M/s DHARAMCHAND JAIN
(Mining Lessee)

"DHARAM VILLA"
12-A, Mahatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV,
New Delhi-110024
Phone: 011-41642414
Email: mdmpl@rediffmail.com
avinjain999@gmail.com

Ref: - DCJ/FDP/2026-27/29

Date: 04.05.2026

To,
The Divisional Forest Officer,
Keonjhar Forest Division,
Keonjhar, Odisha.

Sub.: ***Proposal for seeking prior approval of the Central Government under Section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for 79.367 ha of forest land in favour of Shri Avin Jain (Heir of late D.C Jain) for mining of Iron and Manganese ore in Daipahar Iron & Manganese Ore Mines located in Baitrani RF- II, District: Keonjhar, Odisha (Online Proposal No. FP/OR/MIN/9360/2015)- reg...***

X-Sub- *Submission of complete compliances* to the conditions stipulated in the Stage-I (In-Principle) approval granted by the Ministry of Environment Forests and Climate Change (MoEF&CC), GoI, New Delhi vide letter no 8-31/2015FC (E-91138) dtd 13.02.2026.

Ref.: 1. Memo No. 3672/9F(MG)-18/2015 dated 18.02.2026 Deputy Conservator of Forests, FD & NO, FC Act, O/o the Principal Chief Conservator of Forests, & HoFF, Odisha, Bhubaneswar.

2. Letter No. 2301/6F-Mining-145/2023 dated 21.02.2026 of the Divisional Forest Officer,Keonjhar Forest Division.

Sir,

With reference to the subject cited above and the letters referred therein, we hereby submit two complete sets of compliances pertaining to the proposal for seeking prior approval of the Central Government under Section 2(1)(ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for diversion of 79.367 hectares of forest land in favour of Shri Avin Jain (Heir of Late D.C. Jain) for mining of iron and manganese ore in the Daipahar Iron & Manganese Ore Mines, located within the Baitrani Reserved Forest in Keonjhar District, Odisha (Online Proposal No. FP/OR/MIN/9360/2015).

It is pertinent to mention that the Stage-I (in-principle) approval for diversion of 79.367 hectares of forest land, including 2.822 hectares towards safety zone, has already been granted in favour of Shri Avin Jain (Heir of Late D.C. Jain) for the said mining project over an area of 89.961 hectares.

In view of the above facts and circumstances, we humbly request your good office to kindly expedite the matter and arrange for onward transmission of the compliance report to the competent authority for obtaining Stage-II (final) approval in respect of the Dalpahar Iron & Manganese Ore Mines at the earliest.

Thanking you,

Yours faithfully,

For **Dalpahar Iron & Manganese Mines**

S. N. Mohanty, Agent
Dalpahar Fe. & Mn. Mines,
Dalpahar, Joda

Encl: *Two full sets of the point wise compliances of the stipulated conditions along with Undertakings, Documents and approved Schemes.*

Compliance to the conditions stipulated in the Stage-1/In-Principle approval granted by the Ministry of Environment Forests and Climate Change vide letter no 8-31/2015FC (E-91138) dtd 13.02.2026.

Conditions No.-i

Legal status of the diverted forest land shall remain unchanged;

Compliance:

Legal status of the diverted forest land of Dalpahar Iron & manganese Mines shall remain unchanged. An undertaking to this effect is submitted by the User Agency and is enclosed at Sl. No.1 of Annexure–1, affirming that the legal status of the diverted forest land will be maintained without alteration.

Conditions No.-ii

The User Agency shall transfer the cost of raising and maintaining the Compensatory Afforestation as per the approved CA Scheme at the current wage rate in consultation with State Forest Department in the account of CAMPA of the concerned State through online portal;

Compliance:

For raising of Compensatory Afforestation 81.545 ha of non–forest Govt. land has been identified and allotted by the Collector, Keonjhar in there (3) patches i.e. 9.800 ha in Village Champajhar & 66.745 ha in Village Gundula under Banspal Tahasil and 5.00 ha in Village Binida & Dengana under Ghatagaon Tahasil of Keonjhar forest Division.

The CA schemes for the above areas have been prepared at current wage rate of with a maintenance for 10 years over 66.745 ha, 9.800 ha & 5.00 ha and have been technically approved by the PCCF (FD&NO, FC Act), O/o- the PCCF&HoFF, Odisha, Bhubaneswar with a financial outlay of Rs.4,81,46,300/- Rs.66,14,200/-, & Rs.33,16,500/- respectively.

As per the demand raised by the Divisional Forest Officer, Keonjhar vide Letter No. 2299/6F-Mining-145/2023 dated 21.02.2026 and Letter No. 4968/6F-Mining-42/2026 dated 21.04.2026 the total approved amount of Rs. 6,30,77,00/- for raising of Compensatory Afforestation 81.545 ha of non–forest Govt. land has been transferred to the Odisha CAMPA Account through RTGS (UTR No. ICICR42026031800501321, dated 18.03.2026 and RTGS (UTR No. ICICR42026042400534838, dated 24.04.2026) respectively via the online PARIVESH portal. The copy of the payment details is already enclosed as Annexure-2A.

Conditions No.-iii

Compensatory Afforestation over 81.545 Ha of non-forest land in village Gundula (66.745 Ha), Champajhar (9.80 Ha) under Banspal Tahasil and in village Binida & Delenga (5.00 Ha) under Ghatgaon Tahasil of Keonjhar District shall be raised at the project cost and afforestation work shall start within two years from the date of final approval and maintained thereafter in accordance with the approved CA scheme by the State Forest Department;

Compliance:

The schemes for raising of Compensatory Afforestation over 81.545 non–forest land identified in village Gundula (66.745 Ha), Champajhar (9.80 Ha) under Banspal Tahasil and in village Binida & Delenga (5.00 Ha) under Ghatgaon Tahasil of Keonjhar District have been prepared at current wage rate of Rs. 462/- per MD with a maintenance for 10 years and also technically approved by the PCCF (FD&NO, FC Act), O/o· the PCCF&HoFF, Odisha, Bhubaneswar with a financial outlay of Rs.4,81,46,300/- Rs.66,14,200/-, & Rs.83,16,500/- respectively.

As per the demand raised by the Divisional Forest Officer, Keonjhar vide Letter No. 2299/6F-Mining-145/2023 dated 21.02.2026 and Letter No. 4968/6F-Mining-42/2026 dated 21.04.2026 the total approved amount of Rs. 6,30,77,00/- for raising of Compensatory Afforestation 81.545 ha of non–forest Govt. land has been transferred to the Odisha CAMPA Account through RTGS (UTR No. ICICR42026031800501321, dated 18.03.2026 and RTGS (UTR No. ICICR42026042400534838, dated 24.04.2026) respectively via the online PARIVESH portal. The copy of the payment details is already enclosed as Annexure-2A

The State Government is requested to implement the compensatory afforestation plan over 81.545 ha within two years from the date of issuance of the final diversion order. We shall extend necessary cooperation and support for the smooth implementation of the work.

