Shrub
153.	Dithor	*Zizyphus oenoplia*	Rhamnaceae	Climber
154.	Kathber	*Zizyphus xylopyra*	Rhamnaceae	Tree

FAUNA OF RANCHI FOREST DIVISION

Sl. No.	English Name	Latin Name
1	Four-horned Antelope	*Tetraceros quadricornis*
2	Badger, Honey or Ratel	*Mellivora capensis*
3	Fulvous Fruit Bat	*Rousettus leschenaulti*
4	Indian Flying Fox	*Pteropus giganteus*
5	Short-nosed Fruit Bat	*Cynopterus sphinx*
6	Sloth Bear	*Melursus ursinus*
7	Indian Bison/Gaur	*Bos gaurus*
8	Wild Boar	*Sus scrofa*
9	Jungle Cat	*Felis chaus*
10	Common Palm Civet	*Paradoxurus hermaphroditus*
11	Small Indian Civet	*Viverricula indica*
12	Barking Deer or Muntjac	*Muntiacus muntjak*
13	Mouse Deer/Indian Chevrotain	*Tragulus meminna*
14	Spotted Deer or Chital	*Axis axis*
15	Indian Wild Dog	*Cuon alpinus*
16	Indian Elephant	*Elephas maximus*
17	Nilgai or Bluebull	*Bselaphus trogocamelus*
18	Indian Gerbil	*Tatera indica*
19	Indian Fox	*Vulpes bengalensis*
20	Indian Hare	*Lepus nigricollis*

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21	Striped Hyena	*Hyaena hyaena*
22	Jackal	*Cains aureus*
23	Common Langur	*Preshytis entellus*
23	Leopard	*Panthera pardus*
25	Rhesus Macaque	*Macaca mulatta*
26	Common Mongoose	*Herpestes edwardsi*
27	Mouse, Indian Field	*Mus booduga*
28	Small Indian Mongoose	*Herpestes auropunctatus*
29	Long-tailed Tree Mouse	*Vendeleuria oleracea*
30	Indian Pangolin	*Manis crassiicaudata*
31	Indian Porcupine	*Hystrix indica*
32	Rat, Bandicoot	*Bandicota indica*
33	Rat, Indian Bush	*Golunda ellioti*
34	Shrew, Grey Musk	*Suncus murinus*
35	Sambhar	*Cervus unicolor*
36	Squirrel, Indian Giant	*Ratufa indica*
37	Three-striped Palm Squirrel	*Funambulus palmarum*
38	Tiger	*Panthera tigris*
39	Wolf	*Canis lupus*

REPTILES

Sl. No.	Common Name	Scientific Name	Local Name
	SNAKES		
1	Indian Rock Python	*Python molurus*	Ajgar
2	Red Sand Boa	*Eryx johnii*	Dumuhi
3	Indian rat snake	*Ptyas mucosus*	Dhaman
4	Common krait	*Bungarus caeruleus*	Karait
5	Banded Krait	*Bungarus fasciatus*	
6	Spectacled Cobra	*Naja naja*	Gehuwan, Nag
7	King Cobra	*Ophiophagus hannah*	
8	Russell's viper	*Daboia russelii*	Siarchanda, Bahera sap
	LIZARDS		
9	Common House Gecko	*Hemidactylus flaviviridis*	Chipkali
10	Chameleon	*Chamelion calcarato*	Bahurupa
11	Rock Lizard	*Agma buberculatus*	Lotan, Lotani
12	Monitor Lizard	*Varanus monitor*	Goh Sap

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FISHES

Sl. No.	Scientific Name	Vernacular Name
	Siluriformes	
1	*Ompok bimaculatus*	
2	*Wallago attu*	
3	*Mystus bleekeri*	
4	*Mystus tengara*	
5	*Mystus vittatus*	
6	*Bagarius bagarius*	
7	*Ailia colia*	
8	*Clupisoma garua*	
9	*Heteropneustes fossilis*	
10	*Clarius batrachus*	Mangur
	Osteoglossiformes	
11	*Notopterus notopterus*	
12	*Chitala chitala*	
	Clupeiformes	
13	*Gudusia chapra*	
	Cypriniformes	
14	*Puntius ticto*	Puthi
15	*Puntius sarana*	
16	*Labeo bata*	Bata
17	*Labeo calbasu*	
18	*Catla catla*	Catla
19	*Labeo rohita*	Rohu
20	*Cirrhina mrigala*	Mirgal
21	*Osteobrama cotio*	
	Synbranchiformes	
22	*Monopterus cuchia*	
23	*Mastacembelus pancalus*	
24	*Mastacembelus armatus*	
25	*Macrognathus aual*	
	Perciformes	
26	*Channa punctatus*	Garai
27	*Channa orientalis*	

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28	*Channa striata*	
	Cyprinodontiformes	
29	*Gambusia affinis*	
	Mugliformes	
30	*Rhinomugil corsula*	

Sl. No.	INSECTS	
1	Poduridae	*Achourutes armatus*
2	Dictyoptera	*Blatta arientalis*
3	Dictyoptera	*Mantis religiosa*
4	Pentatomidao	*Nozara virudula*
5	Pyrrhocoridae	*Dysderous cinzulatus*
6	Formicidae	*Componotus compressus*
7	Formicidae	*Solepopsis spp.*
8	Anidae	*Monorium spp.*
9	Anidae	*Apis dorsats*
10	Anidae	*Apis indica*
11	Anidae	*Apis spp.*
12	Andrenidae	*Andrena spp.*
13	Bombidae	*Bombus spp.*
14	Vespidae	*Polistis spp.*
15	Ichneumonidae	*Tchneumop spp.*
16	Carabidae	*Arthia spp.*
17	Buprestidyae	*Chrysochroa spp.*
18	Conccinellidae	*Coccipella septemunctata*
19	Conccinellidae	*Chilomenes sex maculata*
20	Melodae	*Mylabris pustulata*
21	Melolonthidae	*Holotricha serrata*

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LIST OF BIRDS

Sl. No.	English Name	Latin Name
1	Babbler, Common	*Turdoides caudatus*
2	Barbet, Crimson-breasted or Coppersmith	*Megalaima haemacephala*
3	Bird, Black	*Turdus merula*
4	Bird, Tailor	*Orthotomus sutorius*
5	Bittern, Chestnut	*Ixobrychus cinnamomeus*
6	Bulbul, Red-vented	*Pycnonotus cafer*
7	Crow, House	*Corvus splendens*
8	Crow, Jungle	*Corvus macrorhynchos*
9	Curlew	*Numenitus arquata*
10	Dove, Little Brown	*Streptopelia senegalensis*
11	Duck, Pintail	*Anas acuta*
12	Eagle, Crested Hawk	*Spizaetus cirrhatus*
13	Eagle, Crested Serpent	*Spilornis cheela*
14	Eagle, Short-toed	*Circaetus gallicus*
15	Eagle, Tawny	*Aquila rapax*
16	Fowl, Red Jungle	*Gallus gallus*
17	Heron, Grey	*Ardea cinerea*
18	Hoopoe	*Upupa epops*
19	Hornbill, Common Grey	*Tockus birostris*
20	Peafowl, Common	*Pavo cristatus*
21	Ibis, Black	*Pseudibis papillosa*
22	Kingfisher, white breasted	*Halcyon smyrnensis*
23	Kite, Brahminy	*Heliastur indicus*
24	Koel	*Eudynamys scolopacea*
25	Lapwing, Red-wattled	*Vanellus indicus*
26	Lapwing, Yellow-wattled	*Vanellus malabaricus*
27	Lark, Red-winged Bush	*Mirafra erythroptera*
28	Lark, Rufous-tailed Finch	*Ammomanes phoenicurus*
29	Lorikeet	*Loriculus vernalis*
30	Minivet, Scarlet	*Pericrocotus flammeus*
31	Munia, Black-headed	*Lonchura Malacca*
32	Munia, Green	*Estrilda Formosa*
33	Munia, Red or Waxbill	*Estrilda amandava*
34	Munia, Spotted	*Lonchura punctulata*
35	Munia, White-backed	*Lonchura striata*
36	Munia, White-throated	*Lonchura malabarica*
37	Myna, Bank	*Acridotheres ginginianus*
38	Mayna, Grey-headed	*Sturnus malabaricus*
39	Myna, Indian	*Acridotheres tristis*

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40	Myna, Jungle	*Acridotheres fuscus*
41	Myna, Pied	*Sturnus contra*
42	Myna, Brahminy or Black-headed	*Sturnus pagodarum*
43	Nightjar, Common Indian	*Caprimulgus asiaticus*
44	Nuthatch, Chestnut-bellied	*Sitta castanea*
45	Oriole, Black-headed	*Oriolux xanthornus*
46	Oriole, Golden	*Oriolus oriolus*
47	Owl, Barn or Screech	*Tyto alba*
48	Owl, Brown Fish	*Bubo zeylonensis*
49	Parakeet, Alexandrine or Large Indian	*Psittacula eupatria*
50	Parakeet, Blossom-headed	*Psittacula cyanocephala*
51	Pigeon, Common Green	*Treron phoenicoptera*
52	Pipit, Indian	*Anthus phoenicoptera*
53	Pitta, Indian	*Pitta brachyura*
54	Plover, Little Ringed	*Charadrius dubius*
55	Redshank	*Tringa totanus*
56	Robin, Indian	*Saxicoloides fulicata*
57	Robin, Magpie	*Copsychus saularis*
58	Roller or Blue Jay	*Coracias benghalensis*
59	Sandgrouse, Common	*Pterocles exustus*
60	Sandgrouse, Painted	*Pterocles indicus*
61	Shrike, Large Cuckoo	*Coracina novaehollandiae*
62	Shrike, Rufous-backed	*Lanius schach*
63	Skylark, Indian Small	*Alauda guagula*
64	Sparrow, House	*Passer domesticus*
65	Sparrow, Yellow-Throated	*Petronia xanthocollis*
66	Spurfowl, Red	*Galloperdix spadicea*
67	Stilt, Blackwinged	*Himantopus himantopus*
68	Stint, Little	*Calidris minutus*
69	Stork, White	*Ciconia ciconia*
70	Stork, White-nacked	*Ciconia episcopus*
71	Stork, Black-necked	*Ephippiorhynchus asiaticus*
72	Sunbird, Purple	*Nectarinia asiatica*
73	Sunbird, Purple-rumped	*Nectarinia zeylonica*
74	Swallow, Red-rumped	*Hirundo daurica*
75	Swallow, Common	*Hirundo rustica*
76	Swallow, Wire-tailed	*Hirundo smithi*
77	Swift, Crested Tree	*Hemiprocne longipennis*
78	Swift, house	*Apus affinis*
79	Swift, Palm	*Cypsiurus parvus*
80	Teal, Common	*Anas crecca*
81	Tern, Indian Whiskered	*Chlidonias hybrida*

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82	Tern, River	*Sterna aurantia*
83	Tit, Grey	*Parus major*
84	Vulture, White-backed or Bengal	*Gyps bengalensis*
85	Egyptian Vulture	*Nephron percnopterous*
86	Wagtail, Grey	*Motacilla caspica*
87	Wagtail, Large Pied	*Motacilla maderaspatensis*
88	Wagtail, White	*Motacilla alba*
89	Wagtail, Yellow	*Motacilla flava*
90	Wagtail, Yellow-headed	*Motacilla citreola*
91	Warbler, Ashy Wren	*Prinia socialis*
92	Warbler, Indian Wren	*Prinia subflava*
93	Warbler, Streaked Fantail	*Cisticola juncidis*
94	Waterhen, White-breasted	*Amaurornis phoenicurus*
95	Weaver Bird, Baya	*Ploceus philippinus*
96	Weaver Bird, Black-breasted	*Ploceus bengalensis*

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झारखण्ड सरकार
वन, पर्यावरण एवं जलवायु परिवर्तन विभाग

संकल्प

ज्ञापांक–वन्यप्राणी–08/2000 (खण्ड)–[illegible] राँची, दिनांक [illegible]

विषयः– झारखण्ड राज्य में जंगली जानवरों द्वारा जान–माल, फसल, पालतू जानवर एवं मकान की क्षति के फलस्वरूप मुआवजा भुगतान के संबंध में।

झारखण्ड राज्य अन्तर्गत रहने वाले लोगों के जान–माल, फसल तथा उनके पशुधन इत्यादि को जंगली जानवरों द्वारा आकस्मिक रूप से पहुँचाये जानेवाले नुकसान की क्षतिपूर्ति हेतु वन, पर्यावरण एवं जलवायु परिवर्तन विभाग, झारखण्ड सरकार के संकल्प संख्या–3906 दिनांक–18.09.2017 द्वारा निर्धारित मुआवजा दर को संशोधित करते हुए राज्य सरकार द्वारा सम्यक समीक्षोपरांत यह निर्णय लिया गया है कि जंगली जानवरों द्वारा जान–माल (पशुधन, सम्पति इत्यादि) को पहुँचायी गयी विभिन्न प्रकार की क्षति की स्थिति में निम्न दर पर मुआवजा राशि का भुगतान किया जायेगा :–

क्र0 सं0	क्षति का प्रकार	मुआवजा राशि का दर
1	मनुष्य के मृत्यु होने पर	4,00,000/– (चार लाख रूपये)
2	मनुष्य के घायल होने पर	
	(क) गंभीर रूप से घायल होने पर	1,50,000/– (एक लाख पचास हजार रूपये)
	(ख) साधारण/हल्के रूप से घायल होने पर	25,000/– (पच्चीस हजार रूपये)
3	मनुष्य के स्थायी रूप से अपंग होने पर	3,25,000/– (तीन लाख पच्चीस हजार रूपये)
4	मकान की क्षति	
	(i) पूर्ण रूप से क्षतिग्रस्त मकान	(क) IAP जिलों के लिए रू0 1.30 लाख प्रति इकाई (ख) Non IAP जिलों के लिए रू0 1.20 लाख प्रति इकाई
	(ii) गंभीर रूप से क्षतिग्रस्त मकान (कच्चा/पक्का)	
	(क) पक्का मकान	
	(ख) कच्चा मकान	
	(ग) साधारण रूप से क्षतिग्रस्त मकान	
5	भंडारित अनाज	2600/– (दो हजार छः सौ रूपये) प्रति क्विंटल, अधिकतम 20,000/–(बीस हजार रूपये)
6	भैंस/गाय/बैल की मृत्यु	
	(क) स्टॉल फिडिंग	50,000/– (पचास हजार रूपये)
	(ख) खुले में चरने वाले	25,000/– (पच्चीस हजार रूपये)
7	घोड़ा/घोड़ी की मृत्यु	8,000/– (आठ हजार रूपये)
8	भेड़/बकरा/बकरी की मृत्यु	5,000/– (पांच हजार रूपये)

मुआवजा संकल्प-I

15/6/2018 परियोजना पदाधिकारी केन्द्रीय/एच परियोजना

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9	पलाश की क्षति	1 भूमिहार किसान मौजा [illegible] में– 32,500.00/– (तीस हजार पाँच सौ रुपये) प्रति हे0। अधिकतम 65,000.00/–(पैंसठ हजार रुपये) 2 लगुईदार किसानी के मामले में– (क) खेती करने वाले लगुईदार किसान–21,667.00/ (इक्कीस हजार छः सौ सरसठ रुपये) प्रति हे0 अधिकतम 43,334.00/– (तैंतालीस हजार तीन सौ चौंतीस रुपये) (ख) खेत मालिक को – 10,833.00/– (दस हजार आठ सौ तैंतीस रुपये) प्रति हे0 अधिकतम 21,666.00/– (इक्कीस हजार छः सौ छियासठ रुपये)

(2) मकान, फसल, भंडारित अनाज एवं पालतु जानवर की क्षति से प्रभावित व्यक्ति द्वारा संबंधित वन क्षेत्र पदाधिकारी को संलग्न प्रपत्र (अनुलग्नक–I) में सूचना दिया जायेगा। क्षति का आकलन प्रभावित ग्राम के मुखिया, संबंधित ग्राम वन प्रबंधन एवं संरक्षण समिति/इको विकास समिति के अध्यक्ष, सदस्य सचिव, वन क्षेत्र पदाधिकारी, वनपाल/क्षेत्र के वनरक्षी एवं इलका कर्मचारी के द्वारा घटना के एक सप्ताह के अंदर संयुक्त निरीक्षण कर सरकारी/राजस्व यथा रसियान एवं मालगुजारी रसीद इत्यादि अभिलेख के आधार पर सामूहिक समीक्षा/सत्यापन कर सामूहिक रूप से जांच प्रतिवेदन पर हस्ताक्षर कर अपने मंतव्य के साथ वन प्रमण्डल पदाधिकारी को उपलब्ध कराना सुनिश्चित किया जायेगा। वन प्रमण्डल पदाधिकारी द्वारा क्षतिपूर्ति के भुगतान हेतु अभिलम्ब व्यवस्था सुनिश्चित की जायेगी। क्षतिपूर्ति का भुगतान बैंक ड्राफ्ट के माध्यम से किया जायेगा। एक हजार रुपये की राशि से अधिक क्षतिपूर्ति भुगतान के मामले में क्षतिपूर्ति का भुगतान ग्राम वन प्रबंधन एवं संरक्षण समिति/इको विकास समिति के अध्यक्ष की उपस्थिति में किया जायेगा।

(3) उपर्युक्त कंडिका–2 में दी गई संशोधित प्रक्रिया के अतिरिक्त पूर्व से निर्धारित मुआवजा भुगतान की शेष प्रक्रिया, अन्य निर्धारित शर्ते एवं प्रावधान यथावत् रहेंगें।

(4) मुआवजा भुगतान के समय यह सुनिश्चित किया जाएगा कि मुआवजा राशि के भुगतान में लाभुक को दोहरा भुगतान ना हो, अर्थात लाभुक सरकार की किसी अन्य योजना से इस प्रयोजन हेतु लाभान्वित ना हो।

(5) मुआवजा राशि का व्यय मांग संख्या–19–मुख्य शीर्ष–2406 वानिकी तथा वन्यप्राणी उप मुख्यशीर्ष–01–वानिकी लघु शीर्ष–001–निदेशन तथा प्रशासन उप शीर्ष–01 निदेशन एवं प्रशासन विस्तृत शीर्ष–06–अनुदान–51–मुआवजा इकाई के अन्तर्गत विकलनीय होगा।

(6) मुआवजा भुगतान की उपर्युक्त दर संकल्प निर्गत की तिथि से प्रभावी होगी।

आदेश:– आदेश दिया जाता है कि संकल्प को झारखण्ड राजपत्र के अगले अंक में सर्वसाधारण की जानकारी हेतु प्रकाशित किया जाय।

15/6/2017

झारखण्ड राज्यपाल के आदेश से

ह0/–
(राजू रंजन राय)
सरकार के अपर सचिव।

मुआवजा संकल्प-2

Conservator of Forests
Territorial Circle, Ranchi

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Project Officer
KDH Project

परियोजना पदाधिकारी
के0डी0एच0 परियोजना

Scanned with CamScanner

ज्ञापांक–वनप्रधानी–09/2000 (खण्ड)– /वन0, राँची, दिनांक–

प्रतिलिपि–अधिवक्ता, सर्वोच्च न्यायालय, नई दिल्ली को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित। अनुरोध है कि माननीय सर्वोच्च न्यायालय में दायर (सी डी फाईल) इस विभाग को उपलब्ध कराने की कृपा करें।

ह0/-
सरकार के अपर सचिव।

ज्ञापांक–वनप्रधानी–09/2000 (खण्ड)– /वन0, राँची, दिनांक–

प्रतिलिपि–मननीय मुख्यमंत्री, झारखण्ड, राँची को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

ह0/-
सरकार के अपर सचिव।

ज्ञापांक–वनप्रधानी–09/2000 (खण्ड)– /व0प0, राँची, दिनांक–

प्रतिलिपि–माननीय मुख्यमंत्री के प्रधान सचिव, मुख्यमंत्री सचिवालय, झारखण्ड, राँची/मुख्य सचिव, झारखण्ड, राँची/प्रधान सचिव, मंत्रिमंडल सचिव सचिव झारखण्ड, राँची/प्रधान सचिव, वित्त विभाग, झारखण्ड, राँची/प्रधान सचिव, मंत्रिमंडल सचिवालय एवं समन्वय विभाग, झारखण्ड, राँची को सूचनार्थ प्रेषित।

ह0/-
सरकार के अपर सचिव।

ज्ञापांक–वनप्रधानी–09/2000 (खण्ड)– /व0प0, राँची, दिनांक–

प्रतिलिपि–प्रधान मुख्य वन संरक्षक, झारखण्ड, राँची/प्रधान मुख्य वन संरक्षक, वनप्रधानी एवं मुख्य वन्यप्राणी प्रतिपालक, झारखण्ड, राँची/प्रधान मुख्य वन संरक्षक–सह–कार्यकारी निदेशक, नजर भूमि विकास परियोजना, झारखण्ड, राँची/सभी अपर प्रधान मुख्य वन संरक्षक, झारखण्ड, राँची/सभी क्षेत्रीय मुख्य वन संरक्षक, झारखण्ड/सभी मुख्य वन संरक्षक, झारखण्ड/सभी वन संरक्षक, झारखण्ड/सभी वन प्रमंडल पदाधिकारी, झारखण्ड को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

ह0/-
सरकार के अपर सचिव।

ज्ञापांक–वनप्रधानी–09/2000 (खण्ड)– 2265 /व0प0, राँची, दिनांक– 15/06/2017

प्रतिलिपि–निजामीय नोडल पदाधिकारी, ई–गजट को अधिसूचना की प्रति Website में upload करने हेतु प्रेषित।

15/6/2017
सरकार के अपर सचिव।

Conservator of Forests
Territorial Circle, Ranchi

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Project Officer
KDH Project

परियोजना पदाधिकारी
कं0हि0प्र0 परियोजना

Scanned with OKEN Scanner

..... मण्डल।

महाशय,

सूचित करना है कि, दिनांक-..... को मेरे रात/दिन में जंगली जानवरों (नाम) ..... संख्या ..... द्वारा आकर निम्न रूप से क्षति पहुँचायी गयी है :-

1. पिता का नाम तथा पूरा पता : .....

ग्राम का नाम : .....

2. अंचल का नाम : ..... थाना/थाना सं० .....

(लागू नहीं को X करें)

क्षतिग्रस्त मकान की विवरणी		पालतू जानवर की क्षति संबंधी विवरणी	
अर्जित अनाज क्षति: नाम तथा क्षतिग्रस्त किस्मोवार जो:		क्षति किए गये जानवर का नाम (लागू हो तो विवरणी निम्न तालिका में दें)	

क्र० सं०	भूमिधर किसान अथवा बटाईदार किसान	भूमि की तालिका का ग्राम और पता	क्षतिग्रस्त फसल-भूमि रकबा (हे० में)	खाता सं०/ खेसरा सं०	प्लॉट सं०	अभिमुक्ति
1	2	3	4	5	6	7

उपरोक्त दी गयी भूमि का प्लॉट खाता श्री/श्रीमती ..... नाम से दर्ज है उनका उत्तराधिकारी/बटाईदार किसान मैं हूँ जो मेरे ..... हैं।

आवेदक का पूरा नाम एवं पिता/पति का नाम: ..... आवेदक का हस्ताक्षर .....

कार्यालय उपयोग के लिए

हम निम्नलिखित सभी (नाम एवं हस्ताक्षर करने वाले व्यक्ति) निम्न तालिका अनुसार, व्यक्तिगत एवं संयुक्त रूप से संतुष्ट होकर एवं ग्राम के मुखिया/हल्का कर्मचारी के पास उपलब्ध राजस्व अभिलेख से मिलान कर पाया कि आवेदित भूमि मौजा ..... थाना सं०..... प्लॉट सं०..... रकबा ..... एकड़ श्री ..... पुत्र/पुत्री ..... के नाम पर दर्ज है। जंगली जानवर ..... द्वारा आवेदक/आवेदकों श्री ..... पुत्र/पुत्री ..... /एवं श्री ..... पुत्र/पुत्री ..... को निम्न विवरणी अनुसार क्षति का आकलन एवं प्रस्तावित मुआवजा राशि सत्यापित करते हैं :-

क्र० सं०	मकान की क्षति		अनाज की क्षति		पालतू जानवर की क्षति		फसल की क्षति				अभिमुक्ति
	लागू हाँ/नहीं	प्रस्तावित मुआवजा	कुल किस्मोवार	प्रस्तावित मुआवजा	संख्या	प्रस्तावित मुआवजा	रकबा (हे०में)	बटाईदार किसान का मुआवजा	भूमिधर किसान का मुआवजा	कुल मुआवजा	

हल्का कर्मचारी
अंचल .....

राजस्व समिति
ग्राम का प्रधान एवं संरक्षण समिति/इको विकास समिति

अध्यक्ष
ग्राम का प्रधान एवं संरक्षण समिति/इको विकास समिति

मुखिया
पंचायत .....

वन क्षेत्र पदाधिकारी
क्षेत्र .....

15/6/2023

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Territorial Circle, Ranchi

Project Officer
KDH Project

परियोजना पदाधिकारी
के०डी०एच० परियोजना

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Human Elephant Conflicts in Burmu Range of Ranchi Forest Division
(During the last 5 years)

HUMAN DEATHS

Year of HEC Occurance	Name of Forest Range	Name of Forest Beat	Name of Forest Sub-Beat	GPS Co-ordinates of the location, where HEC Occurred	Nature of Conflict (Death/ Injury/House Damage/ Crop Damage)	Name of Nearby Protected Forests (PF's)	Thana Name & Number	Village/ Block Name
2016-17	Burmu Range, Mandar				NIL			
2017-18		Burmu	Bishrampur	23.656064° 84.986009°	Death		Khelari	Subhashnagar
		Mandar	Mandar	23.486062° 84.967903°	Death		Chanho	Patratu Chara
2018-19					NIL			
2019-20					NIL			
2020-21		Mandar	Mandar	23.486062° 84.967903°	Death		Chanho	Bargada(Patratu)

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Territorial Circle, Ranchi

Project Officer
JHLP Project

ANNEXURE-III

परियोजना पदाधिकारी
झारखण्ड पुनर्वास परियोजना

HUMAN INJURY

Year of HEC Occurance	Name of Forest Range	Name of Forest Beat	Name of Forest Sub-Beat	GPS Co-ordinates of the location, where HEC Occurred	Nature of Conflict (Death/ Injury/House Damage/ Crop Damage)	Name of Nearby Protected Forests (PF's)	Thana Name & Number	Village/ Block Name
2016-17	Burmu Range, Mandar				NIL			
2017-18					NIL			
2018-19					NIL			
2019-20		Mandar	Mandar	23.448244° 85.069403°	Normal Injury		Mandar	Sakarpada
		Mandar	Mandar	23.448244° 85.069403°	Normal Injury		Mandar	Loyo (Kataitoli)
2020-21		Mandar	Mandar	23.448244° 85.069403°	Serious Injury		Mandar	Uchari (Nagra)

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Territorial Circle, Ranchi

Project Officer
KDH Project

CROP /HOUSE DAMAGE

Year of HEC Occurance	Name of Forest Range	Name of Forest Beat	Name of Forest Sub-Beat	GPS Co-ordinates of the location, where HEC Occurred	Nature of Conflict (Crop Damage)	Name of Nearby Protected Forests (PF's)	Thana Name & Number	Village/ Block Name
2	4	5	6	7	8	9	10	11
2020-21		Mandar	Mandar	23.494904° 84.972334°	धान		चान्हों	बलथरवा तेतरटोली
		Mandar	Mandar	23.494904° 84.972334°	धान		चान्हों	होन्हें
		Mandar	Mandar	23.494904° 84.972334°	धान		चान्हों	लुरंगी
		Mandar	Mandar	23.494904° 84.972334°	धान		चान्हों	होन्हें
		Mandar	Mandar	23.494904° 84.972334°			मांडर	सोसई
		Mandar	Mandar	23.494904° 84.972334°	आंशिक		मांडर	गोरे
		Mandar	Mandar	23.494904° 84.972334°	आलू		मांडर	मुरकुनी
		Mandar	Mandar	23.494904° 84.972334°			मांडर	सोसई
		Mandar	Mandar	23.494904° 84.972334°	आंशिक		मांडर	गेरे

Conservator of Forests
Territorial Circle, Ranchi

Divisional Forest Officer
Forest Division, Ranchi

Project Officer
DEO Project

परियोजना पदाधिकारी
के0डी0ए0च0 परियोजना

	Mandar	Mandar	23.494904° 84.972334°	आंशिक		चान्हों	कुरगा
	Mandar	Mandar	23.494904° 84.972334°	आंशिक		चान्हों	वछव
	Mandar	Mandar	23.494904° 84.972334°	आंशिक		चान्हों	सिसई
	Mandar	Mandar	23.494904° 84.972334°	आंशिक		चान्हों	लुण्डरी
	Mandar	Mandar	23.494904° 84.972334°	आंशिक		मांडर	मुरकुनी
	Mandar	Mandar	23.494904° 84.972334°	आंशिक		मांडर	मुरकुनी

Divisional Forest Officer
Ranchi Forest Division, Ranchi

2019-20

2019-20	Mandar	Mandar	23.387221° 84.998225°			नरकोपी	बजरा
	Mandar	Mandar	23.387221° 84.998225°	फसल क्षति		मांडर	हरहुरी
	Mandar	Mandar	23.387221° 84.998225°	फसल क्षति		मांडर	कोको
	Mandar	Mandar	23.387221° 84.998225°			मांडर	लुरंगी
	Mandar	Mandar	23.387221° 84.998225°			मांडर	होन्हें

Conservator of Forests
Territorial Circle, Ranchi

Project Officer
KDM Project

परियोजना पदाधिकारी
कोडीएम परियोजना

		Mandar	Mandar	23.387221° 84.998225°			मांडर	होन्हें
		Mandar	Mandar	23.387221° 84.998225°			मांडर	होन्हें
		Mandar	Mandar	23.387221° 84.998225°				होन्हें
		Burmu	Duli	23.603553° 84.979455°	फसल क्षति		बुढ़मू	दुल्ली
		Burmu	Duli	23.603553° 84.979455°	फसल क्षति		बुढ़मू	दुल्ली
		Burmu	Duli	23.603553° 84.979455°	फसल क्षति		बुढ़मू	दुल्ली
		Burmu	Duli	23.603553° 84.979455°	फसल क्षति		बुढ़मू	हुरहू
		Burmu	Duli	23.603553° 84.979455°	फसल क्षति		बुढ़मू	कोनका
		Burmu	Duli	23.603553° 84.979455°	फसल क्षति		बुढ़मू	नवाडीह
		Mandar	Mandar	23.387221° 84.998225°			नरकोपी	बजरा
		Burmu	Nawadih	23.662326° 84.955407°	आंशिक क्षति		मैक्लुस्कीगंज	नावाडीह
		Mandar	Mandar	23.387221° 84.998225°	कच्चा मकान गंभीर क्षति		मांडर	बजरा
		Mandar	Mandar	23.387221° 84.998225°	साधारण		मांडर	बरहे

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Territorial Circle, Ranchi

Project Officer
KDH Project

परियोजना पदाधिकारी
के0डी0ए0च0 परियोजना

		Mandar	Mandar	23.387221° 84.998225°	साधारण		मांडर	पतरातु
		Mandar	Mandar	23.387221° 84.998225°	साधारण		मांडर	हुरहुरी
		Mandar	Mandar	23.387221° 84.998225°	साधारण		मांडर	होन्हें
		Mandar	Mandar	23.387221° 84.998225°	आंशिक		चान्हों	पतरातु
		Mandar	Mandar	23.387221° 84.998225°	आंशिक		चान्हों	पतरातु
		Mandar	Mandar	23.387221° 84.998225°	आंशिक		चान्हों	पतरातु
		Mandar	Mandar	23.387221° 84.998225°	पूर्ण		चान्हों	पतरातु
		Mandar	Mandar	23.387221° 84.998225°	आंशिक क्षति		मांडर	चामा
		Mandar	Mandar	23.387221° 84.998225°	आंशिक क्षति		मांडर	चलियो
		Mandar	Mandar	23.387221° 84.998225°	कच्चा मकान पूर्ण क्षति		मांडर	ओपा
		Burmu	Mandar	23.387221° 84.998225°	चाहरदीवारी		मैक्लुस्कीगंज	नवाडीह
		Burmu	Kotari	23.542554° 85.114976°	आंशिक मकान क्षति		बुढ़मू	उसकु
		Burmu	Kotari	23.542554° 85.114976°	आंशिक मकान क्षति		बुढ़मू	हुरहू

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Territorial Circle, R

Project Officer
KDA Project

परियोजना पदाधिकारी
के०डी०ए०च० परियोजना

ANNEXURE-V

8/62/2018-FC

20/2023

Government of India
Ministry of Environment, Forest and Climate Change
(Forest Conservation Division)
****

Indira Paryavaran Bhawan,
Jor Bag Road, Aliganj,
New Delhi – 110003.
Dated: 27th February, 2023

To

The Principal Secretary (Forests),
Government of Jharkhand,
Ranchi

Sub: Proposal for non-forestry use of 126.72 ha (84.35 ha PF and 42.37 ha Jungle Jhari) of forest land for KDH Open Cast Mine in favour of M/s Central Coalfields Limited (CCL) in Ranchi District, Jharkhand – reg.

Madam/Sir,

I am directed to refer to the Government of Jharkhand's letter no. Van Bhumi-06/2017/3422/V.P. dated 13.08.2018 on the above subject seeking prior approval of the Central Government under Section 2 of the Forest (Conservation) Act, 1980 and letter no. Van Bhumi-06/2017-1201/V.P. dated 22.04.2022 and letter No. Vanbhumi-06/2017-2426-V.P. dated 22.08.2022 forwarding additional information as sought by the Ministry vide its letter of even number dated 22.08.2019 and 22.06.2022 respectively and to say that the proposal has been examined by the Forest Advisory Committee constituted by the Central Government under Section-3 of the aforesaid Act.

After careful examination of the proposal of the State Government and on the basis of the recommendations of the Forest Advisory Committee, and approval of the same by the competent authority of the MoEF&CC, New Delhi, the Central Government hereby accords '**In-principle/Stage-I**' approval under Section - 2 of the Forest (Conservation) Act, 1980 for non-forestry use of 126.72 ha (84.35 ha PF and 42.37 ha Jungle Jhari) of forest land for KDH Open Cast Mine in favour of M/s Central Coalfields Limited (CCL) in Ranchi District, Jharkhand subject to fulfilment of the following conditions:

A. Conditions which need to be complied prior to handing over of forest land by the State Forest Department and compliance is to be submitted prior to Stage-II approval :-

1. *As per the approved Mining plan, an additional forest area of 135.91 ha is required for the expansion of the project. However, the instant proposal has been submitted for 126.72 ha only, excluding the area of 9.19 ha forest land which as per approved mining plan is earmarked as safety zone. The State government shall either revise the Mining plan or seek the diversion of the 9.19 ha. for the purpose of safety zone;*

2. *The State Govt. shall submit a detailed status report of the approvals under FCA, 1980 of the forest land involved in the entire lease area. The forest areas for which a valid approval under FCA, 1980 is not available shall not be used before a valid approval under FCA, 1980 for the same is obtained;*

3. The cost of compensatory afforestation at the prevailing wage rates as per compensatory afforestation scheme and the cost of survey, demarcation and erection of permanent pillars, if required on the CA land, shall be deposited in advance with the Forest Department by the user agency. The CA will be maintained for 10 years. The

27/02/23

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Ranchi Forest Division, Ranchi

Conservator of Forests
Territorial Circle, Ranchi
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scheme may include afforestation of indigenous species with appropriate provision for anticipated cost increase for works scheduled for subsequent years;

4. The User Agency shall transfer the funds towards the cost of Net Present Value (NPV) of the forest land being diverted under this proposal in accordance with the MoEF&CC gurdelines dated 6.01.2022 read with guidelines dated 19.01.2022;

5. Compensatory levies to be realized from the User Agency under the project shall be transferred/ deposited, through e-challan, in to the account of CAMPA pertaining to the State concerned through e-portal (*https://parivesh.nic.in/*);

6. The State Government shall complete settlement of rights, in term of the Scheduled Tribes and Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, if any, on the forest land to be diverted and submit the documentary evidence, along with compliance of Stage-I approval, as prescribed by this Ministry's letter No. 11-9/1998-FC (Pt.) dated 03.08.2009 read with 05.07.2013, in support thereof;

7. 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 de-silting of these village tanks and other water bodies so as to mitigate the impact of siltation of such tanks/water bodies. A detailed plan for de-silting of identified ponds and water bodies prepared in consultation with forest department shall be submitted;

8. 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 Stage II approval;

9. The compliance report shall be uploaded on e-portal (*https://parivesh.nic.in/*).

B. Conditions which need to be complied on field after handing over of forest land to the user agency by the State Forest Department but the compliance in form of undertaking shall be submitted prior to Stage-II approval:-

1. Legal status of the diverted forest land shall remain unchanged;
2. *Wildlife Management plan shall be prepared and implemented at the cost of the user agency. The approved Wildlife management plan shall be submitted and the applicable cost shall be deposited as per the guidelines issued by the Ministry in this regard;*
3. Compensatory afforestation over degraded forest land, double in extent to the forest land being diverted, shall be raised by the State Forest Department at the project cost within three years from the date of grant of Stage - II approval;
4. 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;
5. 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;
6. Trees should be felled in phased manner as per the requirement in the approved Mining Plan with prior permission of concerned DFO;

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7. 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;
8. 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;
9. 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;
10. The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;
11. 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;
12. 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;
13. 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 Stage-I approval:

22/12/25

i. Mitigative measures to minimize soil erosion and choking of stream shall be implemented within a period of three year with effect from the issue of Stage-II clearance in accordance with the approved Plan in consultation with the State Forest Department.
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;
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;
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
v. No damage shall be caused to the top-soil and the user agency will follow the top soil management plan.

14. The User agency either himself or through the State Forest Department shall undertake gap planting and soil & moisture conservation activities to restock and

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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 shall be prepared and submitted to MoEF&CC;

15. **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:

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 coordinates with barbed wire fencing and deploying adequate number of watchers under the supervision of the. State Forest Department;
ii. Boundary of the safety zone of the mining lease, adjacent to habitation/roads, should be properly fenced by the user agency;
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;
iv. Afforestation on degraded forest land to be selected elsewhere, measuring one and a half times the area under safety zone, shall also be done at the project cost under the supervisions of the State Forest Department. The degraded forest land (DFL) so selected will be informed to the MoEF& CC with shape files before Stage-II approval and afforestation will be done within three years from the date of Stage-II clearance and maintained thereafter in accordance with the approved Plan in consultation with the State Forest Department; and
v. The State Government and the user agency shall ensure that safety zone is maintained as per the prescribed norms;

16. The cost of felling of trees shall be deposited by the User Agency with the State Forest Department;

17. 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;

18. 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;

19. No damage to the flora and fauna of the adjoining area shall be caused;

20. 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;

27/04/23

21. 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;

22. The user agency shall comply all the provisions of the all 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; and

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23. Violation of any of these conditions will amount to violation of Forest (Conservation) Act, 1980 and action would be taken as prescribed in para 1.21 of Chapter 1 of the Handbook of comprehensive guidelines of Forest (Conservation) Act, 1980 as issued by this Ministry's letter No. 5-2/2017-FC dated 28.03.2019.

After receipt of compliance report on fulfilment of the conditions mentioned above, the proposal shall be considered for final approval under Section-2 of the Forest (Conservation) Act, 1980. Transfer of forest land shall not be affected till final approval is granted by the Central Government in this regard.

Yours faithfully,

(Suneet Bhardwaj)
Assistant Inspector General of Forests

Copy to:-

1. The Principal Chief Conservator of Forests, Government of Jharkhand, Ranchi;
2. The Regional Officer, Integrate Regional Office of the MoEF&CC at Ranchi;
3. The Nodal Officer (FCA), O/o PCCF, Government of Jharkhand, Ranchi;
4. User Agency;
5. Monitoring Cell, Forest Conservation Division, MoEF&CC, New Delhi.

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Territorial Circle, Ranchi

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ANNEXURE-VI

कार्यालय : अपर प्रधान मुख्य वन संरक्षक, विकास,
झारखण्ड, राँची।
वन भवन, डोरण्डा, राँची
e-mail : pccf-development@gov.in
☎ - 0651-2481813/ 9304727852

कार्यालय आदेश

संख्या–01 / यो0ब0–30 / 2020– 08 दिनांक 26/04/2023

वन एवं पर्यावरण विभाग के अधिसूचना संख्या सं0सं0–4 / यो0बजट–42 / 2010–2371 व0प0, दिनांक 05.05.2015 द्वारा वृक्षारोपण एवं पौधशाला कार्य हेतु दर निर्धारण के लिए राज्य स्तर पर एक स्थायी समिति का गठन किया गया।

अपर प्रधान मुख्य वन संरक्षक, विकास, झारखण्ड, राँची के अध्यक्षता में राज्य स्तरीय दर निर्धारण समिति की बैठक दिनांक 15.09.2022 को आयोजित की गई।

समिति द्वारा समीक्षोपरान्त बाँस वनों में कंजेशन (Congestion) हटाना एवं वन–वर्द्धन कार्यो का अनुसूचित कार्यदर की अनुशंसा की गई। समिति की अनुशंसा पर प्रधान मुख्य वन संरक्षक, झारखण्ड, राँची का अनुमोदन प्राप्त है। यह दर तत्काल प्रभाव से वित्तीय वर्ष 2023–24 के लिए लागू होंगी एवं अगले पुनरीक्षण तक प्रभावी रहेगी।

बाँस वनों में कंजेशन (Congestion) हटाना एवं वन–वर्द्धन कार्यो हेतु कार्य दर तालिका

मजदूरी दर – 346.01 रु0
प्रति 200 बांस बखार

(राशि रूपये में)

क्र0 सं0	कार्य का विवरणी	मानव दिवस (प्रति हे0)	मजदूरी	आपूर्ति एवं सामग्री	कुल राशि	अभ्युक्ति
i	ii	iii	iv	v	vi	vii
A	प्रथम वर्ष					
1	सर्वे एवं सीमांकन एवं बखार की नंबरिंग	3	1038.03	50.00	1088.03	
2	बाँस बखारों (Clumps) की सफाई एवं Silviculturially avaliable बाँसों के विदोहन (200 बखार प्रति)	40	13840.40	250.00	14090.40	एक मानव दिवस में 5 बखारों में कार्य किया जाएगा। बखार के गोले का चिन्ह में विभक्त करना
3	वनों में आंतरिक अग्नि रेखा की सफाई, 5 मीटर चौड़ा (प्रत्येक 250 मीटर पर) एवं स्थल से सफाई किए गए बांसों को हटाना	10	3460.10	0.00	3460.10	

Conservator of Forest
Territorial Circle, Ranchi

GA2023-24\Rate 2022-23 Revised\PLAN\Office order Rate.doc

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4	बखारों के चारों ओर 1.5 फीट गोलाई में कोड़नी/निकोनी तथा गोबर खाद/वर्मी कम्पोस्ट इत्यादि डालना	20	6920.20	1875.00	8795.20	एक मानव दिवस में 10 बखारों में कार्य किया जाएगा
5	राइजोम प्रिजरवेशन हेतु बखारों में कोड़नी/निकोनी क्षेत्र के बाहर 1 फीट गोलाई से मिट्टी लेकर बखारों पर चढ़ाना	20	6920.20	0.00	6920.20	एक मानव दिवस में 10 बखारों में कार्य किया जाएगा
6	सुरक्षा (करील, चराई, अग्नि सुरक्षा)	3	1038.03	0.00	1038.03	
7	लेबर सेस मजदूरी का 1 प्रतिशत		0.00	332.17	332.17	
	कुल	96.00	33216.96	2507.17	35724.13	
B	द्वितीय वर्ष					
1	सुरक्षा (करील, चराई, अग्नि सुरक्षा)	14.6	5051.75	0.00	5051.75	अप्रैल– मार्च तक
2	लेबर सेस मजदूरी का 1 प्रतिशत			50.52	50.52	
	कुल	14.60	5051.75	50.52	5102.26	
	सकल योग –	110.60	38268.71	2557.69	40826.39	

अपर प्रधान मुख्य वन संरक्षक, विकास
झारखण्ड, राँची

ज्ञापांक–01/यो0ब0–30/2020– 280 दिनांक– 26/4/2023

प्रतिलिपि :

1. सभी प्रधान मुख्य वन संरक्षक।
2. सभी अपर प्रधान मुख्य वन संरक्षक।
3. सभी क्षेत्रीय मुख्य वन संरक्षक।
4. सभी मुख्य वन संरक्षक।
5. सभी वन संरक्षक।
6. सभी उप वन संरक्षक।
7. सभी वन प्रमण्डल पदाधिकारी।

को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

अपर प्रधान मुख्य वन संरक्षक, विकास
झारखण्ड, राँची

परियोजना पदाधिकारी
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Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Territorial Circle, Ranchi

Project Officer
KDH Project

पतरा दक्षिणी प्रमंडल, पतरा

जल संरक्षण-सह-वृक्षारोपण योजना

1	स्थान का नाम				स्पष्टीकरण		रकबा (हे०)	100
2	पौधों की सघनता प्रति हे०	1000	पौधे				3 मी x 3 मी	अथवा
3	मजदूरी दिवस प्रति मानव दिवस	₹ 346.01					2 मी x 2 मी	अथवा
4	प्राक्कलन कार्य वर्ष	2023	-	2024			3 मी x 2 मी	
क्र.सं.	कार्य की विवरणी	इकाई प्रति	मानव दिवस प्रति इकाई	मजदूरी प्रति इकाई (रु में)	सामग्री प्रति इकाई (रु में)	मजदूरी कुल (रु)	सामग्री कुल (रु)	कुल (रु)
1	2	3	4	5	6	7	8	9
क	अग्रिम कार्य (प्रथम वर्ष)	द्वितीय वर्ष	2023	-	2024	मजदूरी दर	₹ 346.01	
1	सर्वेक्षण एवं संभाव्यता	हे०	3.00	₹ 1,038.03	₹ -	₹ 1,03,803.00	₹ -	₹ 1,03,803.00
2	झाड़ी सफाई (सामान्य झाड़ी)	हे०	7.00	₹ 2,422.07	₹ -	₹ 2,42,207.00	₹ -	₹ 2,42,207.00
3	पौधा कार्य					₹ -	₹ -	₹ -
3.2	मशीन द्वारा Trench छंटाई Dressing सहित (जल संसाधन विभाग की अनुसूचित दर सूची दिनांक 01.01.2014 में लागू का आइटम संख्या 7.1.43.1 में 9.1 परिशोधन संवेदक लाभ सहित दर, (प्रति पौन रु 1963.79 - एवं 2 मानव दिवस कर्म बनाने सहित)	6 पौन	12.00	₹ 4,152.12	₹ 11,782.74	₹ 4,15,212.00	₹ 11,78,274.00	₹ 15,93,486.00
4	गड्ढा कार्य (0.3 मी x 0.3 मी x 0.3 मी) 0.027 क्यू० मी 1000 पिट प्रति हे० (खोदन एवं गड्ढा भोकाइल पिट सहित)	हे०	22.00	₹ 7,612.22	₹ -	₹ 7,61,222.00	₹ -	₹ 7,61,222.00
5	गड्ढा एवं जल संरक्षण कार्य					₹ -	₹ -	₹ -
5.1	कंटूर trench -41 कंटूर साइज 5 मी x 3 मी x 3 मी का छोटा जाना जिसके बीच की दूरी 2 मी से 3 मी हो तथा इसकी मिट्टी का मेड़ी ढाल पर 15 मी हर कर 30 मी की चौड़ाई में 15 मी गहरा कोड़नी कर रखा जाना	हे०	25.00	₹ 8,650.25	₹ -	₹ 8,65,025.00	₹ -	₹ 8,65,025.00
6	जल संरक्षण संरचना एवं सिल्ट डिटेंशन ट्रेंच चेक ट्रेंच रिटेनिंग एवं बैरेस्ट वाल, टो वाल, स्पर एवं टोरेंट नियंत्रण कार्य आदि	हे०	55.00	₹ 19,030.55	₹ -	₹ 19,03,055.00	₹ -	₹ 19,03,055.00
7	गली प्लांटिंग	हे०	10.00	₹ 3,460.10	₹ -	₹ 3,46,010.00	₹ -	₹ 3,46,010.00
8	अस्थायी पौधशाला कार्य शेड घेरा सहित	हे०	10.00	₹ 3,460.10	₹ -	₹ 3,46,010.00	₹ -	₹ 3,46,010.00
9	सामग्री (पौधीयन योनी बीज, उर्वरक, खाद रसायन मिट्टी पुआल पौधशाला तथा पेरान सामग्री आदि)	हे०	0.00	₹ -	₹ 1,350.00	₹ -	₹ 1,35,000.00	₹ 1,35,000.00
10	विविध कार्य (प्रावाकन, प्रचार प्रसार, मुद्रण एवं संकलन आदि)	हे०	0.00	₹ -	₹ 150.00	₹ -	₹ 15,000.00	₹ 15,000.00
	योग		144.00	49825.44	13282.74	4982544.00	1328274.00	6310818.00
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹ -	₹ 2,390.89	₹ -	₹ 2,39,089.32	₹ 2,39,089.32
	प्रथम वर्ष का योग		144.00	49825.44	15673.63	4982544.00	1567363.32	6549907.32
11	प्रथम वर्ष की लागत राशि का 15 प्रतिशत प्रवेश पिट कार्यों पर व्यय की जाएगी							₹ 9,82,486.10
	प्रथम वर्ष सकल कुल		144.00	49825.44	15673.63	4982544.00	1567363.32	7532393.42
ख	रखरखाव कार्य (द्वितीय वर्ष) (मजदूरी दर में संभावित 15% वृद्धि के अनुसार)	द्वितीय वर्ष	2024	-	2025	मजदूरी दर	₹ 397.91	
1	अस्थायी पौधशाला कार्य शेड घेरा सहित	हे०	13.00	₹ 5,172.85	₹ -	₹ 5,17,284.95	₹ -	₹ 5,17,284.95
2	वृक्षारोपण	हे०	22.00	₹ 8,754.05	₹ -	₹ 8,75,405.30	₹ -	₹ 8,75,405.30
3	ट्रेंच कंडीशनिंग एवं निकौनी	हे०	25.00	₹ 9,947.78	₹ -	₹ 9,94,778.75	₹ -	₹ 9,94,778.75
4	Trench के बर्म पर पेरान हेतु बीज रोपण	हे०	2.00	₹ 795.82	₹ -	₹ 79,582.30	₹ -	₹ 79,582.30
5	पौधों की सुरक्षा	स्थान	9.00	₹ 3,581.20	₹ -	₹ 3,58,120.35	₹ -	₹ 3,58,120.35
6	सामग्री (बीज, उर्वरक, कम्पोस्ट, खाद डी ए पी /यरिया जैविक कीटनाशक आदि)	हे०	0.00	₹ -	₹ 1,575.00	₹ -	₹ 1,57,500.00	₹ 1,57,500.00
7	विविध कार्य (प्रावाकन, प्रचार प्रसार, मुद्रण एवं संकलन आदि)	हे०	0.00	₹ -	₹ 150.00	₹ -	₹ 15,000.00	₹ 15,000.00
	योग		71.00	₹ 28,251.72	₹ 1,725.00	₹ 28,25,171.65	₹ 1,57,500.00	₹ 29,97,671.65
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹ -	₹ 310.50	₹ -	₹ 28,350.00	₹ 28,350.00
	द्वितीय वर्ष का योग		71.00	₹ 28,251.72	₹ 2,035.50	₹ 28,25,171.65	₹ 1,85,850.00	₹ 30,26,021.65
ग	रखरखाव कार्य (तृतीय वर्ष) (मजदूरी दर में संभावित 15% वृद्धि के अनुसार)	द्वितीय वर्ष	2025	-	2026	मजदूरी दर	₹ 457.60	
1	एक कोड़नी-निकौनी	हे०	14.00	₹ 6,406.38	₹ -	₹ 6,40,637.52	₹ -	₹ 6,40,637.52
2	सामग्री (बीज, उर्वरक, कम्पोस्ट, खाद डी ए पी /यरिया जैविक कीटनाशक आदि)	हे०	0.00	₹ -	₹ 785.00	₹ -	₹ 78,500.00	₹ 78,500.00
3	पौधों की सुरक्षा	स्थान	12.00	₹ 5,491.18	₹ -	₹ 5,49,117.87	₹ -	₹ 5,49,117.87
4	पेरान मरम्मती	पौन	1.00	₹ 457.60	₹ -	₹ 45,759.82	₹ -	₹ 45,759.82
5	मृत पौधों का प्रतिस्थापन	हे०	2.00	₹ 915.20	₹ 176.00	₹ 91,519.65	₹ 17,600.00	₹ 1,09,119.65
	योग		29.00	13270.35	961.00	1327034.85	96100.00	1423134.85
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹ -	₹ 172.98	₹ -	₹ 17,298.00	₹ 17,298.00
	तृतीय वर्ष का योग		29.00	13270.35	1133.98	1327034.85	113398.00	1440432.85
घ	रखरखाव कार्य (चतुर्थ वर्ष) (मजदूरी दर में संभावित 15% वृद्धि के अनुसार)	द्वितीय वर्ष	2026	-	2027	मजदूरी दर	₹ 526.24	
1	एक कोड़नी-निकौनी	हे०	14.00	₹ 7,367.33	₹ -	₹ 7,36,733.14	₹ -	₹ 7,36,733.14
2	सामग्री (बीज, उर्वरक, कम्पोस्ट, खाद डी ए पी /यरिया जैविक कीटनाशक आदि)	हे०	0.00	₹ -	₹ 785.00	₹ -	₹ 78,500.00	₹ 78,500.00
3	पौधों की सुरक्षा	स्थान	12.00	₹ 6,314.86	₹ -	₹ 6,31,485.55	₹ -	₹ 6,31,485.55
4	मृत पौधों का प्रतिस्थापन	हे०	2.00	₹ 1,052.48	₹ 176.00	₹ 1,05,247.69	₹ 17,600.00	₹ 1,22,847.69

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Territorial Circle, Ranchi

Project Officer,
KDH Project

परियोजना पदाधिकारी
के०डी०एच० परियोजना

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क्र.स.	कार्य की विवरणी	इकाई प्रति	मानव दिवस प्रति इकाई	मजदूरी प्रति इकाई (रु में)	सामग्री प्रति इकाई (रु में)	मजदूरी कुल (रु)	सामग्री कुल (रु)	कुल (रु)
1	2	3	4	5	6	7	8	9
	योग		28.00	14734.66	961.00	1473466.28	96100.00	1569566.28
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹ -	₹ 172.98	₹ -	₹ 17,298.00	₹ 17,298.00
	चतुर्थ वर्ष का योग		28.00	14734.66	1133.98	1473466.28	113398.00	1586864.28
E	संरक्षण कार्य (पंचम वर्ष) (मजदूरी दर में संभावित 15% वृद्धि के अनुसार)	वित्तीय वर्ष	2027	-	2028	मजदूरी दर	₹ 605.17	
1	एक कोइली-निकोली	हे०	14 00	₹ 8,472 43	₹ -	₹ 8,47,243 11	₹ -	₹ 8 47,243 11
2	सामग्री (बैरल एवंक कम्पोजर स्लाइ ई.ए.पी. पुस्तिका आदि)	हे०	0 00	₹ -	₹ 300 00	₹ -	₹ 30 000 00	₹ 30 000 00
3	पौधों की सुरक्षा	स्थल	12 00	₹ 7,262 08	₹ -	₹ 7,26,208 38	₹ -	₹ 7 26,208 38
4	पेड़ान की मरम्मत	दैन	1 00	₹ 605 17	₹	₹ 60,517 37	₹ -	₹ 60,517 37
	योग		27.00	16339.69	300.00	1633968.86	30000.00	1663968.86
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹ -	₹ 54.00	₹ -	₹ 5,400.00	₹ 5,400.00
	पंचम वर्ष का योग		27.00	₹ 16,339.69	₹ 354.00	₹ 16,33,968.86	₹ 35,400.00	₹ 16,69,368.86
F	संरक्षण कार्य (षष्ठम वर्ष) (मजदूरी दर में संभावित 15% वृद्धि के अनुसार)	वित्तीय वर्ष	2028	-	2029	मजदूरी दर	₹ 695.95	
1	पौधों की सुरक्षा	स्थल	12 00	₹ 8,351 40	₹ -	₹ 8,35,139 64	₹ -	₹ 8,35,139 64
	योग		12.00	₹ 8,351.40	₹ -	₹ 8,35,139.64	₹ -	₹ 8,35,139.64
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹ -	₹ -	₹ -	₹ -	₹ -
	षष्ठम वर्ष का योग		12.00	₹ 8,351.40	₹ -	₹ 8,35,139.64	₹ -	₹ 8,35,139.64
G	संरक्षण कार्य (सप्तम वर्ष) (मजदूरी दर में संभावित 15% वृद्धि के अनुसार)	वित्तीय वर्ष	2029	-	2030	मजदूरी दर	₹ 800.34	
1	पौधों की सुरक्षा	स्थल	12 00	₹ 9,604 11	₹ -	₹ 9,60,410 59	₹ -	₹ 9 60,410 59
	योग		12.00	₹ 9,604.11	₹ -	₹ 9,60,410.59	₹ -	₹ 9,60,410.59
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹ -	₹ -	₹ -	₹ -	₹ -
	सप्तम वर्ष का योग		12.00	₹ 9,604.11	₹ -	₹ 9,60,410.59	₹ -	₹ 9,60,410.59

सारांश	मजदूरी	सामग्री	जी.एस.टी.	प्रवेश विंदु कार्य	कुल
प्रथम वर्ष	₹ 49,82,544 00	₹ 13 28,274 00	₹ 2,39,089 32	₹ 9,82,486 10	₹ 75 32,393 42
द्वितीय वर्ष	₹ 28,25,171 65	₹ 1,57,500 00	₹ 28,350 00	₹ -	₹ 30 11,021 65
तृतीय वर्ष	₹ 13,27,034 85	₹ 96,100 00	₹ 17,298 00	₹ -	₹ 14 40 432 85
चतुर्थ वर्ष	₹ 14,73,466 28	₹ 96,100 00	₹ 17,298 00	₹ -	₹ 15 86,864 28
पंचम वर्ष	₹ 16,33,968 86	₹ 30,000 00	₹ 5,400 00	₹ -	₹ 16 69,368 86
षष्ठम वर्ष	₹ 8,35,139 64	₹ -	₹ -	₹ -	₹ 8 35,139 64
सप्तम वर्ष	₹ 9,60,410 59	₹ -	₹ -	₹ -	₹ 9 60 410 59
कुल	₹ 1,40,37,735.88	₹ 17,07,974.00	₹ 3,07,435.32	₹ 9,82,486.10	₹ 1,70,35,631.29
	या			₹	1,70,35,631.00
शब्दों में	(एक करोड़ सत्तर लाख पैंतीस हजार छः सौ इकतीस रुपए मात्र)				

यह प्राक्कलन तथाम मुख्य वन संरक्षक, विकास, झारखण्ड, राँची के कार्यालय आदेश संख्या-01/वो०व०-10/2014-36 दिनांक 13/08/2019 पर आधारित तथा वर्तमान मजदूरी दर पर तैयार की गयी है ।

समर्पित

वन क्षेत्र पदाधिकारी

वन प्रमंडल पदाधिकारी

AVANTIKA GREEN MINES PRIVATE LIMITED

Project Officer
KDH Project

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Territorial Circle, Ranchi

परियोजना पदाधिकारी
के०डी०एच० परियोजना

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ANNEXURE -VII

GSTNumber - 20AASFD6960A1ZC

DS DILIGENT SERVICES

Ref No: DS/QUT/23-24/375 Date: 08.08.2023

To,
DFO,
Ranchi

Subject:Quotation for 15watt all in one solar street light.

Dear Sir,
Please find offer for street light.

SR NO	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	SITC of 15Watt All in one solar street Light .Maintenance and replacement warranty of 3 year.Make -Havells	Set	60	28500	1710000
				GST	235980
				TOTAL	1945980

Technical Specification

1) 15w All in One Solar LED Street Light
2) OSRAM LED make
3) dusk to dawn luminary
4) Inbuilt MPPT Charge Controller With Driver
5)BIS approved cell 12.8v 12Ah LiFePO4 battery pack
6) 40wp MNRE approved solar PV module.
7) 5 mtr MS pole

Temrs and Condition:
1.GST Extra as applicable.
2.Warranty against any manufacturing defects is 3 year.
3.Maintenance work upto 3 year.
4.Offer validity is 30 days.

Thanks & Regards,

SamratChaudhuri

Divisional Forest Officer
Ranchi Forest Division, Ranchi

परियोजना प्रदाधिकारी
के०डी०एच० परियोजना

Project Officer
KDH Project

Conservator of Forests
Territorial Circle, Ra

6513585378/8797476386 info@diligentservices.co.in Vatika Apartment, 4th Floor, Lin
Road, Chadri Lake, Ranch 340

SURYA ROSHNI LTD.

High Mast and Projects Division

Office Addr.: Daladali Chowk, Ring Road,Ratu, Ranchi -835222
Email ID - mukesh.khandait@surya.in

Client	Forest Department - RANCHI
	REF: SRL/23/01
	Date :- 10.08.2023

OFFER OF HIGH MAST AND POLE

S.N	DESCRIPTION OF EQUIPMENTS / ACTIVITIES	UNIT	QNTY	UNIT RATE (RS)	AMOUNT (RS)
	Supply :-				
1	Supply of 12 Mtr High Mast as per Standard specification Including F.Bolts and Power Tool (6 Fittings Each) - SURYA	Sets	1	125000.00	125000.00
2	Supply Feeder pillar as per standard spec	Sets	1	25000.00	25000.00
3	Supply of 200 Watt LED Flood Light lunminaires (6 Lum Each) - SURYA	Set	6	7500.00	45000.00
4	Supply of Single dome LED type Aviation Obstruction Fittings	Set	1	2900.00	2900.00
5	Cable and Accessories(16sqmm 4core cable/Cu Flexible Junction Box/Lugs)	Set	1	25000.00	25000.00
6	Installation and Commissioning	Set	1	50000.00	50000.00
				Total Supply amount (without Tax)	**222900.00**
				18%	**40122.00**
					263022.00

Note:

1. FOR - Trandportation charge Included
2. TAX:- GST @ 18% shall be charged as extra
3. Payment Terms :- 30% Advance along with P.O. and balance 70 % before dispatch of material
4. Delivery Time :Within 3-4 weeks from the date of formal confirmed, technocommercially clear purchase order or receipt of 30% advance..
5. Validity :- Offer is valid for 30 days from the date of our offer.
6. Our offer is for supply of above items only. Civil Foundation, Installation , Errection and supervision works are not in our scop

For , SURYA ROSHNI LIMITED
Mukesh Khandait
Ranchi

AVANTIKA

परियोजना पदाधिकारी
के0डी0एच0 परियोजना

Project Officer
KDH Project

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Territorial Circle, Ranchi

ANNEXURE IX

Contract | अनुबंध

Contract No | अनुबंध क्रमांक: GEMC-511687799104572
Generated Date | अनुबंध तिथि: 29-May-2023
Bid/RA/PBP No. | बोली/आरए/पीबीपी संख्या: GEM/2023/B/3392306

Organisation Details | संगठन विवरण

Type	प्रकार :	State Autonomous
Ministry	मंत्रालय :	-
Department	विभाग :	Environment Department West Bengal
Organisation Name	संगठन का नाम :	West Bengal Pollution Control Board (WBPCB)
Office Zone	कार्यालय क्षेत्र:	Head Office

Buyer Details | खरीदार विवरण

Designation	पद :	assistant emnvironmental engineer
Contact No	संपर्क नंबर :	-
Email ID	ईमेल आईडी :	aee28.wbpcb-wb@bangla gov.in
GSTIN	जीएसटीआईएन :	-
Address	पता :	HIMALAYA BHAWAN, DELHI ROAD, DANKUNI, HOOGHLY, HOOGHLY, WEST BENGAL-712103, India

Financial Approval Detail | वित्तीय स्वीकृति विवरण

IFD Concurrence	आईएफडी सहमति:	No
Designation of Administrative Approval	प्रशासनिक अनुमोदन का पदनाम:	MEMBER SECRETARY
Designation of Financial Approval	वित्तीय अनुमोदन का पदनाम :	MEMBER SECRETARY

Paying Authority Details | भुगतान प्राधिकरण विवरण

Role:	BUYER
Payment Mode	भुगतान का तरीका:	Offline
Designation	पद :	assistant emnvironmental engineer
Email ID	ईमेल आईडी :	aee28.wbpcb-wb@bangla.gov.in
GSTIN	जीएसटीआईएन :	-
Address	पता:	HIMALAYA BHAWAN, DELHI ROAD, DANKUNI, HOOGHLY, Hooghly, WEST BENGAL-712103, India

Seller Details | विक्रेता विवरण

GeM Seller ID	जेम विक्रेता आईडी :	X7J4230008221773
Company Name	कंपनी का नाम :	Ground 2 Skye Solutions LLP
Contact No.	संपर्क नंबर :	09830123540
Email ID	ईमेल आईडी :	dipanjan@g2sinfraa.com
Address	पता :	7th Floor,1/425,Garlahat Road,Kolkata, Kolkata, WEST BENGAL-700068, -
MSME Registration number	एमएसएमई पंजीकरण संख्या :	UDYAM-WB-10-0050552
MSE Social Category	एमएसई सामाजिक श्रेणी :	General
MSE Gender	एमएसई लिंग श्रेणी :	Male
GSTIN	जीएसटीआईएन:	19AASFG3462C1Z9

*GST / Tax invoice to be raised in the name of | जिसके नाम के पक्ष में GST/TAX इनवॉइस पेश किया जाएगा - Buyer

Delivery Instructions | वितरण निर्देश : AS PER BID DOCUMENT

Product Details | उत्पाद विवरण

#	Item Description | आइटम विवरण	Ordered Quantity | आइटम विवरण	Unit | इकाई	Unit Price (INR) | इकाई मूल्य (INR)	Tax Bifurcation (INR) | कर विभाजन (INR)	Price (Inclusive of all Duties and Taxes in INR) | मूल्य (INR में सभी शुल्क और कर सहित)
1	**Product Name | उत्पाद का नाम :** Domestic Size Solid Bio Mass Cook Stove by Adarsh Plant Protect Limited **Brand | ब्रांड :** Adarsh **Brand Type | ब्रांड प्रकार :** Registered Brand **Catalogue Status | कैटलॉग की स्थिति:** Catalogue not verified by OEM **Selling As | किसी सेवा या रूप में :** Reseller not verified by OEM **Category Name & Quadrant | श्रेणी का नाम और चतुर्थांश :** Domestic Size Solid Bio Mass Cook Stove by Adarsh Plant Protect Limited (Q3) **Model | मॉडल:** Adarsh Domestic Size Cook Stove **HSN Code | एचएसएन कोड:** 73218990	500	pieces	8,148	NA	4,074,000
Total Order Value | कुल ऑर्डर मूल्य (in INR)						4,074,000

Consignee Detail | परेषिती विवरण

S.No | क्र.सं.	Consignee | परेषिती	Item | वस्तु	Lot No. | लॉट नंबर	Quantity | मात्रा	Delivery Start After | डिलीवरी के बाद डिलीवरी शुरू करना है	Delivery To Be Completed By | वितरण पूरा कब तक करना है
	Designation	Domestic Size Solid Bio				

ANJIKA

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Territorial Circle, Ranchi

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परियोजना प्रदाधिकारी
के0डी0एच0 परियोजना

Project Officer
KDH Project

1	Contact|संपर्क : - GSTIN|जीएसटीआईएन : - Address|पता : HIMALAYA BHAWAN, DELHI ROAD, DANKUNI HOOGHLY, HOOGHLY, WEST BENGAL-712103, India	Mass Cook Stove by Adarsh Plant Protect Limited	-	500	29-May-2023	28-Jun-2023

Product Specification for Domestic Size Solid Bio Mass Cook Stove by Adarsh Plant Protect Limited

Specification|विनिर्देश	Sub-Spec|उप-विनिर्देश	Value|मूल्य
Custom Specification	Custom Specification	Yes

Seller Specification Document\|विक्रेता विशिष्टता दस्तावेज़:

1. SpecificationDocument1	mkp.gem.gov.in/catalog_data/catalog_support_document/46/75/741/CatalogAttrs/SpecificationDocument/2023/5/17/2023_05_17_19_56_01_tech-specs-for-domestic-cook-st_2023-05-17-19-56-05_adb05d8ab30de5ca33b2defd66d40001.pdf

Buyer Specification Document\|खरीदार विशिष्टता दस्तावेज़:

1. SpecificationDocument	mkp.gem.gov.in/catalog_data/catalog_support_document/buyer_documents/10893231/54/78/703/CatalogAttrs/SpecificationDocument/2023/4/26/domestic_technical_spec_0001_2023-04-26-22-42-59_6de74d786f43878787d18bc0f44b6f73.pdf

ePBG Detail | ईपीबीजी विवरण

Advisory Bank | स्लाहकार बैंक :	NA
ePBG Percentage(%) | ईपीबीजी प्रतिशत (%) :	NA

Terms and Conditions\|नियम और शर्तें

1. General Terms and Conditions-

1.1 This contract is governed by the General Terms and Conditions, conditions stipulated to this Product/Service as provided in the Marketplace.

1.2 This Contract between the Seller and the Buyer, is for the supply of the Goods and/ or Services, detailed in the schedule above, in accordance with the General Terms and Conditions (GTC) unless otherwise superseded by Goods / Services specific Special Terms and Conditions (STC) and/ or BID/Reverse Auction Additional Terms and Conditions (ATC), as applicable

2. Buyer Added Bid Specific Terms and Conditions-

2.1 *Generic*

OPTION CLAUSE: The Purchaser reserves the right to increase or decrease the quantity to be ordered up to 25 percent of bid quantity at the time of placement of contract. The purchaser also reserves the right to increase the ordered quantity by up to 25% of the contracted quantity during the currency of the contract at the contracted rates. Bidders are bound to accept the orders accordingly.

2.2 *Generic*

Products supplied shall be nontoxic and harmless to health. In the case of toxic materials, Material Safety Data Sheet may be furnished along with the material.

2.3 *Turnover*

Bidder Turn Over Criteria: The minimum average annual financial turnover of the bidder during the last three years, ending on 31st March of the previous financial year, should be as indicated in the bid document. Documentary evidence in the form of certified Audited Balance Sheets of relevant periods or a certificate from the Chartered Accountant / Cost Accountant indicating the turnover details for the relevant period shall be uploaded with the bid. In case the date of constitution / incorporation of the bidder is less than 3 year old, the average turnover in respect of the completed financial years after the date of constitution shall be taken into account for this criteria.

2.4 *Turnover*

OEM Turn Over Criteria: The minimum average annual financial turnover of the OEM of the offered product during the last three years, ending on 31st March of the previous financial year, should be as indicated in the bid document. Documentary evidence in the form of certified Audited Balance Sheets of relevant periods or a certificate from the Chartered Accountant / Cost Accountant indicating the turnover details for the relevant period shall be uploaded with the bid. In case the date of constitution / incorporation of the OEM is less than 3 year old, the average turnover in respect of the completed financial years after the date of constitution shall be taken into account for this criteria. In case of bunch bids, the OEM of CATEGORY RELATED TO primary product having highest bid value should meet this criterion.

2.5 *Service & Support*

Availability of Service Centres: Bidder/OEM must have a Functional Service Centre in the State of each Consignee's Location in case of carry-in warranty. (Not applicable in case of goods having on-site warranty). If service center is not already there at the time of bidding, successful bidder / OEM shall have to establish one within 30 days of award of contract. Payment shall be released only after submission of documentary evidence of having Functional Service Centre.

2.6 *Certificates*

Bidder's offer is liable to be rejected if they don't upload any of the certificates / documents sought in the Bid document, ATC and Corrigendum if any.

2.7 *Certificates*

ISO 9001: The bidder or the OEM of the offered products must have ISO 9001 certification.

2.8 *Certificates*

Material Test Certificate Should Be Sent Along with The Supply. The Material Will Be Checked by Buyer's Lab & the Results of the Lab will be the Sole Criteria for Acceptance of the Item.

2.9 *Certificates*

The bidder is required to upload, along with the bid, all relevant certificates such as BIS licence, type test certificate, approval certificates and other certificates as prescribed in

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
160 Territorial Circle, Ranchi

परियोजना पदाधिकारी
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Project Officer

the Product Specification given in the bid document.

Note: This is system generated file. No signature is required. Print out of this document is not valid for payment/ transaction purpose.

नोट: यह सिस्टम जनरेटेड फाइल है। कोई हस्ताक्षर की आवश्यकता नहीं है। इस दस्तावेज का प्रिंट आउट भुगतान/लेनदेन उद्देश्य के लिए मान्य नहीं है।

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Territorial Circle, Ranchi

Project Officer
KDH Project

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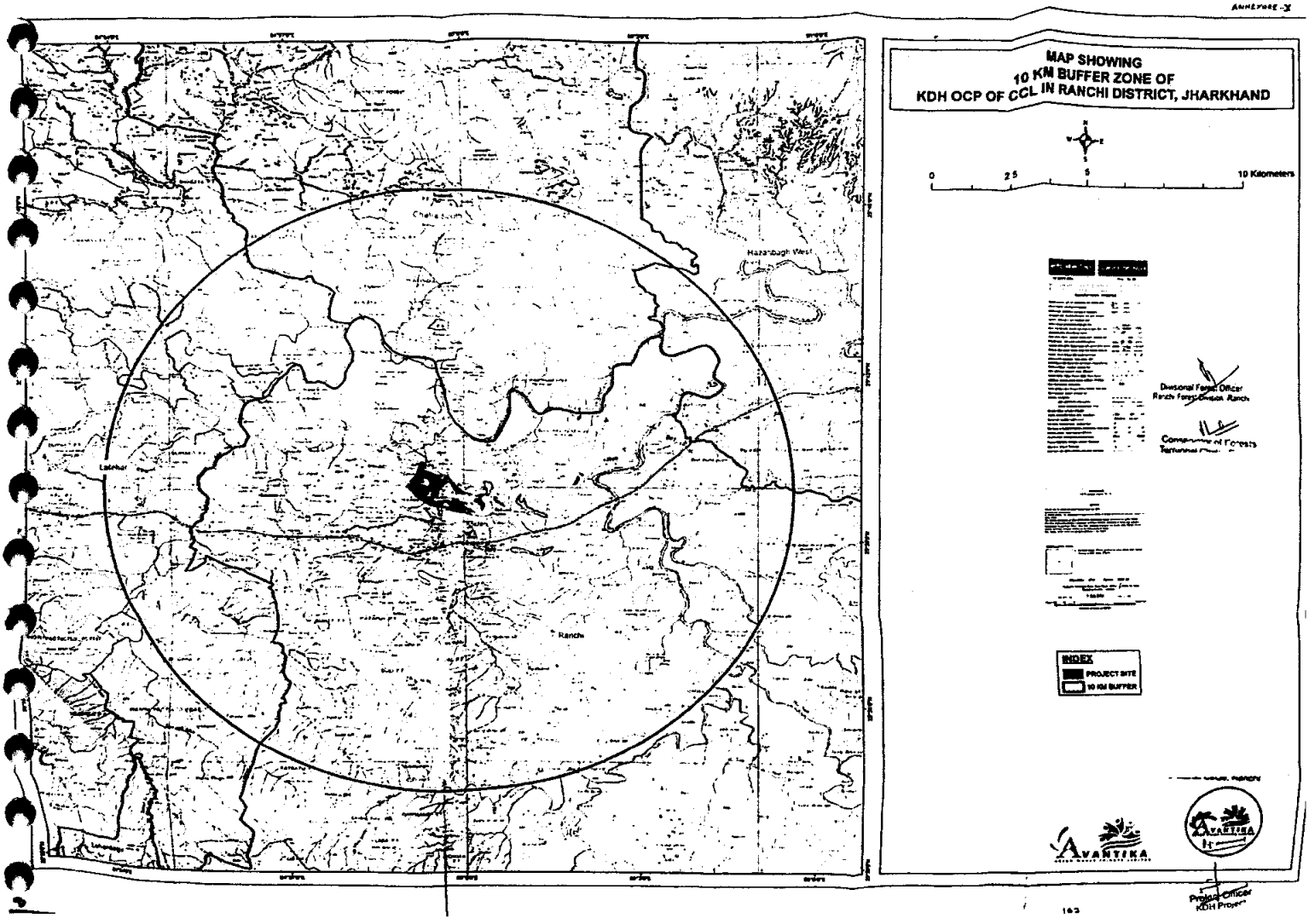
ANNEXURE - X



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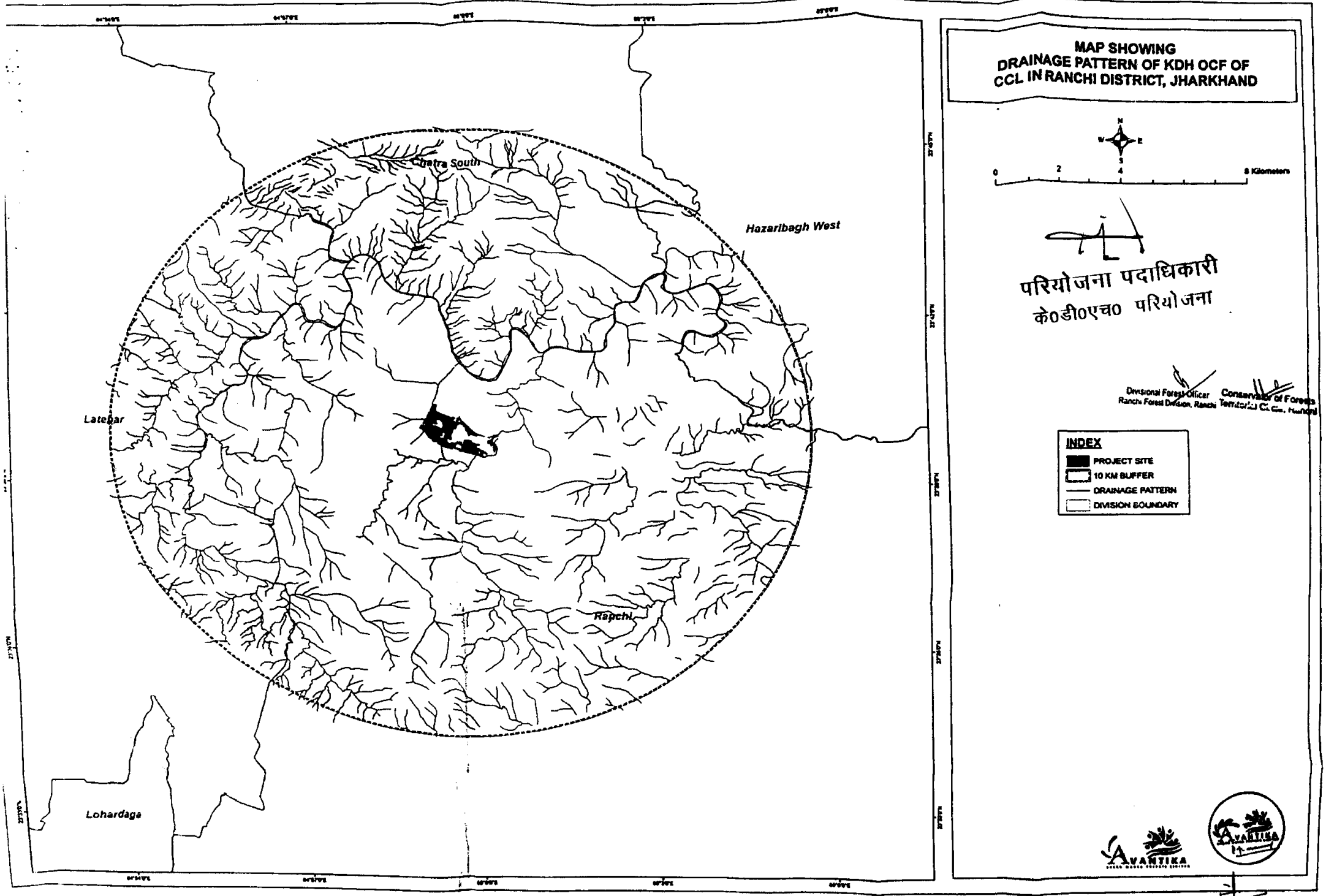

MAP SHOWING DRAINAGE PATTERN OF KDH OCF OF CCL IN RANCHI DISTRICT, JHARKHAND

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परियोजना पदाधिकारी
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Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Territorial Circle, Hazaribagh

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- PROJECT SITE
- 10 KM BUFFER
- DRAINAGE PATTERN
- DIVISION BOUNDARY

AVANTIKA

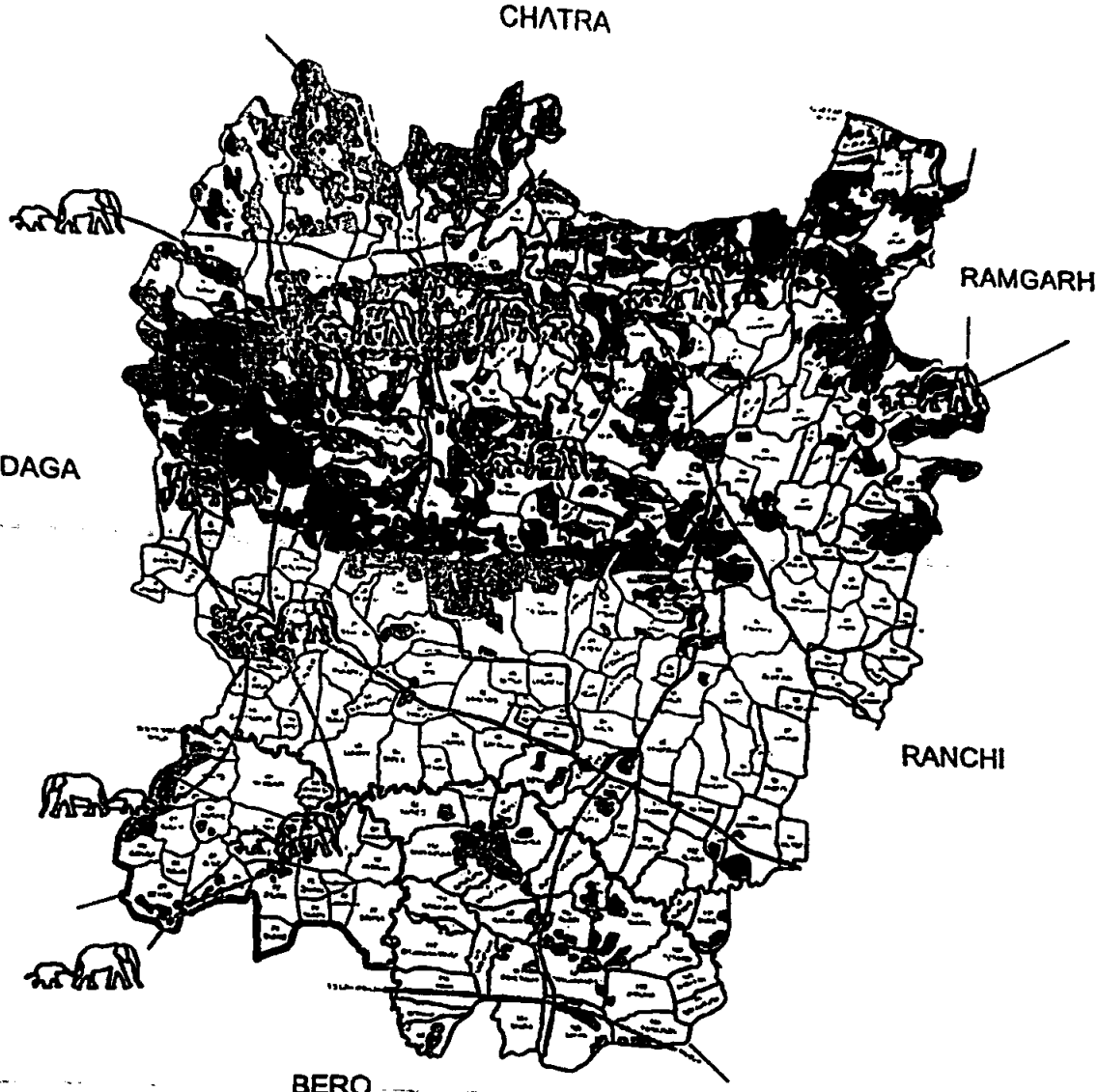
AVANTIKA

Project Officer
KDH P...

BURMU RANGE MANDAR SHOWN ELEPHANT CORRIDOR

N

SCALE- 1"= 2 MILE



ELEPHANT MOVEMENT AREA

FOREST PATCH

Project Officer
KDA Project

Conservator of Forests
Territorial Circle, Ranchi

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ANNEXURE-III

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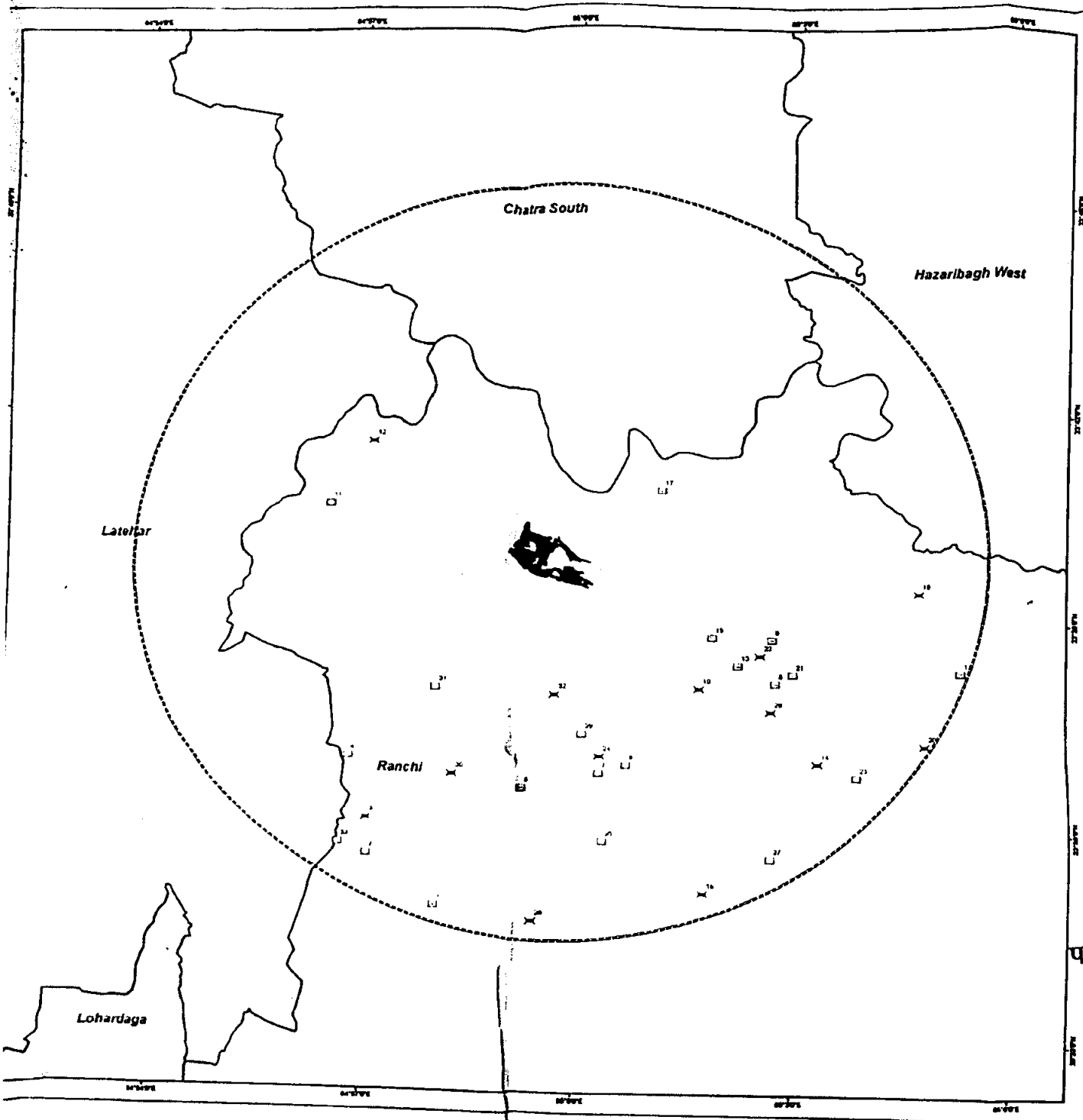

MAP SHOWING
PROPOSED SITE OF CHECK DAM IN 10 KM BUFFER AREA IN RANCHI DISTRICT, JHARKHAND

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- 10 KM BUFFER
- DIVISION BOUNDARY
- KACCHA CHECK DAM
- PUCCA CHECK DAM

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Terrestrial Circle, Ranchi

COORDINATE ID	LONGITUDE	LATITUDE
1	84° 58' 3.372" E	23° 34' 54.096" N
2	84° 57' 5.015" E	23° 35' 38.867" N
3	84° 57' 5.551" E	23° 36' 9.383" N
4	84° 56' 50.522" E	23° 37' 5.185" N
5	84° 59' 15.566" E	23° 36' 37.015" N
6	85° 0' 40.319" E	23° 36' 56.361" N
7	85° 0' 17.889" E	23° 36' 49.375" N
8	85° 2' 42.710" E	23° 38' 7.225" N
9	85° 2' 39.440" E	23° 38' 44.768" N
10	85° 1' 40.899" E	23° 38' 2.587" N
11	84° 56' 34.782" E	23° 40' 38.910" N
12	84° 57' 9.046" E	23° 41' 33.048" N
13	85° 2' 12.329" E	23° 38' 22.417" N
14	85° 3' 18.213" E	23° 36' 57.716" N
15	85° 1' 50.817" E	23° 38' 46.784" N
16	85° 1' 46.949" E	23° 35' 7.678" N
17	85° 1' 7.427" E	23° 40' 53.447" N
18	85° 4' 41.884" E	23° 39' 25.687" N
19	85° 5' 16.731" E	23° 38' 17.816" N
20	85° 4' 48.156" E	23° 37' 14.426" N
21	85° 2' 57.059" E	23° 36' 15.057" N
22	85° 2' 30.229" E	23° 36' 30.851" N
23	85° 3' 51.367" E	23° 36' 46.209" N
24	85° 0' 18.572" E	23° 37' 3.825" N
25	85° 0' 22.161" E	23° 35' 50.926" N
26	84° 59' 25.967" E	23° 34' 44.005" N
27	85° 2' 40.924" E	23° 35' 36.570" N
28	85° 2' 39.506" E	23° 37' 42.815" N
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32	84° 59' 41.700" E	23° 37' 57.280" N
33	84° 56' 41.412" E	23° 35' 47.912" N

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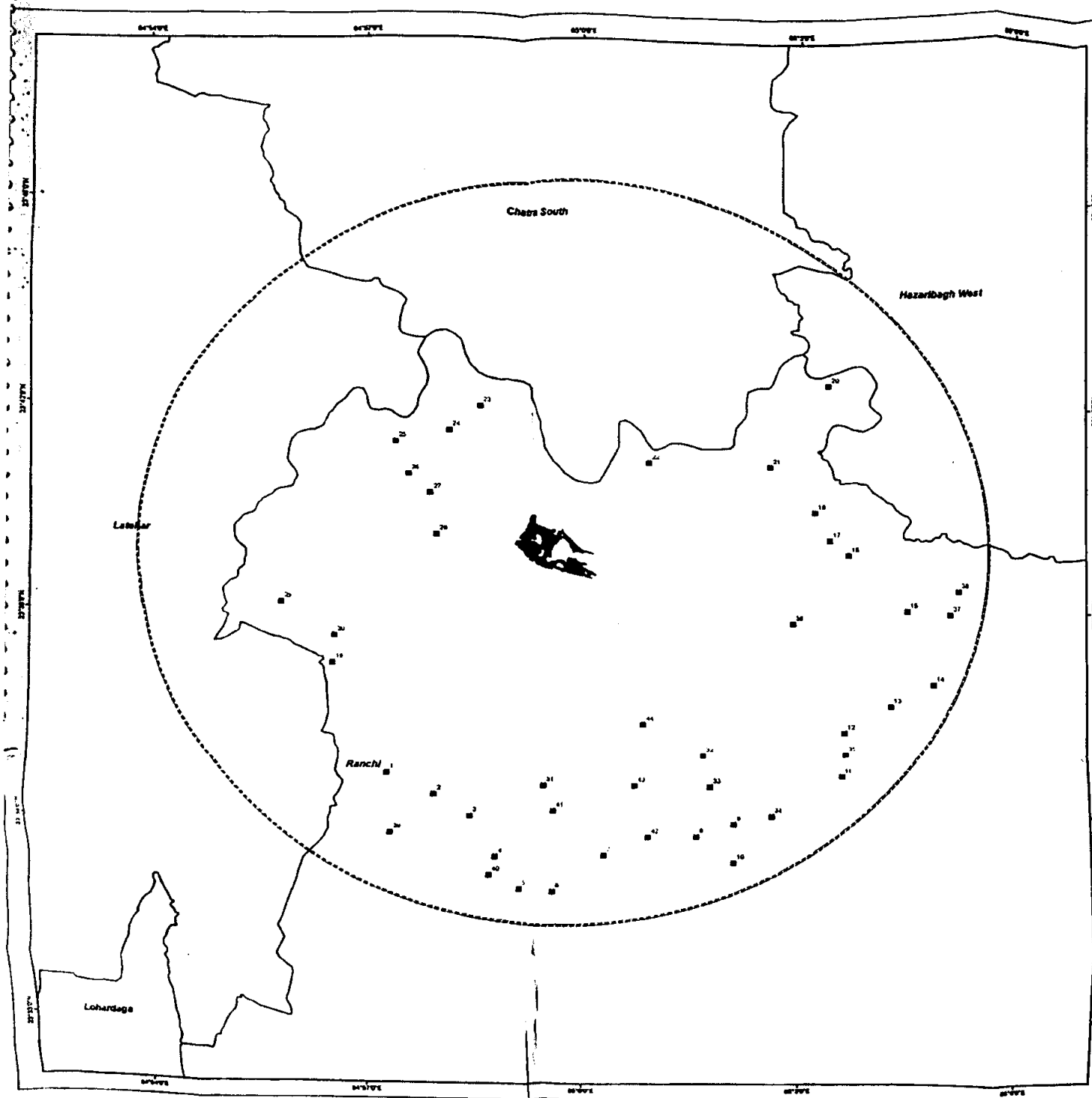
AVANTIKA

ANNEXURE-VII (P)



MAP SHOWING
PROPOSED SITE OF PONDS IN 10 KM BUFFER AREA IN RANCHI DISTRICT, JHARKHAND

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- PROJECT SITE
- 10 KM BUFFER
- DIVISION BOUNDARY
- PROPOSED POND SITE

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Territorial Circle

Coordinate ID	Longitude	Latitude
1	84°19'16.23"E	23°18'38.49"N
2	84°19'32.33"E	23°18'38.49"N
3	84°19'16.23"E	23°18'2.89"N
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7	84°20'3.03"E	23°16'27.29"N
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9	84°20'34.23"E	23°16'51.69"N
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20	84°21'52.23"E	23°14'25.29"N
21	84°22'7.83"E	23°14'0.89"N
22	84°21'52.23"E	23°13'36.49"N
23	84°21'36.63"E	23°13'12.09"N
24	84°21'52.23"E	23°13'12.09"N
25	84°22'7.83"E	23°13'12.09"N
26	84°22'23.43"E	23°13'36.49"N
27	84°22'39.03"E	23°13'36.49"N
28	84°22'54.63"E	23°13'12.09"N
29	84°23'10.23"E	23°13'12.09"N
30	84°22'54.63"E	23°12'47.69"N
31	84°23'10.23"E	23°12'47.69"N
32	84°23'25.83"E	23°12'23.29"N
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40	84°25'30.63"E	23°11'58.89"N
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48	84°27'35.43"E	23°10'21.29"N
49	84°27'51.03"E	23°9'56.89"N

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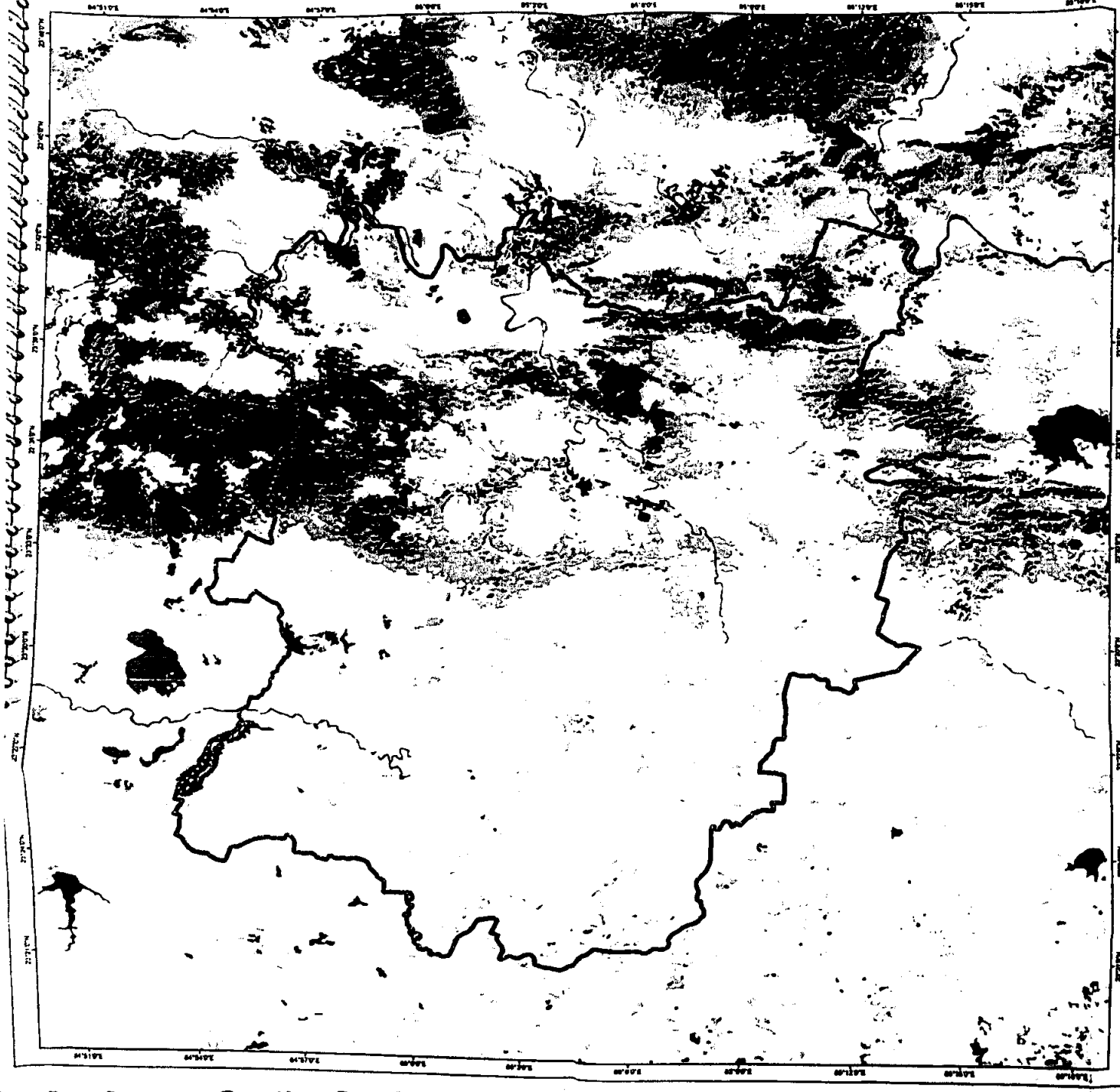
Project Officer
KDH Project

ANNEXURE - XCV

MAP SHOWING FOREST COVER IN BURMU RANGE RANCHI FOREST DIVISION, JHARKHAND



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- BURMU RANGE

FOREST COVER

- WATER
- NON-FOREST
- SCRUB
- OPEN-FOREST
- MOD DENSE-FOREST
- VERY DENSE-FOREST

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Territorial Circle, Ranchi

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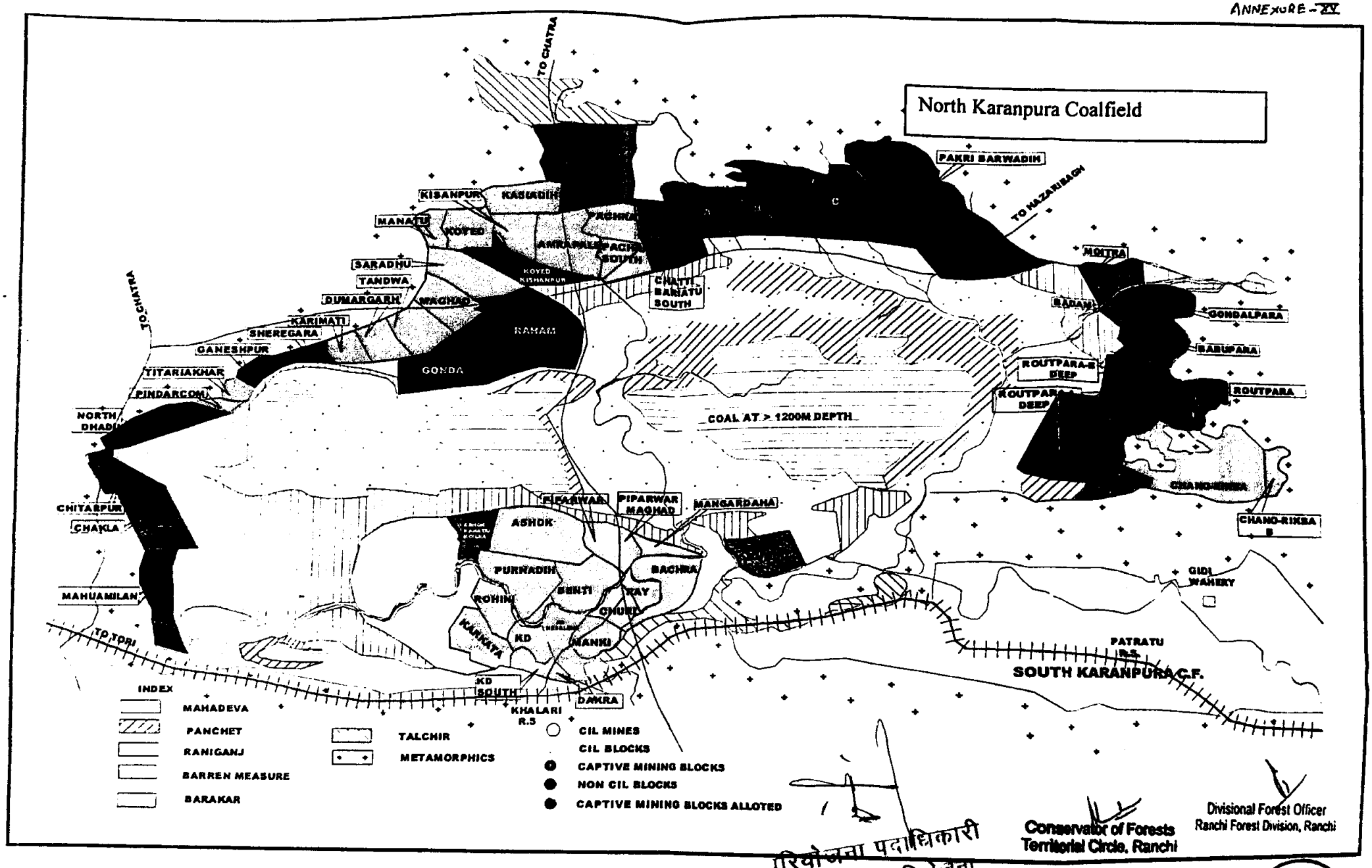
Project Officer



परियोजना पदाधिकारी
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Conservator of Forests
Territorial Circle, Ranchi

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Project Officer
KDH Project

AVANTIKA

FUELLING SUSTAINABLE GROWTH

CENTRAL COALFIELDS LIMITED
(A subsidiary of Coal India Limited)
Office of the Project Officer, KDH Project
P.O: Dakra.829210,Dist:Ranchi(Jharkhand)

Ref No: PO/KDH/Forest/2025-26/ 278

Date: 31.10.2025

Annexure-VIII

Undertaking

Condition no. B (4) 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.