Conditions No.-iv

The non-forest land shall be transferred and mutated in favour of the State Forest Department, OR shall be notified by the State Government as Protected forest under section 29 of the Indian Forest Act, 1927 or under the relevant section(s) of the local Forest Act, before handling over the forest land to the user agency;

Compliance:

The total non-forest Government land measuring 81.545 hectares, identified and allotted for raising Compensatory Afforestation in three patches, has already been transferred and mutated in favour of the State Forest Department.

Out of the aforesaid land, an extent of 66.745 hectares located in Village Gundula under Banspal Tahasil has been duly mutated and transferred in favour of the State Forest Department vide Alienation Case No. 09/2026. The Tahasildar, Banspal, has also intimated the same to the Divisional Forest Officer, Keonjhar Division, vide Letter No. 1000/Rev dated

15.04.2026 Copies of the said intimation letter, the approved alienation order, and the Record of Rights (RoR) are enclosed herewith as Annexure–3A.

Further, non-forest land measuring 9.800 hectares identified in Village Champajhar under Banspal Tahasil has also been mutated and transferred in favour of the State Forest Department vide Alienation case no.08/2026 . The Tahasildar, Banspal has intimated the same to the Divisional Forest Officer, Keonjhar Division vide Letter No. 1000/Rev dated 15.04.2026 Copies of the said intimation letter, the approved alienation order, and the Record of Rights (RoR) are enclosed herewith as Annexure–3B.

Furthermore, non-forest land measuring 5.00 hectares, identified in Village Binida (2.920 ha) and Village Dengana (2.080 ha) under Ghatgaon Tahasil, has also been duly mutated and transferred in favour of the State Forest Department vide Alienation Case No. 07/2026 and Case No. 08/2026, respectively. The Tahasildar, Ghatgaon, has intimated the same to the Divisional Forest Officer, Keonjhar Division, vide Letter No. 1368/Rev dated 04.05.2026 (for Binida) and Letter No. 1368/Rev dated 04.05.2026 (for Dengana). Copies of the said intimation letters, approved alienation orders, and the Record of Rights (RoR) pertaining to 2.920 ha of non-forest land in Village Binida are enclosed herewith as Annexure–3C, and those pertaining to 2.080 ha of non-forest land in Village Dengana are enclosed herewith as Annexure–3D.

Notification under Section 33 of the Odisha Forest Act, 1972 in respect of the aforesaid land is presently under process.

Conditions No.-v

The additional compensatory afforestation shall be raised over 83.49 ha of degraded forest land and maintained by the State Forest Department at the cost of the User Agency and the work of compensatory afforestation shall start within two years of issue of order of diversion of the corresponding forest land;

Compliance:

For raising Additional Compensatory Afforestation (ACA) over 83.49 ha of degraded forest land, suitable areas have been identified in two patches, namely 67.49 ha in Jyotipur R.F. under Champua Range and 16.00 ha in Bansuli R.F. under Patana Range of Keonjhar Forest Division.

The ACA schemes for the above areas have been prepared at the current wage rate of Rs. 462/- per man-day, with a maintenance period of 10 years. The schemes covering 67.49 ha and 16.00 ha have been technically approved by the PCCF (FD & Nodal Officer, FC Act), O/o PCCF & HoFF, Odisha, Bhubaneswar, with a financial outlay of Rs. 4,18,16,500/- and Rs. 1,01,83,900/-, respectively.

As per the demand raised by the Divisional Forest Officer, Keonjhar vide Letter No. 2259/6F-Mining-145/2023 dated 21.02.2026, and Letter No. 4968/6F-Mining-42/2026 dated 21.04.2026 the approved amount of Rs. 4,18,16,500/- for 67.49 ha degraded forest land has been deposited into the Odisha CAMPA Account through RTGS [UTR No. ICICR42026031800501321, dated 18.03.2026) and RTGS (UTR No. ICICR42026042400534838,

dated 24.04.2026) respectively via the online PARIVESH portal. The copy of the payment details has already been enclosed as Annexure-2A.

Further, for raising Additional Compensatory Afforestation over 10.00 ha of degraded forest land the approved amount of Rs. 1,01,83,900/-, has been deposited into the Odisha CAMPA Account through RTGS (UTR No. ICICR42026042400534838, dated 24.04.2026) via the online PARIVESH portal as per the demand raised vide Letter No. 4968/6F-Mining-42/2026 dated 21.04.2026 of the Divisional Forest Officer, Keonjhar. The copy of the payment details has already been enclosed as Annexure-2A.

The State Government is requested to implement the ACA scheme over 83.49 ha within two years from the date of issuance of the final diversion order. We shall extend necessary cooperation and support for the smooth implementation of the work.

Conditions No.-vi

The cost of survey, demarcation and erection of permanent pillars, if required on the identified CA land, shall be deposited in advance with the Forest Department by the user agency. 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;

Compliance:

The three patches of non-forest land identified for raising Compensatory Afforestation (CA) over a total extent of 81.545 hectares—comprising 56.745 hectares in village Gundula, 9.800 hectares in village Champajhar under Banspal Tahasil, and 5.000 hectares in villages Binida & Delenga under Ghatgaon Tahasil of Keonjhar District—have been duly demarcated on the ground by erecting permanent RCC boundary pillars based on DGPS survey.

Further, for proper demarcation and protection of the aforesaid areas, the cost of providing angle iron posts with chain-link wire mesh fencing along the boundary, including maintenance for a period of 10 years, has been incorporated in the approved CA schemes. The total approved amount of ₹6,30,77,000/- for raising Compensatory Afforestation over the said 81.545 hectares has been deposited into the Odisha CAMPA account.

Moreover, the schemes have been prepared with due consideration to plantation of indigenous species, provision for anticipated escalation in costs, and inclusion of works scheduled for subsequent years along with a 10-year maintenance period.

Conditions No.-vii

The State Government shall charge the Net Present Value (NPV) of the forest land being diverted under this proposal from the User Agency as per the orders of the Hon'ble Supreme Court of India dated 28.03.2008, 24.04.2008 and 09.05.2008 in Writ Petition (Civil) No. 202/1995 and the guidelines issued by this Ministry vide its letter No. 5-3/2007-FC (pt.) dated 29.12.2023 in this regard;

Compliance:

Totally an amount of Rs. 9,49,99,569/- (Rs.95,49,120 + Rs.6,18,36,110+ Rs.2,36,14,339) has been deposited towards the Net Present Value (NPV) for five lease blocks, namely Block-A (89.961 ha), Block-B1 (0.607 ha), Block-B2 (7.689 ha), Block-B3 (1.012 ha), and Block-C (1.902 ha), covering a total forest area of 101.171 hectares, calculated at the rate of Rs. 9,39,000/- per hectare.