"KDH Project CCL undertakes to pay the additional amount of NPV, if so, determined, as per the final decision of the Hon'ble Supreme Court of India."

Project Officer,
KDH Project
NK Area, Dakra.

Annexure - IX

REPORT ON
SOIL EROSION MITIGATIVE MEASURES AND TOP-SOIL MANAGMENT PLAN

In Compliance to

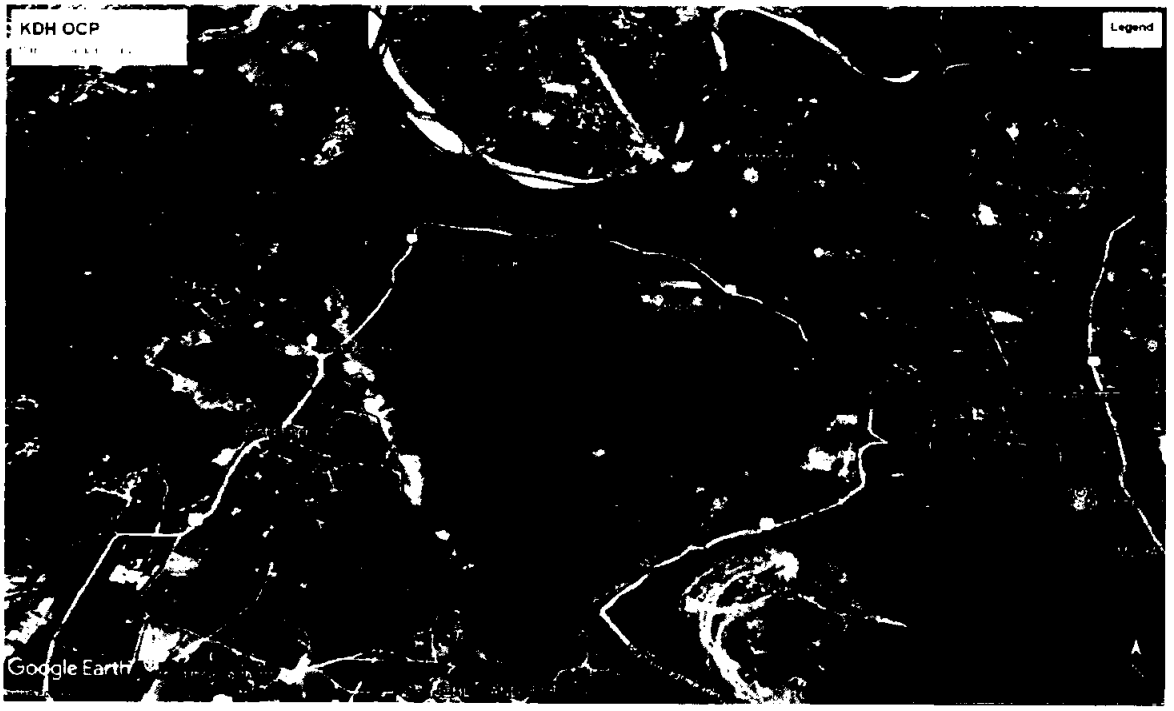
Condition No B-13 of In *principle/ Stage-I"* approval of Forest Clearance Granted Vide File No.8-62/2018-FC-(Vol) Dated 27.02.2023 by Ministry of Environment, Forests & CC of Govt. of India, New Delhi.

For

Non-forestry use of 126.72 ha of forest land for KDH Open Cast Coal Mining Project

OF

KDH OPENCAST COAL MINING PROJECT, NK AREA, CCL



August 2025

Central Mine Planning & Design Institute Ltd.
Opencast Division-HQ
Environment Division-HQ & Regional Institute-III
Kanke Road, Ranchi - 834008 (Jharkhand), India

परियोजना पदाधिकारी
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Chapter 1
Introduction

1.1 Introduction

Karanpura Dewarkhand Hesalong (KDH) Opencast Mine is situated in the North Karanpura Coalfield of Jharkhand. Presently, it is a part of North Karanpura Area of CCL. The mine was nationalised in 1973, when it was producing about 0.2 Mte of coal per annum. The Project Report for KD Hesalong opencast project (Expansion) was prepared in March'87 for a rated capacity of 4.5 MTPA of coal at an average stripping ratio of 1.19m3/te. The project was expanded to 4.50 MTPA based on PR approved in July, 1987. The project is proposed to be extended in dip side for the same rated capacity with increase in lease area. Extension Project Report for KDH OCP (capacity 4.50/5.00 MTPA Normative/Peak capacity) was approved by CCL Board on 19th Aug. 2010.

1.2 Purpose of the Report

CCL had submitted a proposal to MoEF&CC, GoI through Department of forest, GoJ, Ranchi, for the diversion of non-forestry use of 126.72 ha (84.35 ha PF and 42.37 ha Jungle Jhair) of forest land for KDH Opencast Mine, CCL.

In principle Stage – I approval under section 2 of the forest (Conservation) Act, 1980 for non – forestry use of 126.72 ha of forest land for KDH Opencast mining project in favour of CCL, has been accorded by MoEF&CC vide letter no. File.No. 8-62/2018-FC dated 27.02.2023.

As per condition no B.13 Para i,ii,iii,iv & v of the said letter, the user agency has to comply with following conditions: in the lease area under the supervision of the State Forest Department

a. 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

b. 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

c. Construction of check dams, retention /toe walls to arrest sliding down of the excavated material along the contour in accordance with the approved scheme;

d. 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 28^0; and

e. No damage shall be caused to the top-soil and the user agency will follow the top soil management plan.

Accordingly, CCL has entrusted CMPDI as a consultant to make a scheme for the above said job vide PO no: 5700383155 dated 16.01.2025 and was communicated to CMPDI on 08.07.2025

1.3 Objective and Scope of the Study

Key objectives of the study are as follows:

1. To carry out soil erosion study and mitigation plan with main focus on the forest land within the Mine lease area proposed for diversion.
2. Reclamation of Mining area including Dump Management plan, Topsoil Management Plan and biological reclamation plan.

1.4 Details of the Project Proponent

SN	Particulars	Details
1	Name of Project	KDH Opencast Coalmine
2	Name of the proponent	Project Officer, KDH OCP, NK Area, CCL
3	Registered Address	Office of the Director Technical (Project & Planning), Central Coalfields Limited, Darbhanga House, Kutchery Rd District - Ranchi, Jharkhand - 834029
4	Legal Status of the Company	A subsidiary of Coal India Ltd.- Public Sector Undertaking under Central Government (Ministry of Coal)-A Mini-Ratna Company

1.5 Location and Communication

The KDH Opencast project falls within Hesalong and KD South geological blocks. It is located in the south central part of North Karanpura Coalfields and is included in Survey of India toposheet no. 73 E/2 and 73 A/14 in Ranchi district of Jharkhand. KDH Opencast project is bounded between latitude 23°39' 21" to 23°42'0" and longitude 84°59'15" to 85°00'24

The area is connected to Ranchi by State Highway no 7. The distance between Ranchi and the block is around 65km. The Khalari railway station on the Gomoh-Dehri-on-Sone loop line of the Eastern Railway is about 1 km from the southern extremity of the KD South block

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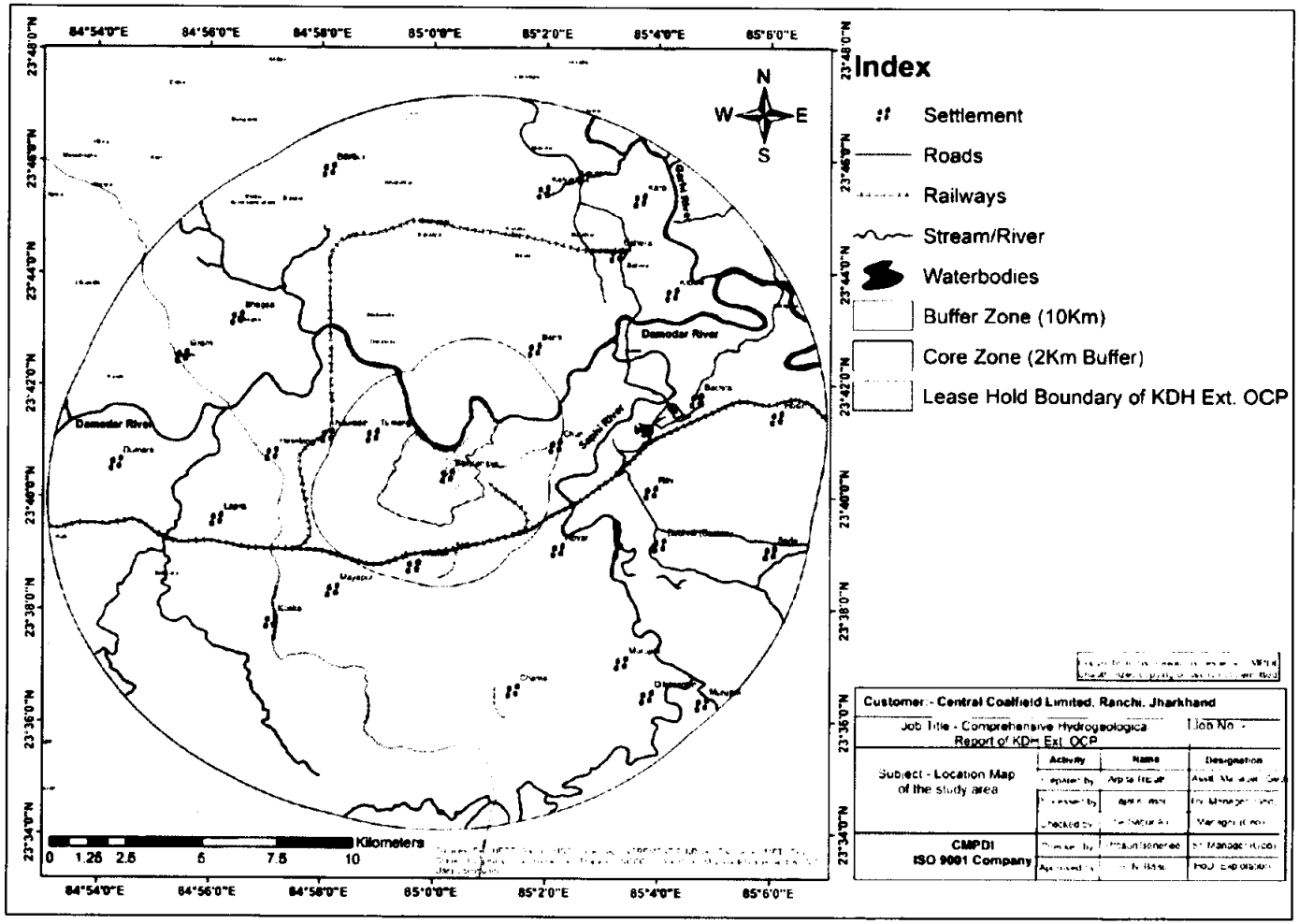

Figure 1.1: Location of the Project

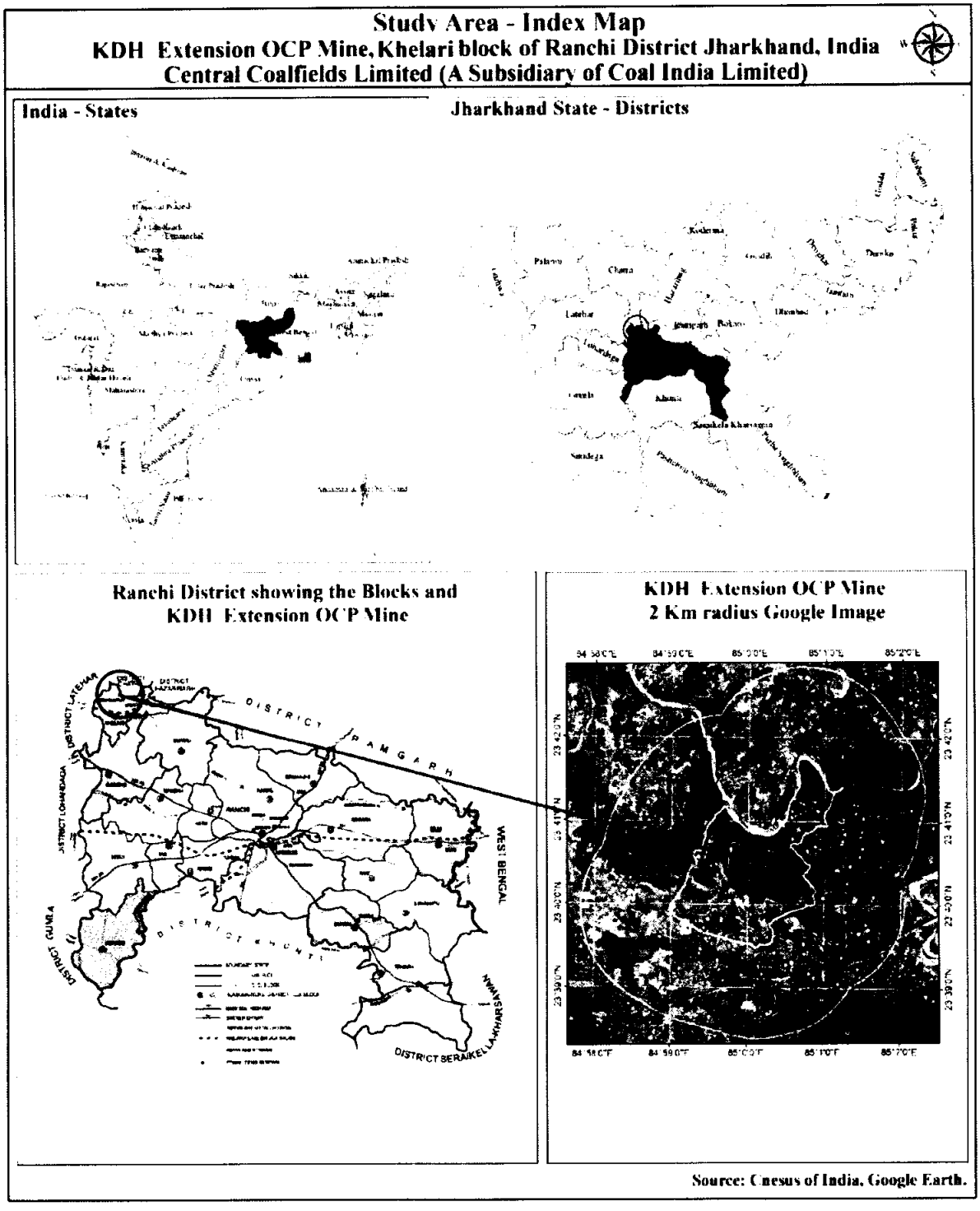

Figure 1.2: Location of the study area

Chapter 2
Soil Erosion and Mitigation: An Overview

2.1 Soil Erosion

Soil erosion is a global phenomenon impacting diverse landscapes, from small residential properties to vast forests and deserts. It occurs due to natural processes such as rainfall, wind, and ice melt, which dislodge and transport soil particles. Simultaneously, rock disintegration contributes to soil formation, creating a dynamic balance between erosion and soil generation. However, human activities often accelerate soil erosion, disrupting this natural equilibrium.

- **Mechanisms of Soil Erosion**

Soil erosion results from the action of natural agents such as:

- **Rainfall**
- **Wind**
- **Ice Melt**

Each agent contributes uniquely to the erosion process. Below, the major types of soil erosion and their mechanisms are detailed.

2.2 Rainfall-Induced Erosion

Studies indicate that water-induced soil erosion is primarily initiated by falling raindrops, with surface runoff acting as a secondary agent. The erosion process begins with the onset of rainfall and involves two key factors:

1. **Falling raindrops**
2. **Flowing runoff**

2.2.1 Falling Raindrops

When raindrops strike the soil surface, they break apart soil clods and aggregates, dislodging particles from the soil mass. The impact energy of falling water detaches the particles, while surface runoff transports them downslope. This phenomenon is referred to as the splash erosion process.

In hilly catchments, splash erosion is more pronounced than in flat catchments due to the downhill movement of soil particles. On flat surfaces, the splash impact is more evenly distributed, balancing the incoming and outgoing soil displacement.

2.2.2 Flowing Runoff

Runoff occurs when rainfall exceeds the soil's infiltration capacity, causing water to flow downslope due to gravity. As water depth and flow velocity increase, the runoff gains sufficient kinetic energy to detach and transport soil particles. Over time, this process lowers the soil surface and creates preferential flow paths, which further accelerate erosion in those areas.

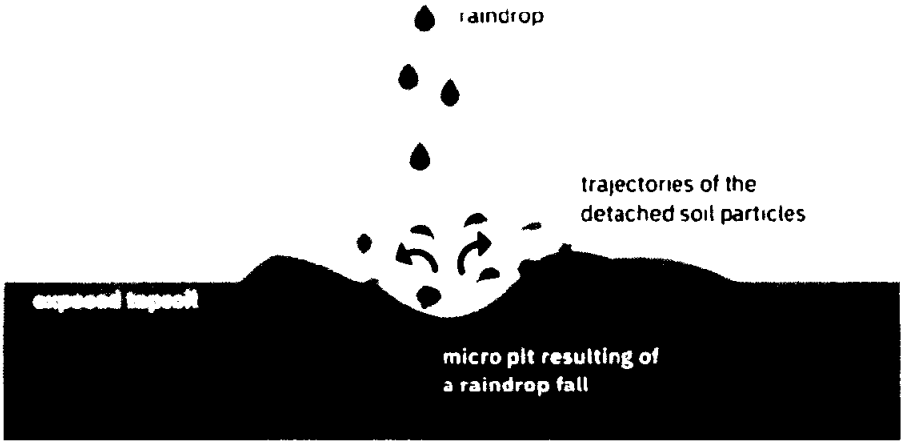

Figure. 2.1: Figure showing splash erosion

2.3 Wind-Induced Erosion

Wind erosion occurs on dry, sandy, or dusty surfaces that lack adequate vegetation cover. Strong winds pick up and transport loose fine-grained particles, leaving behind coarser materials. This sorting action alters soil texture, removing vital components such as silt, clay, and organic matter, which are essential for productivity and water retention. Wind erosion is influenced by storm intensity, wind speed, and duration.

2.4 Ice-Induced Erosion

Erosion caused by snow and glacier melt occurs in regions with sustained cold temperatures. Snowmelt peaks in spring, while glacier melt is most pronounced during summer. These processes create seasonal fluctuations in river flow, with peak activity driven by air temperature and sunlight duration. However, ice-induced erosion is not relevant in tropical regions like the present study area, where temperatures do not reach freezing levels.

2.5 Consequences of Soil Erosion

Soil erosion has far-reaching impacts on the environment, agriculture, and human settlements. The most critical consequences of soil erosion include:

- Water pollution
- Irregular water availability
- Choking of streams
- Alteration of soil texture

2.5.1 Water Pollution

Water is the most essential requirement after air for the survival of any kind of life which needs more or less some quantity of water. It holds a pivotal position in the total environment so that

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if its availability is in optimum quantity, it can protect all aspects of the environment and if availability is less or more than the requirement then the quality of all aspects of the environment gets endangered. Water is made available by nature in good quantity and quality in the form of rainwater, underground water, and through the river, Nala, ponds etc. This water gets affected due to disturbance in nature using man's activities associated with construction, mining activities, etc.

Mainly two types of actions cause water pollution.

- Mixing foreign substances with natural water causes physical and chemical changes.
- Interception or diversion of full or part of any waterway.

The operation of mining and allied activities of this project would have an impact on water quality through the generation of wastewater in the surrounding area in many ways. The source of such a polluted liquid effluent has an impact on water quality and these are discussed elaborately in the EMP report.

2.5.2 Improper Water Availability

When soil lacks adequate cover from vegetation, mulches, or crop residues, it becomes more vulnerable to the impact of raindrops. When raindrops strike bare soil, their energy dislodges individual soil particles from larger clods. These particles can block surface pores, forming thin, nearly impermeable sediment layers called surface crusts, typically composed of sandy or silty particles. These crusts, which can range from a few millimetres to over a centimetre in thickness, hinder rainwater infiltration into the ground. As a result, the soil's water-holding capacity decreases, leading to increased surface runoff and heightened soil erosion. The displaced soil is often deposited in low-lying areas, ponds, streams, or water channels, reducing their water storage capacity. Furthermore, reduced infiltration rates limit groundwater recharge, significantly diminishing the overall water-holding capacity of the region. This leads to water shortages during dry periods.

Conversely, the increased speed and volume of surface runoff can lead to flooding in downstream areas, disrupting water availability and creating further imbalances in the region's water resources

2.5.3 Choking of Streams

Rainfall water that does not infiltrate into the soil starts to flow downhill under the action of gravity. Initially, run-off moves down the slope as a thin diffused film of water that has lost virtually all the kinetic energy which it possessed as falling rain. Thus, it moves only slowly, has a low flow power, and is generally incapable of detaching or transporting soil particles.

If the rain continues, the increasing depth of water will eventually increase. Overland flow that is released in this way is likely to flow downhill more quickly and in greater quantities (i.e. possess more flow power as a result of its kinetic energy), and so it may be able to begin transporting and even detaching and picking up the soil particles. When the speed of runoff is decreased, the carrying capacity of the runoff gets reduced, subsequently, sedimentation takes place, causing the choking of the stream. Following are the main area where maximum soil erosion takes place.

2.5.4 Change in Soil Texture

The most serious and significant effect of soil erosion, by far, is the change in soil texture caused by wind/water erosion. Finer soil fractions (silt, clay, and organic matter) are removed and carried away by the wind, leaving the coarser fractions behind. This sorting action not only removes the most important material from the standpoint of productivity and water retention but leaves a more sandy soil and thus a more erodible soil than the original. Successive removals eventually create such a soil condition wherein plant growth is minimized and erodibility is greatly increased. Damage results both from water erosion and the consequent dust storms. Control becomes more and more difficult. In the extreme, the sand begins to drift and form unstable dunes which encroach on better surrounding lands. Throughout recorded history, huge agricultural areas have been ruined for further agricultural use in this manner

2.6 Estimation of Soil Erosion

Erosion is a natural geomorphic process occurring continually over the earth's surface and it largely depends on topography, vegetation, soil, and climatic variation and, therefore, exhibits pronounced spatial variability due to catchments heterogeneity and climatic variation.

Soil erosion is a three-stage process:

(1) Detachment,

(2) Transport, and

(3) Deposition of soil.

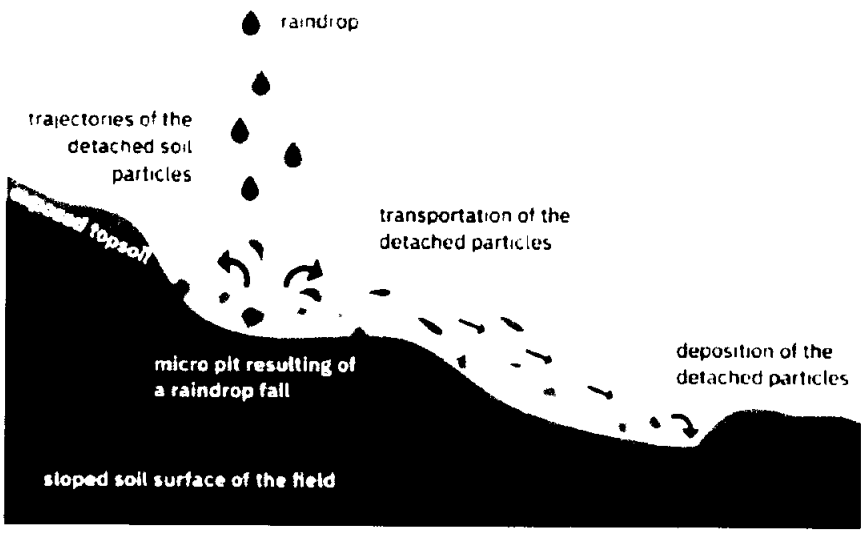

Figure. 2.2: Figure showing stages of soil erosion processes

Different energy source agents determine different types of erosion. There are five principal sources of energy that affect erosion such as wind, water, gravity, chemical reactions, and anthropogenic, such as tillage. Soil erosion begins with detachment, which is caused by the breaking down of aggregates by raindrop impact, sheering, or drag force of water and wind. Detached soil particles are transported by flowing water (overland flow and inter-flow) and wind, and deposited when the velocity of water or wind decreases by the effect of slope or

ground cover. Three processes viz. dispersion, compaction, and crusting accelerate the natural rate of soil erosion. These processes decrease structural stability, reduce soil strength, exacerbate erodibility and accentuate susceptibility to transport by overland flow, interflow, wind, or gravity. These processes are accentuated by soil disturbance (by tillage, vehicular traffic), lack of ground cover (bare fallow, residue removal or burning), and harsh climate (high rainfall intensity and wind velocity).

The above problems can be circumvented by describing the catchments into approximately homogeneous sub-areas using the Geographic Information System (GIS). In this study, the remote sensing and GIS techniques (through Satellites Imagine and interrelated software) were used for the derivation of spatial information, catchments description, data processing, etc.

2.9 Nature of Soil Erosion Works

Soil erosion works on the site are carried out as per the site-specific approved treatment plan. Emphasis is to be given to contour line treatment with small and medium erosion control works. The soil erosion and area development works are concerned; the entire area is to be treated as a unit. In an area prone to Soil Erosion and degraded forest, following measures are suggested to increase moisture level:

Contour Trenches

Check Dams

Earthen Ponds

Grassing

Mulching

Various plantation models such as mangrove plantation, coastal border plantation, plantation as per the provision in different areas, soil and moisture conservation works of forest and plantation areas, maintenance & up-keep of plantation areas with different models are formulated for different areas.

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Chapter 3
Hydrogeological Studies

3.1 Introduction

KDH Opencast coal mine occupying the South-central part of the North Karanpura Coalfield is characterized by undulating terrain sloping towards east i.e towards the flow direction of Damodar river. In general, the ground slopes towards east in major part of the block. As per DEM based on SRTM30 maximum and minimum elevation in the study area is 791 m and 393 m respectively. The DEM of the study area shows the north central of the buffer area and some portion in the south central and south eastern region are represented by high altitude area whereas north east region is characterized by relatively flat terrain. Several major hillocks are present in the buffer zone. Tukuwa Pahar having elevation of 686 m amsl, around 9 km S-W of the project and Sat pahar about 655 m amsl is present around 9 to 10 km N of the project.

3.2 Drainage Pattern of the Study area

The Damodar River, which is the master drainage of the buffer zone, flows from west to east in the north of the project. The other major drainages present in the study area are Saphi nadi, flows from south to north to meet Damodar River at distance of about 6-7 km N-E of the project and Haharo nadi, flows from NW to SE to meet Damodar river at a distance of about 4.5-5.0 km N-W of the project. There are some other small tributaries of the Damodar River present in buffer zone i.e. Kendua nala, Sonadobajore nala, Dainkita nala, Chal nala and Tiru nadi The drainage pattern of the area is mostly dendritic.

The area is drained mainly by seasonal Kendua Nala in the west of the block and Sonadoba jore nala in the east. Both the nalas, flowing south to north carry the run-off to the Damodar River flowing in the north of the property. The HFL of the Damodar River as recorded in the vicinity of the project area is 418.72 m above MSL.

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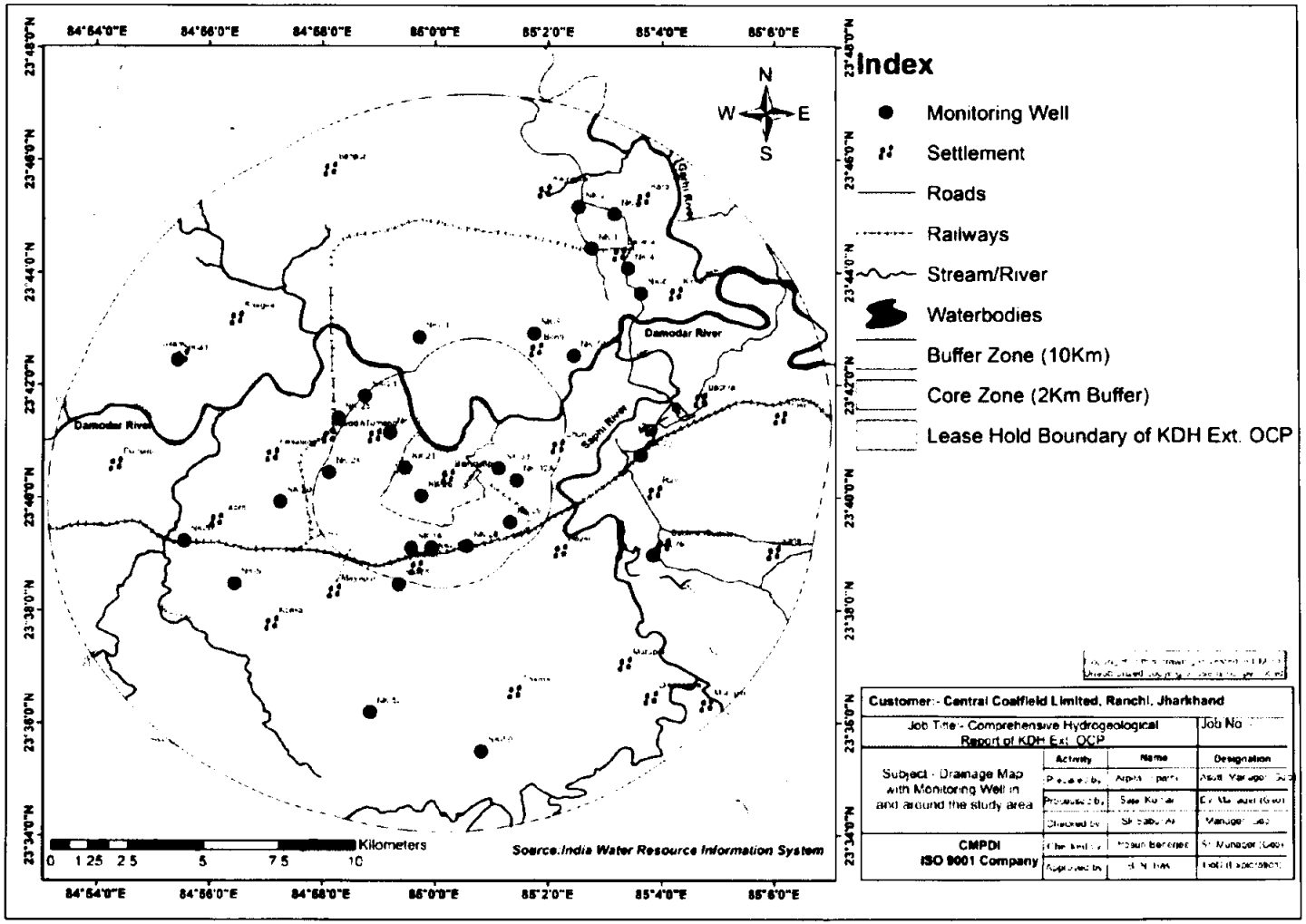

Figure 3.1: Drainage Plan of the Study area showing Buffer Zone

3.2.1 Aquifer Description

The thin alluvial formation comprising of soil, loose sand, weathered sandstone, poorly cemented thin shaly sandstone lies above the coal seam K3 in the KDH Ext. block behaves as unconfined aquifer. The lower formations, consisting of compact fine to medium grained sandstone with lamination and intercalation with thin shale and carbonaceous shale bands with secondary porosity, behave as semi-confined in nature and are less potential. The deeper aquifers behave as an unconfined aquifer at the outcrop region. In the sandstone aquifer, groundwater moves laterally through the inter-granular pore spaces of the sandstone.

The types of aquifers are given in the table below

Table: Generalized Hydrogeological Units developed in KDH OCP

Aquifer Unit	Lithology	Avg. Thickness in m
Unconfined aquifer	Alluvium, sandy soil and weathered / partly consolidated thin shaly sandstone.	35.0
Aquiclude	**K3**	0.8
Semi confined aquifer	Carb. Shale, Intercalation of shale and sandstone	7.9
Aquiclude	**K2**	4.3
Semi confined aquifer	Intercalation of shale and sandstone	10.2
Aquiclude	**K1**	3.1
Semi confined aquifer	Generally gray shale and intercalation of shale and sandstone	9.0
Aquiclude	**Karkata**	4.1
Semi confined aquifer	Generally, carb. Shale and intercalation of shale and sandstone	29.1
Aquiclude	**Bisrampur**	3.9
Semi confined aquifer	Carb shale, gray shale and intercalation of shale and sandstone	14.2
Aquiclude	**Bukbuka**	16.3
Semi confined aquifer	Medium grained sandstone and sandy shale, shale & gray shale	30.2
Aquiclude	**Dakra (Combined)**	24.9
Semi confined aquifer P (Bet Dakra Top and Bukbuka)	Medium grained sandstone and sandy shale, shale & gray shale	22.9
Aquiclude	**Upper Dakra**	6.3
Semi confined aquifer	Medium grained sandstone and alternative shale and sandstone	4.3
Aquiclude	**Lower Dakra**	18.5

3.2.2 Groundwater Level

CMPDI has established a network of 25 monitoring stations (dug wells) spread over the buffer zone (10 km radius) to collect the representative groundwater levels in the study area for monitoring GW level in pre-monsoon and post-monsoon period for last few years. The location

of the monitoring stations has been shown in the drainage map of the area with respect to KDH OCP in the buffer area (10Km). The detail GW level data of the monitoring stations in the core (2 km Buffer) and buffer zone (10Km Buffer) for the pre-monsoon and post-monsoon of the year 2022 has been in table below.

Table: Details of GW level of the monitoring stations in core and buffer zone of mine

1	NK-13	455.20	23.685900	84.986504	3.58	3.04	0.54
2	NK-15	452.10	23.651899	84.998901	0.96	0.72	0.24
3	NK-16	451.60	23.651800	84.992798	5.70	5.65	0.05
4	NK-21	455.70	23.675501	84.990997	18.43	15.85	2.58
5	NK-23	458.40	23.696800	84.979103	7.85	6.43	1.42
6	NK-24	473.00	23.674200	84.968597	5.71	5.10	0.61
7	NK-28	461.80	23.652399	85.009499	2.92	1.40	1.52
8	NK-29	448.40	23.659401	85.022202	1.61	0.80	0.81
9	NK-33	442.10	23.675400	85.018799	6.53	4.78	1.75
10	NK-32A	453.60	23.671900	85.024101	6.78	6.30	0.48
			Buffer Zone				
11	NK-1	443.60	23.740500	85.045998	5.41	3.08	2.33
12	NK-2	447.20	23.752701	85.042198	9.59	3.09	6.50
13	NK-3	440.90	23.750601	85.052696	4.43	3.30	1.13
14	NK-4	428.00	23.734501	85.056702	3.74	2.52	1.22
15	NK-6	421.70	23.727200	85.060501	6.03	4.60	1.43
16	NK-9	433.80	23.715401	85.029198	7.70	7.65	0.05
17	NK-11	457.00	23.714300	84.995201	8.50	7.90	0.60
18	NK-20	474.50	23.665501	84.954300	5.58	5.05	0.53
19	NK-25	467.20	23.690201	84.971497	7.53	5.40	2.13
20	NK-41	478.50	23.707500	84.923798	6.27	5.02	1.25
21	NK-56	530.30	23.641300	84.940804	7.50	5.95	1.55
22	NK-57	472.70	23.653900	84.925797	4.15	3.55	0.60
23	NK-72	441.40	23.679199	85.060501	3.78	4.00	-0.23
24	NK-75	476.00	23.641001	84.989098	5.44	2.05	3.39
25	NK-79	436.30	23.708799	85.040802	4.85	5.03	-0.18

Ground water level (bgl) range in and around the study area has been furnished below: -

	Area	Pre-monsoon	Post-monsoon	Fluctuation (m)
Ground water level range (bgl) in 2022	**Core Zone**	0.96m to 18.43m	0.72m to15.85m	0.05m to 2.58m
	Buffer zone	3.74m to 9.59m	2.05m to 7.90m	-0.23m to 6.50

Depth to water level (DTWL) contour map for both pre-monsoon kk and post-monsoon kk have been furnished in the plates below for better understating of the recharge and discharge zone in the study area.

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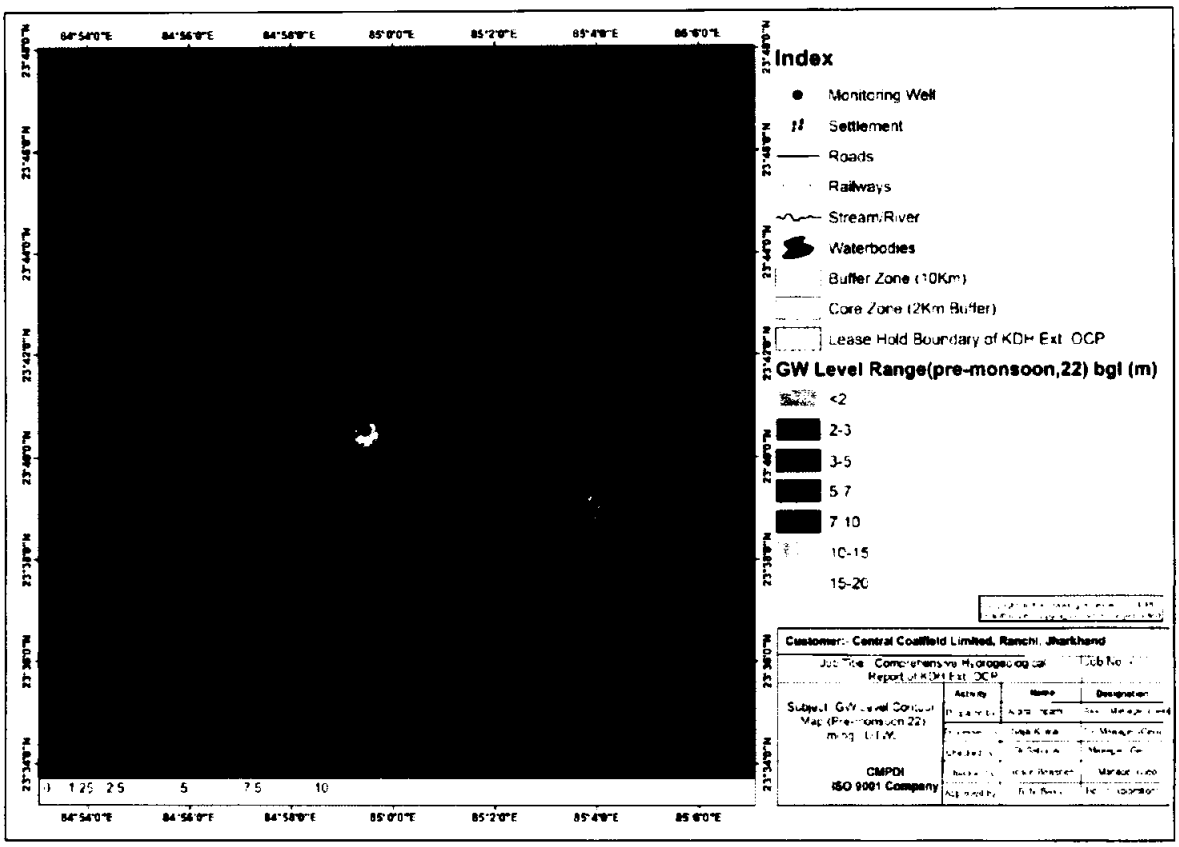

Figure 3.2: **Depth to Water Level (DTWL) Contour Map, Pre-Monsoon 22**

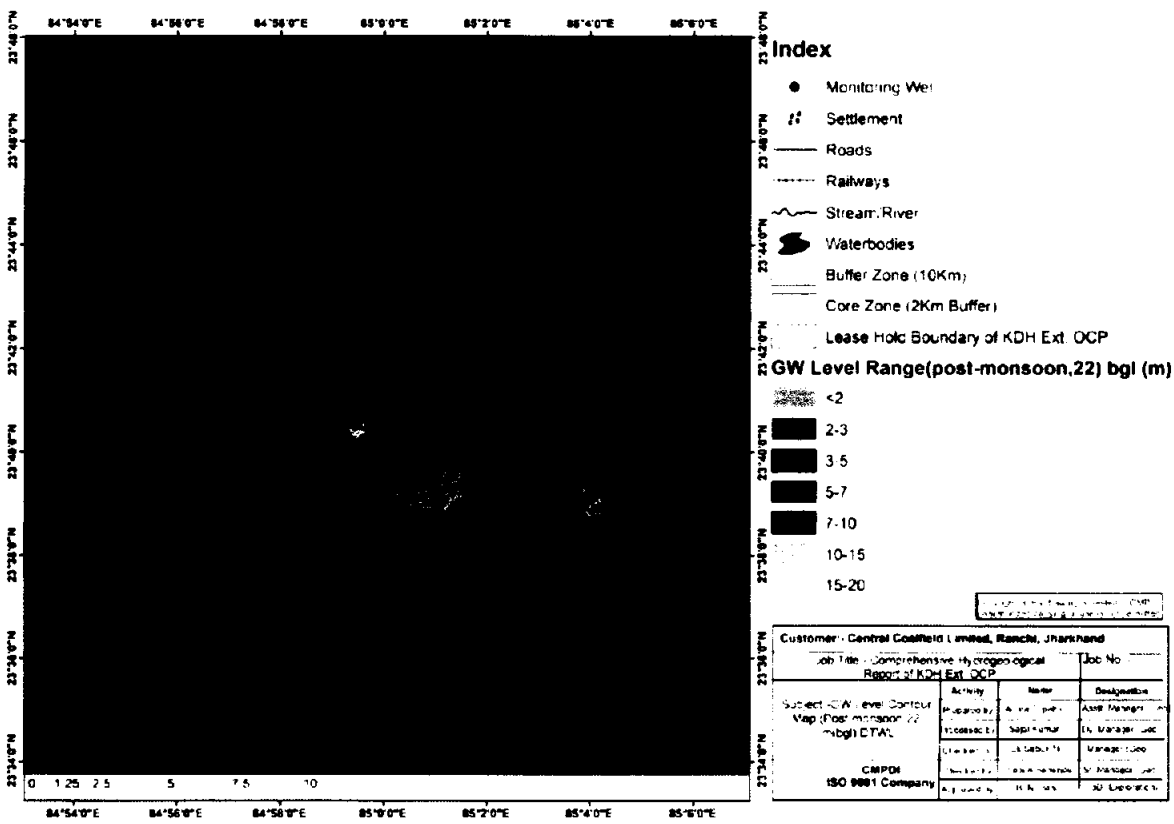

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Figure 3.3: **Depth to Water Level (DTWL) Contour Map, Post-Monsoon 22**

Ground water leel trend analysis has been done for village dug well no. – NK 15 & NK 22, situated in the core zone of the KDH Ext. OCP for last few years. The trend analysis based on linear regression method of the hydrographs shows the trend of depth to water table below ground level in cm/year for both pre monsoon and as well post monsoon period.

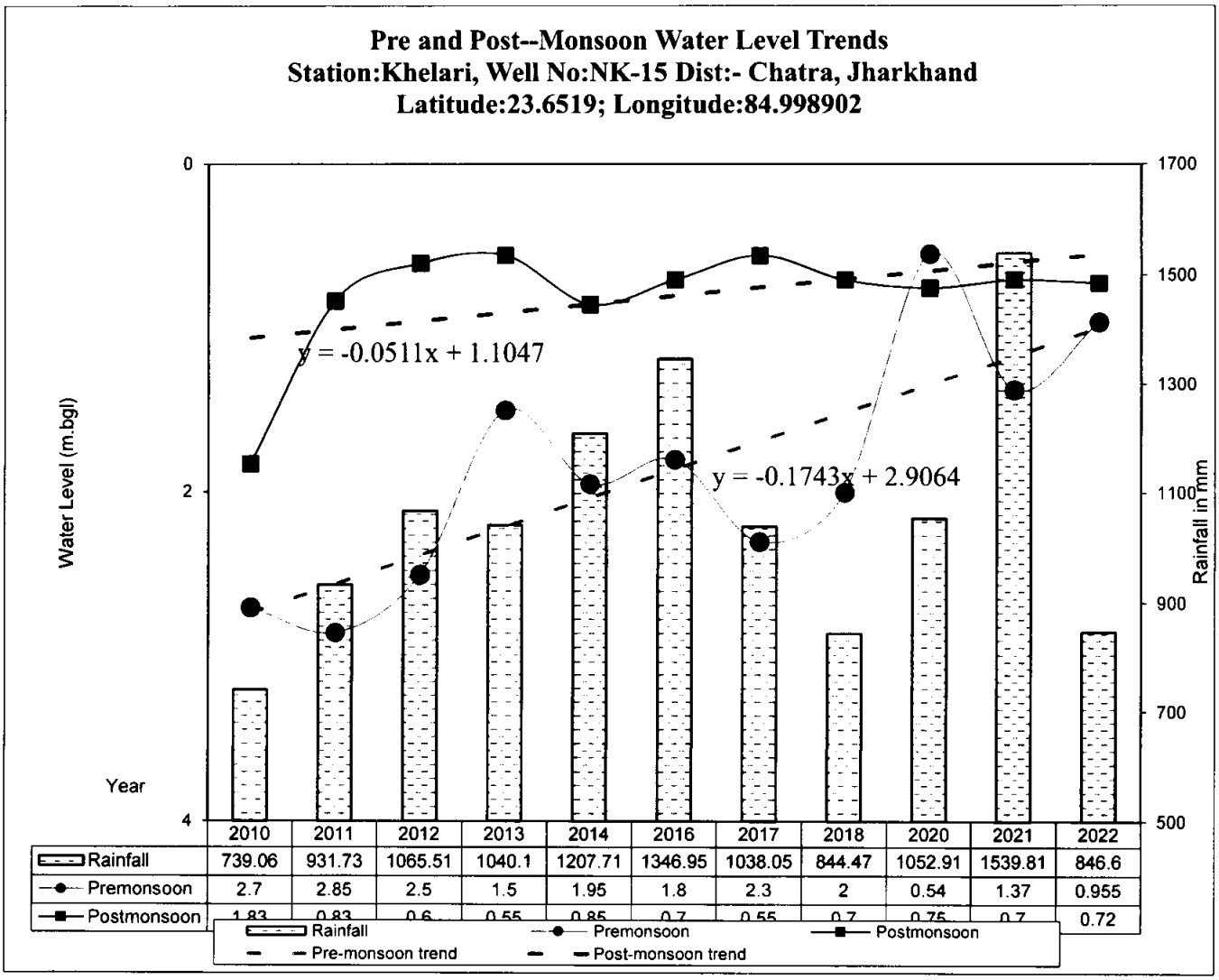

Figure 3.4: **Pre-monsoon and post-monsoon Water level trend of hydrograph station NK-15**

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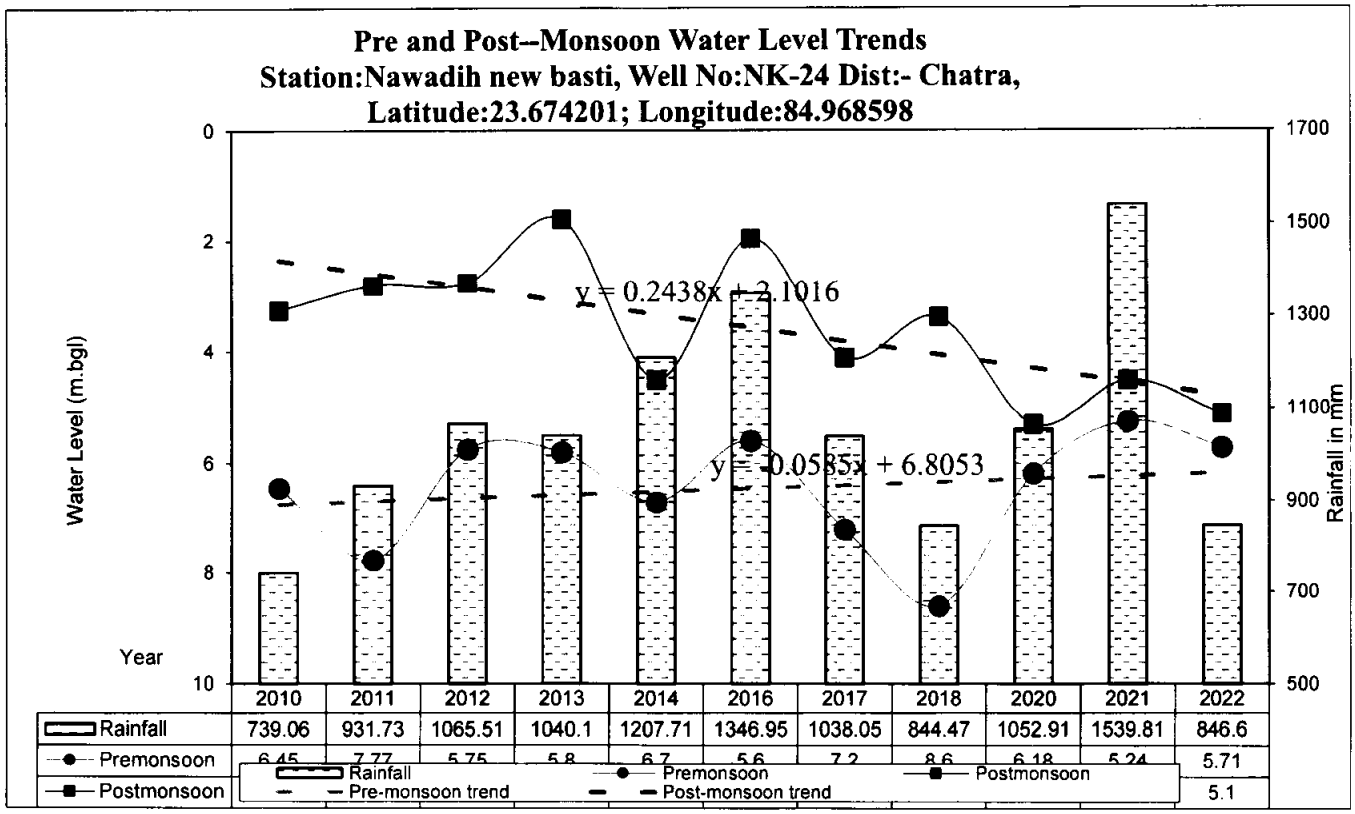


Year	2010	2011	2012	2013	2014	2016	2017	2018	2020	2021	2022
Rainfall	739.06	931.73	1065.51	1040.1	1207.71	1346.95	1038.05	844.47	1052.91	1539.81	846.6
Premonsoon	6.45	7.77	5.75	5.8	6.7	5.6	7.2	8.6	6.18	5.24	5.71
Postmonsoon											5.1

Figure 3.5: **Pre-monsoon and post-monsoon Water level trend of hydrograph station NK-24**

Chapter 4
Soil Quality and Parameter Assessment

4.1 Soil Quality

Soil is one of the most significant ecological factors on which plants depend for their nutrients; water and mineral supply. Indiscriminate deforestation, digging for minerals, and destruction of grazing lands for human habitation have done irreparable damage to the environment and even led to harsh climatic change. Some of the dangers posed by soil pollution are due to the fact that while the number of the earth's inhabitants are increasing, the earth's natural resources are by and large fixed as well as limited. Thus, the soil gets heavily polluted day by day by rapid anthropogenic activities and population explosion in developing countries.