Out of the total lease area of the five blocks, 16.464 hectares has already been diverted, while the remaining 84.707 hectares (101.171 ha – 16.464 ha) constituted un-diverted forest land initially proposed for diversion. Accordingly, the NPV amount Rs. 7,95,39,9873/- for the said 84.707 hectares of un-diverted forest land has already been included in the total NPV deposited.

Subsequently, Lease of Blocks B1, B2, B3, and C were declared lapsed by the Steel & Mining Department, Government of Odisha. As a consequence, an area of 5.34 hectares of un-diverted forest land falling within these lapsed blocks was excluded from the present proposal. Accordingly, the net forest area considered for diversion has been revised to 79.367 hectares, against which the Net Present Value (NPV) amounting to Rs. 7,95,39,000/- has already been deposited.

Further, out of the revised 79.367 hectares of un-diverted forest land, a differential NPV amount of Rs. 31,85,088/- (calculated @ Rs. 14,36,670/- per hectare for Eco value Class-I, Density- 04 to 0.7) has been deposited for an extent of 6.40 hectares pertaining to prospecting proposal No. FP/OR/SRY/436505/2023.

Thus, a total NPV amount of Rs. 8,27,24,961/- (i.e., Rs. 7,95,39,000/- + Rs. 31,85,088/-) has already been deposited for the revised forest area of 79.367 hectares. In addition, the balance differential NPV amount of Rs. 3,12,99,227/- has also been duly deposited in the Odisha CAMPA account, as per the demand raised by the Divisional Forest Officer, Keonjhar, vide Letter No. 3368/6F-Mining dated 12.03.2026. All the above payment evidences are enclosed in Annexure-2B.

Conditions No.-viii

At the time of payment of the Net Present Value (NPV) at the then prevailing 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;

Compliance:

An amount of Rs. 12,39,71,954/- towards Net Present Value (NPV) of the entire lease area measuring 89.961 ha has been deposited in the Odisha CAMPA account through the PARIVESH portal. This includes Rs. 11,40,24,188/- for the forest land proposed for diversion over 79.367 ha in the revised rate (calculated @ Rs. 14,36,670/- per hectare for Eco value Class-I, Density- 04 to 0.7) and Rs. 99,47,766/- for the forest land already diverted over 10.594 ha. (calculated @ Rs. 9,39,000/- per hectare for Eco value Class-I, Density- 04 to 0.7).

Further, the user agency has submitted an undertaking (enclosed at Sl. No.2 of Annexure-1) to pay any additional amount of NPV, if so determined, in accordance with the final decision of the Hon'ble Supreme Court of India.

Conditions No.-ix

The State Forest Department shall prepare and implement a comprehensive Wildlife Management Plan in consultation with Wildlife Institute of India (WII) to mitigate the adverse impacts of mining on the forest and its flora and fauna in the surrounding area, at the cost of the User Agency.

Compliance:

A Comprehensive Site-Specific Wildlife Management Plan (SSWMP) has been prepared for the Dalpahar Iron & Manganese Mines and its zone of influence to mitigate the adverse impacts of mining on the surrounding forest ecosystem, including flora and fauna. The plan has been formulated in accordance with Wildlife Mitigation Planning frameworks developed by the Wildlife Institute of India as well as the latest guidelines issued by CWLW.

The said plan has been duly approved by the Chief Wildlife Warden, Odisha, vide Letter No. 13358/CWLW-FDWC-FD-0144-2021 dated 14.12.2023, for a total amount of Rs. 491.46 lakh for taking up mitigation measures due to impact of the mining. This includes Rs. 286.26 lakh for the project impact area under Keonjhar Forest Division and Rs. 205.20 lakh for the project impact area under Bonai Forest Division. The approved plan is enclosed as Annexure-4 for kind perusal.

Further, as per the demand raised by the Divisional Forest Officer, Keonjhar Forest Division, vide Letter No. 14034 /6F-Mining-145/2023 dated 16.12.2023, the approved amount towards implementation of the plan has been deposited in the Odisha CAMPA Fund through RTGS mode vide UTR No. KKBKR52024011500724506 dated 15.01.2024 via the online PARIVESH portal. The copy of the remittance receipt is enclosed vide Annexure- 2C.

Further, as per the letter of the Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, Odisha, the Divisional Forest Officer, Keonjhar Division has forwarded the approved SSWMP to the Director, Wildlife Institute of India, Uttarakhand, vide Letter No. 4703/6F-Mining-05/2022 dated 13.04.2024, requesting him for preparation of a comprehensive Wildlife Management Plan to mitigate the adverse impact of mining on the forest and its flora and fauna in the surrounding area

The User Agency hereby also undertakes to bear the additional cost towards preparation and implementation of the comprehensive wildlife management plan by the State Forest Department in consultation with Wildlife Institute of India (WII) for the surrounding landscape, in proportion with other mining projects operating in the same landscape. The undertaking in this regard is enclosed at Sl. No.3 of Annexure-1.

Furthermore, the User Agency has also deposited a proportionate cost of Rs. 73,76,802/- for the Mining Lease area over 89.961 ha, in the Odisha CAMPA Fund on 23.09.2011 and 29.08.2023 towards the implementation of the Regional Wildlife Management Plan, as per

the demand raised by the Divisional Forest Officer, Keonjhar Division, vide Letter No. 5632/Mining dated 06.08.2011 and Letter No. 8993/6F-Mining-57/2020 dated 03.08.2023. Copies of the remittance receipts are enclosed as Annexure-2D.

Conditions No.-x

The User Agency shall submit a time-bound plan for reclamation of the mined-out area and surrender of the land to the State Government, and shall strictly adhere to the approved timeline. The same shall be submitted along with compliance of Stage- I approval.

Compliance:

The time-bound plan for reclamation of the mined-out area and subsequent surrender of the land to the State Government for the Dalpahar Iron & Manganese Mines (over an extent of 89.961 ha) has been prepared in compliance with applicable statutory requirements. The plan outlines a comprehensive framework for the restoration of land disturbed by mining activities through a combination of engineering stabilization measures, soil and moisture conservation interventions, vegetation development, and hydrological restoration. A financial provision of Rs. 82.44 crore has been earmarked for the implementation of the plan. The detailed plan is enclosed as Annexure-5 for kind perusal.

Further, an undertaking has also been submitted at Sl. No.4 of annexure-1 for the implementation of the said time-bound reclamation plan.

Conditions No.-xi

A comprehensive Catchment Area Treatment Plan shall be prepared and implemented by the User Agency through the State Forest Department to minimize the adverse impact of the mining project on the surface hydrology of the area.

Compliance:

A comprehensive Catchment Area Treatment (CAT) Plan has been prepared considering the prevailing wage rate of Rs. 462/- per man-day, with a financial outlay of Rs. 1,40,08,852/- for the lease area (core zone) and Rs. 85,93,954/- for the buffer zone. Further, to account for likely increases in the cost of materials and labour during the implementation period, an escalation provision of 20% has been incorporated into the total estimated cost to accommodate future price variations.

The plan has been technically approved by the RCCF, Rourkela Circle vide memo no.1988/3F(Misc)-39/2025 dated22.04.2026. A copy of the approved Plan is enclosed as Annexure-6.

Furthermore, an undertaking is being submitted by the user agency for the implementation of the approved comprehensive Catchment Area Treatment Plan at the project cost in a phased manner, in consultation with the State Forest Department. The undertaking to this effect is enclosed at Sl. No.5 of Annexure-1.

Conditions No.-xii

The User Agency, in consultation with the State Government, shall explore the feasibility of translocation of affected trees wherever possible, subject to species suitability and other relevant considerations.

Compliance:

The feasibility of translocating suitable trees identified for felling will be explored wherever possible. Tree felling shall be undertaken only when it is unavoidable, and strictly under proper supervision, in accordance with the directions of the Divisional Forest Officer, Keonjhar. The user agency has submitted an undertaking to this effect is enclosed at Sl. No.6 of **Annexure-1**.

Conditions No.-xiii

The User Agency shall maintain a contiguous safety zone along the entire project boundary.

Compliance:

A 7.5-meter-wide safety zone along the entire inner boundary of the mining lease area (89.961 ha) of the Dalpahar Iron & Manganese Mines, over an extent of 3.118 hectares, shall be maintained as a green belt with proper protection measures.

Furthermore, the User Agency is submitting an undertaking to maintain a continuous 7.5-meter-wide safety zone along the inner boundary of the mining lease area. The undertaking to this effect is enclosed at Sl. No.7 of **Annexure-1**.

Conditions No.-xiv

The State Government shall implement Rehabilitation and Resettlement (R&R) measures in accordance with the applicable rules & Guidelines.

Compliance:

Since the entire Mining Lease area of 89.961 ha for the Dalpahar Iron & Manganese Mines falls within the Baitarani Reserve Forest and no habitation of household exists within the lease area, so the implementation of Rehabilitation and Resettlement (R&R) measures is not required.

Conditions No.-xv

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

Compliance:

All compensatory levies pertaining to the project have been duly transferred/deposited through e-challan into the account of the National Authority, CAMPA, corresponding to the

concerned State, via the e-portal (https://parivesh.nic.in/), in accordance with the demand raised by the State Forest Department.

The funds related to the project have been deposited as per the details provided below:

Sl No.	Type of deposit (NPV/CA/ IWMP/Others (specify)	whether by RTGS/DD/ NEFT (Specify)	UTR/ DD /Challan No.	Amount deposited (Rs.)	Date of deposit	Name of bank from which amount transferred to account of CAF	Bank Account of CAF managed by CAMPA in which found deposited
1	NPV	Challan	Vide Treasury Challan No.05/05	95,49,120	06.05.2005	From Oriental Bank of Commerce	Orissa CAMPA
2	NPV	RTGS	ORBCH13260096241	6,18,36,110	17.09.2013	From SB A/c No.10592100021560 in Oriental Bank of Commerce, Newdelhi-10049	Orissa CAMPA A/c No.34490201010 5428
3	Differential NPV	RTGS	UTR No.ORBCN20287023974	2,36,14,339	13.10.2020	From Punjab National Bank South East New Delhi.	Orissa CAMPA A/c No.150825851900152, IFSC CORP0000371
4	Differential NPV	RTGS	UTR No.KKBKRS20240115007245 06	31,35,088	14.12.2023	From S/B A/c of Avain Jain in Kotak Mahindra Bank at New Delhi-110049	Orissa CAMPA A/c No.4213145237
5	Differential NPV	RTGS	UTR No.ICICR420260402 00559240	3,12,99,227	02.04 2026	Avain Jain in ICICI Bank at New Delhi-110049	Orissa CAMPA A/c No.150825893600952,IFSC-UBIN0996335
6	C.A.& Add.C.A	RTGS	UTR No.ICICR420260318 00501321	9,98,98,600	18.03.2026	Avian Jain in ICICI Bank at New Delhi-110049	Orissa CAMPA A/c No.150825893600486,IFSC-UBIN0996335
7	Revised C.A & Add.C.A	RTGS	UTR No. ICICR420 2604240 0534838	1,51,78,800	24.04.2026	Avian Jain in ICICI Bank at New Delhi-110049	Orissa CAMPA A/c No.150825893600630,IFSC-UBIN0996335

8	scheme for creation & maintenance of alternate habitat/ home for the avifauna	RTGS	UTR No. ICICR4202604240 0534838	1,45,92,000	24.04.2026	Avian Jain in ICICI Bank at New Delhi-110049	Orissa CAMPA A/c No.150825893600630,IFSC-UBIN0996335
7	RWMP	DD No.855737 dated 23.09.2011	-	20,23,420	23.09.2011	From S/B A/c of Avian Jain in Kotak Mahindra Bank at New Delhi-110049	Orissa CAMPA A/c No.1508258519 00623, IFSC - UBIN0996335, Bangaluru-560027.
8	Differential cost of RWMP	RTGS	UTR No.KKBKR52023082 90061995 9/29	55,77,582	29.08.2023	From S/B A/c of Avian Jain in Kotak Mahindra Bank at New Delhi-110049	Orissa CAMPA A/c No.1508258519 00623, IFSC - UBIN0996335, Bangaluru-560027.
9	SSWCP	RTGS	UTR No.KKBKR52024011 50072450 6	4,91,46,000	15.01.2024	From S/B A/c of Avan Jain in Kotak Mahindra Bank at New Delhi-110049	Orissa CAMPA A/c No.1508258519 00780, IFSC - UBIN0996335, Bangaluru-560027.
Total				**Rs. 31,59,00,286/-**			

Conditions No.-xvi

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

Compliance:

We confirm that the stipulated condition has been duly complied with, and the complete compliance report has been uploaded on the PARIVESH portal (https://parivesh.nic.in/) for kind reference

Conditions No.-xvii

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, Van (Sanrakshan Evam Samvardhan) Adhiniyam, 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 DDGF (Central) may direct that the mining activities shall remain suspended till such time, such reclamation activities are satisfactorily executed;

Compliance:

The User Agency shall abide by the stipulated conditions and undertake mining in a phased manner as per the approved mining plan and will ensure concurrent reclamation of the mined-out area in a phased manner, commencing from the first year of operation, also in accordance with the approved Mining Plan. Further, the User Agency shall submit an annual report on the status of reclamation to the concerned department. An undertaking to this effect is being submitted at Sl No 8 of Annexure-1.