Further, major mining activities affect the soil regime of the surrounding areas directly or indirectly. Hence, it becomes important to study soil quality as knowledge of soil parameters is essential for the planning and implementation of afforestation. Keeping the above aspects in view, four locations were selected to represent the entire area study area, and samples were collected from three depths viz. 0-30, 30-60 cm and 60-90 cm during the study period.

4.2 Methodology

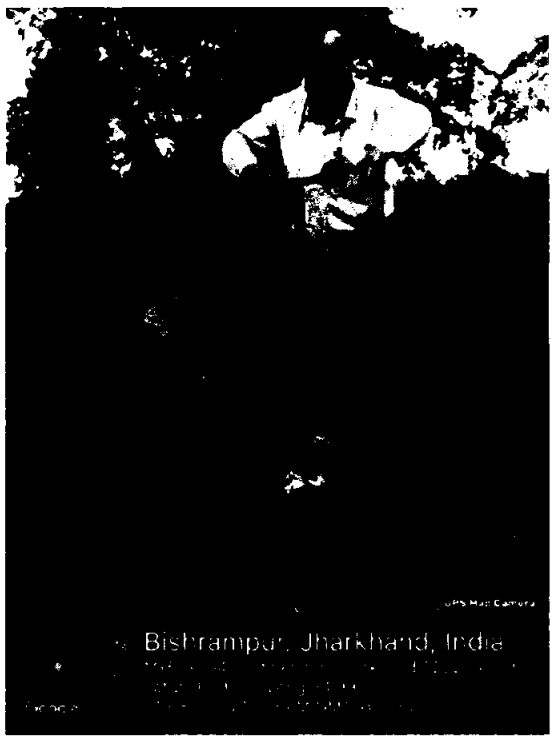
Soil samples were collected by digging a pit at the appropriate location from depths 0-30, 30-60 cm and 60-90 cm with the help of a spade/ AGAR and a ' Khurpi'. The samples were brought to the CMPDI's laboratory at Ranchi and air-dried for a few days. The air-dried samples were then ground in an agate mortar with the help of a wooden hammer and passed through a 2 mm (10 mesh) sieve. The coarser materials were rejected and the sieved material was sampled by the standard Coning & quartering method (Ref. Jackson, M.L., 'Soil chemical analysis', Prentice Hall, India 1958).

The processed samples were analyzed for the different parameters according to the standard methods as described under Jackson, M.L., 'Soil Chemical Analysis, Prentice Hall, India 1958; millar, CE, turk, L.M. Foth, H.D. Fundamentals of Soil Science, John Wiley & Sons, Inc., New York, 1962, Indian Council of Agricultural Research, New Delhi, ' Hand Book of Agriculture', IS:2720 (Part IV), 1975 and IS:2720, Part (V), 1970; Methods of Soil Analysis, Part I & II, Black, CA et.al. American society of Agronomy, Inc. USA, 1965.

4.3 Soil Quality Status

Soil is one of the planet's most valuable natural resources, varying in composition based on climate and topography. It directly influences the productivity of various ecosystems, playing a crucial role in supporting life on Earth and regulating natural cycles such as carbon, nitrogen, and water through well-established geophysical and chemical processes. Soil also facilitates a balanced dynamic interaction between the atmosphere, biosphere, lithosphere, and hydrosphere. However, industrial and mining activities can lead to significant changes in soil, affecting both its physical and biological properties. This study aims to assess the critical soil characteristic.

Soil samples were collected from three locations—two from the core zone and one from the buffer zone on 01.08.2025. Samples were taken at three depths (0-30 cm, 30-60 cm, and 60-90 cm) at each location.



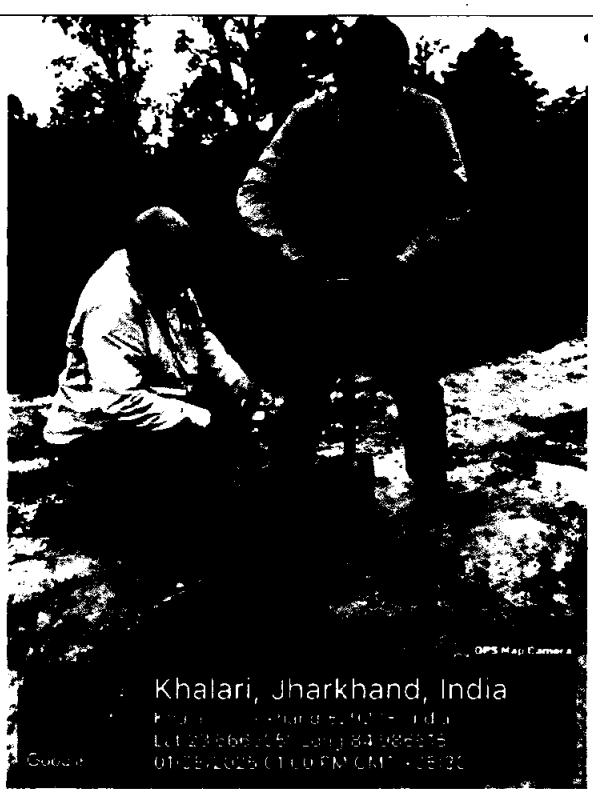


Figure 4.1: **Soil Sample Collection from the Project Area**

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4.3.1 Methodology

Soil samples were collected by digging a pit at the designated locations, with samples taken from the depths of 0-30 cm, 30-60 cm, and 60-90 cm using a spade, auger, and a 'Khurpi'. The samples were transported to the laboratory and allowed to air dry for several days. Once dried, the samples were processed for analysis of various parameters following the standard methods outlined below.

Table 4.1 Standard Methods used for Soil Analysis

Sl. No.	Parameter	Unit	Test Method
1	pH	-	IS:2720 (Part 26)
2	Water Holding Capacity	%	USDA Method
3	Electrical Conductivity	µS/cm	IS: 14767:2000
4	Available Nitrogen	kg/ha	TP/C/4.7
5	Available Phosphorus	kg/ha	TP/C/4.5
6	Available Potassium	kg/ha	TP/C/4.6
7	Sodium absorption ratio (SAR)	-	S.K. Maithi (Volume 2)
8	Available Organic Carbon	%	IS:2720 (PART 22)
9	Cation exchange capacity	meq/100g	TP/C/4.14
10	Specific Gravity	-	IS:2720 (PART 3)
11	Field Capacity	%	S.K. Maithi (Volume 2)
12	Wilting Coefficient	%	S.K. Maithi (Volume 2)
13	Texture	-	IS:2720 (PART 4)
	a) Sand	%	IS:2720 (PART 4)
	b) Silt	%	IS:2720 (PART 4)
	c) Clay	%	IS:2720 (PART 4)

4.3.2 Results

The results of the soil quality analysis conducted during the study period are presented below.

Table 4.2 Soil Monitoring in Agricultural Land

Location: Agriculture land					
Date of Sampling: 01.08.2025					
Sr. No.	Parameter	Unit	Depth of Sampling		
			0-30 cm	30-60 cm	60-90 cm
1.	pH	-	7.11	7.20	7.32
2.	Organic Carbon	%	1.1	0.66	0.27
3.	Available Phosphorus	kg/ha	17.1	12.4	9.0
4.	Electrical Conductivity	mS/cm	0.51	0.54	0.52
5.	SAR	-	0.20	0.19	0.17
6.	Cation Exchange Capacity	Meq/100gm	25.4	27.9	30.1
7.	Texture (Clay)	%	13.5	12.9	10.8
8.	Texture (Sand)	%	53.0	52.6	62.3

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09.	Texture (Silt)	%	33.5	34.5	26.9
	Texture		Sandy Loam	Sandy Loam	Sandy Loam
10.	Specific Gravity	-	2.62	2.59	2.68
11.	Available Potash	kg/ha	256.1	228.4	193.9
12.	Available Nitrogen	kg/ha	464.8	364.0	224.0

Table 4.3 Soil Monitoring Barren Land

Location: Barren land

Date of Sampling: 01.08.2025

Sr. No.	Parameter	Unit	Depth of Sampling		
			0-30 cm	30-60 cm	60-90 cm
1.	pH	-	6.12	6.2	6.33
2.	Organic Carbon	%	0.49	0.32	0.14
3.	Available Phosphorus	kg/ha	9.1	7.0	6.2
4.	Electrical Conductivity	mS/cm	0.44	0.37	0.38
5.	SAR	-	0.14	0.13	0.13
6.	Cation Exchange Capacity	Meq/100gm	21.8	19.5	18.6
7.	Texture (Clay)	%	10.4	9.6	8.8
8.	Texture (Sand)	%	59.1	58	64.3
09.	Texture (Silt)	%	30.5	32.4	26.9
	Texture		Sandy Loam	Sandy Loam	Sandy Loam
10.	Specific Gravity	-	2.69	2.67	2.74
11.	Available Potash	kg/ha	141.9	120.9	102.4
12.	Available Nitrogen	kg/ha	252.0	212.8	173.6

Table 4.4 Soil Monitoring Forest Land

Location: Forest land

Date of Sampling: 01.08.2025

Sr. No.	Parameter	Unit	Depth of Sampling		
			0-30 cm	30-60 cm	60-90 cm
1.	pH	-	6.36	6.14	6.2
2.	Organic Carbon	%	0.92	0.72	0.46
3.	Available Phosphorus	kg/ha	13.3	11.0	7.8
4.	Electrical Conductivity	mS/cm	0.42	0.46	0.41
5.	SAR	-	0.18	0.17	0.16
6.	Cation Exchange Capacity	Meq/100gm	24.8	24.6	23.4
7.	Texture (Clay)	%	29.2	28.1	27.0
8.	Texture (Sand)	%	33.5	35.0	37.0
09.	Texture (Silt)	%	37.3	36.9	36.0
	Texture		Clay Loam	Clay Loam	Clay Loam
10.	Specific Gravity	-	2.57	2.63	2.65
11.	Available Potash	kg/ha	198.8	180.2	154.9
12.	Available Nitrogen	kg/ha	414.4	336.0	280.0

4.3.3 Discussion

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Table 4.5 Table showing Soil Classification

Sl. No.	Soil Test	Classification
1.	*p*H	<4.5 Extremely acidic 4.51□5.50 Very Strongly Acidic 5.51-6.0 Moderately Acidic 6.01-6.50 Slightly Acidic 6.51-7.30 Neutral 7.31-7.80 Slightly Alkaline 7.81-8.50 Moderately Alkaline 8.51-9.0 Strongly Alkaline 9.01 Very Strongly Alkaline
2.	Salinity Electrical Conductivity (mmhos/cm) (1ppm = 640 mmho/cm)	Up to 1.00 Average 1.01 -2.00 harmful to germination 2.01 □3.00 harmful to crops (sensitive to salts)
3.	Nitrogen (kg/ha)	Upto 50 very Less 51-100 Less 101-150 Good 151-300 Better >300 sufficient
4.	Phosphorous (kg/ha)	Upto 15 Very Less 16-30 Less 31-50 Medium, 51-65 on an Average Sufficient 66-80 Sufficient >80 more than Sufficient
5.	Potassium (kg/ha)	0 -120 very less 120-180 less 181-240 medium 241-300 average 301-360 better >360 more than sufficient

Source **Handbook of Agriculture, Indian Council of Agricultural Research, New Delhi ***

Rating chart for the soil test data for Organic Carbon

Soil Parameters	Low	Medium	High
Organic Carbon	**< 0.50 %**	**0.50 - 0.75%**	**> 0.75%**

Source: Text Book of Soil Science by R. K. Mehra

Soil Texture Diagram

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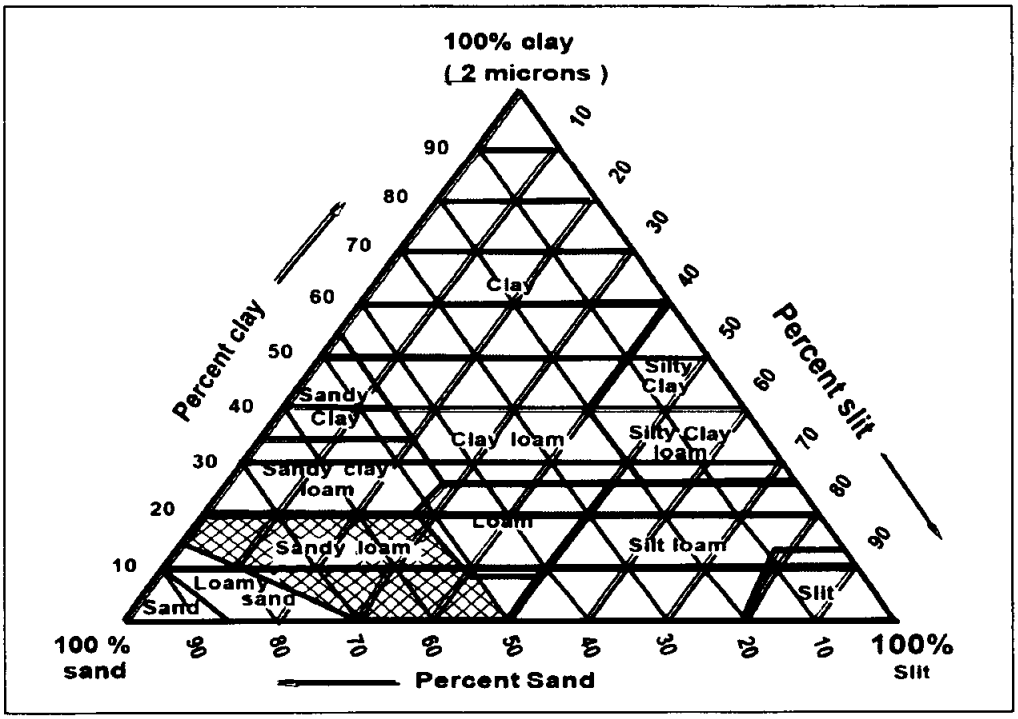

Figure 4.2: **Soil Texture Diagram**

Chapter 5
Soil Erosion Estimation

5.1 Introduction

The assessment of soil erosion was conducted using the Revised Universal Soil Loss Equation (RUSLE) to estimate soil loss rates under the existing land use conditions. The findings are presented in terms of RUSLE factors, overall soil loss estimates, and their spatial distribution.
The total forestland proposed for diversion spans 126.72 hectares; however, this area is dispersed across the entire leasehold of the KDH Open Cast Project (OCP). To effectively analyze the soil erosion patterns within these forest patches, it is necessary to examine the catchment area encompassing these patches.
Following a comprehensive analysis of the catchment characteristics and the existing land-use patterns within the forested areas, it was determined that the study should encompass the entire leasehold area of the KDH OCP and an additional 5 km buffer zone. Adopting this wider coverage ensures a more accurate and comprehensive assessment of soil erosion trends, particularly within forest patches, while also accounting for external factors influencing erosion within the buffer area. Such an approach not only enhances the reliability of the analysis but also establishes a strong foundation for developing well-informed, site-specific mitigation measures aimed at minimizing soil loss, preserving forest health, and promoting sustainable land-use practices across the broader landscape This approach allows for a more accurate estimation of soil erosion patterns specific to the forest patches and provides a basis for recommending appropriate mitigation measures.

5.2 RUSLE Factors Analysis

The topographic factor (LS) derived from the Cartoset Digital Elevation Model highlighted substantial variability in slope gradients across the study area, contributing to localized differences in erosion susceptibility. Soil erodibility (K) values from the Harmonized World Soil Database, validated with in-situ soil sampling, indicated moderate to high erodibility in specific zones, aligning with the region's soil texture and organic matter content. Rainfall erosivity (R), calculated from IMD rainfall data, exhibited significant annual variability, with localized intense rainfall events contributing disproportionately to soil erosion. The cover management (C) and support practice (P) factors, adapted from relevant literature, demonstrated the influence of vegetation cover and management practices in mitigating soil erosion.

5.2.1 Digital Elevation of the Study Area

The Digital Elevation Model (DEM) for the study area was sourced from CartoSAT-1 (1 Arc-Second Global) via Bhoonidhi, NRSC. The SRTM DEM (PAN_CartoDEM-30m) provides high-resolution global elevation data derived from radar measurements and is widely utilized for topographic and geospatial analyses. With a spatial resolution of 30 m × 30 m, it is well-suited for detailed terrain mapping and a range of environmental assessments. The digital elevation profile for the KDH leasehold area, along with its 5 km buffer zone, and the DEM map highlighting forest patches are presented below.

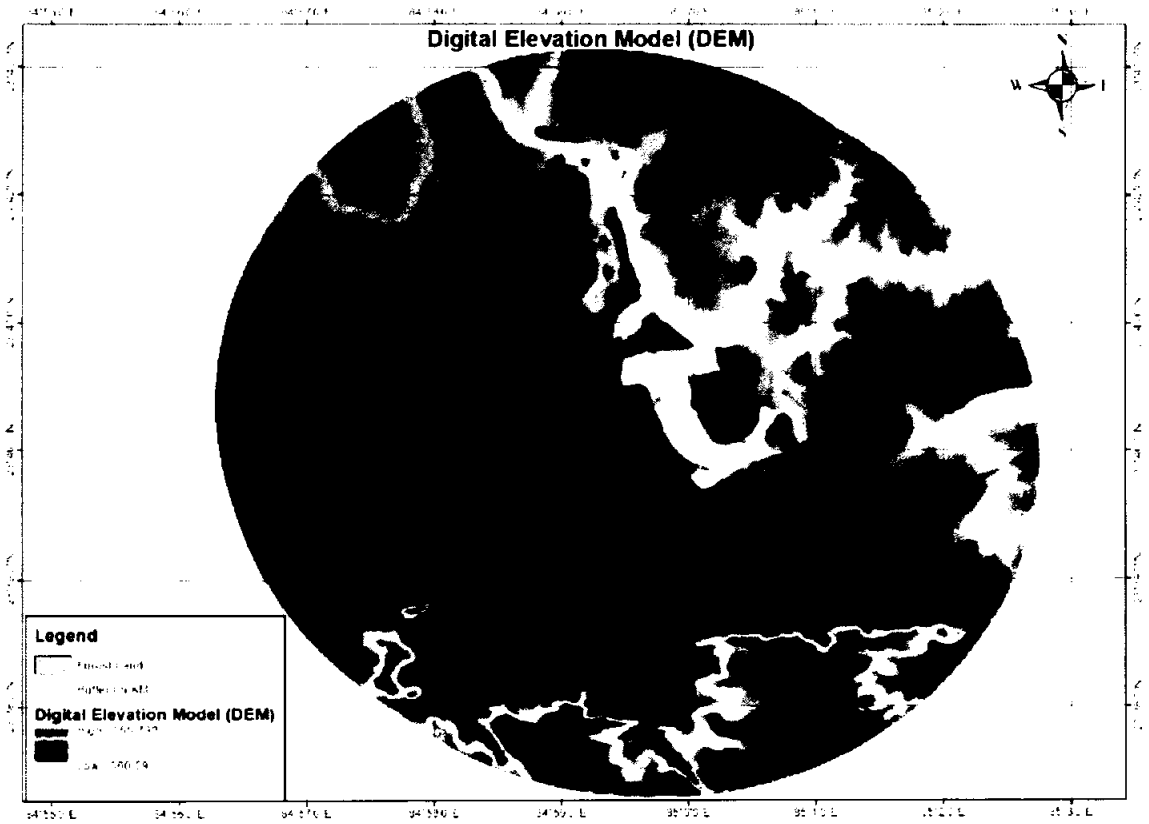

Figure 5.1: DEM Profile of Study Area (Forest land including 5km Buffer): Existing Conditions

The DEM analysis indicates that the elevation within the study area ranges from 360.59 meters to 555.79 meters. Lower elevations are primarily found in zones where land-use patterns have been modified by mining activities, while higher elevations are predominantly located in the forested areas towards the southern part of the study region.

5.2.2 Slope Profile

The slope profile map of the KDH OCP leasehold area and its 5 km buffer zone provides a detailed representation of terrain gradients, derived from Digital Elevation Model (DEM) data. The analysis categorizes slope values into six distinct classes: 0–5°, 5–10°, 10–15°, 15–25°, 25–35°, and greater than 35°. These slope classes are crucial for understanding terrain characteristics, surface runoff potential, erosion susceptibility, and land management planning. Forested areas within the leasehold boundary and buffer zone are also delineated, enabling correlation between slope patterns and land cover types. Slope Profile of study area highlighting forest patches are presented below.

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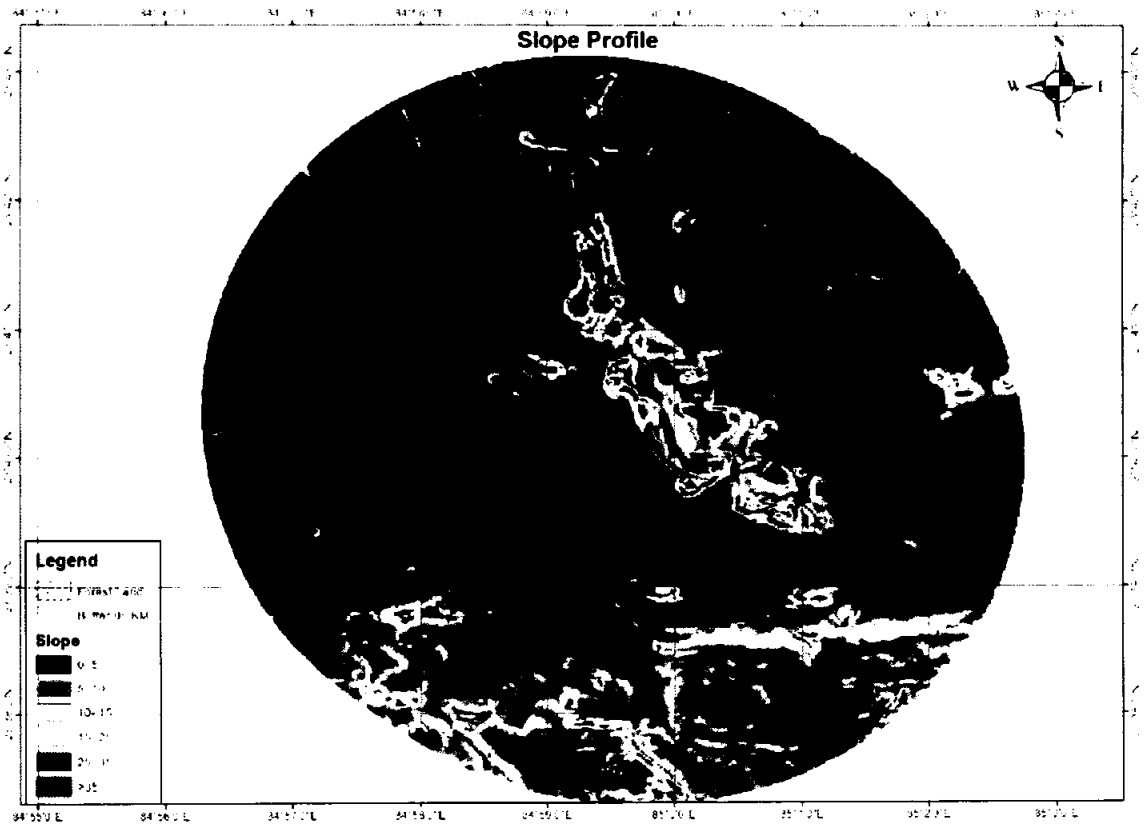

Figure 5.2: Slope Profile of Study Area (Forest land including 5km Buffer)

The slope analysis reveals that the majority of the study area falls within the 0–5° slope category, indicating predominantly gentle terrain, especially in the central and northern zones. Moderate slopes (5–15°) are observed primarily along the ridges and transitional areas, while steeper gradients (15–35°) and very steep slopes (>35°) are concentrated along specific mining areas and hilly patches, particularly towards the eastern and southern sectors respectively. Many of these steeper slopes coincide with mining area and forested patches.

5.2.3 Land Use Land Cover of Study Area

The existing land cover of the study area has been studied through Remote sensing data obtained from LISS-IV. LISS IV (Linear Imaging Self-Scanner IV) is a high-resolution multispectral sensor deployed on Indian Remote Sensing (IRS) satellites, capable of acquiring imagery across three spectral bands—red, green, and near-infrared—at a spatial resolution of 5.8 meters. This sensor is extensively utilized in applications such as urban planning, precision agriculture, forestry management, and environmental monitoring, owing to its fine spatial detail and spectral sensitivity. The maps were generated for present day conditions.

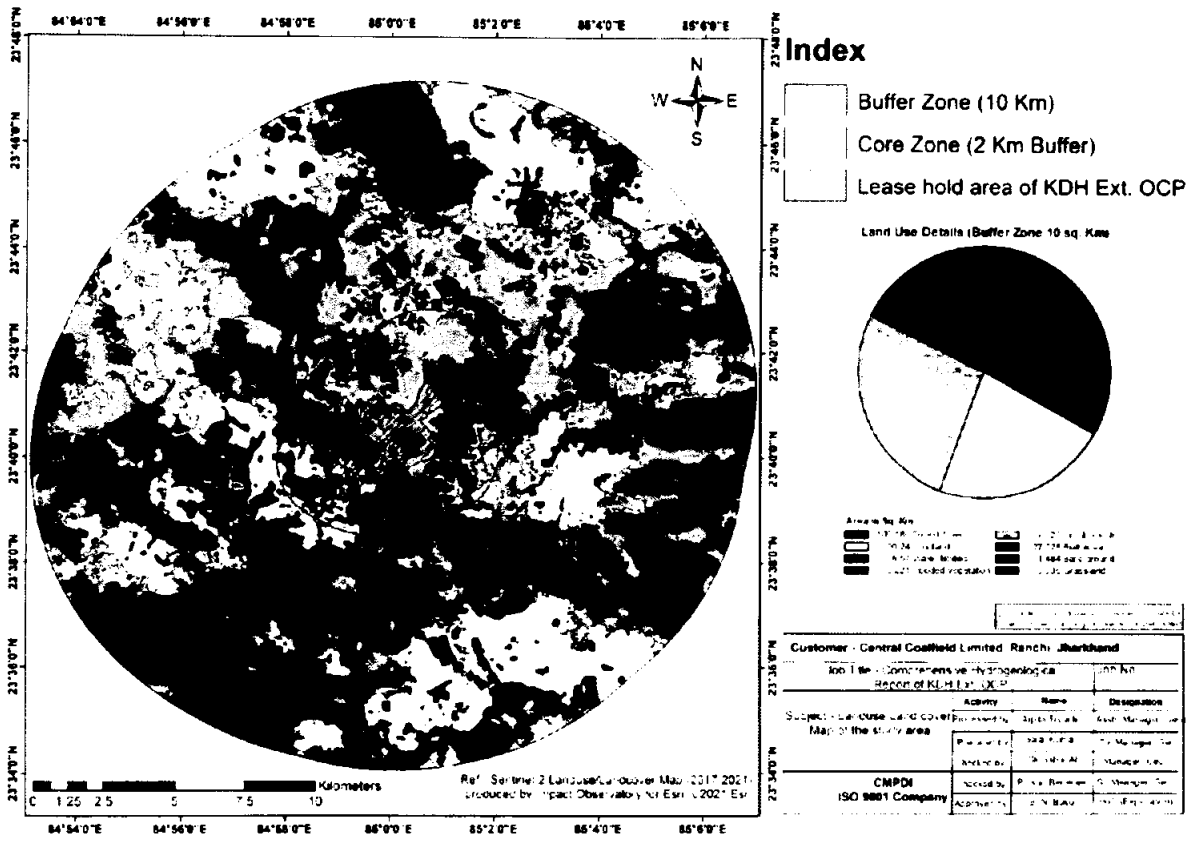

Figure 5.3: LULC Map in and around the Study Area

5.2.4 Revised Universal Soil Loss Equation (RULSE)

Soil erosion models make use of mathematical expressions so as to relate dominant parameters and processes that occur on land's surface. The parameters involved include terrain characteristics, soil properties, land use/land cover, and weather variables. Soil erosion models describe detachment, transport, and deposition phases, which comprise the soil erosion process. Soil erosion models serve as important tools for planning because they enable the prediction of soil loss. Above all, models create a clear understanding of the entire soil erosion phenomenon and the resulting impacts. However, the choice of appropriate models for a particular soil erosion study is based on the objectives, catchment characteristics, and data available on the model's efficiency. Consequently, models differ based on complexity, involved processes, and data required to calibrate and use the model. In this study empirical model Revised Universal Soil Loss Equation (RUSLE).

RUSLE model is a good example of an empirical model which is well recognized, widely accepted, and very much implemented in soil erosion studies. It is derived from the USLE model, and its application spans over 40 years. The model was designed and developed by a team of high-ranking scientists and some soil conservationists having vast experience in matters relating to soil erosion. It comprises mathematical equations that quantify the average soil loss on an annual basis at different geospatial scales. Many researchers had cited it as the best technology ever for estimation of soil loss in undisturbed areas characterized by overland flow, land surface experiencing disturbance, and recently or already reclaimed lands. Additionally, the model is very well applicable in ungauged catchments, its demand for data is quite moderate, and above all, it

integrates well with GIS enabling upscaling of the soil erosion process. The results of the RUSLE model are a representation of the sediment amount lost from a user-defined landscape. The superiority of the model is brought about by its prowess in accounting for different control management actions with minimal data requirements. The basic assumption that forms the foundation of the RUSLE model is that detachability and deposition processes are a function of sediment content. It is argued that until sediment load attains threshold capacity, soil detachment cannot occur. Therefore, the process of soil erosion is influenced by the flow carrying capacity and not by its source. Recent breakthroughs in spatial information technologies have augmented the prevailing methods in monitoring, analyzing, and above all managing resources. The spatial variation of soil erosion risk is brought about by heterogeneity in topography, geomorphology, geology, land cover, soil types, and land use. Such spatial variability of soil erosion parameters is easily and efficiently handled by geographic information systems (GIS). The trend has improved the accuracy, costs, and scales of application. The state-of-the-art technology geographic information system provides essential mapping interpolation techniques for creating a database that comprises input datasets for modeling soil erosion. Management of large datasets is made easier with the use of GIS; therefore, such spatial techniques provide a basis for the management of land upon the estimation of soil loss rates. In RUSLE, soil loss is predicted by converting the input data (rainfall data, soil data, digital elevation model, and land use) into a geographical information system format, following which it is implemented in the geospatial framework.

Many researchers worldwide have adopted this methodology to carry out soil erosion studies at different spatial scales. For instance, the following researchers studied soil loss in catchment areas by applying the RUSLE model, GIS, and remote sensing. The studies revealed that, apart from estimating soil erosion, the methodology was found to be satisfactory in identifying areas that had higher soil erosion risks. Further, geospatial tools facilitated the extraction of important information, which was deemed critical in implementing plans for soil conservation.

RUSLE Model Parameterization

The model quantifies average annual soil loss (A) using five important factors, notably rainfall erosivity (R), soil erodibility (K), slope length and slope steepness (LS), cover management (C), and support practice (P).

$$A = R \times K \times LS \times C \times P \qquad (5.9)$$

Where, A is the mean annual soil loss in t/ha/yr, R is the rainfall erosivity (MJ mm/ha/yr), K is the soil erodibility factor (t-ha-h/ MJ/mm), LS is the slope length and slope steepness factor (dimensionless), C is the cover management factor (dimensionless), and P is the support practice factor (dimensionless).

Rainfall is a precondition for any form of water erosion to materialize. The amount and even intensity of rainfall are the two important attributes of rainfall. Waterborne erosion is more pronounced when the two rainfall attributes are on the higher side. The rainfall erosivity factor (R) quantifies the erosive power possessed by rainfall, and it much depends on the rainfall's intensity and amount. The R factor is expressed as the sum of EI-values for each particular storm for a year and averaged over long periods of time (more than 30 years) so as to accommodate discernible recurring rainfall patterns. The abbreviation EI refers to the product of energy and maximum intensity of rainfall in 30 minutes. The amount of soil loss is proportional to the product of the total storm's energy, E (MJ/ha), and the storm's maximum intensity in a time of 30 min, I30 (mm/h). The resulting product is known as the EI30 index or commonly as the storm erosivity index expressed in MJmm/ha/h. The storm erosivity index reflects the amalgamated effect of soil particle dislodgement and runoff transportability to cause net erosion. The mean of the annual sums for the period under consideration gives the rainfall erosivity factor (R factor). Different

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researchers have developed equations from which the R factor has been derived and applied in different regions. For India following equation (5.10) can be used:

$$R = 50 + 0.389 \times P \quad (5.10)$$

Where, P is annual rainfall in mm. In present study average annual rainfall has been obtained from nearby 7 rain gauge stations of IMD based on which the average annual precipitation of the study area has been derived.

Table 5.1: Rainfall Recorded at Nearby Rainguages

Point	Station	Precipitation
1	Tandwa	1045.5
2	Mandar	1312.3
3	Khilari	1406.2
4	Keradari	1074.6
5	Pathrathu	1328.9
6	Balumath	1186.9
7	Chandwa	1286.6

5.2.5 Soil Erodibility Factor (K)

Different soils show varying degrees of resistance to water-related erosion. Soil erodibility is an essential requirement when estimating soil loss and also when implementing soil conservation activities. The characteristics of soil and its properties have a pronounced influence on soil erosion. There is effect is well represented by the soil erodibility factor. Hence, the K factor is affected by a variety of the soil's physicochemical properties. The K factor is simply defined as the inherent susceptibility of soil-to-soil erosion. The RUSLE model identifies the distribution of particle size, permeability, organic matter content, and structure of the soil as the critical physicochemical properties which affect erodibility. The physico chemical properties of the soil have been obtained from in-situ soil sampling analysis as presented in the earlier sections, and correlated with the global Harmonized soil database of FAO. Based on the above soil classification study, the texture class of soil is found be sandy loam and the corresponding value of K factor for the study area is 0.14. The K-factor classification has been obtained from the literature as given in the table below.

Table 5.2: K-Factor for different Soil Type

Basic textural class	Organic matter content		
	Average K Factor	<2%	>2%
Sandy loam	0.13	0.14	0.12
Sandy clay loam	0.2	0.2	0.2
Clay loam	0.305	0.33	0.28
Loam	0.3	0.34	0.26
Clay	0.225	0.24	0.21

Source: Journal of Environmental Science, Agricultural and Food Sciences

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5.2.6 Topographic (LS) Factor

Slope length and slope steepness is the other main factor for estimating the soil loss which measures the sediment transport capacity of the flow. LS does not consider the 3D complexity of the topography but simply assumes soil loss increases with slope length and/or upslope contributing area. The LS- factor is calculated based on the following equation.

$$LS = \left(Flow.Accumulation \times \frac{CellSize}{22.13} \right)^{0.4} \times \left(\frac{\sin(Slope)}{0.0896} \right)^{1.4}$$

The slope length (L) and slope steepness (S) define the landscape's topography, which mostly influences the extent of soil erosion. L and S are the two most important parameters with regard to soil erosion modeling and most importantly when calculating the transporting power of surface runoff. The LS factor, therefore, combines the effects of slope length and slope steepness, both of which account for the landscape's topographical effects on erosion. Hence, terrain effects on erosion processes are accounted for by the LS factor within the RUSLE model. Soil erosion is noted to increase when both the slope angle and length increase. The is explains the sensitivity of terrain effects on soil erosion, and therefore determination of the LS factor needs to be accurate.

The LS factor maps for the study area are shown in the figures given below.

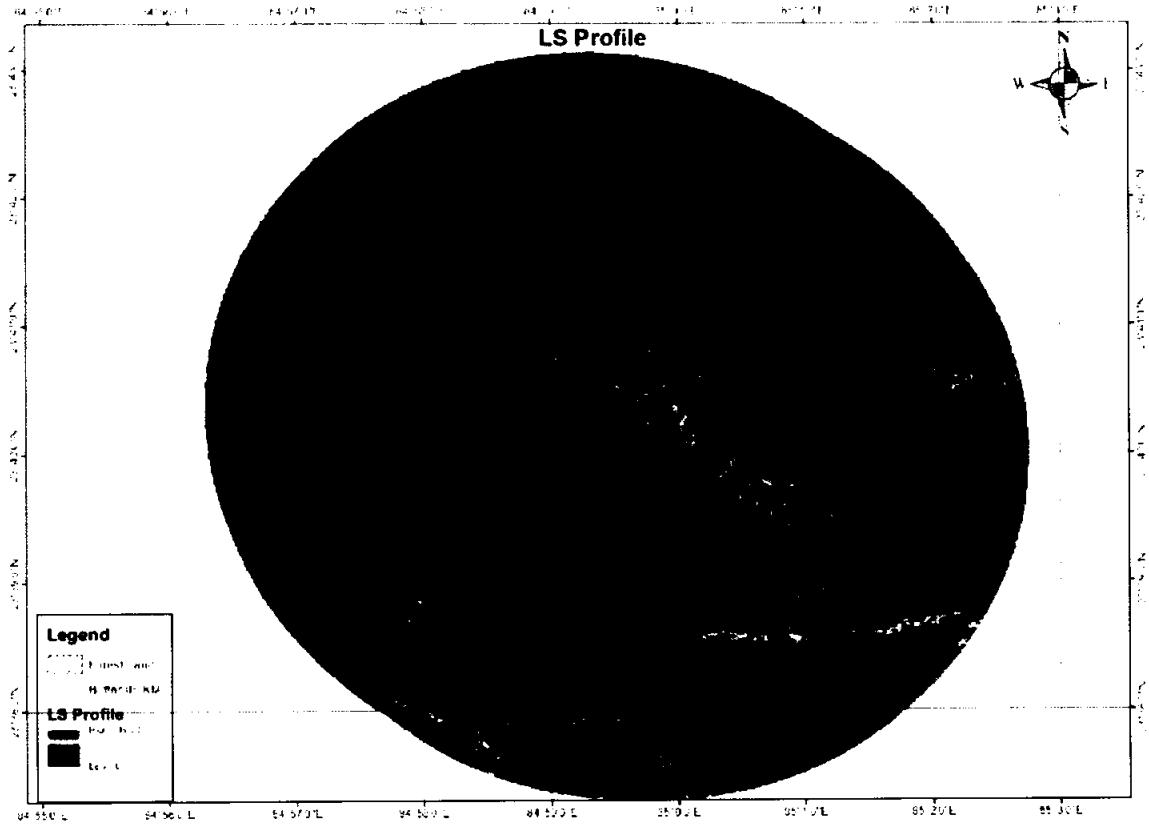

Figure 5.4: LS Profile

The LS profile map of the study area, ranging from 0 to 35.21, shows pronounced spatial variability in slope length and steepness. The elevated LS values are mainly the result of

topographic changes caused by the construction of overburden dumps and the presence of mined-out quarries in the central.

5.2.7 Cover Management Factor (C)

Vegetation cover ranks second behind terrain effects in influencing soil erosion rate. The parameters that define vegetation cover are mainly ground cover and plant canopy cover, respectively. Spatial distribution of vegetation cover fraction requires accurate estimation and is of utmost importance in soil erosion matters. Vegetation cover prevents the soil from the impact of raindrops by dissipating the amount of energy they possess before reaching the soil surface. Moreover, vegetation cover intercepts rainfall, thereby encouraging more infiltration. In the RUSLE model, vegetation cover effects are accounted for by the cover management factor (C). The C factor is defined as the ratio of soil lost from cropped land under specified conditions to that lost from bare soil. It is much influenced by vegetation type, growth stage, and percent cover. The crop management factor is indicative of the influence of vegetation cover and specified management practices on soil erosion. The values have a range of between 0 and 1 depending on land cover types. The C factor is derived based on prior land uses, canopy shading factor, percent soil cover by crop remains, soil surface roughness, and above all soil moisture. Satellite image information is an important input in the preparation of land cover maps, and as such, it has become an integral component in natural resources management. Traditionally, the C factor values have been spatially estimated by assigning values to land cover classes identified using remote sensing. C-Factors of maps of the both conditions are presented below:

Table 5.3: C Factor Range

Cover and management (C)	C-factor value
Forest and grasslands	0.01
Degraded forest/wasteland	0.14
Croplands	0.20 0.43
Degraded (waste) lands	0.50
Fallow lands	1.00

Source: *Singh et al.*

5.2.8 Cover Management Factor (C)

The support practice (P) factor is regarded as one of the most uncertain factors of the RUSLE model. It relates strongly to the cover management factor because both reflect positive impacts resulting from management interventions in controlling soil erosion. The two factors differ in that the support practice factor quantifies the effects of some implementation that targets reducing the runoff and eventual soil loss. The most common support practices include the use of contours,

terraces, crop strips, grassed waterways, and cross-slope cultivation. The P factor is expressed as the ratio between the rate and the amount of soil lost when a specific support practice is used and similar soil loss when row farming is executed in an up-and downslope manner. Typical P factor values range between 0 and 1. A value of 1 corresponds to lands without any support practice (especially grasslands and bare lands), while values which approach 0 are indicative of lands under specified support practices. Lower P factor values are indicative of effectiveness in conservation practices.

Sn	Cover % / Practice	Factor
1	10%	0.70
2	20%	0.50
3	30%	0.36
4	40%	0.26
5	50%	0.20
6	60%	0.15
7	70%	0.12
8	80%	0.10
9	90%	0.085
10	100%	0.075
11	Waffle wall / Contouring	0.45
12	Grass	0.17
13	Terracing	0.90

5.2.9 Soil Erosion Estimation

The Soil Erosion estimation has been carried out for the study based on the RUSLE model using the above derived parameters. The parameter wise detailing of RULSE equation has been detailed in the previous section and the same has been used for soil loss estimation using ArcGIS software. The soil erosion severity map was generated by overlaying all the parameter layers of RUSLE and the results have been presented below.

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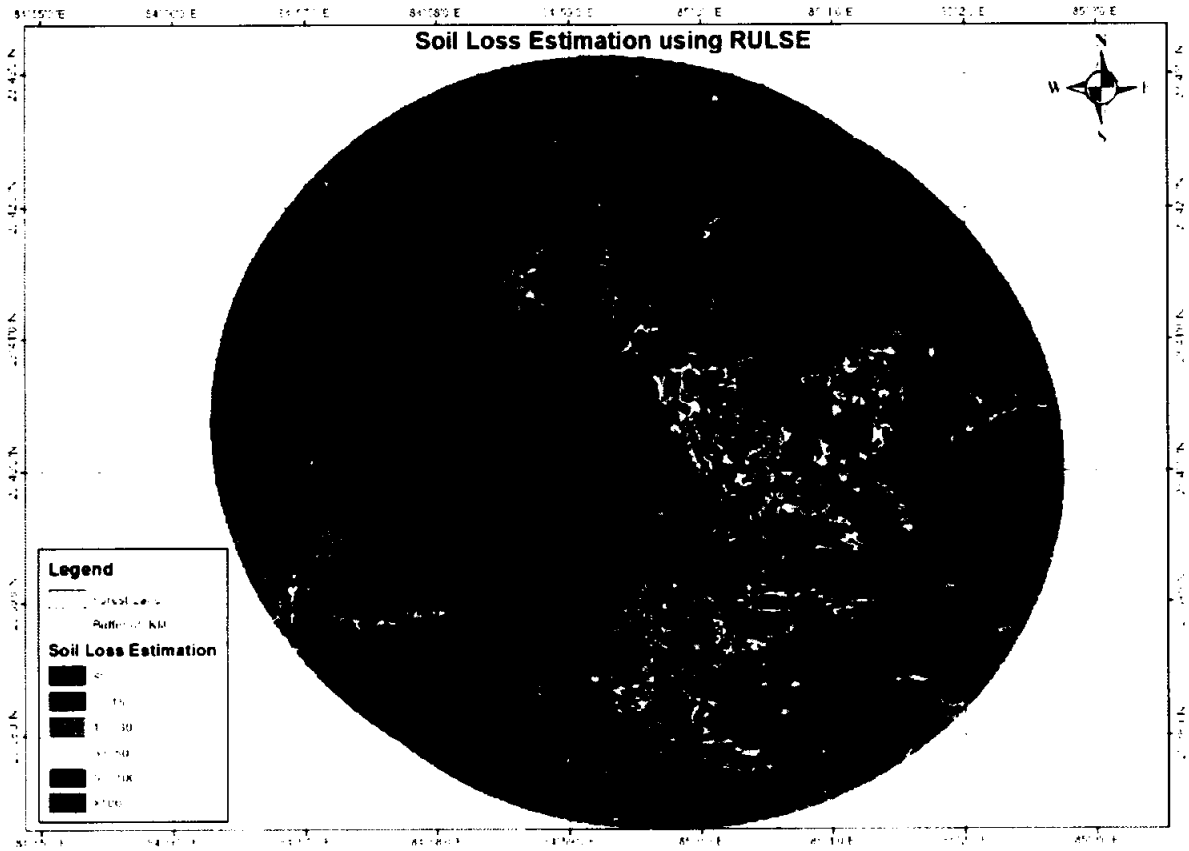

Figure 5.5: Soil Erosion Estimation

The soil loss estimation map of the study area, derived using the RUSLE model, shows a wide range of erosion rates from less than 5 t/ha/yr to more than 100 t/ha/yr. The majority of the area, particularly the forested regions, falls within the <5 t/ha/yr category, indicating minimal soil erosion. Moderate soil loss (15–50 t/ha/yr) is observed along hilly slopes and undulating terrain, while high to very high soil loss (>50 t/ha/yr) is concentrated in the central and southern portions of the study area. These high erosion zones correspond to disturbed landscapes, including overburden dumps, mined-out quarries, and exposed soil surfaces, where vegetation cover is sparse, and slope steepness is high. The spatial distribution highlights the influence of topography, land cover, and anthropogenic activities on soil erosion patterns in the region.

5.3 Proposed Mitigation Measures

Strategy for Management of Active Mining Area

The material generated during mining will be systematically disposed of in designated dumping areas as per approved mining plan. The following measures are proposed to mitigate soil erosion through overburden (OB) dumps:

Dump Stability: The ultimate slope of the OB dump will be maintained at approximately 28 degrees to ensure stability and prevent slope failure as envisaged mine plan. The typical cross-section diagram of dump with soil erosion protection measures are provided below.

Slope Stabilization:

The methods to be adopted for stabilization of dumps and soil erosion conservation are as follows:

- **Structural measures:**
    a. Terracing of slopes, plugging of gullies by construction of catch drain (0.5m W X 0.75 H) and garland drain (1M width and 1 M height) around the dump area to manage runoff and prevent soil erosion. The garland drain around the dump shall be permanent type and around the quarry are temporary type. The catch drain is temporary in nature.
    b. Toe/gabion wall (1.5-meter height and 1-meter width) shall be constructed all along the dump toe to arrest the silt transport.
    c. Sequential Settling ponds/ sedimentation tank (30meterr X 20 metered with 2-meter depth) are proposed in continuation to garland / catch drain, to settle suspended solids from the runoff from OB dumps and other mining areas. The tentative locations of the sedimentation tanks are shown in the land use plan below.
- Bio-engineering Measures:
    a. Coir matting followed by grass plantation with species viz as indicated in top soil management plan in consultation with forest officials
    b. Dump surface area shall be reclaimed by spreading top soil and plantation by native species in consultation of forest department. Top soil management is discussed in the following section

Apart from the above, permanent storm water drains around the infrastructure and roads are proposed to be constructed once the location of the infrastructure is finalized.

Detail plan of the proposed control measures along with the location are marked on the surface plan and the same presented below.

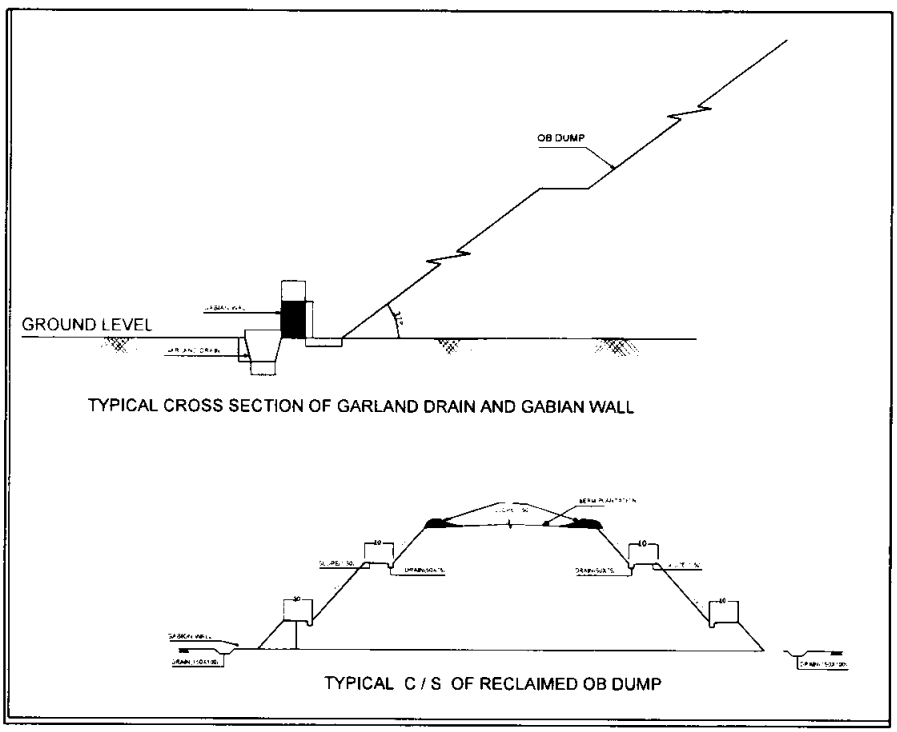

Figure 5.6: Typical C/S Showing Toe Wall and Garland Drain

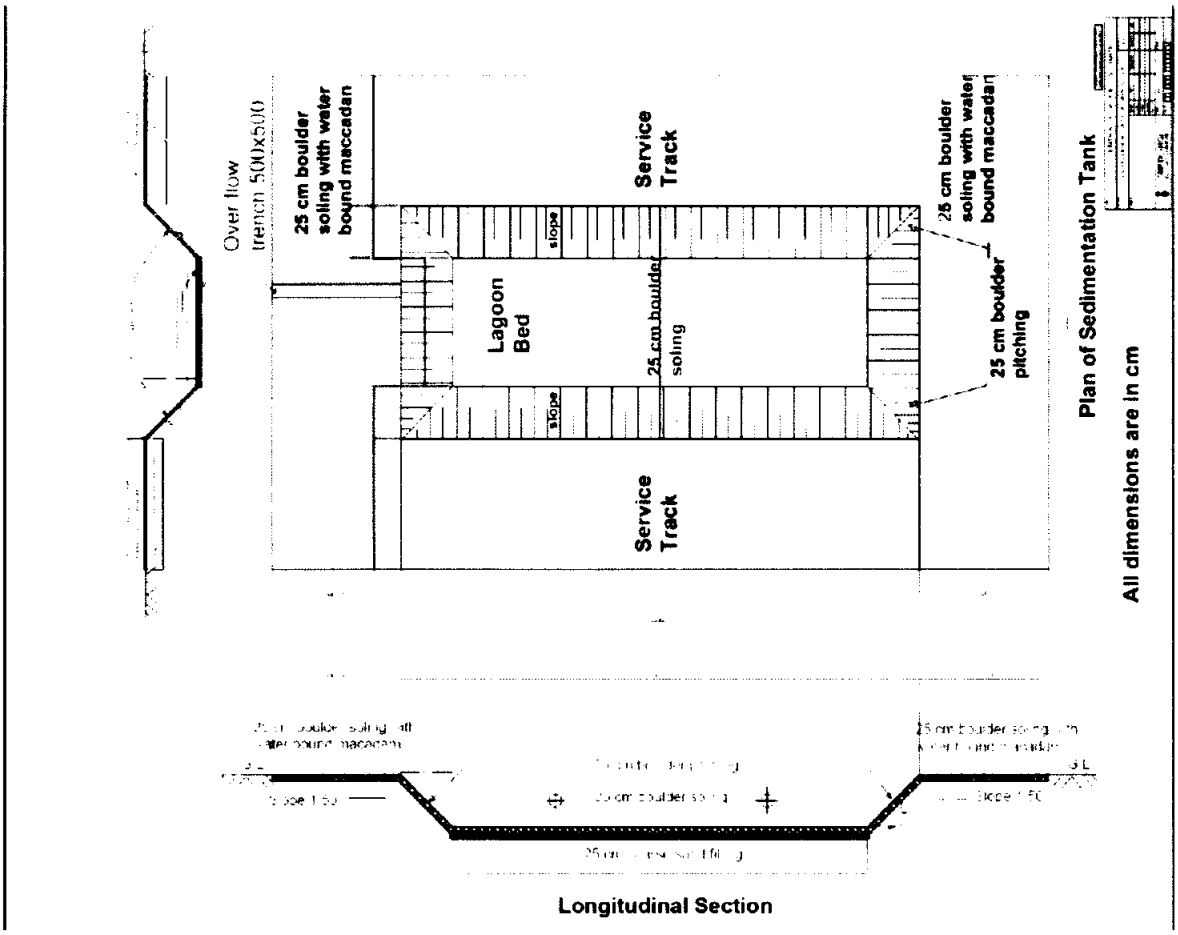

Figure 5.7: Details of Sedimentation Pond

Area Falling outside the Active Mining Area

The mitigation plan designates the forest patches within the 5 km buffer zone or catchment area, which are vital for ecosystem connectivity and biodiversity. To address soil erosion, a key challenge in these patches, an integrated management strategy has been developed. This strategy focuses on planting native species with deep roots to stabilize soil, implementing contour bunding, terracing, and check dams to reduce runoff, and promoting sustainable land-use practices to prevent soil degradation. Community involvement ensures local participation in monitoring and sustaining these efforts. The plan aims to control erosion, strengthen ecological resilience, and enhance the socio-economic benefits of these forest patches, fostering sustainable environmental stewardship.

Key measures proposed for mitigation of Soil Erosion in 5 km buffer zone are as follows:

- Gap Plantation by planting 500 saplings per year for next 5 years
- Provision for making gully plugs for soil conservation
- Construction of ponds within the forest patches and de-siltation of existing ponds for creating water availability and ground water recharge
- Construction of check dams on lower order streams

Chapter 6
Topsoil Management Plan

6.1 Introduction

Topsoil is that uppermost layer of soil capable of growing and supporting vegetation. Topsoil contains the essential microorganisms, nutrients, organic matter, and physical characteristics necessary to grow and sustain permanent vegetation.

The salvaging, stockpiling and re-application of topsoil to be used as growth medium in the reclamation of Internal & External overburden dumps within the mining area is a major environment protection programme. Soil management in opencast mine is necessary to re-establish the stability & productivity of land disturbed due to mining activity.

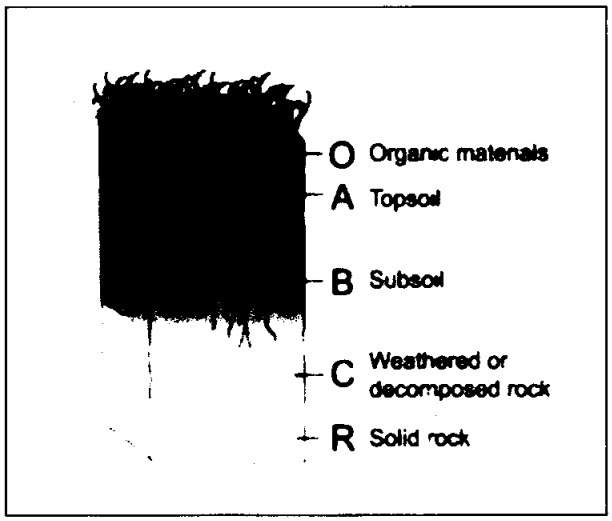

Figure 6.1: Typical Soil Profile

Two factors influence how topsoil performs as a growth medium. One is the quality of the topsoil and other is the depth of the topsoil. The higher the quality of the topsoil and the greater the depth in relation to the root zone, the better the soil will support healthy plant growth and encourage infiltration.

The factors influence the characteristics of topsoil are climate, vegetation and organic matter, topography and physiography, mineralogical constituents, surface processes, biological activity and human activity.

The separation and maintenance of topsoil on the site is imperative to ensure a successful rehabilitation program. Topsoil has essential nutrients and contains seed loads that will significantly aid in the rehabilitation of disturbed mine sites. Inappropriate management of this material may jeopardise the rehabilitation program.

6.1.1 Objective of TopSoil Management Plan

This Topsoil Management Plan has been prepared to address the potential effects of long-term storage of topsoil in stockpiles and to segregate and re-spread the topsoil during mine site

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reclamation. Additionally, this plan presents to achieve a topsoil thickness and fertility commensurate with pre-construction activities.

The objectives of soil management are to:

- Provide sufficient stable topsoil material for rehabilitation;
- Optimise the recovery of topsoil for rehabilitation;
- Identify soil resources and stripping guidelines;
- Identify surface areas requiring stripping (to minimise over clearing);
- Manage topsoil reserves so as not to degrade the resource;
- Identify stockpile locations and dimensions; and
- Identify soil movements for rehabilitation use.

6.1.2 Stripping of Top Soil

Top soil should be stripped only from the area which will be disturbed by Excavation, filling, Infrastructure etc. Approx. 30 cm of top soil is stripped depending upon the soil profile at site. Depth of stripping is determined by taking soil core at several locations. The topsoil stripping and stockpiling will be completed using conventional earth-moving equipment such as bulldozers, scrapers, graders and off-road trucks. In areas where the topsoil is relatively thin, the contractor will remove the topsoil using smaller equipment to minimize mixing of topsoil and sub soil.

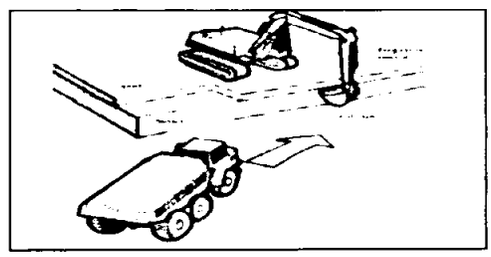

Figure 6.2: Typical Striping of Topsoil

6.2 Topsoil Management

6.2.1 Site location

The site should be flat and established proper erosion and sediment control structure such as diversion, berms, dikes, waterways and sediment basin.

Immediately prior to spreading the top soil, loosen the subgrade by disking or scarifying to a depth of at least 100 millimeters to ensure bonding of the topsoil and subsoil.

If sufficient topsoil is available, a minimum compacted depth of a half meter on 3:1 slopes and one meter on flatter slopes is suggested.

Compact the topsoil enough to ensure good contact with the underlying soil, but avoid excessive compaction, as it increases runoff and inhibits seed germination. Light packing with a roller is recommended where turf is to be established.

6.2.2 Stockpiling

Top Soil will be stacked on the flat horizontal area and where there is no natural drainage. Sediment barrier is provided to retain sediment.

Temporary seeding - protect topsoil stockpiles by temporarily seeding as soon as possible, within 30 days after the formation of the stockpile.

Permanent vegetation - if stockpiles will not be used within 12 months they should be stabilized with permanent vegetation to control erosion and weeds.

As the mine pits expand, there will be more opportunity to strip top soil and apply it directly to area to be reclaimed, thus avoiding topsoil stockpiling. Freshly stripped and placed topsoil retains more viable seed, micro-organisms and nutrients than stockpiled soil. Vegetation establishment is generally improved by the direct return of topsoil and is considered 'best practice' topsoil management.

6.2.3 Maintenance and Inspection

Periodic inspection and maintenance will be required. Make any repairs necessary to ensure the measure is operating properly. Repair and reseed if necessary to control erosion and loss of topsoil. This periodic maintenance procedure applies to either temporary soil stabilization or permanent seeding application

6.2.4 Topsoil Conservation with Grass and Shrub Species

The main objectives of topsoil conservation is to minimize soil erosion from wind and water runoff, enhance soil.

Grass Species Selection:

1. Choose a mix of native grass species suitable for climate, soil type, and rainfall. Here are some options based on their characteristics:
    - **Fast Establishment:** Doob Grass (Cynodon dactylon)
    - **Erosion Control on Slopes:** Vetiver Grass (Chrysopogon zizanioides)
    - **Drought Tolerance:** Dichanthium annulatum (Ditch Pal Grass)
2. A mix of these will be most suitable combination.
3. **Planting Techniques:**

- Sow the grass seeds directly onto the prepared seedbed following the recommended seeding rate for each species.
- Lightly rake the seeds into the soil to ensure good seed-to-soil contact.
- Apply a thin layer of mulch (straw, hay) to retain moisture and suppress weed growth.

Table 6.2: Name of species for planation

S.N.	Name of Species	Common Name	Family Name	Habitat	Purpose
1	***Cynodon dactylon***	Doob Grass	Poaceae	*Grass*	Doob grass is a fast-growing, low-growing perennial grass that forms a dense mat, which helps prevent soil erosion. It's well-adapted to various soil conditions and tolerates moderate foot traffic.
2	***Cyrtococcum patens***	Lemon Grass	Poaceae	*Grass*	Its root system can provide some limited stabilization, and it grows relatively quickly.
3	***Saccharum spontaneum***	Wild sugarcane	Poaceae	*Grass*	This tall grass grows in large clumps and is native and drought resilient.
4	***Cenchrus pedicellatus***	Deenanath Grass	Poaceae	*Grass*	This Grass is a many-branched leafy annual grass up to 1 m tall which will help in wind erosion and control erosion of soil.
	Dichanthium annulatum	Ditch Pal grass	*Poaceae*	*Perennial grass*	This is a perennial grass, up to about 25 cm tall and will be suitable for soil erosion control.
	Chrysopogon zizanioides	Vetiver grass	*Poaceae*	perennial grass	Vetiver grass (Chrysopogon zizanioides) is an exception with its thin fibrous roots penetrating vertically up to 3–4 m (Hellin & Haigh, 2002), thus, this grass is an agent of both erosion reduction and ensuring slope stability against shallow landslides
	Axonopus compressus	Carpet Grass	*Poaceae*	*Grass*	As a covering mat, it can control erosion and provide some protection against infestation by more noxious weeds.
5	***Dodonaea viscosa***	Hop bush	Sapindaceae	*Shrub*	These are all shrubs species, which will offer wind protection to soil
6	***Clerodendrum infortunatum***	Hill glory bower	Lamiaceae	*Perrineal Shrub*	
7	***Woodfordia fruticosa***	Fire flame bush	Lythraceae	*Shrub*	
8	***Clerodendrum phlomoides***	Sage Glory Bower	Lamiaceae	*Shrub*	
9	***Vitex negundo***	Chaste tree	Lamiaceae	*Shrub*	

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Chapter 7
Conclusions and Cost Estimates

7.1 Conclusions

The soil loss estimation map of the study area, derived using the RUSLE model, shows a wide range of erosion rates from less than 5 t/ha/yr to more than 100 t/ha/yr. The majority of the area, particularly the forested regions, falls within the <5 t/ha/yr category, indicating minimal soil erosion. Moderate soil loss (15–50 t/ha/yr) is observed along hilly slopes and undulating terrain, while high to very high soil loss (>50 t/ha/yr) is concentrated in the central and southern portions of the study area. These high erosion zones correspond to disturbed landscapes, including overburden dumps, mined-out quarries, and exposed soil surfaces, where vegetation cover is sparse, and slope steepness is high. The spatial distribution highlights the influence of topography, land cover, and anthropogenic activities on soil erosion patterns in the region.

Overall, while the majority of the project area experiences low erosion risk, targeted management is needed in the more severely affected zones to ensure sustainable land use and conservation.

Planning and Mitigation:

- Implementation of benching and terracing on dump slopes to reduce erosion rates.
- Use of geotextiles or vegetation cover for stabilization.
- Construction of check dams and settling ponds to manage sediment transport.
- Effective topsoil management to enhance post-mining reclamation efforts.

Implications:

1. The results clearly indicate the necessity for implementing effective soil conservation measures, especially in areas with extremely severe erosion potential.
2. Targeted Interventions: The focus should be on stabilizing OB dumps and quarry slopes through techniques like terracing, vegetation cover, and geotextile applications.
3. Long-term Planning: Proper post-mining land reclamation, including stream restoration and vegetation regrowth, is essential to minimize long-term soil degradation.

Need for Mitigation Measures:

Effective erosion control strategies are imperative to minimize environmental degradation. These include:

- Engineering solutions such as terracing and slope grading.
- Biological interventions like revegetation and use of fast-growing plants.
- Structural measures, including check dams, toe walls, and geotextiles.

Sustainable Mining Practices:

The findings highlight the importance of integrating soil conservation measures into the mining life cycle, from planning to reclamation, to ensure long-term environmental sustainability.

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7.2 Construction

It is proposed to construct a gabion wall using stone boulders and iron wire as a toe wall along the overburden (OB) dump. This method is cost-effective, flexible, and easy to repair, making it suitable for the purpose.

A permanent garland drain will be constructed with brick masonry around the OB dumps and coal stockyard, while temporary garland drains will be installed along the quarry to accommodate changes in the mine's shape during its operation.

All storm drains along roads and residential areas will be of permanent construction, ensuring durability. However, sedimentation lagoons near the OB dumps and in the "dirty zones" will be temporary due to the evolving shapes of the OB dump and quarry.

The sedimentation tank near the coal handling plant (CHP) and workshop can be made permanent if the locations are finalized. Baffle walls may be constructed using either earthen or masonry materials, depending on site conditions.

All gully plugs will be of permanent construction to provide long-term stability and effectiveness.

7.3 Maintenance

- The sedimentation tank/lagoon should be cleaned annually before the onset of the monsoon season.
- Garland dams, storm drains, and baffle walls must be inspected, cleaned, and repaired as necessary.
- As the quarry's shape evolves, additional garland drains, storm drains, and baffle walls should be constructed wherever required.
- Fish farming should be initiated in sedimentation tanks or recharge pits to maintain water quality while providing an additional source of income.
- Water quality analysis of recharge pits and nearby wells should be conducted periodically to monitor and evaluate water quality.

7.4 Action Plan for Soil Erosion Control in 5 km Buffer Area

Key measures proposed for mitigation of Soil Erosion in 5 km buffer zone are as follows:

- Gap Plantation by planting 500 saplings per year for next 5 years
- Provision for making gully plugs for soil conservation
- Construction of ponds within the forest patches and de-siltation of existing ponds for creating water availability and ground water recharge
- Construction of check dams on lower order streams

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7.5 Cost

For the mitigation measures within the EC boundary, all the proposed measures have been the part of approved EC and mine plan and mine closure plan, and hence no suitable budgetary provisions have been made in the EMP cost as well as mine closure cost. Whereas, for the mitigation measures outside the EC boundary, the estimated budgetary provisions are as given below:

Table 7.1: Action Plan for Mitigation of Soil Erosion

Sl. No.	Name of the Activity	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year 10
A	**Interventions for Soil Conservation**										
1	Gap Plantation: 500 Plants per year @Rs. 1650 per sapling with Gabion with 10% inflation per year	8.25	9.08	9.98	10.98	12.08	13.29	14.62			
2	Plantation Maintenance Cost		1.00	2.00	3.00	3.00	3.00	3.00	3.00	2.00	1.00
3	Gully plugging for soil conservation @300 mandays per year @425 Rs per day with 10% inflation	1.28	1.40	1.54	1.70	1.87	2.05	2.26	2.48	2.73	3.01
4	Creation of new ponds 5 @ 05x5=50 lakh; Maintenance @ 0.50 lakh after 3 yrs)	25.00			2.50				2.50		
5	De-siltation of 06 nos. of Exiting Pond @50,000 per pond at an interval of 4 years	3.00				3.00				3.00	
6	Check Dams (2 units @ Rs. 7 lakh/unit + Maintenance) within 5 km of the project	14.00					4.00				
B	**ECO Development Work/Capacity Building**										

1	Entry point work like water harvesting, fishery, drinking water facilities within 5km of Project Area	5.00		5.00		5.00		5.00		5.00	
C	**Awareness Programme**										
1	Training programme, financial suppport and follow up for income generation scheme like poultry, Pisciculture, Beekeeping, Mushroom Cultivation etc.		3.00		3.00		3.00		3.00		3.00
Total in Rs. Lakh		**56.53**	**14.48**	**18.53**	**21.18**	**24.95**	**25.34**	**24.87**	**10.98**	**12.73**	**7.01**
Grand Total in Rs. Lakh											**216.59**

The specific locations for implementing the soil erosion protection measures will be determined by the forest department at the time of project execution. This site selection process will involve a systematic assessment by the forest department, taking into account ecological, geomorphological, and hydrological factors to ensure optimal placement of erosion control interventions.

The identification of sites will be guided by field surveys, geospatial analysis, and stakeholder consultations to align with the project's environmental objectives and site-specific conditions, thereby maximizing the effectiveness of the proposed techniques.

Chapter 8
Disclosure of Consultants Engaged

8.1 About CMPDI

Central Mine Planning & Design Institute Limited, it is an ISO 9001:2008 certified company. Established in 1975 as a subsidiary of Coal India Ltd. as an in-house consultant. A Mini-Ratna Company providing consultancy services to various government & private organizations in exploration, mine planning and allied engineering services.

Its registered Corporate office is situated at Gondwana Place, Kanke Road, Ranchi-834 008, a capital city of Jharkhand state. It operates through seven strategically located Regional Institutes over six states territories of India.

8.1.1 Brief resume of the consultant

Establishment background

The company was formerly known as Coal Mines Authority Limited. And, the Central Mine Planning & Design Institute Limited (herein after called as CMPDI) is a planning & design division of Coal India Limited (hereinafter called as CIL) as per Memorandum of Association of the company. The CIL is a holding company since November 01, 1975, and the CMPDIL is one of its subsidiaries since then. It is under Ministry of Coal, Government of India.

Strength & Resources

Manpower

CMPDI has more than 900 multidisciplinary technical executive professionals who combine innovation and initiative to deliver faster and effective solutions in planning, implementation and management of projects.

Resources

CMPDI is equipped with modern laboratory facilities for undertaking various analytical works to supplement its services. It has well equipped network of six environmental laboratories located in various coalfields to regularly monitor air, water and noise parameters. **The Environment Laboratory at Ranchi is accredited with NABL (National Accreditation Board for Testing and Calibration Laboratories).** The environment lab is having recognition of CPCB since 1997 and also working under ISO-9001:2015 Certification. Besides Sasa its own strength, CMPDI has access to the vast resources with its principal, CIL, India's largest coal producer and a **Maharatna Company**.

Recognition

CMPDI is recognized as preferred consultant by Indian and overseas clients, United Nation agencies and international financial institutions, and the company is registered with

- World Bank
- Asian Development Bank

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- African Development Bank
- United Nations Development Programme

Main Functional Area

The main functional area of the CMPDI is to provide adequate and up-to-date planning, design and technological supports to the CIL and its coal producing subsidiaries to enable them to produce the planned quantity of coal efficiently and economically with due attention to safety, conservation, quality and environment. In addition to these, CMPDI also provides necessary consultancy for clients outside the CIL in India and abroad. The Quality management System of CMPDI, Ranchi is certified under international standard-ISO 9001:2015, Services covered under are as follows:

1. Consultancy in Mineral Exploration and Environmental Management.
2. Planning & Design in Mining, Civil & Architectural Engineering, Coal Preparation &c Utilization, Electrical & Mechanical Engineering, Mining Electronics, Geomatics and Mine Construction.
3. Laboratory testing facilities for the above.
4. Technical & Management Training in Mineral & Mining Sector.

Research & Development

The Research & Development activities in coal and lignite is being administered through the Scientific Advisory Committee (SSRC) with Secretary (Coal) as its Chairman. The committee is entrusted with the task of planning, budgeting and overseeing the implementation of R & D programme in coal & lignite sector and also for application of research findings. And, CMPDI is the Nodal Agency to coordinate S & T / R &D activities in coal and lignite Sector and assist SSRC in areas mentioned herein after.

CMPDI applied research and development in the field of mining, beneficiation, utilization, environment, exploration, etc. serving as nodal agency for all S & T schemes funded by Ministry of Coal and R & D schemes funded by R & D Board of the CIL(constituted in August 1995). Field oriented research projects including transfer and absorption of new technology concerning main areas of coal research have been as follows:

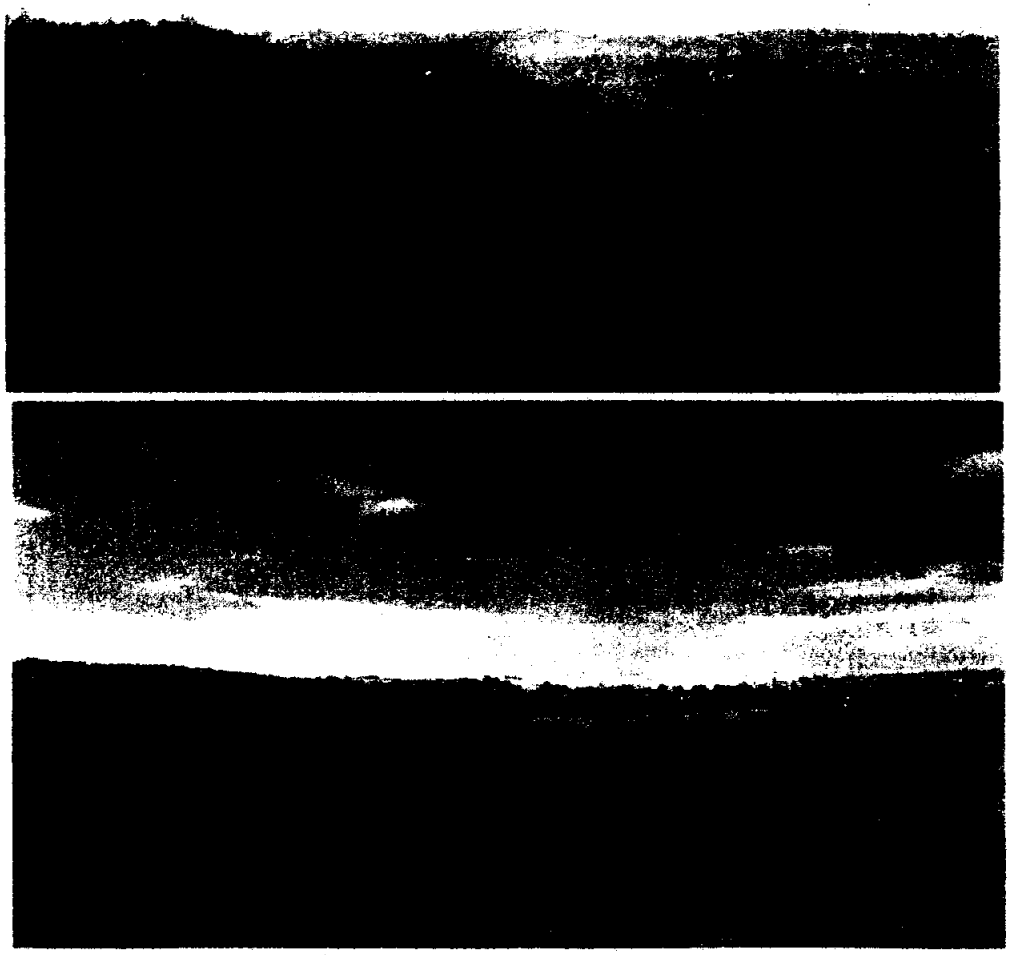
- Production, productivity and safety.
- Coal beneficiation and utilization.
- Environment and Ecology.

Annexure-X

REVISED & CORRECTED

SOIL & MOISTURE CONSERVATION PLAN OF KDH (KARANPURA DEWALKHAND HESALONG) OPENCAST COAL MINES OF CENTRAL COALFIELDS LIMITED UNDER RANCHI FOREST DIVISION

Prepared in compliance of EC Stage I condition no. (B) 14



Prepared by:

Avantika Green Waves Private Limited, Ranchi

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C.M. (M) /Project Officer
KDH Project

Explanatory Notes on the observations made by the PCCF HoFF, Jharkhand on SMC Plan of KDH OCP vide his Office Order No. 57 dated 03.05.2024

Observation No.	Justification	Modifications Made in the Plan
6.(ii)	In the impact zone there is only one village falls under the jurisdiction of DFO Hazaribagh West Division. This village is situated at a distance of approx 9 km away from the battery point of the KDH OCP. Hence it is expected that there will be very [illegible] impact of coal mining [illegible] village. Hence it is proposed to omit this village in the plan.	In the light of justifications furnished may kindly be considered.
6. (iii)	As directed, skill development training for frontline forest staffs has been incorporated in the Plan and awareness programme is already included in the plan.	Provision of Rs. 20.00 lakhs have been made in the plan for this component.
6.(iv)	Development of alternate livelihoods have been included in the plan.	Provision of Rs. 100.00 lakhs have been made in the plan for this component.

Other Modifications: De-siltation of ponds as proposed under item no. B (ix) of the plan budget at page no 66 has been omitted from the plan as a separate De-siltation Plan for ponds and water bodies has been prepared for KDH OCP. It has been omitted to avoid duplication of same item of work in same area.

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DMF, Ltd. Ranchi

Conservator of Forests
Territorial Circle, Ranchi

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Conservator of Forests
Territorial Circle, Raipur

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Divisional Forest Officer
Saoli

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Deputy Conservator of Forests
Ranchi [illegible]

Conservator of Forests
Territorial Circle, Ranchi

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CHAPTER – I

1.1 Introduction & Background of the MDH(Jharkhand) Project:

M/s [illegible] (*Jharkhand Pvt. Ltd.*) Operational area of [illegible] is the new coal project of the North Karanpura Coalfields. MDH coal block is located in the north eastern part of the North Karanpura Coal Block and falls within the administrative jurisdiction of Ranchi district. The North Karanpura Coalfield is an area rich in coal seams having about 60 identified coal blocks. It is elliptical in shape, 64 kms in east – west and 32 kms in north – south. The coalfields are in upper Damodar valley lying between Ranchi plateau in [illegible] plateau in the east. The area occupies the parts of [illegible] Hazaribagh, Chatra and Palamu districts. About 9 % of India's total coal reserve, thus being the largest coal reserve and extends over 1,230 sq. kms. While being rich in coal deposits this area supports good forests also with a variety of wild life both resident and migrant. For winning the coal a vital mineral resource required for development projects, these forests have to be sacrificed. At the time of granting approval for diversion of forest land for non-forestry purpose, Govt. of India imposes conditions on the user agencies for minimizing the negative impact of diversion and for ensuring mitigative measures for compensating the loss of forests. This site-specific Soil & Moisture Conservation Plan is the outcome of one of such imposed conditions.

Envisaging the imminent diversions of forest land in North Karanpura Coal Block, the Govt. of Jharkhand constituted an expert committee vide notification number 4359 dated 26.11.2010 for carrying out studies in the area and suggesting mitigation measures in the form of an integrated management plan, for the entire North Karapura valley aiming at minimizing the adverse effect of ongoing and future mining activities. The main object

[illegible] Conservator of [illegible]

[illegible] प्रतियोजना पदाधिकारी प्रतियोजना

was prepared [illegible] for green coal mining which takes care of various pollution [illegible] to the diversity loss and enhance the socio-economic [illegible] [illegible] on bio-diversity [illegible] [illegible] for migration [illegible] forest area to another which need to be identified with suitable prescriptions for their conservation & development so that these corridors remain intact in healthy condition, which will, in turn, help in reducing the man – animal conflict, an issue of grave concern due to the potential of huge loss to both the sides. The report of the committee was submitted in July 2017 in the form of Integrated Wildlife Management Plan, IWMP, for North [illegible] [illegible] [illegible] [illegible] officers of the [illegible] [illegible] [illegible] [illegible] plan and they were adopted with certain modifications. It was also held that on the basis of these recommendations site specific wild-life management plan will be prepared for each mining block and the concerned user agency will deposit funds for implementation of the same @ Rs. 3.786 lac per hectare of the total lease area. Thus, the recommendations of the IWMP are the basic frame upon which this Soil & Moisture Conservation Plan has been prepare for KDH Coal Block.

Nature and size of the project

The project area of present working as per approved mining plan is 489.30 Ha. No change in the project area has been proposed. The life of the project will increase to 5 years after extension in lease area. The normative capacity will remain at 4.5 MTPA, however peak capacity of 5.00 MTPA has also been proposed, which may be achieved in one or more years during project life

B. Stage – I approval of Forest Land diversion by MoEF&CC: The MoEF&CC has accorded in principle Stage – I approval for diversion of

[illegible]
Ranchi Forest [illegible]

Conservator of Forests
Territorial Circle, Ranchi

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[illegible] परियोजना

126.22 ha forest land to CCL under Forest Conservation Act 1980 vide their letter no. [illegible] dated 27.02.2023. As per condition no. 13 (i, ii, iii, [illegible] 50% on conditions laid down in

"13. *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. The approval of schemes/plan shall be submitted to the Ministry along with compliance of Stage-I approval.*

(i) *Mitigative measures to minimize soil erosion and choking of stream shall be implemented within a period of three year with effect from issue of Stage II clearance in accordance with the approved plan in consultation with the State Forest Department.*

(ii) *Planting of adequate drought hardy plants species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion in accordance with the approved scheme;*

(iii) *Construction of check dams, retention / toe walls to arrest sliding down of excavated material along the contour in accordance with the approved scheme;*

(iv) *Stabilize overburden dumps by appropriate grading / benching, in accordance with the approved scheme, so as to ensure that angle of repose at any given place is less than 28^0 ; and*

(v) *No damage shall be caused to the top-soil and user agency will follow the top soil management plan.*

14. *The User agency either himself or through State Forest Department shall undertake gap plantation and soil & 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 the outer perimeter of the mining lease. The plan of*

[illegible] Forest [illegible] Assistant Director (Forest)

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plantation and SMC activities will be prepared and submitted to MoEF&CC."

(v) 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 mining lease boundary. This list is to be duly verified by the concerned Divisional Forest Officer. The Use 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 plan for desilting of identified ponds, water bodies to be prepared in consultation with the local Agencies and shall be submitted."

In compliance of the above mentioned Condition No B (14) of MoEF&CC the instant Soil & Moisture Conservation Plan has been prepared.

Approval letter of MoEF&CC has been attached as Annexure – II

C. Location of the project:

KDH OCP area falls under Nawadih Sub Beat of Khelari Beat of Burmu Forest Range under Ranchi Forest Division. The project is located just south of Damodar river in Khelari / Burmu block, Ranchi district of Jharkhand State. It lies between latitudes 23°39' 21" to 23°42'0" and longitudes 84°59'15" to 85°00'24". Purnadih OCP and Piparwar OCP are located on north-eastern side of the project.

Access to the project from Ranchi is via Piparwar Khalari- Bijupara, which is on Ranchi - Daltenganj Road (NH-75). The project is also connected to Hazaribagh via Tandwa and Barkagaon with black top road. It is connected directly to Khalari town.

Location map of the project is enclosed as Annexure –XIII

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D. The Project Impact Area:

Core zone [illegible] Hectare Forest land i.e. [illegible] Hectare Forest land and [illegible] Hectare Non-Forest land) comprises [illegible] Ha of Good Lease hold. Core zone area fall in Khelari Block of Ranchi district in Jharkhand state and comprises from the whole or part of following two villages:

1) Bishrampur

2) Kaikatta

Buffer zone comprising the area within a radial distance of 10 km from [illegible] villages and Census population as [illegible] as per [illegible] census is as follows:

Sl. No.	Description	Particulars / Numbers	%
1.	No. of Villages	--	--
2.	Total Population	70025	--
3.	Male	36666	53.36
4.	Female	33359	47.64
5.	Male : Female ratio	909:1000	--
6.	Literate	30727	43.88
7.	Total Working Population	22470	32.08
8.	Main Worker	16706	23.85
9.	Cultivator	5392	7.70
10.	Agriculture Labour	1586	2.26
11.	Household Worker	503	0.71
12.	Other Worker	9225	13.17
13.	Marginal Worker	5764	8.25

Map showing 10 km buffer zone has been attached as Annexure -XIII

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Rural Economy & its dependence on Forest: Alternate source of fuel are crucial for cooking purpose, hence the dependency on forests for [illegible] for fuel degradation is [illegible] forests. The forests provide various Non Timber Forest Produce 'NTFP' which provide employment as well as additional income to the households. The most important NTFP is mahua flowers and fruits which plays a very important role in the village economy and every household is engaged in its collection during March – April. Next comes the Kendu – leaves of *Bidi Patta*, which are succulent leaves from the bushes of *Diospyros melanoxylon*. From April [illegible] Karanj seeds, Mahulan leaves, Sal leaves and various edible fungus in the rainy season are the main Non-Timber Forest Produce, NTFP, which have their fair share in the village economy.

Traditionally the villagers are in the habit of keeping large herds of cattle, though they are less productive. A household having 15 cows may be getting only 2 litres of milk from that many numbers. Similarly, bullocks are also kept in large numbers. These cattle are simply left to graze in the adjoining forests sometimes without any supervision. Practice of stall feeding is almost absent and sometimes fodder from the forest is brought for goats. For the upkeep of cattle population, the villagers are totally dependent on forests.

The project impact area is spread over 10-kilometre radius from the project area. It is estimates that due to coal mining and allied activities carried out in the project area will have adverse effect in this zone. This buffer area comprises of total 42 villages and 1 town and most of them are falling in Khelari/Burmu block and Burmu Forest Range while the other villages falls under geographical boundary of **Hazaribagh West Division** and **Chatra**

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South Forest Division. Study area is restricted to the jurisdiction of Ranchi Forest Division only and 20 villages were surveyed during baseline [illegible]

[illegible] 30 acres fertility [illegible] farmers can choose from the wide range of crops which they prefer to grow.

The dependence on forests is directly proportional to the forest area available in the village. In nearby villages forest cover is abundant people are more dependent on forests. The cattle population has the same trend as of villages in core area. The number of cattle heads is high having low productivity and [illegible] survival. As [illegible] feeding is not followed in the villages of impact zone also. For rearing the goats only some fodder is brought, that too from forest.

Agriculture is the main employment providing sector. Nearly half of the population falls in the category of cultivators which means that the working force of these families are engaged on the farms owned by the family. Most of the remaining workers find employment with the families having large holdings. Workers from villages which are close to Dakra, Khelari and Burmu town find engagement in the town also as labourers. In the months of March to mid-June, the seasonal work of collection of Kendu leaves provides large scale employment opportunities. With the opening of mines in these areas new employment opportunities will be generated both for skilled and unskilled work force, as mining and allied activities will require huge man power for various operations. Due to better remuneration to the workers engaged in these activities the socio-economic condition of these villages is bound to improve.

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E. **Topography, Natural drainage lines, Presence of water bodies:**

The topography of proposed project is characterised by more or less flat terrain [illegible] The elevation is noticed [illegible]

The area has good vegetative cover indicating presence of sufficient moisture in soil and the highest point of elevation is about 308 Mts from MSL. The entire area is part of plateau and the difference in elevation from foot hills to the peak is maximum 30 meters. The river bed of Damodar river represents the minimum elevation which is about 280 Mts above MSL. Few isolated hillocks are also present in the area.

[illegible] through the southern [illegible] In many places it was observed that the river flows on sand rock which adds to the natural beauty. This river is the perennial source of water in the region. Sonadubi nala flows outside the southern block boundary of KDH OCP and it is semi-perennial in nature.

In the drainage system, role of seasonal nalas is of great importance as they are the channels through which the excess run-off is channelized into the drainage system of the area. In every village such seasonal nalas are found which form the initial framework of drainage system. Some of the nalas met in the villages during survey in the buffer zone which are used by local villagers and wild animals both.

A map showing the drainage lines and water bodies in the study area is enclosed in Chapter -V.

F. Impact of the project in the Buffer Zone:

The KDH OCP project area is spread over two villages which is considered as core area. The village falling under the core area are – Bishrampur and Karkatta. In these villages Sal (*Shorea robusta*) is the dominating species

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with its associates like Asan, Mahua, Kend, Dhaura, Chiraunji, Salai, Bahera, Palash etc. These Sal forests are well stocked but of very small degraded [illegible]

As far as the socio-economic aspects of the area are concerned, the work force of this village is mainly divided in two categories – Cultivators and Workers. As the area supports fertile agricultural land, agriculture is the sector which provides employment to both the categories. During lean period, good amount of employment is generated in forestry activities. Rice is the main crop of the area but due to irrigation facilities and good soil fertility the fields are never vacant. This belt is famous for vegetables and every crop right from wheat to pulses to oil [illegible] As coal is available to [illegible] three crops in one year. About 12% of this village population are Workers.

As coal is available abundantly for cooking purpose the dependency on forests for firewood is very limited which is one of the causes for less degradation of forests. Requirement of small timber and poles is met from the forests. The forests provide various Non-Timber Forest Produce, NTFP, which provide employment as well as additional income to the households. The most important NTFP is mahua flowers and fruits which plays a very important role in the village economy and every household is engaged in its collection during March – April. Next comes the Kendu – leaves or *Bidi Patta*, which are succulent leaves from the bushes of *Diospyros melanoxylon*. From April to mid-June, they provide huge employment opportunity to the marginal workers. In addition to these, Sal seeds, Kusum seeds, Amla, Harre, Bahera, Karanj seeds, Mahulan leaves, Sal leaves and various edible fungus in the rainy season are the main Non-Timber Forest Produce, NTFP, which have their fair share in the village economy.

Traditionally the villagers are in the habit of keeping large herds of cattle, though they are less productive. A household having 15 cows may be getting

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only 2 litres of milk from that many numbers. Similarly, bullocks are also kept in large numbers. These cattle are simply left to graze in the adjoining forests sometimes without any supervision. Practice of stall feeding is almost [illegible] goats. For the upkeep of cattle population, the villagers are totally dependent on forests.

The project impact area is spread over 10-kilometre radius from the project area. It is estimates that the mining and allied activities carried out in the project area will have some affect in this zone.

Rural Economy & its dependence on Forest:

Without source of fuel are available for cooking purpose, hence the [illegible] for fuelwood is very limited which is one of the causes for less degradation of forests. Requirement of small timber and poles is met from the forests. The forests provide various Non-Timber Forest Produce, NTFP, which provide employment as well as additional income to the households. The most important NTFP is mahua flowers and fruits which plays a very important role in the village economy and every household is engaged in its collection during March – April. Next comes the Kendu leaves or *Bidi Patta*, which are succulent leaves from the bushes of *Diospyros melanoxylon*. From April to mid-June, they provide huge employment opportunity to the marginal workers. In addition to these, Sal seeds, Kusum seeds, Amla, Harre, Bahera, Karanj seeds, Mahulan leaves, Sal leaves and various edible fungus in the rainy season are the main Non-Timber Forest Produce, NTFP, which have their fair share in the village economy.

Traditionally the villagers are in the habit of keeping large herds of cattle, though they are less productive. A household having 15 cows may be getting only 2 litres of milk from that many numbers. Similarly, bullocks are also kept in large numbers. These cattle are simply left to graze in the adjoining forests sometimes without any supervision. Practice of stall feeding is almost

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chest and sometimes fodder from the forest is brought for goats. For the upkeep of cattle population the villagers are totally dependent on forests.

The [illegible] of Forest [illegible] kilometre [illegible] of the [illegible] and [illegible] and illicit activities carried out in the project area will have adverse effect in this zone. This area comprises of total 46 villages, 4 of them are falling in Core Zone and rest 42 in Buffer Zone. All villages fall under Burmu block and Burmu Forest Range, while the rest villages falls under geographical boundary of **Chatra South Division** and **Latehar Forest Division. Study area is restricted to the jurisdiction of Ranchi Forest Division only.**

The [illegible] pattern in the core zone is almost same. Due to good fertility of the soil farmers can choose from the wide variety of crops which they prefer to grow.

The dependence on forests is directly proportional to the forest area available in the village. In nearby villages forest cover is abundant; people are more dependent on forests. The cattle population has the same trend as of villages in core area. The number of cattle heads is high having low productivity and the entire cattle population is dependent on forest for grazing and survival. As stated in the case of core area villages, the practice of stall feeding is not followed in the villages of impact zone also. For feeding the goats only some fodder is brought, that too from forest.

Agriculture is the main employment providing sector. Nearly half of the population falls in the category of cultivators which means that the working force of their families are engaged on the farms owned by the family. Most of the remaining workers find employment with the families having large holdings. Workers from villages which are close to Dakra, Khelari and Tandwa town find engagement in the town also as labourers. In the months of

March to mid June, the seasonal work of collection of kendu leaves provides large scale employment opportunities. With the opening of mines in these areas, [illegible] would be generated both for skilled and unskilled labour. Besides, the mining activities will require huge man power for various operations. Due to better remuneration to the workers engaged in these activities, the socio-economic condition of these villages is bound to improve.

EXPECTED IMPACT ON FOREST & WILDLIFE DUE TO COAL MINING AND ALLIED ACTIVITIES:

Predicting the exact loss of wildlife habitat due to coal mining in the KDH Coal Block in Ranchi District would require detailed site-specific studies and assessments. Several factors matter, including the type of habitat, the species present, the mining methods used, and the mitigation measures in place. Some general insights into the potential impacts of coal mining on wildlife and its habitat are enlisted below:

(i) **Habitat Destruction:** Coal mining often involves clearing vegetation and altering the landscape, which can lead to the direct loss of habitat for plants and animals. This can disrupt ecosystems and lead to a decline in species that rely on specific habitats.

(ii) **Water Pollution:** Coal mining can result in the release of pollutants into nearby water bodies, impacting aquatic ecosystems and the species that inhabit them. Contaminants such as heavy metals and sedimentation can degrade water quality and harm aquatic life.

(iii) **Air Pollution:** Coal mining and processing can release pollutants into the air, affecting both plant and animal species. Airborne pollutants can harm vegetation and compromise the health of animals that rely on clean air.

(iv) **Noise and Vibration:** Mining operations generate noise and vibrations that can disturb wildlife, affecting their behaviour, communication, and overall well-being.

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(v) **Fragmentation and Isolation:** Mining activities can fragment habitats, creating isolated patches of habitat that are challenging for species to [illegible] connected to [illegible] vulnerability to [illegible]

(vi) **Invasive Species:** Mining operations can introduce invasive species that outcompete native species, disrupting local ecosystems and leading to declines in native biodiversity.

(vii) **Disruption of Ecosystem Services:** Biodiversity loss can impact the ecosystem services that the area provides, such as pollination, soil fertility, and water purification, which can have cascading effects on both natural and [illegible]

(viii) **Indirect Effects:** The infrastructure and [illegible] associated with mining, such as road construction and increased human presence, can further fragment and disturb habitats.

To accurately mitigate the expected habitat loss in the KDH Coal Block, it's important to adopt prescriptions made in environmental impact assessments (EIA) and biodiversity surveys specific to the region. These assessments would consider factors like the local species present, their distribution, their ecological requirements, and potential mitigation measures to minimize negative impacts. Local conservation organizations, research institutions, and government agencies may be involved in conducting these assessments and providing more accurate predictions based on the current conditions in the area.

G. **List of experts involved in the study and details of their visit in the area. Methodology and sampling procedure adopted in arriving at the facts/findings:**

Superannuated Forest officers having in depth knowledge of the area and procedure to be followed for preparation of such site-specific Soil & Moisture

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Conservation Plan were engaged by the consultant firm executing this work who surveyed the area extensively. These retired officers were further supported by [illegible] working in the field as surveyors. The senior [illegible] conservation of the area [illegible] helped during the entire field work. The names of the experts and the dates of their visit to the study area are as follows:

1. **Mr. Sanjay Kumar Sinha, IFS Retd.** A superannuated Chief Conservator of Forests having more than 33 years of field experience. He served in various capacities dealing with core Forestry which included plantation, protection, management of forests and also pollution related issues as [illegible] and state Pollution Control Board. He has extensive field experience having served as the Divisional Forest Officer for divisions like Ranchi, Garhwa, Palamau and Hazaribagh and subsequently as the Territorial Conservator of Forests for Hazaribagh and mineral rich district of West Singbhum. He has also served as Conservator of Forest - Working Plan and had extensive experience in preparation of working plan and mapping of forest land through latest technology. He also served as the Member Secretary of Jharkhand State Pollution Control Board. This involved working with a clear insight and understanding of EP Act, Air Act, Water Act and various rules and regulations formulated under EP Act. He was also the Member Secretary the State Environmental Appraisal Committee (SEAC) for Jharkhand. Through a tenure spanning over three decades, Mr. Sinha had a rare, broad spectrum of experience in statutory provisions and field work. He has a sharp legal acumen in forest related matters in the Supreme Court, High Courts and National Green Tribunal. On several occasions he has been invited with renowned organisations like XLRI, Indian Institute of Coal Management (Coal India) to speak on Environment related matters.

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2. **Mr.Prem jit Anand, IFS Retd.** A superannuated Deputy Conservator of Forests, having more than 35 years of field experience. He served in various [illegible] for 35 years and has extensive experience in forest inventory, protection and management of forests. He has extensive field experience having served as Divisional Forest Officer for divisions like Palamau Tiger Project, Pakur, and Deoghar. He has worked in Indian Council of Forestry Research & Education for seven years. He also has extensive experience in preparation of working plan, wildlife management plan and soil & moisture conservation plan. He has Graduated in Endangered Species Management from Durrell Wildlife [illegible]

3. **Mr.Sriram Bhagat** He is a superannuated Assistant Conservator of Forests having more than 35 years of field experience in forestry management and allied issues.

4. **Mr.Mahesh Kumar Chanchal** A superannuated Technical Officer from the Indian Council of Forestry Research & Education having more than 30 years of experience in forestry research, education and extension.

From the very beginning the forestry experts visited the study area extensively and intensively. The first visit on the 6th June'2023 was for doing a preliminary survey to access the quantum of inputs required in the field work. After award of the work, the experts again visited the area on 14.07.2023 when preliminary discussions with the project officials were held for obtaining the required information. Mobilization of the survey teams and detailed discussion with local forest officials was also done. The experts visited the area again on 2nd August'2023 to monitor the progress of survey and to check the primary data collection in the field. A discussion with the project officers was also held. All three experts visited the study area and interacted with the local villagers and visited the site.

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The field survey work was reported to be conducted for random field verification and for discussing the draft report with the project officers [illegible] Range Officer, Beat Officer, Block Range Forest Officer [illegible]

For preparation of the desired Site Specific Soil & Water Conservation Plan, data on various parameters like Forest & its status, Status of wild life, Socio-economic profile of the study area, Demographic details, Land use pattern, Effect on environmental services due to proposed infrastructure development activities, Enumeration of man animal conflict in the area, proposed corrective measures and requirement of villagers were needed. The [illegible] Primary data [illegible] constituted of local villagers, mostly active members of JFM committee accompanied by local forest officials in many cases. These surveys were randomly checked in the field by experts. Work of primary data collection was done in all the 2 villages of core area and in 20 villages in the buffer area. Areas rich in forest cover, wild life and having incidents of depredation by wild animals were selected for this purpose.

For secondary data, many documents were referred to. First and foremost, for deciding the framework, recommendations made in the EIA/EMP of KDH Open Cast Coal Project.

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Regional Office

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Inspection of proposed KDH OCP Area by the expert team

Land degradation due to mining activities

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CHAPTER II

A. Baseline Environmental Profile of the Project Area as per EIA / EMP Report

Opencast mining operations involve the removal of huge quantities of overburden, dumping, and backfilling of the excavated area. These overburden deposits of waste material containing low-grade ores are represented as mine spoil dumps. The degraded land due to mining activities and overburden of stockpiling of mine discards results not only in the formation of the unsightly landscape but also is associated with the pollution of terrestrial and aquatic ecosystems. The gradual increase in such landscapes [illegible] the natural resources only endangers the agro-forest productivity in the country as well as the ecological balance.

Mining activities generate a large number of waste rocks and tailings which get deposited at the surface. The land surface is damaged and the waste rocks and tailings are often very unstable and will become sources of pollution. Land degradation due to mining may reach alarming proportions mainly due to over-exploitation and mismanagement of natural resources. One of the consequences of the ever-increasing human population, supported by accelerated land degradation is the lowering of the man to land ratio. Therefore, there is an urgent need to address the major environmental issues which are the outcome of the mining activities. The issues include the destruction of habitat and biodiversity at the mine site, ecosystem/habitat biodiversity protection in adjacent land, landscape/visual impact/loss of land-use, site stabilization and rehabilitation, mine waste/tailings disposal, air emissions, dust, climate change, siltation and changes in river regimes, effluent discharges and acid drainage, groundwater alteration or contamination, workplace health and safety, the impact of metals toxicity and settlement issues around mines. Considering all these issues, the

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overall reclamation of overburdened wasteland is a challenging task. The [illegible] in the restoration of these degraded wastelands are sustainable [illegible] of ecological [illegible] of the mine area, its dumps and the adjoining area.

The establishment of the baseline environmental status of the project influence area helps to predict the magnitude of impacts that will likely to be caused due to the proposed development of the project. It also helps to identify critical environmental attributes required to be monitored during and after the proposed developments.

Physiography:

The [illegible] block is characterized by moderately undulating terrain with gentle to moderate slopes. The ground is sloping towards the Damodar River flowing along western and southern boundary of the block. The HFL 428 m has been recorded for Damodar River at this point. The maximum and minimum elevation of the area is 469 m and 420 m respectively. There are several villages falling around the block.