Conditions No.-xviii

The user agency shall prepare a schedule for surrender of the mined out and reclaimed forest land in accordance with existing mining plan and submit the same along with an undertaking to surrender the mined out and reclaimed forest land as per such schedule to the MoEF&CC before grant of 'Final' approval under the Adhiniyam for diversion of the said forest land;

Compliance:

The time-bound plan for reclamation of the mined-out area and subsequent surrender of the land to the State Government for the Dalpahar Iron & Manganese Mines lease area (covering an extent of 89.961 ha) has been prepared in accordance with the approved mining plan. The plan provides a comprehensive framework for restoring land disturbed by mining activities through a combination of engineering stabilization measures, soil and moisture conservation interventions, vegetation development, and hydrological restoration. The detailed plan has been already enclosed as Annexure-5 for kind perusal.

Further, an undertaking is being furnished by the User Agency to implement the time-bound reclamation plan and to ensure the surrender of the mined-out and reclaimed forest land to the State Government. The undertaking in this regard is being submitted at Sl.No. 9 of Annexure-1.

Conditions No.-xix

The rehabilitated forest area after closure of mining operations shall be handed over to the State Forest Department for sustainable forest management in the future;

Compliance:

The time-bound plan for reclamation of the mined-out area and subsequent surrender of the land to the State Government for the Dalpahar Iron & Manganese Mines lease area (covering an extent of 89.961 ha) has been prepared in accordance with the approved mining plan. The detailed plan has been already enclosed as **Annexure-5** may be perused.

Furthermore, the User Agency has furnished an undertaking at Sl. No. 9 of Annexure-1 to hand over the rehabilitated forest area measuring 89.961 ha to the State Forest Department upon closure of mining operations for sustainable forest management.

Conditions No.-xx

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:

a) **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;**

Compliance:

In compliance with the above condition, a detailed scheme has been prepared for the demarcation of the safety zone (a 7.5-meter strip along the entire inner boundary of the mining lease area), including its fencing, protection, and ecological regeneration. The scheme provides for the installation of an adequate number of 6-foot-high RCC boundary pillars inscribed with DGPS coordinates, along with barbed wire fencing, at a total estimated cost of Rs. 1,68,04,500/-. Further, to account for likely increases in the cost of materials and labour during the implementation period, an escalation provision of 20% has been incorporated into the total estimated cost to accommodate future price variations.

The scheme has also been technically approved by the RCCF, Rourkela Circle vide memo no 1988/3F(Misc)-39/2025 dated22.04 2026. A copy of the approved scheme is enclosed as **Annexure-7A.**

Further, the User Agency is submitting an undertaking to implement the approved scheme at its own cost in a phased manner, under the supervision of the State Forest Department. The undertaking to this effect is enclosed at Sl. No. 10 of **Annexure-1.**

b) **Boundary of the safety zone of the mining lease, adjacent to habitation/roads, should be properly fenced by the user *agency*;**

Compliance:

The safety zone along the boundary of the Mining Lease has been duly demarcated by erecting RCC pillars. The fencing of this safety zone forms part of the scheme prepared for the demarcation, protection, and regeneration of the 7.5-meter-wide strip along the inner boundary of the Mining Lease area.

Further, the road adjoining the Mining Lease area will be properly fenced at the cost of the User Agency.

The User Agency is submitting an undertaking to ensure proper fencing of the safety zone, particularly in areas adjacent to the road. The undertaking in this regard is enclosed at Sl. No. 11 of Annexure-1.

c) **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; and**

Compliance:

For the development and maintenance of a green belt around the mining lease, plantation activities will be undertaken within the safety zone to ensure the establishment of a dense canopy and facilitate ecological regeneration of the area. In this regard, a comprehensive scheme has been prepared for the demarcation of the safety zone, defined as a 7.5-meter-wide strip along the entire inner boundary of the mining lease area, along with provisions for its fencing, protection, and ecological restoration with a budgetary provision of Rs. 1,68,04,500/-. Further, to account for likely increases in the cost of materials and labour during the implementation period, an escalation provision of 20% has been incorporated into the total estimated cost to accommodate future price variations.

The scheme has also been technically approved by the RCCF, Rourkela Circle vide memo no.1988/3F(Misc)-39/2025 dated22.04. 2026.A copy of the approved scheme is already enclosed as annexure-7A.

Further, the User Agency is submitting an undertaking to implement the approved scheme at its own cost in a phased manner, under the supervision of the State Forest Department. The undertaking to this effect is already enclosed at Sl. No.12 of Annexure-1.

d) The State Government and the user agency shall ensure that safety zone is maintained as per the prescribed norms;

Compliance:

The User Agency shall abide by the stipulated condition and has submitted an undertaking at Sl. No.13 of Annexure-1 to ensure that the safety zone along the Mining Lease boundary is maintained in accordance with the prescribed norms.

Conditions No.-xxi

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:

a) **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 'Final' approval in accordance with the approved Plan/Scheme in consultation with the State Forest Department;**

Compliance:

A scheme containing appropriate mitigative measures to minimize soil erosion and choking of streams has been prepared, with the prevailing wage rate of Rs. 462/- per man-day and includes provisions for maintenance over a period of ten years. The total financial outlay for the scheme is Rs. 3,72,19,064. Further, to account for likely increases in the cost of materials and labour during the implementation period, an escalation provision of 20% has been incorporated into the total estimated cost to accommodate future price variations.

The scheme has also been technically approved by the RCCF, Rourkela Circle vide memo no 1988/3F(Misc)-39/2025 dated22.04.2026. 2026. A copy of the approved scheme is enclosed as Annexure-7B.

Furthermore, the User Agency has submitted an undertaking to implement the approved scheme at its own cost within a period of three years from the date of issue of the 'Final' approval, in consultation with the State Forest Department. The undertaking to this effect is enclosed at Sl. No.14 of Annexure-1.

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 Plan/scheme; in consultation with the State Forest Department;**

Compliance:

A scheme, regarding planting drought hardy plant species and sowing of seeds in the appropriate area within the mining lease, has been prepared considering the prevailing wage rate of Rs. 462/- per man-day and includes provisions for maintenance over a period of ten years. The total financial outlay for the scheme is Rs. 3,64,252/-. Further, to account for likely increases in the cost of materials and labour during the implementation period, an escalation

provision of 20% has been incorporated into the total estimated cost to accommodate future price variations.