Drainage:

The drainage of the block is controlled by the Damodar River flowing along the Northern and Western block boundary.

The rock exposures are few due to wide spread soil and alluvial cover. The exposures are mostly seen along the river. Extensive surface burning has taken place in about one fourth of the properly laying mainly.

Geology and Soil:

The North Karnpura Coalfield forms prominent East – West trending valley between Hazaibagh Plateau in the North and Ranchi Plateau in the South. The Aswa Pahar in the South – East separates the North and South Karnpura Coalfields by an east-west elongated metamorphic patch. On the eastern side, North Karnpura Coalfield is separated from the West Bokaro Coalfields by a

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various stretch of metamorphic rock having several outliers of Talchar formation. In the East it is separated by a stretch of about 2.0 kms wide [illegible]

Burnt [illegible] and barren and barefaced formations have been in the north eastern part of Block. On surface, the burnt area is characterised by plenty of small scattered boulders of burnt rock. Lower Dakra seam and its splits are affected by the surface burning.

This aspect has been examined in detail in the Environment Impact Analysis exercise and the outcome is documented in detail in the EIA/EMP plan prepared by **the Central Mine Planning & Design Institute Ltd.** Ranchi in June 2011. According to this document, 34 persons need [illegible]

Various secondary data were collected from different Government Offices. On the basis of collected data and information, environmental impact assessment was evaluated through computer simulation and modelling of different environmental parameters. From the EIA result Environmental Management Plan had been prepared for implementation in the respective areas.

Ambient Air Quality:

Ambient Air Quality monitoring was carried out to assess the ambient air quality of the area. Air quality monitoring was carried out at project corridor at 6 locations for parameters SPM, RPM, SO2, and NOx. The air quality monitoring results indicated that the concentration levels of all the parameters were within the prescribed limits of CPCB for residential and rural areas. Levels of NOx & SOx are very low, SPM & RPM levels have been observed within limits.

Noise Levels:

Noise levels were recorded on hourly basis for 8 hours exposures in

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order to have an assessment of the Day and Night time noise levels of industrial, commercial, residential and sensitive areas, keeping in view and night [illegible] Noise levels were recorded [illegible] the study period. Sources of noise in the project area are the traffic movement on the road. Agglomeration and congestion of traffic was observed on main roads and crossing of important roads near market and industrial area. During monitoring period, traffic density at these junctions was observed. All the noise level values are found to be less than 90 dB.

Water Environment:

Water Quality Scenario: Water sources are the naturally available [illegible] carrying water during monsoon season. In the study area dug well, bore well and deep bore well have been made to tap ground water in the area.

The operation of mines and allied services / activities would affect the water resources of the area in many ways in respect of its quality and its regime.

Water Quality Assessment: Main source of water in study area includes surface water source i.e. Damodar River and its major tributaries like Garhi river and Sapahi river, and ground water resources i.e. dug well, deep bore well water. Water samples from these resources were sampled and tested.

Methodology: Grab sampling method was adopted in case of ground water systems like tube wells. Integrated sampling method was adopted in case of surface water.

Some of parameters suen as temperature, pH, DO, Free Chlorine etc which are liable to change with time were analysed at site with the help of an analytical kit while some others in the field laboratory set up at site. Surface and groundwater samples were collected from 6 different locations.

Analysis of Results: It was observed that both surface and groundwater quality was physio-chemically good and within the permissible limits, when

- pH was found in all samples between 6.5 to 8.5 prescribed limits.
- Total Suspended Solid (TSS) levels were found within prescribed limits.
- Total Dissolved Solids (TDS) level has been found to be within the limit but on higher side during dry days which may be due to low discharge.
- Biological Oxygen Demand in all cases of surface water samples [illegible] This may be due to following reasons:
  - Bio mass and organic fertiliser used in agriculture fields which flows to the river through surface run off.
  - A number of settlements are existing on river banks and there are no sewerage systems. Polluted water from these settlements flow to the river nala.
- Chloride levels have been found within the prescribed limits.
- Sulphate level in all samples has been found within prescribed limits.
- Total Nitrogen level in all samples has been found within tolerance level.
- Heavy Metals have been found within the prescribed limits.

Biological Environment:

The mining activities in a region directly and indirectly affect the living beings surrounding the area. The limited resources available in the region are faced with the exploitation due to competition among different species creating an impact in the habitat of the various fauna of the region. However,

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mining is a temporary land use because the mineral deposit is finite and exhaustible in its level. The social and legislative outlook of mining is many [illegible] which is [illegible] for its operation and post closure measures. Most various infrastructure to facilitate the livelihood and sustenance of the local people are effectively implemented through various projects under CSR which also provide alternate resources to the humans which makes the exploitation of previous resources to reduce to a much lower level, hence various fauna of the region will remain free from the competition. There are no endangered species in the Core Zone, which is the mining lease area but [illegible] listed in Schedule II of the Wild Life (P) Act and whose [illegible] there is presence of Elephants during their migration. Though the buffer zone is not an Elephant Corridor *(Ref. Right of Passage Elephant Corridors of India, Wildlife Trust of India)* but is occasionally visited by Elephant and thus should be conserved. The core zone is at distant location from the possible zone of occurrence of the elephant thus no loss of resources such as food, water and shelter are expected from the operations which are confined to the core zone. Also, creation of green belt in the core zone as sustainable initiative will act as an add-on to the setup of a suitable habitat ecosystem development for species in the core zone.

Air Environment: Air pollution includes one or more contaminants (pollutants) in the outdoor atmosphere in such quantities and of such duration that may be injurious to human, plant or animal life. Once these contaminants enter in the atmosphere, either in gaseous form or as particulate matter, these cannot escape and keep circulating and deteriorating the air quality. Air pollution effects encompass those that are health related as well as those associated with damage to property or which cause decrease in atmospheric

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aesthetic features. Examples of air pollution effects on human health include eye irritation, headaches and aggravation of respiratory problems. Plants and crops may suffer from [illegible] pollutants. Smoke and soot can soil buildings and [illegible] to deterioration and decay. Dispersion of air pollutants from the source depends on micro-meteorological parameters of the area. Micro-meteorological parameter is essential to assess the pollution level in the area as well as helpful in taking precautionary measures to control.

Air Quality

The topographical information of project site as well as details of the study area such as [illegible] relating to the collection of data were used collection of [illegible] of micro-meteorological parameters and SPM, RSPM, Pb, CO, SO_2 and NO, were identified as related to the project activities for representing baseline status of ambient air quality with the study area. In addition, fugitive emission was also estimated with reference to mining operation. To assess the base line ambient quality, air quality monitoring location were selected in core and buffer zone area during the EIA exercise.

Ecological Environment Study on the biological aspects was made as per topography, land use, vegetation pattern etc. The biological survey was carried out by considering ecological sensitive receptors like forest areas (protected and social forest) in order to study the existing status of floral and faunal composition.

An ecological study of the ecosystem is essential to understand the impact due to proposed mining activities on the existing flora and fauna of the area. Similarly, biological survey was also carried out in non-forested areas (agriculture, water reservoir, riverside, on hills, in plain areas, village waste land, block plantation etc.), the biological survey was mainly concerned at selected locations.

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Socio Economic Environment

Due to mining operation there will be development of infrastructure resource [illegible] and transport, base power supply and medical facility etc. Economic attributes and the infrastructure resources details have been abstracted from housing, household amenities and assets. There will be positive impact in socio economic area due to increased economic activities, creation of new employment opportunities, infrastructure development and better educational & health facilities.

Anticipated Environment Impact and Mitigation Measures

[illegible] proposed mining activity. Coal mining industry largely deteriorate the air, water, noise and land quality so consequently ecology. Hence, preventive and control measures for above environmental attributes have been suggested. Mitigation measures are broadly divided into two categories namely preventive measures and suppressing measures. Detailed description of mitigation measures have been proposed as various activities described here in under:

Coal mining can have significant and wide-ranging impacts on the environment and the local communities in which it takes place. Here are some potential impacts of coal mining on various aspects of the environment and the social environment in the proposed KDH coal mines in Ranchi district:

Air Environment:

Air Pollution: The mining process, including excavation, transportation, and coal processing, can release dust and particulate matter into the air, leading to

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increased levels of air pollution. This can have adverse effects on respiratory [illegible] workers and nearby communities.

[illegible] of greenhouse gases, contributing to [illegible] and its associated impacts.

Water Environment:

Water Pollution: Runoff from coal mines can carry pollutants like heavy metals and sediment into nearby water bodies, leading to water pollution. This can harm aquatic ecosystems and affect the quality of water used for drinking, agriculture, and other purposes.

[illegible] Mine Drainage (AMD): Exposure of sulfide [illegible] to air and water during [illegible] can result in highly acidic water that [illegible] and groundwater, further degrading water quality.

Soil Environment:

Soil Erosion: Clearing vegetation and disturbing the land during mining operations can increase the risk of soil erosion, leading to loss of topsoil and degradation of soil quality.

Land Degradation: The disruption of natural landscapes and ecosystems can result in long-term land degradation, making it difficult for vegetation to recover after mining activities cease.

Noise Environment:

Noise Pollution: Mining operations, machinery, and transportation of coal can generate significant noise pollution, impacting the quality of life for nearby communities and potentially causing stress and hearing impairments.

Social Environment:

Displacement and Resettlement: Coal mining projects may require the displacement of local communities, causing social disruption, loss of livelihoods, and challenges in resettlement efforts.

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Health Impacts: Increased air and water pollution can have negative health impacts on local communities, including respiratory issues and other health problems. Increased [illegible] can increase employment opportunities in the area, but can also exacerbate the economic dependency on the coal industry, leaving communities vulnerable to economic downturns in the sector.

Biodiversity and Ecosystems:

Habitat Destruction: Mining operations can destroy or fragment natural habitats, leading to a loss of biodiversity and disrupting local ecosystems.

Water Body Contamination: Water pollution from mining can harm aquatic life and ecosystems, affecting fish populations and other aquatic species.

(a) Quantum of pollutants estimated to be produced and its effect on Soil, Water, Vegetation and Animals.

Air Environment:

Operation of this mine will generate a series of activities which will impact on air quality. Sources of air pollutants will be due to mining activities and non mining activities. There are number of operational coal mines within the study area. They are as follows:

(1) Piparwar OCP

(2) Ashoka OCP

(3) Purnadih OCP

(4) Churi UGP

(5) Dakra OCP etc.

Map showing other Coal Blocks in the adjoining area is enclosed in Chapter - V

Most of the mining source activities generate air pollution and affect air quality due to Drilling, Blasting, and Loading & unloading of coal and OB, Transportation, coal crushing and coal handling plant etc.

Non mining source include road & rail traffic, other industries, domestic fuel etc.

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Most of the sources generate dust. Sources of NOx and SO_2 are [illegible] diesel petrol based machinery, locomotives, vehicles and [illegible] Sources of Sulphur [illegible] Nitrogen, Carbon Monoxide and volatile organic carbon. At present SO_2 emission has been measured at 212.5 kg/day (due to burning of 25000 litres of diesel per day) and NO_2 emission 892.5 kg/day as per EIA report of nearby mines Purnadih OCP.

Water Environment: The operation of mining and allied activities of this mine would have impact on water quality through generation of waste water in the surrounding areas in the form of Municipal [illegible] from OB dumps, run off from coal stack area, run off from built up areas etc.

- **Municipal effluents** from residential and service buildings cannot be discharged on either land or inland water sources without proper treatment because it can pollute land and streams. Pollution composition of municipal wastewater of nearby mining area are indicated below:

Sl. No.	Parameters	Value	
1.	pH	7.0	8.0
2.	Total Solid (mg/l)	650	750
3.	Suspended Solid (mg/l)	250	350
4.	Chloride (mg/l)	100	150
5.	BOD 5 day (mg/l)	150	200
6.	COD (mg/l)	300	500

- **Industrial Effluents**: From the mines workshop of the project washing and repairing of all the Heavy Earth Moving Machines, mechanical and electrical equipments, liquid effluents are

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generated at washing stations and workshops with high concentration of suspended solid, oil and grease. These effluents [illegible] discharge source.

- **Mine Drain Effluents**: Mine pit would receive water from direct precipitation, surface run off from surrounding areas and seepage from various deep seated strata. This water will be polluted with suspended solid and some oil and grease. If it is discharged in surface water source, it will pollute it.
- **Different types of Surface run off**: Surface run off is generated in core zone, OB dump, Coal Stack Area and built up areas. [illegible] caused by heavy precipitation. The impact of surface run off can be controlled and that [illegible] can be prevented.

Hydrology: Impact of Coal Mining on ground water system can be [illegible] rainy season there is very less or no problem of surface runs off.

- **Ground Water:** As per EIA report depth of ground water ranges from 5 m to 12 m in post monsoon period, whereas it goes down to 7 m to 15 m during summer.
- **Ground Water Recharge:** Drainage study of the area shows that in the northern and western boundary consists of forest and hill and act as water divide. Topography of the area indicates that the drainage system in the area is separately developed and mainly first, second and third order of stream are abruptly disappearing. This indicates low infiltration of rainfall, which is calculated as 13%, and quantum of which has been calculated at 38.15 M Cum/year.
- **Ground Water Movement:** Major area of the coal block is covered with forest. EIA studies shows that water table for the top aquifer is sloping towards southeast, which is general topographic slope of the

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[illegible] It was observed that water levels of top aquifer fluctuate [illegible]

[illegible]

Mining [illegible] occupational health hazards. Exposure to high noise level is one of them. With high mechanization of coal mines in India, the noise hazards is gradually increasing. Again blasting of coal and O.B. in coal mines is not only a source of noise hazards but also a major safety hazards to man and material. In order to carry out mining operation in an environmental friendly manner, it is essential to adopt noise abetment and blasting vibration control plan.

Land Environment: [illegible]

Topography and land scenario will change completely due to digging of open pits and overburden in the form of large heap. Soil characteristics such as erosion aspects, soil fertility etc have direct bearing on the environment.

Mitigation of Land Environment

1. In the adjoining areas soil type is silty, sandy, loamy, clay followed by sandy loam with medium percolation. However, every precaution will be taken to avoid spillages on soil during construction phase to protect groundwater quality and soil microbiology along the rail route.

   Excavated top soil will be preserved at suitable location and it will be used during reclamation. Temporary drainage channels will be provided to minimize soil erosion. Exposure of soil susceptible to wind and water erosion and sediment build up in natural drainage courses along the rail route will be minimized by adoption of erosion control measures such as raising shrubs and grasses.

2. **Biological Environment:**

   Coal mining is involved a range of disturbing activities including

[illegible]

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excavation, civil works, road and infrastructure development. Nuisance [illegible] dust, noise and [illegible]. These impacts may [illegible] to result in [illegible] especially [illegible] of sensitive species near to proposed mine, road rail route other possible impacts during construction phase like bush fires, road and open trench hunting etc. were also studied and mitigation measures provided accordingly.

- Prevent littering of work site with waste especially plastic and hazardous wastes
- Awareness among the drivers in order to regulate speeding and avoid [illegible]
- Policy for road safety which sets speed limits for vehicle operating for mining and allied operations
- Compensatory afforestation needs to carry out in association with forest department
- The Movement of operation related to vehicles and machines may result in killing of animals
- Cutting of vegetation during mining operations.

Mitigation Measures

- Avoiding tree cutting wherever possible
- Regulating speeding of project related vehicles

Public Awareness Programme The local People will be educated to understand the importance of Forest conservation and plantation Programme and be encouraged to take active part in agro forestry and social forestry Programme with the leading role played by the project proponent and forest department.

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Employment Opportunities

The proposed mining project will be operational for more than 25 years. [illegible] mining process time of mining activities. This the project would provide substantial direct employment, besides more people would be indirectly employed in allied activities and trades also.

- Vocational training Programme will be organized for the local people that may develop their capacity and skill and will be helpful for them in getting more employment opportunities.
- Change in the local socio-economic environment due to the increased [illegible]
- [illegible] infrastructure during construction.

(b) **Degradation anticipated due to project implementation with Qualitative changes in the wild-life habitat pattern in the study area:** For sustainable biodiversity conservation and forest management of the adjoining area of forest land diversion for coal mining in KDH OCP area, it will have considerable impact on wildlife habitat of the area. It will have some adverse impact on land, water and air environment.

A list of Flora & Fauna has been attached in Chapter – V.

Mining activities generate a large number of waste rocks and tailings which get deposited at the surface. The land surface is damaged and the waste rocks and tailings are often very unstable and will become sources of pollution. Therefore, there is an urgent need to address the major environmental issues which are the outcome of the upcoming coal mining and allied activities. The issues include the destruction of habitat and biodiversity at the construction site, ecosystem/habitat/biodiversity protection in adjacent land, landscape/visual impact/loss of land-use, site stabilization and rehabilitation.

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waste/tailings disposal, air emissions, dust, climate change, siltation and changes in river regimes, effluent discharges and acid drainage, groundwater alteration or contamination, workplace health and safety, the impact of metals toxicity and settlement issues around the project area. Considering all these issues, the overall mitigation measures is a challenging task for conservation of soil and moisture in order to restore forest habitat .

Expected soil erosion due to coal mining

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CHAPTER – III

Proposed Interventions to be undertaken by the Project Proponent:

A. Action Taken / Undertaken for compliance of EC Stage Condition no. 15 (ii, iii, iv & v)

I **Planting of Draught Hardy Species:** CCL authorities will undertake planting of draught hardy species within the mining lease area to arrest soil erosion under the guidance of state forest department. It has also been presented in EIA & EMP report of KDH OCP in detail. Adopting various suitable preventive measures against the soil erosion and air polluting activities arising due to mining operation, it is also necessary to use some [illegible] measures. Details of plantation Summary of same have been tabulated below.

- **Green Belt**: Various preventive measures have been proposed in the plan to be implemented by the Forest Department. The Project Proponent will undertake green belt development within mining lease area to suppress and mitigate air pollution, soil erosion, water pollution and it will also have effect in carbon sequestration. Green belts provide much needed fodder, food, MFP and non wood forest produce. Different types of green belt will be created in the project area at strategic locations.

- **Avenue Plantation:** It will cover trees/hedges on both sides of different roads i.e. Haul road, Link road to mine, township and township roads. Objectives of avenue plantation are:

  - To act as wind shield and thus break wind speed. It will help in prevention of dust at road surface from getting air borne.

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- Will provide shade
- To absorb or borne dust
- [illegible]

- Strip Plantation – Strip plantation or single or multiple row linear plantation around the area likely to generate air pollution. It is proposed to be done around mine pit and around service buildings. Basic objective of Strip Plantations are to

  - Act as wind shelter and prevent air pollution
  - Act as natural sink to absorb dust and sequester carbon
  - Act as a medium to reduce noise pollution and absorb [illegible]

- Block Plantation – There are some plots of land which are [illegible] and the township for which no specific use has been identified. It is proposed to use them for mixed plantation @ 2500 plants per ha. as per existing norms/scheme prevalent in the Forest Department. It will be undertaken in Township, Mining Area and Interface Area. Broad objective of Block Plantation are:

  - Improvement of general environment
  - Improvement of aesthetic view
  - Checking of Soil Erosion
  - Control of Air Pollution
  - Provide visual barrier between mining area and villages
  - May provide MFP and NWFP

Selection of Species: A great attention is required for selection of species for above plantations. **In any case monoculture will never be adopted**. Following aspects would be considered for species selection:

- Economic importance
- Ecologically sound

[illegible]

[illegible]

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- Less [illegible] species so far as possible
- [illegible]
- [illegible]
- [illegible]
- Aesthetic value

Suggested Species: A list of species suggested for plantation of mixed species is given in following table according to situation and needs:

For Avenue and Strip Plantation	For Block Plantation	For Block Plantation in Township & Village side
Zizyphus mauritiana	*Emblica officinalis*	*Emblica officinalis*
Acacia auriculaeformis	*Bauhaunia [illegible]*	*Bauhaunia [illegible]*
Syzygium cumuni	*[illegible]*	*Tamrindus indica*
Hardwikia binata	*[illegible]*	*[illegible]*
Ficus religiosa	*Ficus religiosa*	*Ficus religiosa*
Acacia nilotica	*Ricinus communis*	*Ricinus communis*
Azadirachta indica	*Terminalia belerica*	*Terminalia belerica*
Terminalia arjuna	*Terminalia arjuna*	*Terminalia arjuna*
Delonix regia	*Delbergia sisoo*	*Delbergia sisoo*
Millettia pinnata	*Albizia lebbeck*	*Terminalia tomentosa*
Neolamarcka cadamba	*Schleichera oleosa*	*Albezia lebbeck*
Ficus benghalensis	*Millettia pinnata*	*Atrocarpus integrifolia*
Pithecellobium duice	*Ficus benghalensis*	*Mangifera indica*
Albizia procera	*Madhuca indica*	*Aegla marmelis*
Jacaranda mimosifolia	*Pterocarpus marsupium*	*Pterocarpus marsupium*

2. Construction check dams, retention / toe walls to arrest sliding down of the excavated material along the contour:

Drainage:

1. Contour trench of dimension 5m X 50cm X 50cm will be dug / created along the river side of Damodar River, nala and sloppy areas in the staggered manner along the contour.

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Series of check dams will be constructed at suitable locations on [illegible] Gully erosion, [illegible] loose check dams will [illegible]

[illegible] undertaken in the areas susceptible to soil erosion.

3. Proper Garland drains shall be made before every monsoon at the periphery of active edge of quarry and around dumps to prevent the surface rain water to enter the quarry.
4. Suitable drainage gradients will be provided for mine benches.
5. Sumps of adequate capacity will be provided on the quarry floor.
6. [illegible] situated over the coal bench top and will not be affected by water accumulation from rains or strata seepage.

Desiltation of Ponds/ water bodies within lease area.

The presence of silt in water bodies and ponds in coal mine areas can be attributed to various factors often related to mining activities and the surrounding environment. Here are some common causes of siltation in water bodies and ponds in coal mine areas:

Soil Erosion:

During coal mining operations, the removal of vegetation and topsoil can lead to increased soil erosion. Rainfall and surface runoff can carry eroded soil particles into nearby water bodies, causing siltation.

Overburden Handling:

The disposal of overburden (the soil and rock layers removed to access coal seams) can create large piles of loose material. Wind and water erosion can transport fine particles from these piles into water bodies.

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Mining Activities:

Excavation and blasting associated with coal mining can disturb the [illegible] Proper [illegible] Rapid [illegible].

The construction of access roads and haulage routes in coal mine areas can expose bare soil. Rainwater runoff from these surfaces can transport soil particles into water bodies.

Waste Disposal:

Improper disposal of waste materials, including coal dust and slurry, can result in the release of fine particles into water bodies, leading to siltation.

Lack of Vegetation:

The removal of vegetation during mining [illegible] the natural filtration capacity of the land. Vegetation helps stabilize soil and prevent erosion.

Stormwater Runoff:

Heavy rainfall events can wash sediment from exposed surfaces and mining areas into water bodies through storm water runoff.

Poor Erosion Control Measures:

Inadequate erosion control measures, such as silt fences, sediment ponds, and revegetation efforts, can fail to prevent soil from entering water bodies.

Infrastructure Development:

Infrastructure construction associated with mining operations, such as settling ponds and dams, can disturb natural drainage patterns and contribute to siltation.

Illegal Mining:

Unregulated or illegal mining activities may not implement proper erosion control and environmental management practices, exacerbating siltation problems.

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Natural Geology:

The geological characteristics of the area, including soil types and [illegible] bodies.

Climate Conditions:

Extreme weather events, such as heavy rainfall or storms, can lead to rapid sediment transport into water bodies.

Inadequate Water Management:

Poorly designed or maintained water management structures can fail to control sediment runoff effectively.

[illegible] control measures, sediment control structures, and revegetation efforts. Additionally, adequate measures will be undertaken by the CCL authorities for desilation of ponds and other water bodies falling within the lease boundary of Purnadih OCP at an interval of every 2 years.

3. Stabilization of overburden dumps by appropriate grading / benching:

- Dumping of top soil will be avoided at the bottom of the cut as it leads to in stability. Dumping of soil and clayey material will be done away from the working area, which is on farther end of the dump so that formation of weak planes is avoided.
- Afforestation by planting trees will help a lot in improving stability of dumps by preventing erosion.

Reclamation of overburden dumps:

- Stabilization of overburden dumps
- Construction of retaining walls
- Construction of drain for drainage

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- Provision of pit heads or facilitating places of vegetative growth on slopes
- [illegible]

- The degraded area will be reclaimed and rehabilitated with local species of plantation in a phased manner.
- Plantation will be carried out on waste dumps.
- The haulage roads will be planted by trees on either side; and
- A belt of trees with thick canopy will be created along the mine boundary to intercept dust, gaseous pollutants and noise.

f. Top Soil Management

[illegible] conservation to maximize environmental support and support reclamation efforts.

Here is a general method and process for topsoil management in open-cast coal mines:

Topsoil Stripping: Before mining operations begin, the topsoil in the mining area must be carefully removed and stockpiled separately. This topsoil contains valuable organic matter and nutrients necessary for plant growth.

Stockpiling Topsoil: Create designated topsoil stockpiles near the mining area to store the stripped topsoil. These stockpiles should be protected from erosion and contamination.

Mining Operations: Begin the coal mining operations, following all safety and environmental regulations.

Overburden Handling: Overburden (the soil and rock layers above the coal seam) should be removed and stored separately from topsoil to facilitate reclamation.

Topsoil Protection: Throughout the mining process, take measures to protect the stored topsoil from erosion, contamination, and compaction. Covering it with mulch or erosion control mats can help.

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Reclamation Planning: Develop a reclamation plan that outlines how and [illegible] will be used to restore the [illegible]

[illegible]

[illegible] vegetation.

Topsoil Application: The topsoil stockpiles are spread evenly over the reclaimed area to reintroduce the valuable organic material and nutrients. Proper grading and compaction are essential.

Vegetation Establishment: Plant native vegetation suitable for the local ecosystem. This helps stabilize the soil, prevent erosion, and restore the [illegible]

Monitoring and Maintenance: [illegible] vegetation growth, soil stability, and any signs of erosion. Make adjustments as necessary to ensure successful reclamation.

Involve local communities and stakeholders in the reclamation process, ensuring their concerns are addressed and that the reclaimed land serves their interests. It is essential to work closely with local authorities, environmental agencies, and experts to tailor the topsoil management and reclamation process to the unique characteristics of the area and the coal mine operation.

Prescriptions of Mine Closure Plan in this regard may be followed strictly.

Steps Taken by C.C.L. For Environmental Protection

1.) Dust Suppression

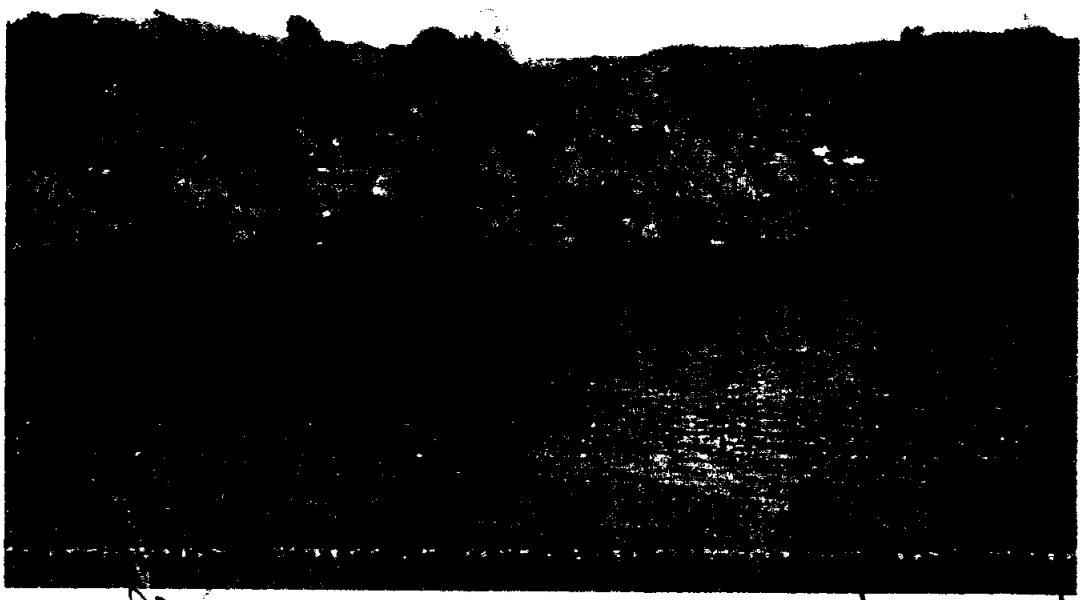
Water sprinkling system is provided at crushers and siding to check the fugitive emission of dust. Water sprinkling by mobile water tankers is also done at roads.

3.) Fixed water sprinklers have been installed at siding.

Adequate number of dust mask are been distributed to the personnel working in dusty areas.

2.) Rain water harvesting

Mine Sumps (~ 150 million gal capacity) are used for rain water harvesting purposes. Also rooftop rainwater harvesting system has been created in project office building. Rain water harvesting pit construction has been completed at ATC, NK area.



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Three Sedimentation tanks are provided to treat water. The water from these sedimentation tanks is used in water sprinkling

3.) OB Stabilization

Dense plantation on OB dumps has been done to prevent any overflow of OB into the river or nallah . Also there are no agricultural fields near KDH mine.

Construction of toe wall to prevent overflow of OB

All the OB generated during mining operation is being dumped in the decoaled quarry area. Also once the active dumps reached required height from the mine floor biological reclamation of the same is done.

The details of reclamation is as follows

Land Broken = 353 ha

Land used in infrastructure = 179.82 Ha

Technically Reclaimed area = 198 Ha (approximately)

Biologically reclaimed area = 185.88 Ha

Plantation in an area of 4.00 ha has been done in 2018-19

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4.)Catch drains and siltation ponds

Catch drains are constructed near the OB dumps .The drains are regularly cleaned Catch drains are being constructed and siltation ponds are provided. 1 mine sumps with a combined capacity of about 70 million gallon and high water retention time have been developed in the mines. The project has also constructed 3 artificial sedimentation tanks for treatment of wastewater. The treated water is then used in water sprinkling system in the railway siding

5.) Plantation

Progressive plantations in consultation with forest department of Jharkhand is carried out. However more plantations will be done throughout the life of the mine . Plantation around 6.6 km roads have been done in the project. . Plantation over embankment has been done. Length of embankment is about 1.2 km.

6.) Air quality monitoring

Monitoring of environmental parameters are done every fortnightly by CMPDIL. Monitoring stations at PO office, Bhooth Nagar Colony, Water

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Tanker Filling Station, Karkatta Village, Bishrampur Village and KDH siding colony has been established. Fortnightly analysis of environmental parameters consists of these stations.

7.) Noise Pollution

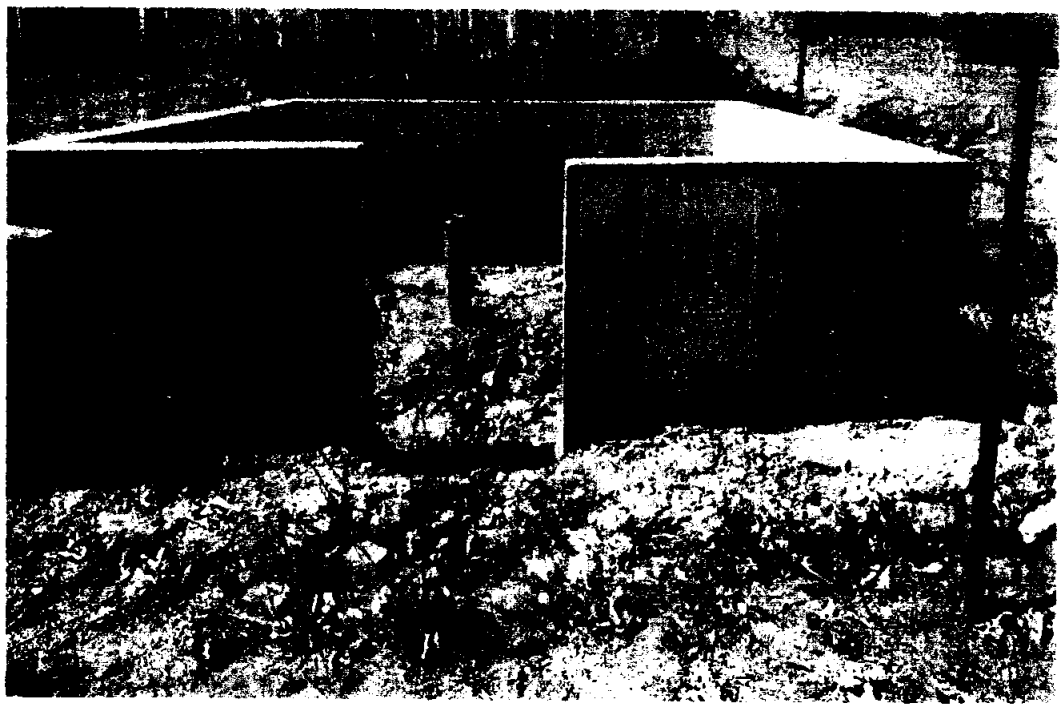
Adequate measures for control of noise pollution have been taken. Ear muffs are continuously been distributed to the personals.

Also Noise level data is being monitored in the core zone.

8.) Groundwater Monitoring

Regular monitoring of the underground water level is being carried out by a network of existing wells and peizometers

New peizometers are being installed as required in and around the core and buffer zone.



9.) Compensatory Afforestation

Plantation is done on the area through out the life of mine. Also project has submitted CA and NPV amount to state government for restoration of waste lands

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The cost of Compensatory afforestation has been deposited as per details below.

Item	Amount
Compensatory Afforestation	Rs 1449300.36
Compensatory Afforestation	Rs 42,83,572 DD no 079234 dated 23.10.2006
Cost of Forest Produce	Rs 4,22,961 DD no 593513 dated 23.10.2006

Equivalent forest land has been identified in Gir's District by the user agency for compensatory land. The land has already been notified as forest land vide forest office order no 7F dated 3.01.97.

The cost of afforestation on degraded forest land including Fencing, Protection and regeneration of safety zone area has been deposited as per details below

Item	Amount	Details
Regeneration and fencing, protection of safety zone.	Rs 1215000 + Rs 521,416.47 Total Rs 1736416.47	Cheque no 989961 dated 27.11.1993 and cheque no 450876 date 21.05.1996
NPV	Rs 14704450	

10.) Occupational Health

Health checkup is being done by Central Hospital dakra and Gandinagar Hospital Ranchi.

PMH for all the work force at regular intervals are being done at central hospital Dakra. In the year 2022, PMH of 745 employees of NK Area had been done in calendar year 2022.

11.) Industrial wastewater

An ETP has been constructed in workshop for treatment of effluents. The ETP has a closed water circuit. The treated water is recycled for washing of HEMMs in the workshop.

12.) Vehicular Emission

Vehicular emissions are kept under control. The mineral transporting vehicles are optimally loaded and covered with tarpaulins.To prevent dust emission 5 mobile water tankers of 28 KL are deployed in KDH mine. Also to stack water sprinklers have been installed in the siding.

Proposed interventions by Project Proponent for to mitigate adverse impact in Project Area by CCL

Mitigation Measures for soil erosion in slop of embankment by planting grass:

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Territorial Circle, Ranchi

Mitigation Measures for water pollution:

1. The sewage will be treated appropriately.
2. [illegible] treated from before reuse.
3. No disposals of cut spoils in to gullies or watercourses.
4. A waste disposal site should be away from water bodies.

Mitigation measures for Noise Pollution:

Machinery and vehicles are maintained regularly with particular attention paid to silencers and mufflers to keep noise levels to minimum.

Mitigation Measures for ground vibration:

1. [illegible] should be taken to maintain to prevent negative impacts [illegible]
2. The vibrations can be reduced considerably by ensuring and keeping correct road geometry by advanced measurement.
3. Effective maintenance programs are essential for controlling ground borne vibrations.
4. Controlling noise vibration at the source.
5. Proper maintenance of excavation equipments.

Mitigation Measures for Air Pollution:

1. All coal transport vehicles should be maintained to minimise toxic emissions.
2. Placing of dust arresters and water sprinklers surrounding the mining area will prevent dispersion of the dust to a great extent.
3. Spray water on the stones while unloading from the truck/dumper.
4. Spray water at the transfer points from one belt conveyor to another
5. Regular cleaning and wetting of the ground should be facilitating.
6. Mulched green wastes temporarily laid over the stockpile and removed when required and retained for later landscaping purposes.

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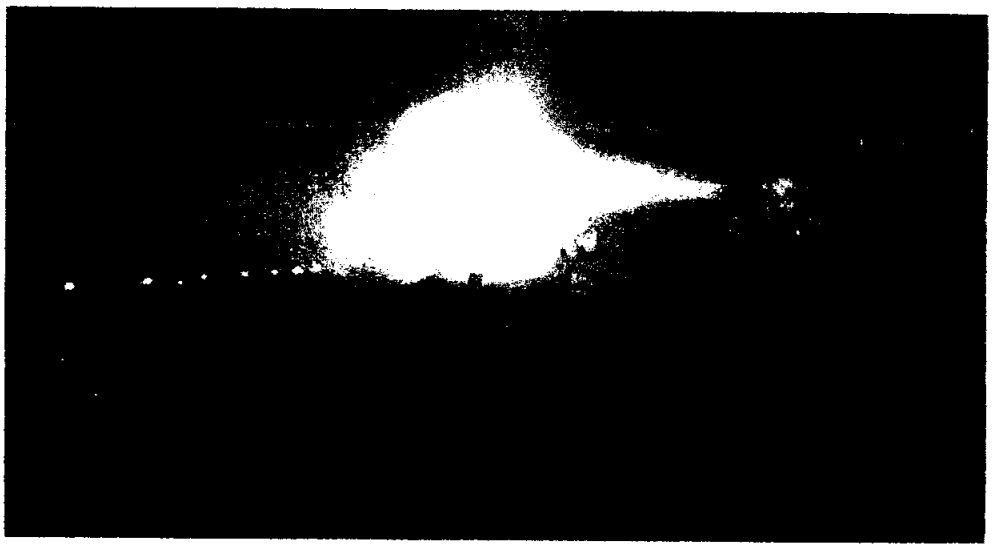

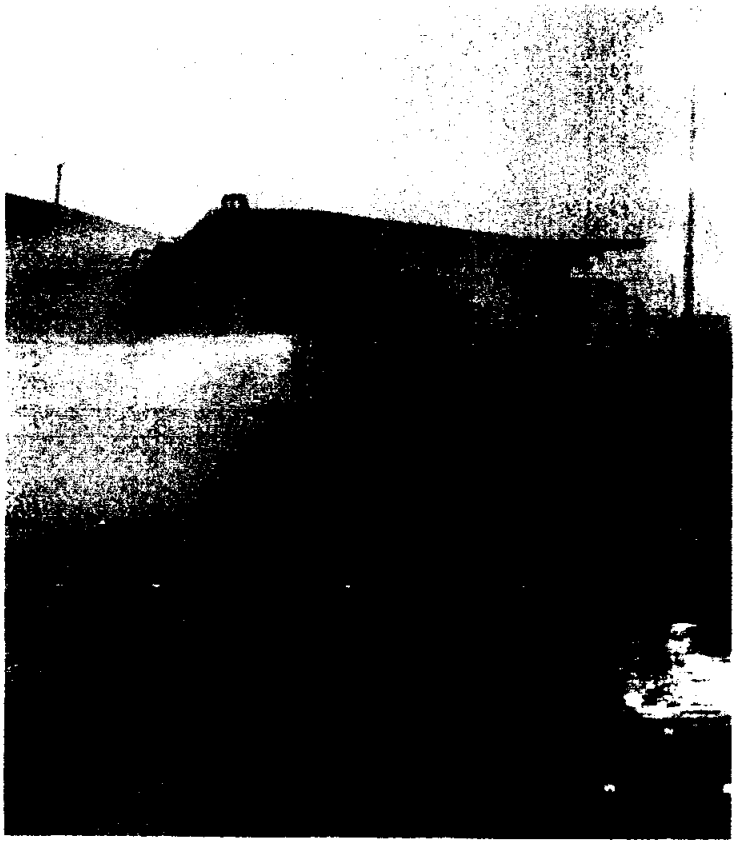

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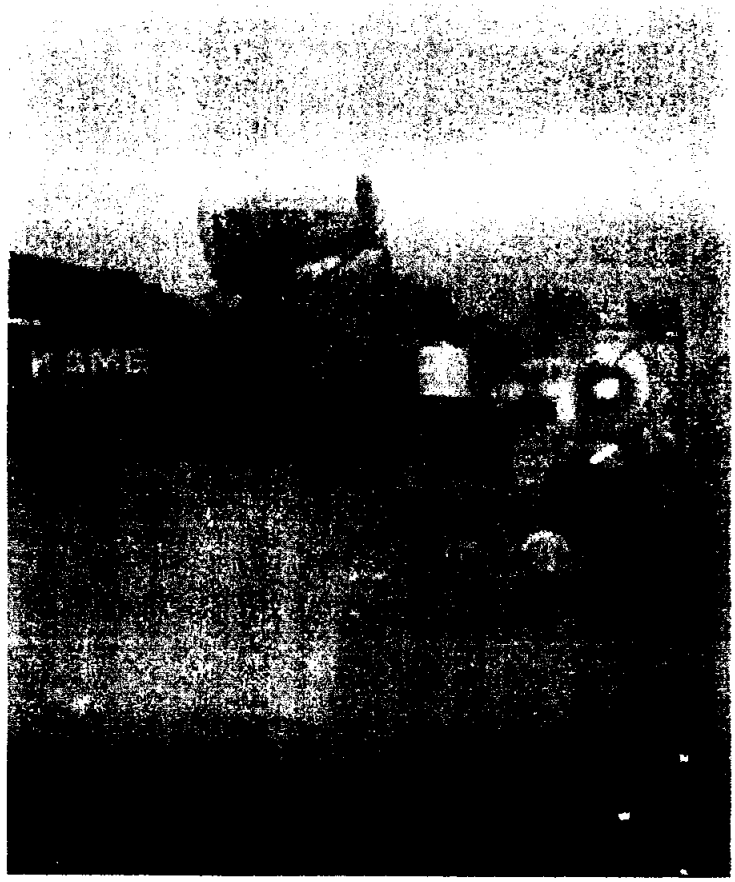
Project



परियोजना पदाधिकारी
के०डी०एच० परियोजना

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Forest Division, Ranchi

Conservator of Forests
Territorial Circle, Ranchi

CHAPTER - IV

Proposed Strategies and Strategies within the identified project impact zone (Buffer area)

IV-a. Approach and Work Carried Out

A detailed survey was carried out in the area, which are within the geographical boundary of Ranchi Forest Division and in the radius of 10 km of the Project Area. It included - Selection of appropriate satellite imagery and procurement, development desired maps with appropriate GIS tools, demarcation of buffer zone, conducting discussion and interaction meeting with [illegible] including the forests [illegible] collection of [illegible] conservation and PRA/MP of the KDH OCP along with scrutiny of the Working Plan of Ranchi Forest Division. Baseline survey was done under supervision of Mr. Sanjay Kumar Sinha, Retd.IFS, Mr. Premjit Anand, Retd. IFS and Sri Sitaram Bhagat, Retd. Assistant Conservator of Forest. Teams were constituted for doing detailed village survey on various parameters and complete survey of 21 villages in the buffer area, was carried out. Field visits were done by the DFO, Ranchi Forest Division and with RFO, Burmu to analyse the scope and suitability of mitigation measures to be implemented. The Period of Field study was limited to July'2023 to August'2023 during which various teams carried exhaustive and parallel study.

IV-b. Interventions in the project impact area by the forest department:

Objectives of the proposals made in the Soil & Moisture Conservation Plan for the project impact zone:

- To mitigate soil erosion through engineering & biological methods
- To provide safe spill over of excess water from Impact Area to relatively rich neighbouring forest areas and water bodies.

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- [illegible] and improve soil fertility
- [illegible] conservation, [illegible] vegetal cover and water [illegible]
- [illegible]
- To [illegible] the health of water [illegible] and encourage its conservation measures
- To create green belt to mitigate wind & noise pollution.
- Treatment of riverside to check soil erosion
- [illegible] awareness camps
- [illegible]

[illegible]

Soil and Moisture conservation approach includes action to protect environment by implementing time tested and suitable forestry and allied schemes. It provides the remedial solutions of the problem, which is assessed by the data collected from the environmental impact evaluations and primary data collected by survey conducted in the villages of impact area. It also takes into account the existing scenario before implementation of the project vis-a-vis of the future scenario due to industrial activities. The proposed interventions are based on the following assumptions:

i. For all measures discussed in this chapter, interventions are to be implemented by the DFO, Ranchi Forest Division. The financial requirement of various interventions suggested by the DFO Ranchi Forest Division in the plan as per current costs is given in flowing table, attached at the end of this chapter, for the plan period of 10 years.

ii. Location of the proposed interventions will be decided by the DFO, Ranchi Forest Division at the time of implementation.

Project Cost: Total Project cost of KDH OCP is Rs. 30,01,00,000/-. As Per [illegible] dated Feb 2011 of Nov 2011 premium Lumpsum [illegible] Divisional Forest Officer, Ranchi Forest Division, Ranchi Conservator [illegible]

IV-d. Financial outlay of SMC works proposed in KDH OCP of CCL under Ranchi Forest Division

(Components of work)

Sl. No.	Components	Total (Rs. in Lakhs)
A.	Vegetative Control of Soil & Water Erosion	514.61
B.	Improvement of water regime and its maintenance	1727.82
C.	Awareness generation, Training and development of alternate livelihoods	248.00
D.	Photography & documentation	20.00
	Total Cost	**2510.43**
	Escalation @20% over 10 year plan period	**469.87**
	Contingency	20.00
	Grand Total	**3000.30**

IV-e. Detailed Budgetary Description:

A. Vegetative Control of Soil & Water Erosion:

(i) River Side Plantation (a. Advance Work, b. Completion & Maintenance): River Damodar flows at North – Western part of the project area. It is proposed to undertake 4 (Four) kilometres length of this river under River Side plantation in 1st year 2 kilometres and 2nd year 2 kilometres of the Plan

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[illegible] maintenance. [illegible] is already in [illegible] Forest Department [illegible] [illegible] [illegible]

[illegible] with a budget of Rs. 559.12 lakhs [illegible] & [illegible]

[illegible] adopted.

(ii) **Construction of pucca check dams:** The check dams are constructed to store the water and conservation of soil erosion. As even the forest also acts like the dams, even this also helps in conservation of soil erosion as heavy rainfall occurs the excessive rain water will be absorbed through root of trees and percolates in ground which increases underground water. The stored water will also be a good [illegible] constructed at suitable locations @ Rs. 10.00 lakhs per check dam **Rs. 150.00 lakhs** have been earmarked for this purpose.

Tentative Location with GPS coordinates of proposed site of check dams have been enlisted in Chapter –V.

(iii) **Creation of new Ponds**

Creation of ponds will facilitate rain water harvesting and water percolating inside the ground will help in ground water recharge. Ponds will be used by wild animals and villagers. It may also be used for fishery purpose. Each pond is of dimension 100'x100'x15' costing Rs. 5.00 lakhs per pond. It is proposed to dig total 30 ponds (1st yr. 10 ponds, 2nd yr 10 pond, 3rd yr 5 pond 4th yr 2 pond & 5th year 2 ponds). **Rs. 150.00 lakhs** have been proposed for this component.

Tentative List of ponds with G.P.S. coordinates has been enclosed in Chapter- V.

(iv) **Contour cutting along both side of Sonadubi Nala:** It has been proposed make contour trench in staggered manner in 5 kilometre (5

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Rs. 6.92 lakhs has been proposed for this component.

(v) Desiltation of Sonadubi Nala: Sonadubi nala flows through south western part of the outer boundary of KDH OCP. This nala is choked badly due to mining and allied activities. Though it is a perennial source of water but dee to siltation its course is choked. Recently local villagers had expressed their concern over it and demanded for [illegible] of Sonadubi Nala. Prescription of public demonstration has been enclosed in Chapter [illegible] It is proposed to desilt this nala by mechanical method with the use of JCB Poklen machines. In 1st year Rs. 50.00 lakhs and in 2nd year 50.00 lakhs, total **Rs 100.00 lakhs** have been proposed for desiltation of Sonadubi Nala.

(vi) **Construction of loose boulder check dam with wire mesh along Sonadubi Nala:** It has been proposed to construct 10 loose boulder check dams in Sonadubi nala in a series at suitable intervals at a cost of Rs. 6.00 lakh per check dam. These check dams will arrest silt flowing in nala during rainy season and also flowing of silt due to mining and allied activities. **Rs. 60.00 lakhs** has been proposed in the plan for this component.

(vii) **(a)Establishment of Hi-Tech Nursery:** It has been proposed to establish a Hi-Tech nursery at suitable place to cater requirement of planting materials for soil enrichment activities from time to time. **Rs. 360.32 lakhs** have been proposed for this component. Detailed estimate for Hi-Tech Nursery has been enclosed in **Chapter – V.**

(v) **Operation & Maintenance of Hi-Tech Nursery:** Regular [illegible] weeding, scarifying of germination pots, soil & [illegible] [illegible] of germinated [illegible] [illegible] plantation, disease & pest control & sprinkler irrigation of Hi-Tech Nursery. To meet these expenses **Rs. 48.00 lakhs** has been proposed in the Plan. From 3rd year to the 10th year Rs. 6.00 lakhs will be spent every year on this component.

(viii) **Treatment of Degraded Forest Land by adopting Yadadri Model:** As a pilot project it has been proposed to treat 5 ha area every year in [illegible] period. Rs. 28.00 lakhs [illegible] [illegible] [illegible] Chapter – V.

(ix) **Deployment of team of Jal – Mitra:** It has been proposed to deploy team of 5 Jal – Mitras consisting of local people to encourage and promote Soil and Moisture conservation activities in and around the KDH Out Area. Field tool kits will also be provided to them. Every year Rs. 6.25 lakhs has been proposed for this purpose for entire 10 year Plan Period. Total **Rs. 62.50 lakhs** has been proposed for this component in the Plan.

C. Awareness Generation, Training and Development of alternate livelihoods:

(i) **Organising awareness camps in local villages to address soil & water conservation:** At village level Awareness Programme will be organised to address the issue of conservation of soil & water. For this purpose, village level camps / meetings / Nukkad – Natak will be organised. An expenditure of Rs. 5.00 lakh will be incurred annually

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for 10 years. Total budget of **Rs. 50.00 lakhs** have been proposed for the activity.

(ii) Planting of Fruit bearing plants & grasses:

Fruit bearing plants & grasses like Bamboo, Kusum etc. will be planted. Soil & Moisture conservation are proposed to create awareness among local people regarding Soil & Moisture conservation in the area. Every year Rs. 1.00 lakh will be spent every year during 10th year Plan Period. Total amount of **Rs. 10.00 lakhs** have been proposed for this purpose.

(iii) **Organising workshop** at district level to address Soil & Moisture Conservation issues at regular interval. It has been proposed to organise [illegible] to address issues of Soil & Moisture conservation [illegible] and suggest corrective and mitigative measures. **Rs. 18.00 lakhs** has been proposed for this purpose. Year wise break up of costs are: 1st year Rs 5.00 lakhs, 3rd year Rs.5.00 lakhs, 5th year Rs. 3.00 lakhs, 6th year Rs. 3.00 lakhs and 7th year Rs. 2.00 lakhs.

(iv) **Training of frontline forest staffs:** It has been proposed to organise training programme for frontline forest staffs to address Soil & Moisture conservation issues in the around mining and adjoining villages. Every year Rs. 2.00 lakhs will be spent for this purpose for entire plan period of 10 years. Total budget of **Rs. 20.00 lakhs** have been proposed for this component.

(v) **Skill development training for development of alternate livelihoods:** It has been proposed to impart training to local people for development of alternate livelihood such as Bee Keeping, Mushroom Cultivation, Poultry Farming, distribution of sewing machines etc to improve their income and reduce their dependence of forest resources. Every year Rs. 10.00 lakhs will be spent for this purpose for entire plan

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period of 10 years. Total budget of **Rs. 100.00 lakhs** have been proposed for this component.

- Energy Use & Water Conservation: Signage at vulnerable locations [illegible] proposed to be fixed at vulnerable locations. It will generate awareness among local people. Expenditure of **Rs. 5.00 Lakhs** will be incurred every year during entire 10 year plan period. Total amount of **Rs. 50.00 lakhs** have been proposed for this purpose.

D. Photography & Documentation:

Photograph of all the components of the plan will be taken before [illegible] and after the work completion. A report will be submitted to the PCCF (HoFF), Additional PCCF CAMPA, Regional CCF Ranchi and Conservator of Forest, Territorial Circle, Ranchi. Every year Rs. 2.00 lakhs will be spent for this purpose. **Rs. 20.00 lakhs** have been proposed for this purpose.

Escalation of Budget: The total amount proposed in the plan is likely to vary due to inflation rate, revision of wage rates and other factors. The overall escalation is estimated 10% of total amount proposed for the intervention **Rs. 469.87 lakhs** have been proposed in the budget as 20% escalation in cost.

Contingency Fund

To meet unforeseen expenses a contingency fund of **Rs. 20.00 Lakhs** are proposed. Its expenditure will be incurred by DFO Forest Division Chatra South as per management and implementation requirements of this plan.

III-f. Location, with GPS coordinates, and maps of the areas of proposed interventions along with the location of man-made infrastructure:

Tentative Locations with GPS coordinates of manmade infrastructures to be created under this plan have been annexed in Chapter V. ***However at the***

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time of implementation of Plan the DFO may alter the site according to the requirements and local circumstances.

III-g. The monitoring of activities and progress shall be done periodically by an internal agency [illegible] as per CAMPA guidelines and as per the direction of Additional PCCF CAMPA, Regional CCF Ranchi and Conservator of Forest Territorial Circle, Ranchi.

III-h. Plan period, initially for 10 years with scope for interim reviews and required modifications.

Financial resources and financial outlay for the plan period to be broken into [illegible] **under the guidance of Additional PCCF CAMPA and Regional CCF Ranchi.** During the review of the Plan if there will be involvement of additional cost/budget, the user agency will bear the additional cost. An undertaking in this regard may be obtained from the user agency.

There is a separate table in the Chapter – V showing cumulative total budget of interventions proposed for project impact area.

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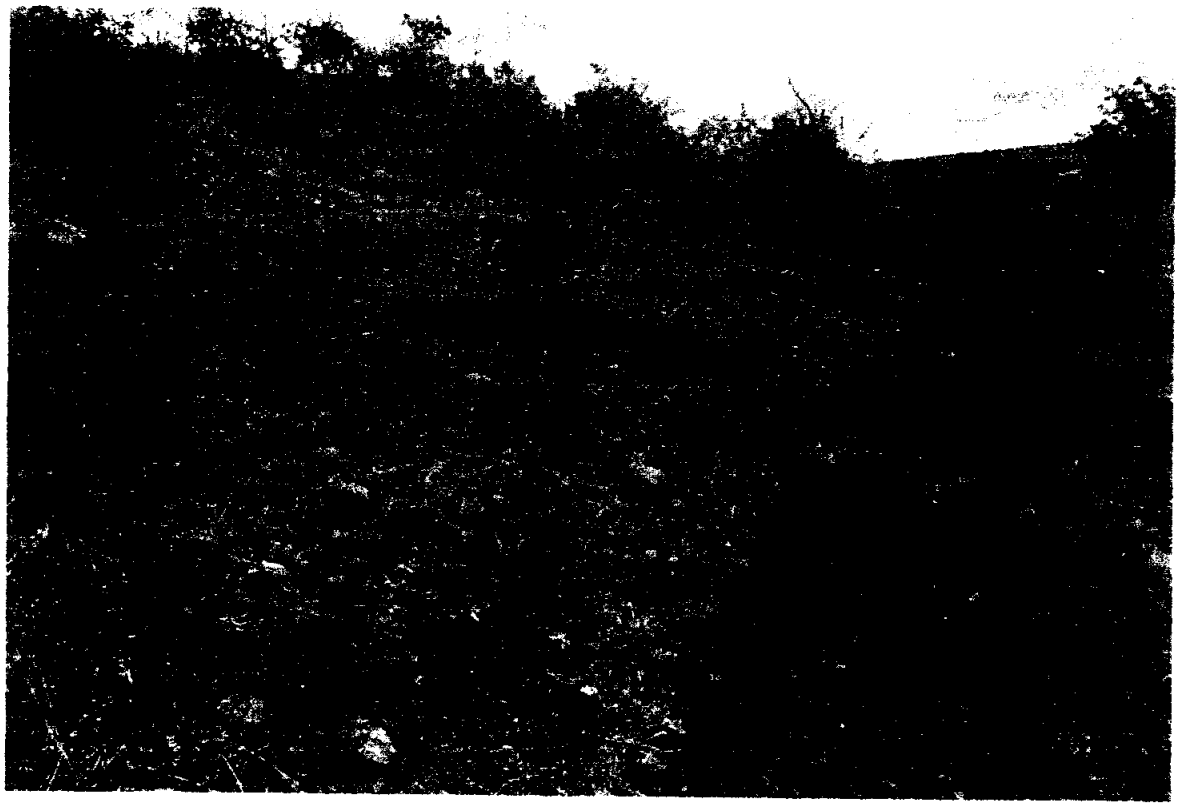
कोडरमा परियोजना

Impact on Soil Erosion, Topography and Drainage due to Coal Mining



Control measures to arrest soil erosion & choking of streams by contour cutting

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Circle, Ranchi

FINANCIAL FORECAST OF THE ACTIVITIES TO BE IMPLEMENTATED BY FOREST DEPARTMENT UNDER SOIL & MOSTURE CONSERVATION PLAN OF KDH OCP OF CCL

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
A	[illegible]											
(I)	[illegible]											
(a)	Advance Work of River Side Plantation 4 kilometers (2 km 1st year & 2 km 2nd year) kilometer along Damodar River as per SOR of Addl. PCCF Development)	25.29	25.29	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	50.58
(b)	Completion / Maintenance of river side plantation	0.00	3.63	7.87	8.88	6.85	3.88	3.59	1.92	0.00	0.00	36.62
(ii)	(a)Plantation around project area: Multi row plantation of draught hardy species with barbed wire fencing 7.5 m x 5000 m (3.75 ha) (1st year 5000 m & 2nd year 5000 m)	55.86	55.86	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	111.72
	(b) Maintenance of Multi row plantation	0.00	10.65	15.31	8.95	12.7	8.80	[illegible]	0.00	0.00	0.00	57.02
(iii) a	Roadside plantation with bamboo gabion (4000 gabion 1st year & 2nd year each)	50.67	50.67	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	101.34
(iii) b	Maintainance of bamboo gabion plantation	0.00	26.84	51.17	51.82	27.49	0.00	0.00	0.00	0.00	0.00	157.33
B	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
(i) a.	Advance Work for Silviculture Operation scheme as per SOR of PCCF Development order 26 dated 06.06.2019. Total area of 800 ha(1st yr 400 ha, 2nd yr 200 ha & 3rd yr 200 ha)	279.56	139.78	139.78	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	559.12
(i) b.	Completion & Maintenance of Silviculture Operation Scheme	0.00	53.78	48.09	58.69	21.20	21.20	[illegible]	0.00	0.00	0.00	202.96
(ii)	Construction of Pucca Check dam (15 @ Rs 10 lakh each), 1st year 5, 2nd year 5 & 3rd year 5 check dam	50.00	50.00	50.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	150.00
(iii)	Creation of new ponds (Size 100'x100'x15') 30 ponds (1st yr. 10 ponds, 2nd yr 10 ponds, 3rd yr 5 ponds, 4th	50.00	50.00	25.00	15.00	10.00	0.00	[illegible]	0.00	0.00	0.00	150.00
(iv)	Contour cutting in staggered manner along both side of Sonadubi Nala (5 km both side= 10 km X 20 metre) 20 ha @ 100	6.92	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	6.92
(v)	Desiltation of Sonadubi nala	50.00	50.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	100.00

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ANNEXURE

(vi)	Construction of loose boulder wire mesh check dam or any other check dam in a series in Sonadubi nala (10 check dams @ 6 lakhs each	0.00	60.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.00
(vii) a.	Establishment of Hi-Tech Nursery to cater requirement of planting materials for soil enrichment activities from time to time (As	0.00	360.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	360.32
(vii) b.	Operation, maintenance and recurring cost of Hi-Tech nursery	0.00	0.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	48.00
(viii)	Treatment of degraded forest land by adopting Yadadri Model as per estimate (5 ha 1st year & 5 ha 2nd year)	14.00	14.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.00
(ix)	Deployment of team of 5 Jal Mitra to encourage & promotion of SMC activities and provision for field kits @ Rs. 1.25 lakhs per Jal Mitra	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	62.50
	Sub-total	468.25	784.13	278.12	89.81	89.81	73.46	73.46	73.46	73.46	73.46	2077.62
C.	Awareness Generation, Training, Research and development of alternate livelihood opportunities											
(i)	Organizing awareness camps in local villages to address soil & water conservation,biodiversity & environment issues	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	50.00
(ii)	Printing of booklets, pamphlets & banners regarding Forest, Soil & Moisture conservation	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(iii)	Organizing workshop at district level to address Soil & Water Conservation issues in the Coal Mining area	5.00	0.00	5.00	0.00	3.00	3.00	0.00	0.00	0.00	0.00	18.00
(iv)	Training of frontline forest staff regarding soil and moisture conservation issues	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
(v)	Skill development training for development of alternate livelihoods such as Bee Keeping, Mushroom Cultivation, Poultry Farming, Distribution of Sewing Machines	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	100.00
(vi)	Fixing of Soil & Water Conservation and Biodiversity Awareness Signage at vulnerable locations	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	50.00
	Sub-total	28.00	23.00	28.00	23.00	26.00	26.00	23.00	23.00	23.00	23.00	248.00
D.	Photography and Documentation											
a.	Photography and Documentation	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
	Sub-total	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
	Escalation @20%	742.26	1146.28	455.96	216.68	142.19	89.11	51.41	47.00	44.70	44.70	2980.30
	Contingency (L.S.) for unforeseen expenses @ Rs 2.00 lakhs per year	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
	Grand Total Year wise	744.26	1148.28	457.96	218.68	144.19	91.11	53.41	49.00	46.70	46.70	3000.30
											Grand Total	

ANNEXURE - II

8-42/2016-FC

Government of India
Ministry of Environment, Forest and Climate Change
(Forest Conservation Division)

Indira Paryavaran Bhawan,
Jor Bagh Road, Aliganj,
New Delhi - 110003
Dated: 27th February, 2023

The Principal Secretary (Forests),
Government of Jharkhand
Ranchi

Sub: Proposal for non-forestry use of 126.72 ha (84.35 ha PF and 42.37 ha Jungle Jhari) of forest land for KDH Open Cast Mine in favour of M/s Central Coalfields Limited (CCL) in Ranchi District, Jharkhand - reg

Sir/Madam,

I am directed to refer to the Government of Jharkhand's letter No. [illegible] dated 22.04.2022 and letter No. Vanbhumi-06/2017-[illegible] dated 20.09.2022 seeking prior approval of the Central Government under Section 2 of the Forest (Conservation) Act, 1980 and subsequent letter dated [illegible] and letter No. Vanbhumi-06/2017-[illegible] dated 20.09.2022 forwarding additional information as sought by this Ministry vide its letter dated [illegible] and [illegible] respectively and to say that the proposal has been considered by the Forest Advisory Committee constituted by the Central Government under Section 3 of the said Act.

2. After due examination of the proposal, the State Government and the Nodal Officer of the Forest Advisory Committee, and approval of the same by the Regional Office (ER) Kolkata, the Central Government hereby accords approval under the provisions of Stage-I (in principle) approval under Section 2 of the Forest (Conservation) Act, 1980 for diversion of 126.72 ha (84.35 ha PF and 42.37 ha Jungle Jhari) of forest land in favour of M/s Central Coalfields Limited (CCL) for Ranchi Project for coal mining subject to the following conditions:

A. Conditions which need to be complied prior to handing over of forest land by the State Forest Department and compliance is to be submitted prior to Stage-II approval:

i. As per the approved Mining plan an additional forest area of [illegible] ha is required for the [illegible] of the project. However, the instant proposal has been submitted for [illegible] excluding the area of 9.19 ha forest land which as per approved mining [illegible] is safety zone. The State government shall ensure that the Mining [illegible] the diversion of the 9.19 ha. for the purpose of safety zone.

ii. The user agency shall submit a detailed status report of the approvals under the Mines Act, 1952 and other laws in the entire lease area. The forest area for which approval under the F.C.A., 1980 is not available shall not be used before obtaining such approvals from the competent authorities.

iii. The cost of compensatory afforestation, the penal afforestation, NPV, the cost of [illegible] and the cost of [illegible] and other charges as per the rates prescribed by the State Government in this regard shall be deposited by the user agency [illegible] the State Government, before the approval is given.

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Scanned with OKEN Scanner

[illegible]

[illegible]

3. [illegible] NPV [illegible] being charged under the provisions in accordance with the Hon'ble SC/ guidelines dated 5.01.2022 read with guidelines dated 19.01.2022.

5. [illegible] fees to be received from the User Agency under this project shall be transferred/deposited through e-challan only to the account of CAMPA pertaining to the State [illegible] through e portal (https://parivesh.nic.in).

6. The State Government shall complete settlement of rights in lieu of the Scheduled Tribes and other traditional Forest dwellers (Recognition of Forest Rights) Act, 2006 if any [illegible] and ensure the acquisition by undertaking [illegible] Rehabilitation and Resettlement, this Ministry's letter No. [illegible] dated 30.7.2010 as applicable.

7. [illegible] proposal for diversion of forest land for mining projects, the project proponent shall [illegible] and shall be responsible for [illegible] of such lakes and bodies. A detailed plan for the [illegible] project with water bodies proposed in consultation with forest department shall be [illegible].

8. [illegible] Ministry's Parivesh portal [illegible] details [illegible].

9. [illegible]

B. Conditions which need to be complied on field after handing over of forest land to the user agency by the State Forest Department but the compliance in form of undertaking shall be submitted prior to Stage-II approval.

1. [illegible]
2. *Wildlife Management plan shall be prepared and implemented at the cost of the user agency. The approved Wildlife management plan shall be submitted and the applicable cost shall be deposited as per the guidelines issued by the Ministry vide [illegible].*
3. [illegible] and double the [illegible] by the State Forest Department at the cost of the user agency, [illegible] Stage-II approval.
4. As the [illegible] payment of the Net Present Value (NPV), at the prescribed rate [illegible] the Hon'ble Supreme Court in its order dated 30.10.2002 in the matter of T.N. Godavarman Vs. Union of India, the additional amount of NPV is to be paid by the user agency to the State Government at the stage of Stage-II approval.
5. [illegible] of trees [illegible] shall be [illegible] of trees proposed to be felled and ensure that any tree felling shall be done only when it is unavoidable and shall be carried out [illegible] of the State Forest Department.
6. [illegible] for the [illegible] Ministry's [illegible] dated 30.10.2002.

परियोजना प्रतिनिधि
कोडरमा/हजारीबाग

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Conservator of Forests
Ranchi Circle, Ranchi

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vi. Safety Zone Management: Following all the provisions of Explosives Rules, 2008 and DGMS circulars for the management of safety zone as per the guidelines issued vide DGMS guidelines.

The project proponent shall ensure demarcation of safety zone (500 meters) around the mining lease area and its fencing, plantation and vegetation by planting adequate number of 6 feet high RCC boundary pillars erected with DGPS co-ordinates and barbed wire fencing and deploying adequate number of security guards under the supervision of the State Forest Department.

The safety zone of the mining lease area should not be used for any other purpose and should be maintained as green belt and no mining activity should be carried out in the safety zone.

The project proponent shall obtain prior permission from the State Forest Department for diversion of forest land for non-forest purpose under the Forest (Conservation) Act, 1980 and Rules made thereunder.

The project proponent shall comply with all the conditions stipulated by the PCB vide its CTE & CTO while granting consent under the Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974.

The project proponent shall comply with the provisions of Mines Act, 1952 and Mines Rules, 1955 and Metalliferous Mines Regulations, 1961 and the directions issued by the Directorate General of Mines Safety from time to time.

The project proponent shall comply with the provisions of Mines and Minerals (Development & Regulation) Act, 1957 as amended in 2015 and Mineral Conservation and Development Rules, 2017 and the directions issued by the Indian Bureau of Mines from time to time.

The project proponent shall comply with the provisions of Explosives Act, 1884 and Explosives Rules, 2008 and the directions issued by the Chief Controller of Explosives from time to time.

The project proponent shall comply with the provisions of Petroleum Act, 1934 and Petroleum Rules, 2002 and the directions issued by the Petroleum and Explosives Safety Organization (PESO) from time to time.

The project proponent shall comply with the provisions of Factories Act, 1948 and Factories Rules, 1950 and the directions issued by the Chief Inspector of Factories from time to time.

The project proponent shall comply with the provisions of Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Central Rules, 1998 and the directions issued by the Labour Welfare Commissioner from time to time.

The project proponent shall comply with the provisions of Motor Vehicles Act, 1988 and Central Motor Vehicles Rules, 1989 and the directions issued by the Regional Transport Authority from time to time.

The project proponent shall comply with the provisions of Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979 and Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Central Rules, 1980 and the directions issued by the Labour Welfare Commissioner from time to time.

The project proponent shall comply with the provisions of Child Labour (Prohibition & Regulation) Act, 1986 and Child Labour (Prohibition & Regulation) Rules, 1988 and the directions issued by the Labour Welfare Commissioner from time to time.

The project proponent shall comply with the provisions of Contract Labour (Regulation & Abolition) Act, 1970 and Contract Labour (Regulation & Abolition) Central Rules, 1971 and the directions issued by the Labour Welfare Commissioner from time to time.

The project proponent shall comply with the provisions of Workmen's Compensation Act, 1923 and Workmen's Compensation Rules, 1924 and the directions issued by the Labour Welfare Commissioner from time to time.

The project proponent shall comply with the provisions of Payment of Wages Act, 1936 and Payment of Wages Rules, 1937 and the directions issued by the Labour Welfare Commissioner from time to time.

The project proponent shall comply with the provisions of Minimum Wages Act, 1948 and Minimum Wages Rules, 1950 and the directions issued by the Labour Welfare Commissioner from time to time.

The project proponent shall comply with the provisions of Payment of Bonus Act, 1965 and Payment of Bonus Rules, 1975 and the directions issued by the Labour Welfare Commissioner from time to time.

The project proponent shall comply with the provisions of Payment of Gratuity Act, 1972 and Payment of Gratuity Rules, 1972 and the directions issued by the Labour Welfare Commissioner from time to time.

The project proponent shall comply with the provisions of Employees' Provident Funds and Miscellaneous Provisions Act, 1952 and Employees' Provident Funds Scheme, 1952 and the directions issued by the Regional Provident Fund Commissioner from time to time.

The project proponent shall comply with the provisions of Employees' State Insurance Act, 1948 and Employees' State Insurance (General) Regulations, 1950 and the directions issued by the Regional Director, Employees' State Insurance Corporation from time to time.

The project proponent shall comply with the provisions of Maternity Benefit Act, 1961 and Maternity Benefit Rules, 1963 and the directions issued by the Labour Welfare Commissioner from time to time.

The project proponent shall comply with the provisions of Equal Remuneration Act, 1976 and Equal Remuneration Rules, 1976 and the directions issued by the Labour Welfare Commissioner from time to time.

The project proponent shall comply with the provisions of Industrial Disputes Act, 1947 and Industrial Disputes (Central) Rules, 1957 and the directions issued by the Labour Welfare Commissioner from time to time.

The project proponent shall comply with the provisions of Industrial Employment (Standing Orders) Act, 1946 and Industrial Employment (Standing Orders) Rules, 1946 and the directions issued by the Labour Welfare Commissioner from time to time.

The project proponent shall comply with the provisions of Trade Unions Act, 1926 and Trade Unions Regulations, 1927 and the directions issued by the Labour Welfare Commissioner from time to time.

The project proponent shall comply with the provisions of Industrial Employment (Standing Orders) Act, 1946 and Industrial Employment (Standing Orders) Rules, 1946 and the directions issued by the Labour Welfare Commissioner from time to time.

The project proponent shall comply with the provisions of Trade Unions Act, 1926 and Trade Unions Regulations, 1927 and the directions issued by the Labour Welfare Commissioner from time to time.

Conservator of Forests
Territorial Circle, Ranchi

परियोजना प्रबन्धिकारी
के०डी०एच० परियोजना

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No. 62, 2018 FC

Yours faithfully,

(Sureet Bhardwaj)

Copy to

परियोजना प्रबन्धक
के०डी०एच० परियोजना

Conservator of Forests
Territorial Circle, Ranchi

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FLORA OF RANCHI FOREST DIVISION

S.NO	LOCAL NAME	BOTANICAL NAME	FAMILY	HABIT
1.	Babul	*Acacia Arabica*	Mimosaceae	Tree
2.	Khair	*Acacia catechu*	Mimosaceae	Tree
3.	Arar	*Acacia pennata*	Mimosaceae	Climber
4.	Chirchiti	*Achyranthus aspera*	Amaranthaceae	Shrub
5.	Karam (Haldu)	*Adina cordifolia*	Rubiaceae	Tree
6.	Bel	*Aegle marmelos*	Rutaceae	Tree
7.	Agawa	*Agave species*	Agavaceae	Shrub
8.	Mahaneem	*Ailanthus excelsa*	Simarubaceae	Tree
9.	Dhela	*Alangium salvifolium*	Alangiaceae	Shrub
10.	Kala siris	*Albizia lebbek*	Mimosaceae	Tree
11.	Jhang siris	*Albizzia odoratissima*	Mimosaceae	Tree
12.	Safed siris	*Albizzia procera*	Mimosaceae	Tree
13.	Kalmegh	*Andrographis paniculata*	Acanthaceae	Herb
14.	Dhaunta	*Anogeissus latifolia*	Combretaceae	Tree
15.	Amti	*Antidesma diandrum*	Phyllanthaceae	Shrub
16.	Dudhia sauri	*Apluda varia*	Phyllanthaceae	Grass
17.	Kathal	*Artocarpus integrifolia*	Moraceae	Tree
18.	Satawar	*Asparagus racemosus*	Liliaceae	Shrub
19.	Neem	*Azadirachta indica*	Meliaceae	Tree
20.	Bara bans	*Bambusa arundinacea*	Poaceae	Bamboo
21.	Konar	*Bauhinia purpurea*	Caesalpiniaceae	Tree
22.	kathmouli	*Bauhinia racemosa*	Caesalpiniaceae	Tree

Conservator of Forests
Territorial Circle, Ranchi

परियोजना प्राधिकारी
के०ई०एव० परियोजना

S.NO	LOCAL NAME	BOTANICAL NAME	FAMILY	HABIT
23.	Kathan bel	*Bauhinia retusa*	Caesalpiniaceae	Tree
24.	[illegible]	*Bauhinia racemosa*	Caesalpiniaceae	Climber
25.	Kachnar	*Bauhinia variegata*	Caesalpiniaceae	Tree
26.	Kashmal	*Berberis aristata*	Berberidaceae	Shrub
27.	Semal	*Bombax ceiba*	Bombgaceae	Tree
28.	Salai	*Boswellia serrata*	Palmae	Tree
29.	Kathi (Kati)	*Bridelia retusa*	Euphorbiaceae	Tree
30.	Piar	*Buchanania lanzen*	Anacardiaceae	Tree
31.	[illegible]	*Butea monosperma*	Leguminosae	Tree
32.	[illegible]	*Butea parviflora*	Fabaceae	Climber
33.	Latpalas	*Butea superba*	Papilionaceae	Climber
34.	Akwan	*Calotropis gigantea*	Asclepiadaceae	Shrub
35.	Kumbhi	*Careya arborea*	Barringtoniaceae	Tree
36.	Karonda	*Carissa carandas*	Apocynaceae	Shrub
37.	Jungli karonda	*Carissa spinarum*	Apocynaceae	Shrub
38.	Amerbel	*Cascuta reflexa*	Convolvulaceae	Climber
39.	Beri	*Casearia tomentosa*	Flacourtiaceae	Shrub
40.	Amaltas	*Cassia fistula*	Caesalpiniaceae	Tree
41.	Chakod	*Cassia tora*	Caesalpinaceae	Herb
42.	Bharhul	*Chloroxylon swietenia*	Rutaceae	Tree
43.	Chorkanta	*Chrysopogon aciculatus*	Poaceae	Grass
44.	Kargali	*Cleistanthes collinus*	Euphorbiaceae	Shrub
45.	Galgal	*Cochlospermum religiosum*	Cochlospermaceae	Shrub
46.	Bahuar	*Cordia myxa*	Boraginaceae	Tree

[illegible]

[illegible]

[illegible]

S.NO	LOCAL NAME	BOTANICAL NAME	FAMILY	HABIT
47.	Patrai	*Canthium dicoccum*	Rubiaceae	Shrub
48.	[illegible]	*Cryptolepis buchanani*	Asclepiadaceae	Climber
49.	Dudhaghas	*Cymbopogon martini*	Poaceae	Grass
50.	Doob	*Cynodon dactylon*	Poaceae	Grass
51.	Sissoo (Shsisham)	*Dalbergia sissoo*	Fabaceae	Tree
52.	Hardi	*Dalbergia lanceolaria*	Fabaceae	Tree
53.	Satsar	*Dalbergia latifolia*	Fabaceae	Tree
54.	Bans	*Dendrocalamus strictus*	Graminae	Bamboo
55.	[illegible]	*Dillenia pentagyna*	Dilleniaceae	Tree
56.	Madankend	*Diospyrous embryopteris*	Ebenaceae	Tree
57.	Kendu (Tendu)	*Diospyrous melanoxylon*	Ebenaceae	Tree
58.	Chamror	*Ehretia laevis*	Ehretiaceae	Tree
59.	Ratangarur	*Elacodendron makorossi*	Mimosaceae	Tree
60.	Amla	*Emblica officinalis*	Euphorbiaceae	Tree
61.	Baboraug	*Emblica robusta*	Euphorbiaceae	Herb
62.	Kathjamun	*Eugenia heyneana*	Myrtaceae	Tree
63.	Jamun	*Eugenia jambo*	Myrtaceae	
64.	Sabai.	*Eulaliopsis binata*	Gramineae	Grass
65.	Dudhi	*Euphorbia hirta*	Euphorbiaceae	Herb
66.	Bargad	*Ficus benghalensis*	Moraceae	Tree
67.	Parho	*Ficus cunia*	Moraceae	Tree
68.	Dumar	*Ficus hispida*	Moraceae	Tree
69.	Pipal	*Ficus religiosa*	Moraceae	Tree
70.	Barun	*Ficus tomentosa*	Moraceae	Tree

District [illegible]
Ranchi

परियोजना पदाधिकारी
के०डी०एच० परियोजना

S.NO	LOCAL NAME	BOTANICAL NAME	FAMILY	HABIT
71.	Kaju	*Holarrhena antidysenterica*	Apocynaceae	Shrub
72.	[illegible]	*Ficus religiosa*	[illegible]	Shrub
73.	Kadba	*Gardenia turgai*	Rubiaceae	Shrub
74.	Papra	*Gardinia latifolia*	Rubiaceae	Tree
75.	Gamhar	*Gmelina arborea*	Verbenaceae	Tree
76.	Patdhaman	*Grewia asiatica*	Tiliaceae	Tree
77.	Orchid	*Habenaria susannae*	Orchidiceae	Orchid
78.	Amtha	*Helicteres isora*	Sterculiaceae	Shrub
79.	[illegible]	*Heteropogon contortus*	Graminae	Grass
80.	[illegible]	*Holarrhena antidysenterica*	Apocynaceae	Shrub
81.	Chilbil	*Holoptelia integrifolia*	Ulmaceae	Tree
82.	Bhurkund	*Hymenodictyon excelsum*	Rubiaceae	Tree
83.	Gaithi	*Hypericum gaitii*	Clusiaceae	Herb
84.	Dudhiata	*Ichnocarpus frutescens*	Apocynaceae	Creeper
85.	cherogras	*Imperata arundinacea*	Poaceae	Grass
86.	Ulu	*Imperata cylindrica*	Poaceae	Grass
87.	Jirhul	*Indigofrea pulchela*	Fabaceae	Shrub
88.	Puta	*Kadia calycina*	Malvaceae	Tree
89.	Sidha	*Lagerstroemia parviflora*	Lythraceae	Tree
90.	Doka	*Lannea grandis*	Anacardiaceae	Tree
91.	Putus	*Lantana camara*	Verbenaceae	Shrub
92.	Banda	*Loranthus species*	Loranthaceae	Shrub
93.	Mahua	*Madhuca indica*	Sapotaceae	Tree
94.	Rori (Sinduri)	*Mallotus philippinensis*	Euphorbiaceae	Shrub

Conservator of Forests
Territorial Circle, Ranchi

परियोजना पदाधिकारी
के०डी०एच० परियोजना

S.NO	LOCAL NAME	BOTANICAL NAME	FAMILY	HABIT
97.	Aam	*Mangifera indica*	Anacardiaceae	Tree
98.	[illegible]	*Melia azedarach*	Meliaceae	Tree
99.	Kuri	*Millusa velutina*	Annonaceae	Tree
98.	Lajwanti	*Mimosa pudica*	Mimosaceae	Herb
99.	Gurikaram	*Mitragyna parviflora*	Rubiaceae	Tree
100.	Tut	*Morus alba*	Moraceae	Tree
101.	Akusi	*Mucuna prurita*	Fabaceae	Climber
102.	Harsingar	*Nyctanthes arbortristis*	Oleaceae	Shrub
103.	[illegible]	*Oxytropis lapponica*	Fabaceae	Tree
104.	Kusi	*Panicum miliaceum*	Poaceae	Grass
105.	Khajur	*Phoenix acaulis*	Palmaceae	Shrub
106.	Orchid	*Pogonia species*	Orchidaceae	Orchid
107.	Kadmi	*Polyalthia cerasioides*	Annonaceae	Tree
108.	Karanj	*Pongamia pinnata*	Papilionaceae	Tree
109.	Bhidialai	*Porana paniculata*	Convolvulaceae	Climber
110.	Bijasal	*Pterocarpus marsupium*	Fabaceae	Tree
111.	Patalkonhra	*Pueraria tuberose*	Fabaceae	Climber
112	Manfal (Porto)	*Randia dumetorum*	Rubiaceae	Shrub
113.	Chandra	*Rauvolfia species*	Apocynaceae	Shrub
114.	Jotsingh	*Rubia cordifolia*	Rubiaceae	Tree
115	Munj	*Saccharum munj*	Poaceae	Grass
116.	Kusum	*Schleichera oleosa*	Sapindaceae	Tree
117.	Eksira	*Schrebera swietinoides*	Oleaceae	Tree
118.	Bhelwa	*Semacarpus anacardium*	Aracardiaceae	Tree
119.	Sal	*Shorea robusta*	Dipterocarpaceae	Tree

Conservator of Forests
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S.NO	LOCAL NAME	BOTANICAL NAME	FAMILY	HABIT
120.	[illegible]	*Smilax macrophylla*	Smilacaceae	Climber
121.	[illegible]	[illegible]	Sterculiaceae	Climber
122.	Mahua	*Solanum nigrum*	Solanaceae	Herb
123.	Rengal	*Solanum xanthocarpum*	Solanaceae	Shrub
124.	Birla	*Sophora bakeri*	Fabaceae	Herb
125.	Rohan	*Soymida febrifuga*	Meliaceae	Tree
126.	Amra	*Spondias pinnata*	Anacardiaceae	Tree
127.	Kesaibi	*Sterculia urens*	Sterculiaceae	Tree
128.	[illegible]	[illegible]	Bignoniaceae	Tree
129.	[illegible]	[illegible]	Acanthaceae	Shrub
130.	Chiretta	*Swertia pulchella*	Gentianaceae	Herb
131.	Lodh	*Symplocos racemosa*	Symplocaceae	Shrub
132.	Imli	*Tamarindus indica*	Caesalpiniaceae	Tree
133.	Sagwan (teak)	*Tectona grandis*	Verbenaceae	Tree
134.	Arjun	*Terminalia arjuna*	Combretaceae	Tree
135.	Asan	*Terminalia tomentosa*	Combretaceae	Tree
136.	Sarpuka	*Tephrosia purpurea*	Fabaceae	Shrub
137.	Behera	*Terminalia bellerica*	Combretaceae	Tree
138.	Harra	*Terminalia chebula*	Combretaceae	Tree
139.	Kapasi	*Thespesia lampas*	Malvaceae	Shrub
140.	Jharugras	*Thysanolaena agrostis*	Poaceae	Grass
141.	Jangli piaz	*Urginea indica*	Liliaceae	Herb
142.	Orchid	*Vanda species*	Orchidaceae	Orchid
143.	Katai	*Vangueria pubescens*	Rubiaceae	Tree
144.	Keoti	*Ventilago madrasatana*	Rhamnaceae	Climber

S.NO	LOCAL NAME	BOTANICAL NAME	FAMILY	HABIT
145	Khus Khus	*Vetiveria zizanioides*	Gramineae	Grass
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
147	Sindoor	*Vitex negundo*	Verbenaceae	Shrub
148	Harjorwa	*Vitis repanda*	Vitaceae	Climber
149	Hilai	*Wendlandia exserta*	Rubiaceae	Tree
150	Dhawai	*Woodfordia fruticosa*	Lythraceae	Shrub
151	Adhikapar	*Wrightia tinctoria*	Apocynaceae	Shrub
152	Ber	*Zizyphus mauritiana*	Rhamnaceae	Shrub
153	Dilla	*Zizyphus oenoplia*	Rhamnaceae	Climber
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

FAUNA OF RANCHI FOREST DIVISION

Sl. No.	English Name	Latin Name
1	Four-horned Antelope	*Tetraceros quadricornis*
2	Badger, Honey or Ratel	*Mellivora capensis*
3	Fulvous Fruit Bat	*Rousettus leschenaulti*
4	Indian Flying Fox	*Pteropus giganteus*
5	Short-nosed Fruit Bat	*Cynopterus sphinx*
6	Sloth Bear	*Melursus ursinus*
7	Indian Bison/Gaur	*Bos gaurus*
8	Wild Boar	*Sus scrofa*
9	Jungle Cat	*Felis chaus*
10	Common Palm Civet	*Paradoxurus hermaphroditus*
11	Small Indian Civet	*Viverricula indica*
12	Barking Deer or Muntjac	*Muntiacus muntjak*
13	Mouse Deer/Indian Chevrotain	*Tragulus meminna*
14	Spotted Deer or Chital	*Axis axis*
15	Indian Wild Dog	*Cuon alpinus*
16	Indian Elephant	*Elephas maximus*
17	Nilgai or Bluebull	*Boselaphus tragocamelus*
18	Indian Gerbil	*Tatera indica*
19	Indian Fox	*Vulpes bengalensis*
20	Indian Hare	*Lepus nigricollis*

Conservator of Forests
Territorial Circle, Ranchi

21	Striped Hyena	*Hyaena hyaena*
22	Jackal	*Canis aureus*
23	[illegible]	*Paguma larvata*
24	[illegible]	*Viverra zibetha*
25	[illegible]	*Viverricula indica*
26	Common Mongoose	*Herpestes edwardsi*
27	Mouse, Indian Field	*Mus booduga*
28	Small Indian Mongoose	*Herpestes auropunctatus*
29	Long-tailed Tree Mouse	*Vandeleuria oleracea*
30	Indian Pangolin	*Manis crassicaudata*
31	Indian Porcupine	*Hystrix indica*
32	Rat, Bandicoot	*Bandicota indica*
33	Rat, Indian Bush	*Golunda ellioti*
34	Shrew, Grey Musk	*Suncus murinus*
35	Sambhar	*Cervus unicolor*
36	[illegible] Giant	*Ratufa indica*
37	[illegible] Palm Squirrel	*Funambulus palmarum*
38	Tiger	*Panthera tigris*
39	Wolf	*Canis lupus*

REPTILES

Sl. No.	Common Name	Scientific Name	Local Name
	SNAKES		
1	Indian Rock Python	*Python molurus*	Ajgar
2	Red Sand Boa	*Eryx johnii*	Dumahi
3	Indian rat snake	*Ptyas mucosus*	Dhaman
4	Common krait	*Bungarus caeruleus*	Karait
5	Banded Krait	*Bungarus fasciatus*	
6	Spectacled Cobra	*Naja naja*	Gehuwan, Nag
7	King Cobra	*Ophiophagus hannah*	
8	Russell's viper	*Daboia russelii*	Siarchanda, Bahera sap
	LIZARDS		
9	Common House Gecko	*Hemidactylus flaviviridis*	Chipkali
10	Chameleon	*Chamelion calcarato*	Bahurupa
11	Rock Lizard	*Agma hubercculatus*	Lotan, Lotani
12	Monitor Lizard	*Varanus monitor*	Goh Sap

FISHES

Sl. No	Scientific Name	Vernacular Name
	Siluriformes	
	Clupisoma garua	
2	*Rita rita*	
3	*Mystus bleekeri*	
4	*Mystus tengara*	
5	*Mystus vittatus*	
6	*Bagarius bagarius*	
7	*Silurus silas*	
8	*Clupisoma garua*	
9	*Heteropneustes fossilis*	
10	*Clarias batrachus*	Magur
	Osteoglossiformes	
11	*Notopterus notopterus*	
12	*Chitala chitala*	
	Clupeiformes	
13	*Gudusia chapra*	
	Cypriniformes	
14	*Puntius ticto*	Puthi
15	*Puntius sarana*	
16	*Labeo bata*	Bata
17	*Labeo calbasu*	
18	*Catla catla*	Catla
19	*Labeo rohita*	Rohu
20	*Cirrhina mrigala*	Mirgal
21	*Osteobrama cotio*	
	Synbranchiformes	
22	*Monopterus cuchia*	
23	*Mastacembelus pancalus*	
24	*Mastacembelus armatus*	
25	*Macrognathus aral*	
	Pereiformes	
26	*Channa punctatus*	Garai
27	*Channa orientalis*	

Conservator of Fores
Territorial Circle, Ran

38	*Channa Marul*	
	Cyprinodontiformes	
[illegible]	[illegible]	
	Mugiliformes	
[illegible]	*Rhinomugil corsula*	

Sl. No.		INSECTS
1	Poduridae	*Achorutes armatus*
2	Dictyoptera	*Blatta orientalis*
3	Dictyoptera	*Mantis religiosa*
4	Pentatomidae	*Nezara viridula*
5	Pyrrhocoridae	*Dysdercus cingulatus*
[illegible]	[illegible]	[illegible]
	Formicidae	*Solenopsis spp.*
8	Apidae	*Vionorium spp.*
9	Apidae	*Apis dorsata*
10	Apidae	*Apis indica*
11	Apidae	*Apis spp.*
12	Andrenidae	*Andrena spp.*
13	Bombidae	*Bombus spp.*
14	Vespidae	*Polistis spp.*
15	Ichneumonidae	*Ichneumon spp.*
16	Carabidae	*Arthia spp.*
17	Buprestidyae	*Chrysochroa spp.*
18	Coccinellidae	*Coccipella septemunctata*
19	Coccinellidae	*Chilomenes sex maculata*
20	Melodae	*Mylabris pustulata*
21	Melolonthidae	*Holotricha serrata*

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के०डी०एच० परियोजना

LIST OF BIRDS

Sl. No.	English Name	Latin Name
1	[illegible]	[illegible]
2	[illegible]	[illegible]
3	Bird, Black	*Turdus merula*
4	Bird, Tailor	*Orthotomus sutorius*
5	Bittern, Chestnut	*Ixobrychus cinnamomeus*
6	Bulbul, Red-vented	*Pycnonotus cafer*
7	Crow, House	*Corvus splendens*
8	Crow, Jungle	*Corvus macrorhynchus*
9	Curlew	*Numenius arquata*
10	Dove, Little Brown	*Streptopelia senegalensis*
11	Duck, Pintail	*Anas acuta*
12	[illegible]	*Spizaetus cirrhatus*
13	[illegible]	*Spilornis cheela*
14	Eagle, [illegible]-toed	*Circaetus gallicus*
15	Eagle, Tawny	*Aquila rapax*
16	Fowl, Red Jungle	*Gallus gallus*
17	Heron, Grey	*Ardea cinerea*
18	Hoopoe	*Upupa epops*
19	Hornbill, Common Grey	*Tockus birostris*
20	Peafowl, Common	*Pavo cristatus*
21	Pipit, Black	*Pseudibis papillosa*
22	Kingfisher, white breasted	*Halcyon smyrnensis*
23	Kite, Brahminy	*Heliastur indicus*
24	Koel	*Eudynamys scolopacea*
25	Lapwing, Red-wattled	*Vanellus indicus*
26	Lapwing, Yellow-wattled	*Vanellus malabaricus*
27	Lark, Red-winged Bush	*Mirafra erythroptera*
28	Lark, Rufous-tailed Finch	*Ammomanes phoenicurus*
29	Lorikeet	*Loriculus vernalis*
30	Minivet, Scarlet	*Pericrocotus flammeus*
31	Munia, Black-headed	*Lonchura Malacca*
32	Munia, Green	*Estrilda Formosa*
33	Munia, Red or Waxbill	*Estrilda amandava*
34	Munia, Spotted	*Lonchura punctulata*
35	Munia, White-backed	*Lonchura striata*
36	Munia, White-throated	*Lonchura malabarica*
37	Myna, Bank	*Acridotheres ginginianus*
38	Mayna, Grey-headed	*Sturnus malabaricus*
39	Myna, Indian	*Acridotheres tristis*

[illegible]

[illegible]

[illegible]

परियोजना पदाधिकारी
के०डी०एच० परियो

40	Vivaa, Jungle	*Acridotheres fuscus*
41	Myna, Pied	*Sturnus contra*
42	[illegible]	[illegible]
43	[illegible]	[illegible]
44	[illegible]	[illegible]
45	Oriole, Black-headed	*Oriolus xanthornus*
46	Oriole, Golden	*Oriolus oriolus*
47	Owl, Barn or Screech	*Tyto alba*
48	Owl, Brown Fish	*Bubo zeylonensis*
49	Parakeet, Alexandrine or Large Indian	*Psittacula eupatria*
50	Parakeet, Blossom-headed	*Psittacula cyanocephala*
51	Pigeon, Common Green	*Treron phoenicoptera*
52	Pipit, Indian	*Anthus phoenicoptera*
53	Pitta, Indian	*Pitta brachyura*
54	Plover, Little Ringed	*Charadrius dubius*
55	Redstart	*Phoenicurus* [illegible]
56	Robin, Indian	*Saxicoloides fulicata*
57	Robin, Magpie	*Copsychus saularis*
58	Roller or Blue Jay	*Coracias benghalensis*
59	Sandgrouse, Common	*Pterocles exustus*
60	Sandgrouse, Painted	*Pterocles indicus*
61	Shrike, Large Cuckoo	*Coracina novaehollandiae*
62	Shrike, Rufous-backed	*Lanius schach*
63	Skylark, Indian Small	*Alauda gulgula*
64	Sparrow, House	*Passer domesticus*
65	Sparrow, Yellow-Throated	*Petronia xanthocollis*
66	Spurfowl, Red	*Galloperdix spadicea*
67	Stilt, Blackwinged	*Himantopus himantopus*
68	Stint, Little	*Calidris minutus*
69	Stork, White	*Ciconia ciconia*
70	Stork, White-necked	*Ciconia episcopus*
71	Stork, Black-necked	*Ephippiorhynchus asiaticus*
72	Sunbird, Purple	*Nectarinia asiatica*
73	Sunbird, Purple-rumped	*Nectarinia zeylonica*
74	Swallow, Red-rumped	*Hirundo daurica*
75	Swallow, Common	*Hirundo rustica*
76	Swallow, Wire-tailed	*Hirundo smithi*
77	Swift, Crested Tree	*Hemiprocne longipennis*
78	Swift, house	*Apus affinis*
79	Swift, Palm	*Cypsiurus parvus*
80	Teal, Common	*Anas crecca*
81	Tern, Indian Whiskered	*Chlidonias hybrida*

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82	Tern, River	*Sterna aurantia*
83	Tit, Grey	*Parus major*
84	[illegible]	[illegible]
85	[illegible]	[illegible]
86	[illegible]	[illegible]
87	Wagtail, Large Pied	*Motacilla maderaspatensis*
88	Wagtail, White	*Motacilla alba*
89	Wagtail, Yellow	*Motacilla flava*
90	Wagtail, Yellow-headed	*Motacilla citreola*
91	Warbler, Ashy Wren	*Prinia socialis*
92	Warbler, Indian Wren	*Prinia subflava*
93	Warbler, Streaked Fantail	*Cisticola juncidis*
94	Waterhen, White-breasted	*Amaurornis phoenicurus*
95	Weaver Bird, Baya	*Ploceus philippinus*
96	Weaver Bird, Black-breasted	*Ploceus bengalensis*

परियोजना [illegible]
के०डी०एच० परियोजना

Rainfall data (in mm) of KDH Coal field and nearby coal field during 2022 are shown below:

Month	Name of Coal Mines				
	Kathara	Dakra	Rohini	KDH	Churi
January	31	33	33	33	34
February	70	71	70	67	71
March	0	0	0	0	0
April	0	0	0	0	0
May	67	68	68	67	68
June	213	211	213	211	213
July	141	142	145	139	145
August	375	371	376	368	377
September	547	543	549	526	550
October	95	95	99	80	99
November	0	0	0	0	0
December	0	0	0	0	0
Total	**1539**	**1534**	**1553**	**1491**	**1557**

(Source: Central Coalfields Limited)

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Territorial Circle, Ranchi

परियोजना पदाधिकारी
के०डी०एच० परियोजना

ANNEXURE "U"

...ी वृक्षारोपण का सात वर्षीय एवम् डिवीजन प्राक्कलन

1	स्थल का नाम							
2	पौधो की संख्या (प्रति हे.)	1600		2	वृक्षारोपण की कुल लम्बाई			कि.मी./हे.
3	यूनिट का विवरण	1000		8	कुल इकाइयो की संख्या		25	इकाई
4					इकाई का आकार		50 मीटर x	25 मीटर
5					गड्ढो की संख्या		40	
6					प्रति किलो इकाई की			

क्र.सं.	कार्य/मद का विवरण	इकाई	मात्रा प्रथम वर्ष प्रति इकाई	मजदूरी प्रति इकाई (रु में)	सामग्री प्रति इकाई (रु में)	मजदूरी कुल (रु)	सामग्री कुल (रु)	कुल (रु)
1	2	3	4	5	6	7	8	9
1	**प्रथम कार्य (प्रथम वर्ष)**	वित्तीय वर्ष	2023		2024	मजदूरी दर	₹ 346.01	
1	मार्किंग एवं गड्ढा							
2	पानी डालाई सम्पूर्ण							
3	**पैरान कार्य**							
	योग		161.64	₹ 55,938.26	₹ 59,710.54	₹ 11,19,965.17	₹ 11,84,210.80	₹ 23,14,175.97
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹	₹ 10,747.90	₹	₹ 2,13,157.94	₹ 2,13,157.94
	प्रथम वर्ष का योग		161.64	₹ 55,938.26	₹ 70,458.44	₹ 11,19,965.17	₹ 14,09,168.74	₹ 25,29,133.91
B	**रखरखाव कार्य (द्वितीय वर्ष) (मजदूरी दर में संभावित 15% वृद्धि के अनुसार)**	वित्तीय वर्ष	2024		2025	मजदूरी दर	₹ 397.91	
4								
5	पौधो की संख्या							
	योग		32.10	₹ 12,772.96	₹ 4,572.13	₹ 2,55,459.18	₹ 91,442.60	₹ 3,46,901.78
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹	₹ 822.98	₹	₹ 16,459.67	₹ 16,459.67
	द्वितीय वर्ष का योग		32.10	₹ 12,772.96	₹ 5,395.11	₹ 2,55,459.18	₹ 1,07,902.27	₹ 3,63,361.45
C	**रखरखाव कार्य (तृतीय वर्ष) (मजदूरी दर में संभावित 15% वृद्धि के अनुसार)**	वित्तीय वर्ष	2025		2026	मजदूरी दर	₹ 457.60	
5	पौधो की संख्या							
6	पैरान की मजदूरी							
	योग		43.66	₹ 19,978.74	₹ 1,036.40	₹ 3,99,574.77	₹ 20,728.00	₹ 4,20,302.77
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹	₹ 186.55	₹	₹ 3,731.04	₹ 3,731.04
	तृतीय वर्ष का योग		43.66	₹ 19,978.74	₹ 1,222.95	₹ 3,99,574.77	₹ 24,459.04	₹ 4,24,033.81
D	**रखरखाव कार्य (चतुर्थ वर्ष) (मजदूरी दर में संभावित 15% वृद्धि के अनुसार)**	वित्तीय वर्ष	2026		2027	मजदूरी दर	₹ 526.24	
4	पौधो की संख्या							
5	मजदूरी की गणना							
	योग		43.04	₹ 22,649.28	₹ 479.90	₹ 4,52,985.63	₹ 9,598.00	₹ 4,62,583.63
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹	₹ 86.38	₹	₹ 1,727.64	₹ 1,727.64
	चतुर्थ वर्ष का योग		43.04	₹ 22,649.28	₹ 566.28	₹ 4,52,985.63	₹ 11,325.64	₹ 4,64,311.27

परियोजना प्रभारी
के०डी०एच०

ANNEXURE-V

कंटीले तार से घेराव के 3 (या अधिक) पंक्ति तार रोपण (Multi Row Barbed wire Fencing)

स्थल का नाम					
मजदूरी दिवस प्रति माननीय दिवस		स्थल	इकाई संख्या		किलोमीटर
अधिक कार्य वर्ष					इकाई
					संख्या
					किलोमीटर