The scheme has also been technically approved by the RCCF, Rourkela Circle vide memo no 1988/3F(Misc)-39/2025 dated22.04.2026. A copy of the approved scheme is enclosed as Annexure-7C.

Further, the User Agency has submitted an undertaking to implement the approved scheme at its own cost in a phased manner, in consultation with the State Forest Department. The undertaking to this effect is enclosed at Sl. No.15 of Annexure-1.

c) **Construction of check dams, retention /toe walls to arrest sliding down of the excavated material along the contour in accordance with the approved Plan/Scheme;**

Compliance

A scheme for the construction of check dams and retention/toe walls along the contours to arrest the sliding of excavated material has been prepared. No separate budgetary provision has been made for this component, as the cost has been incorporated in the budgetary provisions of the comprehensive scheme for mitigative measures to minimize soil erosion and choking of streams, prepared in compliance with Condition No. xxi(a).

The scheme has also been technically approved by the RCCF, Rourkela Circle vide memo no.1988/3F(Misc)-39/2025 dated22.04.2026. A copy of the approved scheme is enclosed as Annexure-7D.

Further, the User Agency has submitted an undertaking to implement the approved scheme at its own cost in a phased manner, in consultation with the State Forest Department. The undertaking to this effect is enclosed at Sl. No.16 of Annexure-1.

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°; and**

Compliance

A scheme to stabilize the overburden dumps by appropriate grading/benching so as to ensure that the angles of repose at any given place is less than 28° has been prepared. No separate budgetary provision has been made for this component, as the cost has been incorporated in the budgetary provisions of the comprehensive scheme for mitigative measures to minimize soil erosion and choking of streams, prepared in compliance with Condition No. xxi(a).

The scheme has also been technically approved by the RCCF, Rourkela Circle vide memo no.1988/3F(Misc)-39/2025 dated22.04.2026. A copy of the approved scheme is enclosed as Annexure-7E.

Further, the User Agency has submitted an undertaking to implement the approved scheme at its own cost in a phased manner, in consultation with the State Forest Department. The undertaking to this effect is enclosed at Sl. No.17 of Annexure-1.

e) **No damage shall be caused to the top-soil and the user agency will follow the top soil management plan.**

Compliance

For proper collection, protection and utilization of top soil, a scheme for topsoil management has been prepared with the prevailing wage rate of Rs. 462/- per man-day and includes provisions for maintenance over a period of ten years. The total financial outlay for the scheme is Rs. 1,18,00,700/-. Further, to account for likely increases in the cost of materials and labour during the implementation period, an escalation provision of 20% has been incorporated into the total estimated cost to accommodate future price variations.

The scheme has also been technically approved by the RCCF, Rourkela Circle vide memo no.1988/3F(Misc)-39/2025 dated22.04.2026. A copy of the approved scheme is enclosed as Annexure-7F.

Further, the User Agency has submitted an undertaking to implement the approved scheme at its own cost in a phased manner, in consultation with the State Forest Department. The undertaking to this effect is enclosed at Sl No.18 of Annexure-1.

Conditions No.-xxii

The validity of approval granted under the Adhiniyam shall be for a period co- terminus with the validity of the mining lease proposed to be granted under the Mines and Minerals (Development and Regulation) Act, 1957, as amended from time to time or Rules framed there under, or for such period as may be specified by the Central Government;

Compliance

The user agency has submitted an undertaking at Sl.No.19 of Annexure-1 to abide by the provision that the period of diversion of forest land under the present proposal shall be co-terminus with the validity period of the mining lease, as amended under the provisions of the Mines and Minerals (Development and Regulation) Amendment Act, 2015, and the Rules framed thereunder.

Conditions No.-xxiii

The User Agency either himself or through the State Forest Department shall undertake gap planting and soil and moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located within the periphery of 100 m from outer perimeter of the mining lease as per approved plan for plantation and SMC activities submitted along with compliance of 'in-principle' approval;

Compliance

A scheme has been prepared over an area of 23 ha to undertake gap planting and soil & moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.4), located in the area within 100 metres from the outer perimeter of the mining lease with a budgetary provision of Rs. 56,94,414/ at the current wage rate of Rs.462/- man-day with maintenance for ten years. Further, to account for likely increases in the cost of materials and labour during the implementation period, an escalation provision of 20% has been incorporated into the total estimated cost to accommodate future price variations.

The scheme has also been technically approved by the RCCF, Rourkela Circle vide memo no.1988/3F(Misc)-39/2025 dated22.04.2026. A copy of the approved scheme is enclosed as **Annexure-7G**.

Further, the User Agency has submitted an undertaking to implement the approved scheme at its own cost, in consultation with the State Forest Department. The undertaking to this effect is enclosed at Sl. No.20 of **Annexure-1**.

Conditions No.-xxiv

The User Agency shall regularly undertake desilting of village tanks and other water bodies, located within five km from the mine lease boundary, as per approved plan, to mitigate the impact of project on such tanks/water bodies;

Compliance

A scheme for the de-silting of village tanks and other water bodies located within 5 km radius of the mining lease boundary has been prepared to mitigate the impact of the mining on such water bodies. The scheme covers 8 ponds across 7 villages, with a total budgetary provision of Rs. 1,12,89,900/- based on the prevailing wage rate of Rs. 462 per man-day, to be implemented at intervals of five years. Further, to account for likely increases in the cost of materials and labour during the implementetion period, an escalation provision of 20% has been incorporated into the total estimated cost to accommodate future price variations.

The scheme has also been technically approved by the RCCF, Rourkela Circle vide memo no.1988/3F(Misc)-39/2025 dated22.04.2026. A copy of the approved scheme is enclosed as **Annexure-7H**.

Further, the User Agency has submitted an undertaking to implement the approved scheme at its own cost. The undertaking to this effect is enclosed at Sl. No.21 of **Annexure-1.**

Conditions No.-xxv

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;

Compliance

The user agency has submitted an undertaking at Sl. No.22 of Annexure-1 to comply with the Hon'ble Supreme Court's order on re-grassing and undertakes to re-grass the mining area and any other areas disturbed due to mining, to restore them to a condition which is fit for the growth of fodder, flora, fauna, etc in a timely manner as per the approved Mining plan and Mining Closer Plan.