क्रम सं०	कार्य की विवरण	इकाई प्रति	मानक दिवस प्रति इकाई	मजदूरी प्रति इकाई (रु में)	सामग्री प्रति इकाई (रु में)	मजदूरी कुल (रु)	सामग्री कुल (रु)	कुल (रु)
1	2	3	4	5	6	7	8	9
अ	कृषिम कार्य (प्रथम वर्ष)	द्वितीय वर्ष	2023		2024	मजदूरी दर	₹ 346.01	
I	घेराव कार्य							
क	खूटा 1550 मि० मि० लंबे चौड़ा [illegible] का आकार 100 मि० मि० x 65 मि० मि० x 2 मि० मि० मजबूती का	प्रति कि०मी० दोनों तरफ के लिए	9.00	₹	₹ 1,61,250.00	₹	₹ 7,36,250.00	₹ 8,97,500.00
ख	कंटीला तार 4 Point 2 Point [illegible] 64.32 x [illegible] में 3.75 मैट्रिक टन	प्रति कि०मी० दोनों तरफ के लिए	[illegible]	₹	₹ [illegible]	₹	₹ [illegible]	₹ [illegible]
ग	कोसेलवर [illegible] 58.01 x प्रति [illegible]	प्रति कि०मी० दोनों तरफ के लिए	[illegible]	₹	[illegible]	₹	₹ [illegible]	₹ [illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
घ	खूटा एवं तार की कार्य स्थल तक ढुलाई खूटा रोपाई, खूटा लगाने के लिए गड्ढा खोदना (1'x1'x1', खूटा लगाना 05 कतार तार खींचना एवं यू नेल लगाना	प्रति कि०मी० दोनों तरफ के लिए	1850.00	₹ 6,40,118.50	₹	₹ 26,54,562.50	₹	₹ 26,54,562.50
ङ	मृदा कार्य पौधा लगाने हेतु 45 cm x 45 cm x 45 cm आकार का गड्ढा खोदना एवं खोदी गयी मिट्टी को समीपवर्ती स्थान पर संचित करना @ 10 मानव दिवस प्रति गड्ढा	2000 गड्ढा	250.00	₹ 69,202.50	₹	₹ 3,46,012.50	₹	₹ 3,46,012.50
	योग		1850.00	₹ 6,40,118.50	₹ 4,04,464.00	₹ 32,00,592.50	₹ 20,22,320.00	₹ 52,22,912.50
	जी एस टी (18 प्रतिशत सामग्री पर)			₹	₹ 72,803.52	₹ -	₹ 3,64,017.60	₹ 3,64,017.60
	प्रथम वर्ष का योग		1850.00	₹ 6,40,118.50	₹ 4,77,267.52	₹ 32,00,592.50	₹ 23,86,337.60	₹ 55,86,930.10
ख	समापन कार्य (द्वितीय वर्ष) (मजदूरी दर में समाविष्ट 15% वृद्धि के अनुसार)	द्वितीय वर्ष	2024		2025	मजदूरी दर	₹ 397.91	
1	पौधों का मूल्य मृत पौधों के प्रतिस्थापन हेतु 10 प्रतिशत अतिरिक्त पौधों के प्रावधान के साथ रोपण एवं बुलाई सहित @ Rs 20/- प्रति पौधा	[illegible]	[illegible]	₹	₹ 44,000.00	₹	₹ 2,20,000.00	₹ 2,20,000.00
2	पौधा रोपण	कि मी	49.00	₹ 17,906.02	₹ -	₹ 89,530.09	₹ -	₹ 89,530.09
3	टी कोड़नी एवं निकौनी	कि मी	50.00	₹ 19,895.58	₹ -	₹ 99,477.88	₹ -	₹ 99,477.88
4	पौधों की सुरक्षा	कि मी	120.00	₹ 47,749.36	₹ -	₹ 2,38,746.90	₹ -	₹ 2,38,746.90
5	सामग्री (बीज उर्वरक खाद रसायन आदि)	कि मी	0.00	₹	₹ 3,150.00	₹ -	₹ 15,750.00	₹ 15,750.00
6	विविध कार्य (छायाकन पत्राचार मुद्रण एवं संकलन आदि)	कि मी	[illegible]	₹	₹ [illegible]	₹	₹ [illegible]	₹ [illegible]
7	पर्यटन आवश्यकतानुसार	कि मी	180.00	₹ 71,624.02	₹ -	₹ 3,58,120.35	₹ -	₹ 3,58,120.35
	योग		395.00	157175.04	47450.00	785875.21	237250.00	1023125.21
	जी एस टी (18 प्रतिशत सामग्री पर)			₹	₹ 8,541.00	₹ -	₹ 42,705.00	₹ 42,705.00
	द्वितीय वर्ष का योग		395.00	157175.04	55991.00	785875.21	279955.00	1065830.21

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1	2	3	4	5	6	7	8	9
	संपोषण कार्य (तृतीय वर्ष) (मजदूरी दर में सम्भावित 15% वृद्धि के अनुसार)	द्वितीय वर्ष	2025	-	2026	मजदूरी दर	₹ 457.60	
1	एक कोड़नी निकाली	कि.मी.	28.00	₹ 12,817.76	₹ -	₹ 14.20	₹ -	₹ 64,068.72
2	सामग्री (बीज उर्वरक खाद रस्सा आदि)	कि.मी.	9.00	₹ -	₹ 1,368.00	₹ -	₹ 6,840.00	₹ 6,840.00
3	पौधों की मरम्मत (मरकाव 10% प्रतिवर्ष खुटो के बदलाव एवं अन्य सामग्री सहित							₹ 1,52,000.00
4	सुरक्षा पर व्यय						₹ -	₹ 2,36,807.08
	योग		212.00	97010.82	6834.24	466064.12	26840.00	2,59,684.12
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹ -	₹ 960.24	₹ -	₹ 4,831.20	₹ 4,831.20
	तृतीय वर्ष का योग		212.00	97010.82	6834.24	466064.12	31671.20	516725.32
III	संपोषण कार्य (चतुर्थ वर्ष) (मजदूरी दर में सम्भावित 15% वृद्धि के अनुसार)	द्वितीय वर्ष	2026	-	2027	मजदूरी दर	₹ 526.24	
1	एक कोड़नी निकाली	कि.मी.	28.00	₹ 14,734.66	₹ -	₹ 16,873.31	₹ -	₹ 73,673.31
2	सामग्री (बीज उर्वरक खाद रस्सा आदि)	कि.मी.	9.00	₹ -	₹ 1,368.00	₹ -	₹ 6,840.00	₹ 6,840.00
3	पौधों की मरम्मत (मरकाव 10% प्रतिवर्ष खुटो के बदलाव एवं अन्य सामग्री सहित	कि.मी.	0.00	₹ -	₹ 10,000.00	₹ -	₹ 50,000.00	₹ 50,000.00
4	सुरक्षा पर व्यय	कि.मी.	90.00	₹ 47,361.42	₹ -	₹ 26,807.08	₹ -	₹ 2,36,807.08
	योग		118.00	62096.08	11368.00	310480.40	56840.00	367320.40
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹ -	₹ 2,046.24	₹ -	₹ 10,231.20	₹ 10,231.20
	चतुर्थ वर्ष का योग		118.00	62096.08	13414.24	310480.40	67071.20	377551.60
IV	संपोषण कार्य (पंचम वर्ष) (मजदूरी दर में सम्भावित 15% वृद्धि के अनुसार)	द्वितीय वर्ष	2027		2028	मजदूरी दर	₹ 605.17	
1	एक कोड़नी निकाली	कि.मी.	28.00	₹ 16,944.66	₹ -	₹ 19,404.21	₹ -	₹ 84,724.31
2	सामग्री (बीज उर्वरक खाद रस्सा आदि)	कि.मी.	9.00	₹ -	₹ 1,368.00	₹ -	₹ 6,840.00	₹ 6,840.00
3	पौधों की मरम्मत (मरकाव 10% प्रतिवर्ष खुटो के बदलाव एवं अन्य सामग्री सहित	कि.मी.	0.00	₹ -	₹ 10,000.00	₹ -	₹ 50,000.00	₹ 50,000.00
4	सुरक्षा पर व्यय	कि.मी.	90.00	₹ 54,465.83	₹ -	₹ 30,828.19	₹ -	₹ 2,72,329.19
	योग		283.00	₹ 1,71,264.14	₹ 5,368.00	₹ 8,56,320.72	₹ 31,840.00	₹ 8,88,160.72
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹ -	₹ 1,146.24	₹ -	₹ 5,731.20	₹ 5,731.20
	पंचम वर्ष का योग		283.00	₹ 1,71,264.14	₹ 7,514.24	₹ 8,56,320.72	₹ 37,571.20	₹ 8,93,891.92

सारांश	मजदूरी	सामग्री	जी एस टी	कुल
प्रथम वर्ष	₹ 32,00,592.50	₹ 20,32,320.00	₹ 3,54,017.82	₹ 55,65,930.10
द्वितीय वर्ष	₹ 7,85,875.21	₹ 2,37,250.00	₹ 42,705.00	₹ 10,65,830.21
तृतीय वर्ष	₹ 4,85,054.12	₹ 26,840.00	₹ 4,831.20	₹ 5,16,725.32
चतुर्थ वर्ष	₹ 3,10,480.40	₹ 56,840.00	₹ 10,231.20	₹ 3,77,551.60
पंचम वर्ष	₹ 8,56,320.72	₹ 31,840.00	₹ 5,731.20	₹ 8,93,891.92
कुल	₹ 56,38,322.95	₹ 23,75,090.00	₹ 4,27,516.20	₹ 84,40,929.15
	या			₹ 84,40,929.00
अक्षर में				(चौरासी लाख चालीस हजार नौ सौ उनतीस रुपए मात्र)

उक्त प्राक्कलन प्रधान मुख्य वन संरक्षक [illegible] रांची के कार्यालय आदेश संख्या 22 दिनांक 25/04/2016 एवं आधारित तथा वर्तमान मजदूरी दर पर तैयार की गयी है।

उप क्षेत्र पदाधिकारी

वन मंडल पदाधिकारी

परियोजना पदाधिकारी
के०डी०एच० [illegible]

Conservator of Forests
Territorial Circle, Ranchi

ANNEXURE - VII

प्रति वन प्रक्षेत्र (हे.)

पौधरोपण कार्यक्रम की योजना (औसतन 10%-25% वृक्षारोपित पौधों के खुले वन क्षेत्र हेतु)

1	स्थल का नाम							
2	क्षेत्रफल	100	हे.		पौधे प्रति हे.		200	
3	मजदूरी दिवस प्रति व्यक्ति							
4	अंतिम कार्य वर्ष							
क्र. सं.	कार्य	इकाई	मात्रा	मजदूरी प्रति इकाई (रु. में)	सामग्री प्रति इकाई (रु. में)	मजदूरी कॉलम (5)	सामग्री कॉलम (6)	कुल (7)
1	2	3	4	5	6	7	8	9
A	अंतिम कार्य (प्रथम वर्ष	हिसाब वर्ष	2024	-	2024	मजदूरी दर	₹ 345.24	
1	[illegible]	[illegible]	[illegible]	₹ 1,038.00	₹	₹ [illegible]	₹	₹ [illegible]
2	[illegible]	[illegible]	[illegible]	₹ [illegible]	₹	₹ [illegible]	₹	₹ [illegible]
3	स्थल की [illegible]	घन मी.	[illegible]	₹ 4,152.00	₹ 11,382.40	₹ [illegible]	₹ [illegible]	₹ 3,00,456.00
4	[illegible]	[illegible]	[illegible]	1,400.00	₹	₹ [illegible]	₹	₹ [illegible]
5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6	गली खनिकर	घन	4.00	₹ 2,076.06	₹	₹ 2,07,606.00	₹	₹ 2,07,606.00
7	सिमेन्ट प्रिटेशन [illegible]		15.00	₹ 5,190.75	₹ -	₹ 5,19,075.00	₹ -	₹ 5,19,075.00
8	[illegible] आकार की ट्रेंच [illegible] पौधा तैयार करना।		2.00	₹ 884.00	₹ 984.49	₹ 88,400.00	₹ 98,449.00	₹ 1,86,849.00
9	वनों की सुरक्षा		2.00	₹ 692.02	₹	₹ 69,202.00	₹	₹ 69,202.00
	योग		130.00	₹ 44,981.30	₹ 13,243.14	₹ 44,98,130.00	₹ 13,24,314.00	₹ 58,22,444.00
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹ -	₹ 2,383.77	₹ -	₹ 2,38,376.52	₹ 2,38,376.52
	प्रथम वर्ष का योग		130.00	₹ 44,981.30	₹ 15,626.91	₹ 44,98,130.00	₹ 15,62,690.52	₹ 60,60,820.52
B	समापन कार्य (द्वितीय वर्ष) (मजदूरी दर में सम्भावित 15% वृद्धि के अनुसार)	द्वितीय वर्ष	2024	-	2025	मजदूरी दर	₹ 397.91	
1	Prespruated [illegible] Seeding [illegible] प्रतिरोपण,	[illegible]	2.00	₹ 796.52	₹ 840.00	₹ 79,652.00	₹ 84,000.00	₹ 1,63,652.00
2	वृक्षारोपण		4.40	₹ 1,750.81	₹ -	₹ 175,081.06	₹ -	₹ 175,081.06
3	टी कोठी एवं [illegible]		5.00	₹ 1,989.56	₹ -	₹ 198,955.75	₹ -	₹ 198,955.75
4	सामग्री (उर्वरक, कीटनाशक खाद)		0.00	₹ -	₹ 500.00	₹ -	₹ 50,000.00	₹ 50,000.00
5	सिंगलिंग कार्य		4.00	₹ 1,591.65		₹ 1,59,164.60	₹ -	₹ 1,59,164.60
6	पौधों की सुरक्षा (75 से. मी. के लिए रक्षक।		7.30	₹ 2,904.75	₹	₹ 2,90,475.40	₹	₹ 2,90,475.40
	योग		22.70	₹ 9,032.59	₹ 1,140.00	₹ 9,03,259.11	₹ 1,14,000.00	₹ 10,17,259.11
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹ -	₹ 205.20	₹ -	₹ 20,520.00	₹ 20,520.00
	द्वितीय वर्ष का योग		22.70	₹ 9,032.59	₹ 1,345.20	₹ 9,03,259.11	₹ 1,34,520.00	₹ 10,37,779.11
C	संपोषण कार्य (तृतीय वर्ष) (मजदूरी दर में सम्भावित 15% वृद्धि के अनुसार)	द्वितीय वर्ष	2025	-	2026	मजदूरी दर	₹ 457.60	
1	पौधों की सुरक्षा एवं संपोषण	[illegible]	7.30	₹ 3,340.47	₹ -	₹ 3,34,046.70	₹ -	₹ 3,34,046.70
	योग		7.30	₹ 3,340.47	₹ -	₹ 3,34,046.70	₹ -	₹ 3,34,046.70
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹ -	₹ -	₹ -	₹ -	₹ -
	तृतीय वर्ष का योग		7.30	₹ 3,340.47	₹ -	₹ 3,34,046.70	₹ -	₹ 3,34,046.70
D	संपोषण कार्य (चतुर्थ वर्ष) (मजदूरी दर में सम्भावित 15% वृद्धि के अनुसार)	द्वितीय वर्ष	2026	-	2027	मजदूरी दर	₹ 526.24	
1	पौधों की सुरक्षा एवं संपोषण	पौधे प्रति	7.30	₹ 3,841.54	₹ -	₹ 3,84,153.71	₹ -	₹ 3,84,153.71
	योग		7.30	₹ 3,841.54	₹ -	₹ 3,84,153.71	₹ -	₹ 3,84,153.71
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹ -	₹ -	₹ -	₹ -	₹ -
	चतुर्थ वर्ष का योग		7.30	₹ 3,841.54	₹ -	₹ 3,84,153.71	₹ -	₹ 3,84,153.71

सारांश	मजदूरी	सामग्री	जी.एस.टी.	कुल
प्रथम वर्ष	₹ 44,98,130.00	₹ 13,24,314.00	₹ 2,38,376.52	₹ 60,60,820.52
द्वितीय वर्ष	₹ 9,03,259.11	₹ 1,14,000.00	₹ 20,520.00	₹ 10,37,779.11
तृतीय वर्ष	₹ 3,34,046.70	₹ -	₹	₹ 3,34,046.70
चतुर्थ वर्ष	₹ 3,84,153.71	₹	₹	₹ 3,84,153.71
कुल	₹ 61,19,589.52	₹ 14,38,314.00	₹ 2,58,896.52	₹ 78,16,800.04

Divisional Forest Officer, Ranchi Forest Division, Ranchi

परियोजना पदाधिकारी

ANNEXURE VIII

झारखण्ड राज्य जलछाजन मिशन
ग्रामीण विकास विभाग

ज्ञापांक 75 (SLNA-JSWM) 2011 ग्रा० वि०/ राँची दिनांक

प्रेषक

उप सचिव सह प्रशासी पदाधिकारी,
झारखण्ड राज्य जलछाजन मिशन,
ग्रामीण विकास विभाग।

सेवा में

1. सभी उप विकास आयुक्त-सह-परियोजना प्रबंधक,
जलछाजन प्रकोष्ठ-सह-आँकड़ा केन्द्र (WCDC)

2. सभी राजकीय वन प्रमंडल पदाधिकारी-सह-परियोजना प्रबंधक,
जलछाजन प्रकोष्ठ-सह-आँकड़ा केन्द्र (WCDC)

विषय झारखण्ड राज्य जलछाजन मिशन अंतर्गत संचालित जलछाजन परियोजनाओं के लिए **SCT, DCT, WAT, TCB, Field Bund, Dova (60ft x 60ft x 12ft), Farm Pond (100ft x 100ft x 12ft), Stone Only Plug/Loose Boulder Structure, Nala Bund (Earthen Check Dam), Activity Display Board (3ft x 3ft) एवं Common Display Board (3ft x 4ft)** के स्वीकृत मानक प्राक्कलनों को उपलब्ध कराने के संबंध में।

महोदय,

निवेदनपूर्वक उपर्युक्त विषय के संबंध में कहना है कि झारखण्ड राज्य जलछाजन मिशन, ग्रामीण विकास विभाग अंतर्गत संचालित जलछाजन परियोजनाएँ यथा– **WDC-PMKSY 2.0 एवं झारखण्ड जलछाजन योजना (JJY)** के लिए भूमि संरक्षण एवं जल संचयन संरचनाओं के निर्माण हेतु Schedule of Rates, 2022 GoI पर आधारित Model Estimate तैयार कर उपलब्ध कराई जा रही है।

अतः अनुरोध है कि WDC-PMKSY 2.0 एवं झारखण्ड जलछाजन योजना (JJY) में संलग्न Model Estimate का उपयोग वार्षिक कार्य योजना (AAP) एवं विस्तृत परियोजना प्रतिवेदन (DPR) के निर्माण में Unit Cost के रूप में किया जाय।

अनुलग्नक: **Model Estimate.**

विश्वासभाजन

05.4.23
(प्रमोद कुमार)
उप सचिव–सह–प्रशासी पदाधिकारी,
झारखण्ड राज्य जलछाजन मिशन,
ग्रामीण विकास विभाग।

ज्ञापांक 75 (SLNA-JSWM) 2011 ग्रा० वि०/
प्रतिलिपि: सभी जिलों के जिला तकनीकी विशेषज्ञ, WCDC [illegible]

05.4.23
उप सचिव–सह–प्रशासी पदाधिकारी,
झारखण्ड राज्य जलछाजन मिशन,
ग्रामीण विकास विभाग।

ज्ञापांक 75 (SLNA-JSWM) 2011 ग्रा० वि०
प्रतिलिपि: WDC-PMKSY 2.0 एवं झारखण्ड जलछाजन योजना (JJY) के सभी PIAs को सूचनार्थ एवं आवश्यक हेतु प्रेषित।

05.4.23
उप सचिव–सह–प्रशासी पदाधिकारी,
झारखण्ड राज्य जलछाजन मिशन,
ग्रामीण विकास विभाग।

परियोजना पदाधिकारी
के०डी०एच० परियोजना

Different Activities Approved Estimate by SLNA-ISWM

		Size	Unit Rate of Est.
		i. Length of SGP/LBS-5m ii. Height of SGP/LBS from Foundation level - [illegible] iii. Height of SGP/LBS from Bed level - 0.85 m iv. Top width of SGP/LBS - 0.9m v. Base width of SGP/LBS-2.6m	(a) Estimated Cost 12,400.00 upto 05 Km Carriage. (b) Estimated Cost - 12,000.00 upto 02 Km Carriage
	Nala Bund/ Earthen Check Dam (Less by [illegible] Stone	i. Length of Bund - 40 m ii. Total Bund Height - 5 m iii. Maximum Reservoir Level (MRL) - 3.5 m iv. Normal Reservoir Level (NRL) - 3.0 m v. Top width - 3.0 m vi. Bottom width - 23 m vii. Upstream slope - 1:2 viii. Downstream slope - 1:1 ix. Type of Nala Bund/ Earthen check Dam - [illegible]	Estimated Cost 5,01,645.00
(i)	[illegible] Dug Out Pond	2 feet wide x 3 feet height	Estimated Cost 4560.00
(ii)	[illegible] Dug Out Pond	3 feet wide x 4 feet height	Estimated Cost 6840.00

Conservator of Forests
Territorial Circle, Ranchi

परियोजना पदाधिकारी
के०डी०एच० परियोजना

Scanned with CamScanner

[illegible] BY LABOUR

As per SOR 28th July 2022 (WRD)

Sl. No.	Particulars	Description
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]

Sl No	SOR Item No	Particulars	Unit	Length (in m)	Cross Section (sqm)	Quantity (cum)	Rate (Rs)	Amount (Rs)
		[illegible]						
	CI 18 & CI 401	having earth in 22° max layer and neigh by using of soil with natural soil (in 10 M and 15 cm in M) all complete as per approved design specification and direction of E.I. Less available for pedestrian [illegible]	cum	656.00	0.56	236.46	[illegible]	32118.30
		Labour cess @ 1% of Total Bill as Contractor Degree Board						[illegible]
		Miscellaneous Earthwork Marking Powder, Sprayer etc	LS					[illegible]

Total ₹30,000.07

Say ₹30,000.00

(Rupees Thirty Thousand Only)

Note:- (i) Horizontal (H) and Vertical Interval (V) [illegible] depending upon the steepness of the slope

(ii) One Display Board must be fixed [illegible] Executed and covering at least 25 Square

(iii) Trench should be [illegible] perpendicular to [illegible] Road

(iv) Degree of soil without [illegible]

(v) Spacing between two trench should be 2 m

(vi) Indigenous tree species seedling [illegible] as per [illegible] SOR

परियोजना पदाधिकारी
के०डी०एच० परियोजना

Divisional Forest Officer
Ranchi Forest Division, Ranchi

Planning for Project.

1. Capacity development
2. Farming of Medicinal Plants
3. Post Harvesting
4. Marketing
5. Processing and Value addition work

Activities of project:

1. **Making of PPR and DPR** –

   Under this project, a survey will be done on base line infrastructure in Ranchi, through which cluster-based work plan will be made and the work of GIS meeting will be done.

2. **Construction of Hitech Nursery**-

   Under this project to prepare the high-quality planting contents, an idol plant spear is to be made. Which will require on an average 5 hector area.

3. **Farming of medicinal plants.**

   Under this project, demand based and medicinal plants which are on the edge of getting extinct, and are suitable for the local atmosphere will be selected and farmed over 300 acres of land in Ranchi

S No.	Name of Herbal Plant	Specie	Useful part
1	Safajan (Mogra)	Plant	Leaves, Fruits and Bark
2	Bach	Plant	Root and stem
3	Bhatavari	Plant	Tubers
4	Tulsi	Plant	Panchang
5	Giloya	Creeper	Stem
6	Ashwagandha	Plant	Root
7	Cauch	Creeper	Seed
8	Daruhaldi	Plant	Tubers
9	White Muesli	Plant	Tubers
10	Chirayata	Plant	Panchang

4. **Post Harvesting Management** –

   Under this, after the farming of herbal plants dying shed (Public Sector) Storage godawn will be used.

5. **Processing and Value addition work**-

   Under this project, through 20 local women groups, processing and value addition work will be done and 40 herbal congregation will get employment opportunities. Under this processing unit, marketing infrastructure collection center, organic G.M.P certification work will be done while doing necessary capacity building.

6. **Flexi Component work**-

   Under the project, buy back interventions mobilizing linkage SHG FPO/ Co-Operatives (Buyer Selling Meeting) and philanthropy-work will be done.

7. **Environment Building**-

   For the successful execution of the project, environment building, media campaign, audio visual etc. work will be done.

8. **To give space to Knowledge of Jharkhand public health traditional herbal medicine** –

   Under the project, Chhatisgari public health traditional herbal medicine-based supplements will be made. For which various state level schemes such as AanganBadi for malnutrition free, mid-day meal in school, NRC in hospitals will be contacted for the execution

Regional Project Director

परियोजना पदाधिकारी
के०डी०एच० परियोजना

Budget

Hitech Nursery Expenses Details

Sno	Description of work	Amount
1	Preparation of plot & sapling development	8,92,00,000.00
2	Nursery civil work development	28,63,600.00
3	Admin Block	58,12,892.00
4	Godown and Store Building	26,75,852.00
5	Guard Quarter	5,47,000.00
6	Pest Control Room	6,25,352.00
7	Toilet	5,67,241.00
8	Poly House	40,60,000.00
9	Green Net House	9,00,000.00
10	Semi Mechanized Irrigation System	7,00,000.00
11	Lighting Protection	2,20,000.00
12	Main Entrance	7,00,000.00
13	Overall fighting	10,00,000.00
14	Plumbing Sewage	4,50,000.00
15	Miscellaneous (5% of total amount)	15,45,344.00
	TOTAL	**3,60,32,050.00**

Conservator of Forests
Territorial Circle, Ranchi

परियोजना पदाधिकारी
के०डी०एच० एफ

Timeline:

Sl.No.	Activities	Timeline (in months)											
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th

1	Concept note preparation & submission	√											
2	Field visit by expert & soil testing	√											
3	Approval of concept note & submission of detailed proposal	√											
4	District level workshop for policy budget with district administration and finalization of proposal	√											
5	Formal agreement between NACOF & district administration	√											
6	DPR preparation	√	√										
7	Meeting with different stakeholders	√											
8	Enabling environment & community mobilization	√											
9	Baseline survey training for DPR preparation	√											
10	High-tech nursery	√	√										
11	Plantation		√	√	√								
12	SHG/FPO formation	√	√	√	√	√	√	√	√	√	√	√	√
13	Capacity building	√	√	√	√	√	√	√	√	√	√	√	√
14	Marketing Initiatives		√										
15	Post harvest management, storage, godown etc.					√	√	√					
16	Processing & value addition						√	√	√				
17	Technical Assistance Evaluation	√	√	√	√	√	√	√	√	√	√	√	√
18	Admin works	√	√	√	√	√	√	√	√	√	√	√	√

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Territorial Circle, Ranchi

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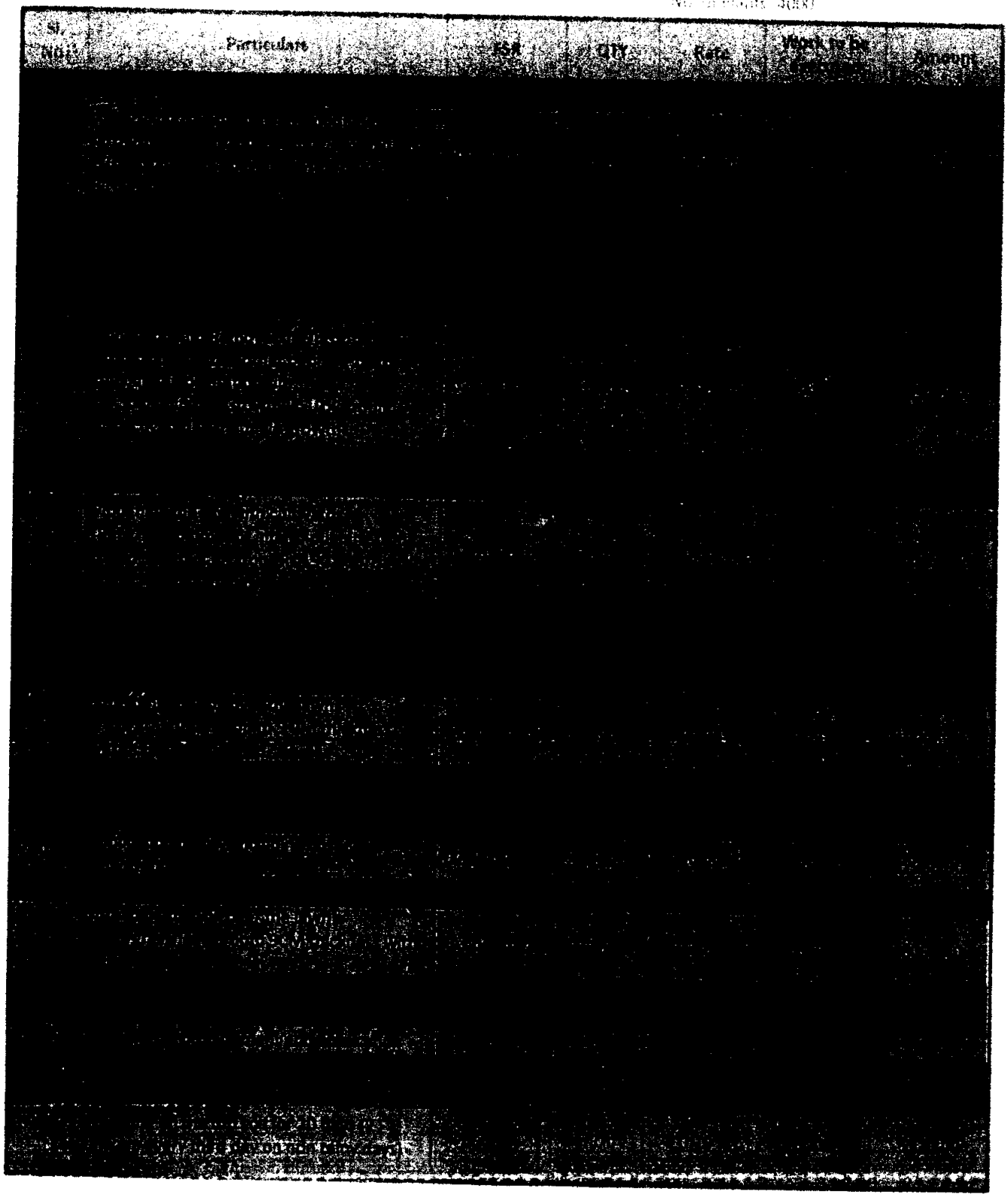
ANNEXURE-X

Model Estimate for Development of Yadadri Model Natural Forest in Degraded Reserve Forest Blocks with less than 0.1 canopy cover(FSR 2020-21)



Sl. No.	Particulars	FSR	Qty	Rate	Work as Ex	Amount

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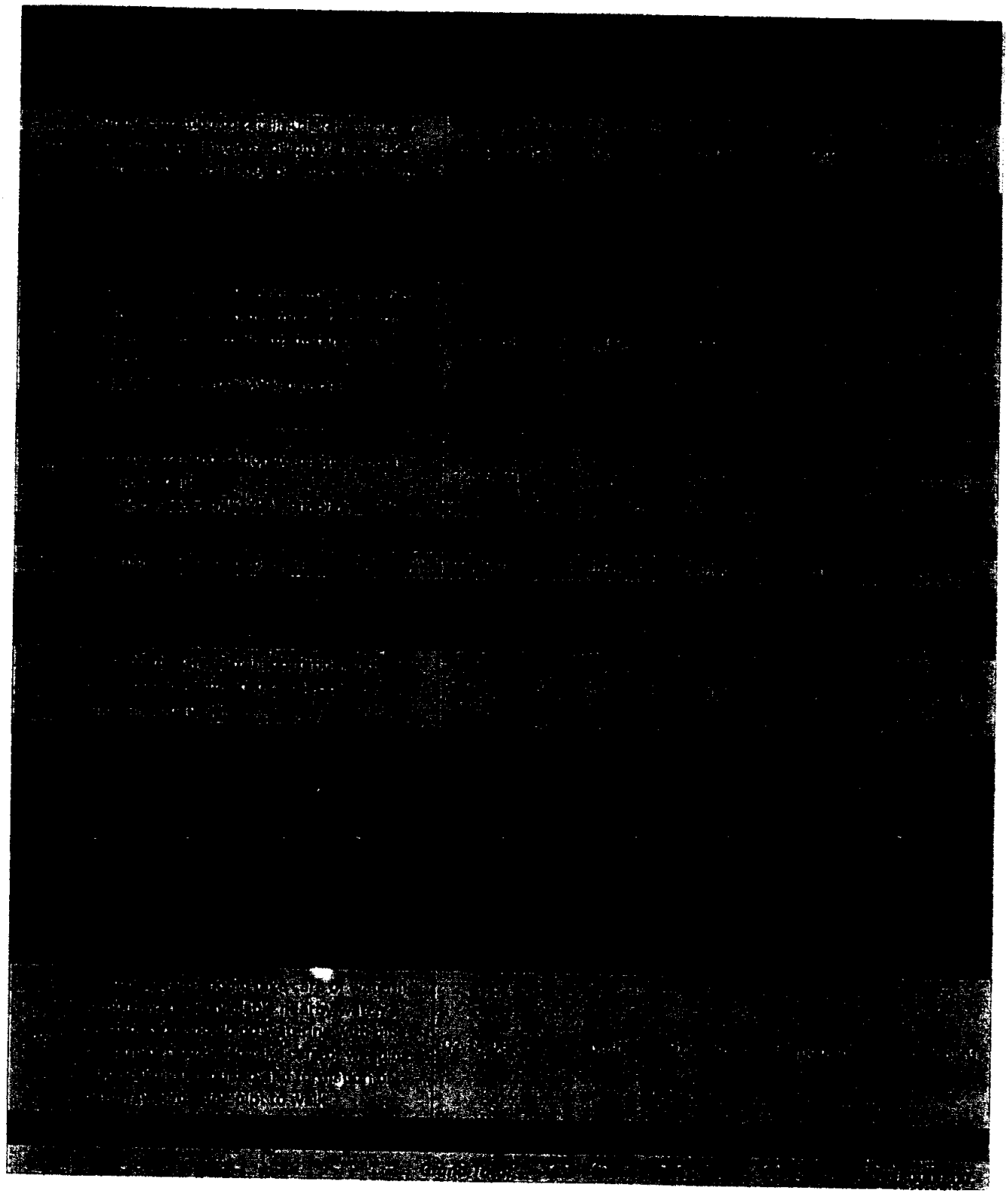

*In case of degraded forest areas a minimum of one hectare is to be taken up at each location so that unit cost will be reduced as one watch and ward is suffcient per hectare.

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ANNEXURE - 8

[illegible] संख्यांकन आदि की मूर्ति पर हाथ गोदना [illegible]

1	स्थान का नाम					पौधिन से पौधिन की दूरी			3	मी
2	गोदिंग की संख्या	1000		6		लाइन से लाइन की दूरी			5	मी
3	बांस गोदिंग का आकार	6'6"x2 6"x2 6"		7						
4	मजदूरी दिवस प्रति मानक हेक्टेयर									
5	क्रमिक कार्य वर्ष									
		इकाई दर	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		1	2	3	4	5	6	7	8	9
	[illegible]							₹ 346.01		
	खोदाई का		2024							
[illegible]	[illegible]	[illegible]						₹ [illegible]		₹ [illegible]
ख	[illegible]	प्रति गोदिंग	[illegible]	₹ [illegible]	₹ [illegible]		₹ [illegible]	₹		₹ 5,46,010.00
ग	खुदी की गोलाकार [illegible] से रगड़ाई	प्रति गोदिंग	[illegible]	₹ [illegible]	₹ [illegible]		₹ 69,300.00	₹ 6,000.00		₹ 75,402.00
घ	[illegible]	प्रति गोदिंग	[illegible]	₹ [illegible]	₹ [illegible]		₹ 91,300.00	₹ 98,060.00		₹ 2,01,863.75
ङ	गोदिंग को पूरा भरने हेतु [illegible]	प्रति लाख पौधे	[illegible]	₹ [illegible]				₹		₹ [illegible]
च	[illegible]	[illegible]	[illegible]	[illegible]				₹ [illegible]		₹ [illegible]
	[illegible]									
	[illegible]									
	[illegible]							₹ [illegible]		₹ [illegible]
	मेड़ को [illegible]	[illegible]	[illegible]	₹ [illegible]	₹ [illegible]		₹ [illegible]	₹ -		₹ 58,821.70
	योग		2.07	₹ 716.24	₹ 466.46		₹ 7,16,240.70	₹ 4,66,460.00		₹ 11,82,700.70
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹	₹ 83.96		₹	₹ 83,962.80		₹ 83,962.80
	प्रथम वर्ष का योग		2.07	₹ 716.24	₹ 550.42		₹ 7,16,240.70	₹ 5,50,422.80		₹ 12,66,663.50
B	संपोषण कार्य (द्वितीय वर्ष) (मजदूरी दर में संभावित 15% वृद्धि के अनुसार)	द्वितीय वर्ष	2024	₹ [illegible]	2025		मजदूरी दर	₹ 397.91		
	[illegible]	[illegible]	[illegible]	₹ [illegible]	[illegible]		[illegible]	₹ [illegible]		₹ [illegible]
2	गड्ढे में [illegible]	प्रति गोदिंग	[illegible]	₹ [illegible]	₹ [illegible]		[illegible]	₹ [illegible]		₹ [illegible]
3	[illegible]	प्रति गोदिंग	[illegible]	₹ [illegible]	₹ [illegible]		[illegible]	₹ [illegible]		₹ [illegible]
4	तीन कोडली निकौनी, प्रथम 5 ग्राम यूरिया 5 ग्राम कीटनाशक, द्वितीय 10 ग्राम यूरिया 5 ग्राम कीटनाशक, तृतीय 5 ग्राम यूरिया 5 ग्राम कीटनाशक) मेड़ों पर लगाए गये कीड़े की स्थिति में रोपे गये मृत पौधों का बदलाव	प्रति गोदिंग	[illegible]	₹ [illegible]	₹ [illegible]		₹ [illegible]	₹ 4,500.00		₹ 64,186.15
5	पटवन (रिबशा/तेल टंकी)	प्रति गोदिंग	0.50	₹ 198.96	₹ [illegible]		₹ [illegible]	₹ 25,000.00		₹ 2,23,958.75
6	सुरक्षा	प्रति गोदिंग	0.50	₹ 198.95	₹ [illegible]		₹ 1,98,955.75	₹ -		₹ 1,98,955.75
7	साइन बोर्ड एवं मेडिसन लगवाना	प्रति गोदिंग	0.00	₹ -	₹ 20.00		₹	₹ 20,000.00		₹ 20,000.00
	योग		1.40	₹ 557.08	₹ 96.50		₹ 5,57,076.10	₹ 96,500.00		₹ 6,53,576.10
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹ -	₹ 17.37		₹ -	₹ 17,370.00		₹ 17,370.00
	द्वितीय वर्ष का योग		1.40	₹ 557.08	₹ 113.87		₹ 5,57,076.10	₹ 1,13,870.00		₹ 6,70,946.10
C	**संपोषण कार्य (तृतीय वर्ष) (मजदूरी दर में संभावित 15% वृद्धि के अनुसार)**	द्वितीय वर्ष	2025		2026		मजदूरी दर	₹ 457.60		
	तीन कोडली निकौनी (प्रथम 5 ग्राम यूरिया 5 ग्राम कीटनाशक, द्वितीय 10 ग्राम यूरिया 5 ग्राम कीटनाशक, तृतीय 5 ग्राम यूरिया 5 ग्राम कीटनाशक) मेड़ों पर लगाए गये कीड़े की स्थिति में रोपे गये मृत पौधों का बदलाव	प्रति गोदिंग	[illegible]	₹ [illegible]	₹ [illegible]		₹ [illegible]	₹ 4,500.00		₹ [illegible]
2	पटवन (रिबशा/तेल टंकी)	प्रति गोदिंग	[illegible]	₹ [illegible]	₹ [illegible]		₹ [illegible]	₹ [illegible]		₹ [illegible]
3	बांस गोदिंग की मरम्मती एवं सहेत	प्रति गोदिंग	0.50	₹ 228.80	₹ 60.00		₹ 2,28,799.11	₹ 5,000.00		₹ 2,33,799.11
	योग		1.15	₹ 526.24	₹ 69.50		₹ 5,26,237.96	₹ 69,500.00		₹ 5,95,737.96
	जी.एस.टी (18 प्रतिशत सामग्री पर)			₹ -	₹ 12.51		₹ -	₹ 12,510.00		₹ 12,510.00
	तृतीय वर्ष का योग		1.15	₹ 526.24	₹ 82.01		₹ 5,26,237.96	₹ 82,010.00		₹ 6,08,247.96
D	**संपोषण कार्य (चतुर्थ वर्ष) (मजदूरी दर में संभावित 15% वृद्धि के अनुसार)**	द्वितीय वर्ष	2026		2027		मजदूरी दर	₹ 526.24		

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होममेड बेकरी समेत कई प्रकार के उत्पाद लोगों ने काफी पसंद किया।

सरकार को सहना करनी है। वहीं, जमीन भी राज्य सरकार को उपलब्ध करानी होगी। उन्होंने दोनों

संस्कृत मंत्रालय की ही स्वायतशासी संस्था नेशनल काउंसिल आफ साईंस एंड म्यूजियम्स द्वारा किया जाएगा।

अंचल अधिकारी व कनीय अभियंता ने किया नदी का भौतिक निरीक्षण

दैनिक जागरण के अभियान के बाद प्रशासन की खुली नींद

सोनाडुबी को बचाना है

संसू, खलारी: दैनिक जागरण द्वारा सोनाडुबी नदी को बचाने को लेकर चलाए जा रहे अभियान के कारण इस नदी के दिन बहुरने की अब उम्मीद जग गई है। शुक्रवार को अंचल अधिकारी शिशुपाल आर्य और बीडीओ लेखराज नाग के साथ कनीय अभियंता रमेश गुप्ता व अंचल अमीन कृष्णा तिर्की ने सोनाडुबी नदी का भौतिक निरीक्षण किया तथा इसके वर्तमान हाल से अवगत हुए।

हुटाप में सोनाडुबी नदी को देखते खलारी सीओ व अन्य • जागरण

सोनाडुबी अपने उद्गम स्थल चानों-खलारी की सीमा से निकलकर पूरे खलारी प्रखंड क्षेत्र में बहती हुई खलारी में ही दामोदर नदी में मिल जाती है। सीओ सहित अंचल व प्रखंड की टीम ने सोनाडुबी को कई जगहों पर जाकर देखा। अंचल अधिकारी इस नतीजे पर पहुंचे कि पूरे सोनाडुबी नदी की सफाई करा दी जाए, तो नदी भी जीवित हो जाएगी और आम जनता के लिए भी यह काफी उपयोगी साबित होगी। सीओ ने कहा कि पूरी नदी की सफाई का कार्य हालांकि खर्चीला है परंतु डिस्ट्रीक्ट मिनरल फाउंडेशन ट्रस्ट फंड से यह संभव है। डीएमएफटी फंड कनीय अभियंता रमेश गुप्ता से आवश्यक प्रक्रिया पूरी करने कहा। उन्होंने कहा कि वे सीसीएल को भी पत्र लिखेंगे ताकि सीसीएल क्षेत्र में गुजरने के दौरान सोनाडुबी नदी की सफाई सीसीएल द्वारा किया जा सके। कहा कि सरकारी अभिलेख में सोनाडुबी नदी है, न कि नाला। सफाई के समय ही नदी को अतिक्रमणमुक्त भी किया जाएगा। सीओ ने कहा कि मोनेट कोल वाशरी को एनजीटी के निर्देश पर बनी टीम द्वारा आवश्यक निर्देश दिए गए हैं। निदेश के क्रियान्वयन की समीक्षा उपायुक्त स्वयं कर रहे हैं।

सोनाडुबी के संरक्षण के लिए कई योजनाओं का किया गया है चयन

खलारी बीडीओ लेखराज नाग ने कहा कि सोनाडुबी के संरक्षण के लिए कई योजनाएं ग्रामसभा में पास कराई गई हैं। इसे डीएमएफटी मद से कराने के लिए जिला में भेजी जाएगी। उन्होंने कहा कि सोनाडुबी से जुड़े एसएसी छठ तालाब, खलारी तालाब आदि की सफाई की जानी है। नदी जहां आबादी से गुजरी है वहां सफाई के साथ तटबंधों को दुरुस्त कराया जाएगा। बीडीओ ने सोनाडुबी नदी की स्थिति को संज्ञान में लाने के लिए दैनिक जागरण का आभार भी जताया।

Conservator of Forests
Territorial Circle, Ranchi

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CENTRAL COALFIELDS LIMITED
(A subsidiary of Coal India Limited)
Office of the Project Officer
KDH Project, P.O: Dakra 829210,
Dist: Ranchi (Jharkhand)

Fuelling Sustainable Growth

Ref No: Ref. No.: PO(KDH)/Forest/2025-26/ 279 Date 31/10/2025

To
Divisional Forest Officer
Ranchi Division
Vanbhavan-Ranchi
Email: dforanchi2@gmail.com

Subject: Submission of pointwise reply in reference to query raised by MoEF&CC in compliance of In principle/ Stage-I approval in respect of proposal for non-forestry use 126.72 ha(84.35 PF and 42.37 ha Jungle Jhari) of forest land for KDH Opencast Mine of M/s Central Coalfields Limited in Ranchi District Jharkhand.

Ref No: 8/62/2018-FC dated 27.02.2023
Letter of MoEF&CC, New Delhi Dated 30.06.2025

Dear Sir,

This is to bring to your kind notice that KDH OCP, CCL has been accorded Stage-I forestry clearance for an area of 126.72 ha forest land by MoEF&CC vide letter no 8-62/2018-FC dated 27.02.2023.

MoEF&CC has raised queries in respect to the compliance of In principle/ Stage-I approval, The point wise Reply to queries are as follows:

S No.	Query	Compliance
1	In compliance of condition no. A (1) of Stage-I approval, the State Government has informed that the user Agency has revised the mining plan and excluded the 9.19 ha forest land which was earmarked for safety zone as per CCL Board approval. However, the copy of revised approved mining plan has not been submitted. The same needs submission along with the comparative analysis of the land use approved earlier and	As per the earlier approved PR, forest land of 9.19 Ha was earmarked to be maintained as Safety Zone outside the lease area. However as per the Stage I FC condition (Condition no. A.1 of MoEF&CC letter dated 21.02.2023) the mine plan was to be revised excluding the safety zone area of 9.19 Ha. Accordingly, keeping all the other parameters of PR/mine plan of KDH OCP same, only the land chapter of the mine plan was revised by excluding 9.19 Ha of the Safety Zone. Competent approval for the same has also been obtained on 13.09.2023. (Approval of CCL Board is enclosed as **Annexure I.**) An area of 9.19 Ha earmarked for safety zone has only been excluded in revised land chapter of the mine plan,, as such there is no change in land use proposed in earlier mine plan and revised mine plan.

	the land use proposed as per revised mining plan.	The mining plan with the revised land chapter duly approved by CCL Board is attached as **Annexure II.**
2	In compliance of condition no. A (4) of Stage-I approval, the State Government has informed that the user agency has deposited Rs. 12,13,69,882/- against NPV in account of NA, CAMPA. However, as per details available on web portal, it has been observed that the user agency has deposited Rs. 4,20,43,162/- against NPV. The State Govt. shall therefore provide the details of the remaining amount towards NPV deposited online in CAMPA account.	The details of the payment made in respect of NPV i.e Rs. 12,13,69,882/- was submitted along with duly signed Ad Hoc CAMPA format with Stage I FC compliance. However, the details are again being reiterated below: **1. 1st time NPV paid – Rs. 7,93,26,720/-** The amount of Rs. 7,93,26,720/- was paid in CAMPA account as a part payment of Rs. 220,50,41,439/- paid vide RTGS UTR no. PUNBR52016033110025459 and SD1288460349 as per MoEF&CC guideline dated 01.04.2015 in offline mode. Payment of Rs. 7,93,26,720/- has also been endorsed by State Forest Department vide various letters (**Enclosed as Annexure III**) based on which Stage I FC has been issued to the instant proposal. The details of payment along with bank certificate is enclosed as **Annexure IV.** **2. 2nd time NPV paid - Rs. 4,20,43,162/-** The amount of Rs. 4,20,43,162/- has been paid as per the demand note of DFO Ranchi dated 06.07.2023 at revised rate of NPV as per MoEF&CC guideline dated 06.01.2022 through e-challan. The details of the same is available on PARIVESH portal and enclosed as **Annexure V.**
3	In compliance of condition no. A (8) of Stage-I approval, the State Government has not submitted the details (ID No.) of KML files of diverted area, the CA areas, the proposed SMC treatment area and the	The details of KML files of diverted area, the CA areas, the proposed SMC treatment area and the WLMP area uploaded on the e Green watch portal. The same has been endorsed by PCCF/Nodal Officer, GoJ in letter dated 06.05.2025. Copy of letter enclosed as **Annexure VI**

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	WLMP area uploaded on the e Green watch portal and same needs submission.	8 | 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 Stage II approval. | In this regard, the details have been uploaded on e-Green Watch portal by DFO, Ranchi Forest Division. (Annex- C1 of Folder-II).
4	In compliance of condition no. B (2) of Stage-I approval, the State Government has informed that the Wildlife Management plan has been approved. However, a copy of the approved plan has not been submitted. The detail of funds deposited by user agency in CAMPA account in this regard may also be submitted.	**Condition no. B (2) is part of condition mentioned at point (B) which needs to be complied on field after handing over of forest land to the user agency by the State Forest Department but the compliance in the form of Undertaking shall be submitted prior to Stage II approval.** However, as an advance action, KDH Project, CCL has got approved the Wild life Management Plan (WLMP). A copy of approved WLMP enclosed as **Annexure VII.** As the given condition is part of condition mentioned at point (B) which needs to be complied after handover of the forest land , KDH Project, CCL undertakes to pay the cost of WLMP after Stage II FC and before handing over of forest land.
5	In compliance of condition no. B (4) of Stage-I approva,l the User agency has submitted an undertaking, however, the undertaking is not in consonance with the condition. The State Govt. shall ensure that the user agency shall submit an undertaking as per the said condition.	Revised undertaking has been enclosed as **Annexure VIII** The undertaking is as under: ***"KDH Project CCL undertakes to pay the additional amount of NPV, if so, determined, as per the final decision of the Hon'ble Supreme Court of India."***
6	In compliance of condition no. B (13) of Stage-I approva,l the State Government has not submitted copy of	**Condition no. B (13) is part of conditions mentioned at point (B) which needs to be complied on field after handing over of forest land to the user agency by the State Forest Department but the**

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के०डी०ए०व० परियोजना

	the approved Plan/Scheme w.r.t Mitigative measures to minimize soil erosion and choking of stream and same needs submission.	**compliance in the form of Undertaking shall be submitted prior to Stage II approval.** However, KDH project CCL hereby submits the copy of the Plan w.r.t Mitigative measures to minimize soil erosion and choking of stream before handing over of the forest land. The plan is enclosed as **Annexure IX**.
7	In compliance of condition no. B (14) of Stage-I approval, the State Government has not submitted a copy of approved Soil & Moisture Conservation Plan.	**Condition no. B (14) is part of conditions mentioned at point (B) which needs to be complied on field after handing over of forest land to the user agency by the State Forest Department but the compliance in the form of Undertaking shall be submitted prior to Stage II approval.** However, as an advance action, KDH Project, CCL has got approved the Soil & Moisture Conservation Plan. A copy of approved Soil & Moisture Conservation Plan is enclosed as **Annexure X.**

This is for your kind information please.

Thanking You.

Yours Faithfully

Project Officer,
KDH Project
NK Area, Dakra

Enclosures: As mentioned above

Copy to:-

1) General Manager, NK Area: for kind information
2) TS to DT(P&P), CCL HQ for kind information
3) General Manager(Forest), CCL HQ: for kind information
4) SO(P&P), NK Area
5) O/c