Conditions No.-xxvi

Adequate care shall be taken to check any rolling of overburden/dumps beyond the designated area and to check soil erosion caused due to mining activities;

Compliance

The User Agency shall abide by the stipulated conditions and has submitted an undertaking at Sl. No.23 of Annexure-1 will take all adequate measures to ensure that no overburden or dump material rolls beyond the designated area and to effectively control soil erosion arising from mining activities

Conditions No.-xxvii

The User Agency will undertake comprehensive soil and moisture conservation measures at the project cost in consultation with the State Forest Department. A scheme of the same shall be submitted along with the 'in- principle' approval;

Compliance

A comprehensive scheme for soil and moisture conservation measures in the Mining Lease area has been prepared. Since all required structural and biological measures, along with their budgetary provisions, have already been incorporated under various schemes to comply with the conditions stipulated in the Stage-I approval (i.e., Condition Nos. 2(xi), 2(xxi)(a), 2(xxi)(e), 2(xx)(a, b & c), and 2(xxi)(b)), considering the prevailing wage rate of Rs. 462/- per man-day, no separate budgetary provision has been made for this component in the lease area (core zone). However, a provision of Rs. 12,38,441/- has been allocated for the buffer zone. Further, to account for likely increases in the cost of materials and labour during the implementation period, an escalation provision of 20% has been incorporated into the total estimated cost to accommodate future price variations.

The plan has also been technically approved by the RCCF, Rourkela Circle vide memo no.1988/3F(Misc) 39/2025 dated22.04.2026. A copy of the approved plan is enclosed as Annexure-i.

Further, an undertaking has been submitted by the user agency for the implementation of the scheme approved for soil and moisture conservation measures at the project cost in a phased manner, in consultation with the State Forest Department. The undertaking to this effect is enclosed at Sl. No.24 of Annexure-1.

Conditions No.-xxviii

The user agency shall explore the possibility of translocation of maximum number of trees identified to be felled, if any, 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;

Compliance

The User Agency shall explore the feasibility of translocating suitable trees identified for felling, wherever practicable. Tree felling shall be undertaken only when unavoidable, and strictly under proper supervision, in accordance with the instructions of the Divisional Forest Officer, Keonjhar Division. An undertaking to this effect has already been submitted at Sl. No.6 of Annexure-1.

Conditions No.-xxix

The cost of felling of trees, if any, shall be deposited by the User Agency with the State Forest Department;

Compliance

The user agency will abide by the condition. An undertaking to this effect is submitted at Sl. No.25 of Annexure-1.

Conditions No.-xxx

The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;

Compliance

The User Agency has obtained Environmental Clearance under the provisions of the Environment (Protection) Act, 1986 from the competent authority, i.e., the State Environment Impact Assessment Authority (SEIAA), Odisha, Bhubaneswar, vide File No. 55644/46-NCMB1/02-2021 and Letter No. 2260/SEI dated 19.08.2021.

Conditions No.-xxxi

The forest land shall not be used for any purpose other than specified in the proposal;

Compliance

The User Agency has submitted an undertaking at Sl. No.26 of Annexure-1 stating that the diverted forest land shall be used solely for the purpose specified in the approved proposal and for no other purpose.

Conditions No.-xxxii

No labour camp shall be established on the forest land;

Compliance

The User Agency shall not establish any labour camps within the forest land and an undertaking to this effect has been submitted at Sl. No.27 of Annexure-1.

Conditions No.-xxxiii

The User Agency shall provide fuels preferably alternate fuels, if required to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas;

Compliance

The user agency will provide alternate fuels to the labourers and staff working at the site to avoid any damage and pressure on the nearby forest areas. An undertaking to this effect has been submitted at Sl. No.28 of Annexure-1.

Conditions No.-xxxiv

The boundary of the diverted forest land 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;

Compliance

The User Agency has already erected all boundary pillars along the diverted forest land using 4-foot-high reinforced cement concrete (RCC) pillars. Each pillar is duly inscribed with its serial number, inter-pillar distance, and corresponding GPS coordinates. The lease boundary pillars have also been established in accordance with the prescribed norms. The boundary description, along with photocopies of the erected pillars for the diverted forest land, mining lease area, and safety zone, is enclosed as Annexure–8.

Conditions No.-xxxv

The layout plan of the 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;

Compliance

The User Agency has submitted an undertaking at Sl. No.29 of Annexure-1 stating that no changes shall be made to the layout plan of the proposal without prior approval of the Central Government, and that the diverted forest land shall be used solely for the purpose specified in the approved proposal and for no other purpose.

Conditions No.-xxxvi

The user agency in consultation with the State Government shall create and maintain alternate habitat/home for the avifauna, whose nesting trees are to be cleared in this project. Bird's nests artificially made out of eco-friendly material shall be used in the area, including forest area and human settlements, adjoining the forest area being diverted for the project;

Compliance

The scheme for creation and maintenance of alternate habitat/home for the avifauna, whose nesting trees are to be cleared in respect of this mining project has been technically approved with a total financial outlay of Rs.145.920 lakh by the PCCF (WL) &CWLW,Odisha vide letter No.3429/PT1-CWLW-FDWC-FD-0144-2021 dated 16.04.2026.

As per the demand raised by the Divisional Forest Officer, Keonjhar vide Letter No. 4882/6F-Mining-42/2026 dated 18.04.2026, the approved amount of Rs. 1,45,92,000/- has been deposited into the Odisha CAMPA Account through RTGS (UTR No. ICICR42026042400534838, dated 24.04.2026) via the online PARIVESH portal towards implementation of the scheme. Further, an amount of Rs. 7,30,000/- has been deposited into the account of the DFO, Keonjhar Division through RTGS (UTR No. ICICR42026042500516192, dated 25.04.2026) towards monitoring of the scheme. Copies of the payment details are enclosed as **Annexure-2E**.

The approved scheme also includes provision for installation of artificial bird nests made from eco-friendly materials across the project area, including nearby human settlements, to support and conserve the displaced avifauna population. A copy of the approved scheme with approved letter is enclosed as **Annexure-9**.

Conditions No.-xxxvii

The User Agency shall implement the R&R Plan, if applicable, as per R&R policy of State Government in consonance with National R &R policy, Government of India before the commencement of the project work and implementation. The said R&R plan shall be monitored by the State Govt./Regional Office of MoEF&CC;

Compliance

Since the entire Mining Lease area of 89.961 ha for the Dalpahar Iron & Manganese Mines falls within the Baitarani Reserve Forest and no habitation of household exists within the lease area, so the implementation of Rehabilitation and Resettlement (R&R) measures is not required.

Conditions No.-xxxviii

The KML files of proposed area for diversion as well as the land identified for the compensatory afforestation, area identified under the Wildlife Management Plan and Soil & Moisture Conservation Plan shall be uploaded on the e-Green watch portal with all requisite details before handover of the land;

Compliance

The KML files of proposed area for diversion as well as the land identified for the compensatory afforestation, area identified under the Wildlife Management Plan and Soil & Moisture Conservation has been provided in the pen-drive for uploading on the e-Greer watch portal.

Conditions No.-xxxix

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;

Compliance

The user agency has submitted an undertaking at Sl. No.30 of Annexure-1, stating that the diverted forest land will not be transferred to any other agency, department, or individual without obtaining prior approval from the Ministry of Environment, Forest & Climate Change, and Government of India.

Conditions No.-xl

No damage to the flora, fauna or the environment of the adjoining area shall be caused;

Compliance

We will ensure that no damage is caused to the flora and fauna of the adjoining areas during mining activities, and appropriate protective measures will be implemented in consultation with the Divisional Forest Officer, Keonjhar Forest Division.

The user agency has submitted an undertaking to this effect at Sl. No.31 of Annexure-1.

Conditions No.-xli

Adequate measures to ensure no damage to the adjoining forest areas should be taken by the User Agency at the project cost;

Compliance

Adequate measures, including proper site planning, operational controls during mining, pollution control, waste management, and compliance with Environmental Impact Assessment (EIA) regulations, shall be undertaken by the user agency at its own cost to ensure that no damage is caused to the adjoining forest areas during mining operations.

An undertaking to this effect is submitted at Sl. No.32 of Annexure-1.

Conditions No.-xlii

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;

Compliance

The annual self-compliance report on the conditions stipulated in the Stage-II approval shall be submitted to the State Government, the concerned Regional Office, and this Ministry by the end of March every year, after the commencement of mining operations.

The user agency has submitted an undertaking to this effect at Sl. No.33 of Annexure-1.

Conditions No.-xliii

Any other condition that the Ministry of Environment, Forests & Climate Change may stipulate from time to time in the interest of conservation, protection and development of forests & wildlife shall be carried with by the State Government and user agency;

Compliance

The User Agency has submitted an undertaking at Sl. No.34 of Annexure-1 to comply with any additional conditions that may be stipulated from time to time by the Ministry of Environment, Forest and Climate Change in the interest of conservation, protection, and development of forests and wildlife.

Conditions No.-xliv

The user agency shall comply all the provisions of 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;

Compliance

The user agency will comply with all the provisions of the applicable Acts, Rules, Regulations, Guidelines, Hon'ble Court Orders, and NGT Orders pertaining to the project, as may be in force from time to time. An undertaking to this effect is submitted at Sl. No.35 of Annexure-1.

Conditions No.-xlv

The State Government, before issuing the final diversion order, shall ensure that the user agency has complied with all the provisions of the all Acts, Rules, Regulations, Guidelines, Hon'ble Court Order (s) and NGT Order (s), including compliance of Forest Rights Act, 2006, pertaining to this project, for the time being in force, as applicable to the project;

Compliance

The user agency undertakes to abide by this condition and an undertaking to this effect is already submitted at Sl. No.35 of Annexure-1.

Conditions No.-xlvi

Violation of any of these conditions will amount to violation of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and action would be taken as prescribed in para 1.16 of Chapter 1 of the consolidated guidelines and clarifications issued under Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and Van (Sanrakshan Evam Samvardhan) Rules, 2023 as issued by this Ministry's letter No. 5-2/2017-FC dated 29.12.2023.

Compliance

The User Agency has submitted an undertaking at Sl No 36 of Annexure-1 stating that it shall not violate any of the conditions stipulated in the forest diversion order. In the event of any violation, the User Agency shall abide by the action as prescribed under Para 1.16 of Chapter 1 of the Consolidated Guidelines and Clarifications issued under Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980, by the Ministry vide letter dated 29.12.2023.

For Dalpahar Iron & Manganese Mines

Authorized Signatory

S. N. Mohanty, Agent
Dalpahar Fe. & Mn. Mines
Dalpahar, Joda

M/s DHARAMCHAND JAIN
(Mining Lessee)

"DHARAM VILLA"
12-A, Mahatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV,
New Delhi-110024
Phone: 011-41642414
Email: mdmpl@rediffmail.com
avinjain999@gmail.com

Annexure-I

UNDERTAKING

I, **Sri Samarendra Nath Mohanty**, the authorized representative of Dalpahar Iron and Maganese Mines of Shri Avin Jain, do hereby undertake to bear any cost, as and when demanded, and further undertake to carry out all works as stipulated in Principle Approval (Stage-I) Forest Clearance Order issued by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India, vide order dated 13.02.2026.

I further undertake to abide by the following stipulated conditions of the said order as below:

Condition No.i

1) To keep the legal status of the diverted forest land unchanged.

2) **Condition No.viii**

To pay the additional amount of NPV of the diverted forest land, if so determined, as per the final decision of the Hon'ble Supreme Court of India.

3) **Condition No.ix**

The User Agency shall bear the additional towards the preparation and implementation of the approved Site-Specific Wildlife Management Plan as will be required by the State Forest Department for the surrounding landscape, as recommended by the Wildlife Institute of India.

4) **Condition No.x**

We will implement the submitted time-bound plan for reclamation of the mined-out area and surrender of the land to the State Government at the project cost in consultation with the State Forest Department.

M/s DHARAMCHAND JAIN
(Mining Lessee)

"DHARAM VILLA"
12-A, Mahatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV,
New Delhi-110024
Phone: 011-41642414
Email: mdmpl@rediffmail.com
avinjain999@gmail.com

5) **Condition No.xi**

To implementation of the approved comprehensive Catchment Area Treatment Plan at the project cost in a phased manner, in consultation with the State Forest Department.

6) **Condition No.xii**

We will explore the feasibility of translocating suitable trees identified for felling, wherever practicable, and ensure that tree felling is undertaken only when unavoidable, under proper supervision and in accordance with the instructions of the Divisional Forest Officer, Keonjhar.

7) **Condition No.xiii**

We shall maintain a contiguous safety zone of 7.5 meters in width along the entire inner boundary of the mining lease area.

8) **Condition No.xvii**

We will carry out mining operations in a phased manner and ensure reclamation of the mined-out areas as per the approved mining plan. An annual report on the reclamation status of the mine will be submitted to the concerned Government Departments/Authorities.

9) **Condition No.xviii**

We shall surrender the mined-out and reclaimed forest land to the State Forest Department at the end of the mining lease period, in accordance with the submitted time-bound reclamation plan for the mined-out area.

10) **Condition No.xx.(a)**

We will implement the approved scheme for maintaining a green belt around the mining lease area, including demarcation of the safety zone (a 7.5-meter strip along the inner boundary), and its fencing, protection, and regeneration by erecting adequate numbers of 6-foot-high RCC boundary pillars inscribed with DGPS coordinates and barbed wire fencing, along with deployment of adequate watchers, within two years from the commencement of project activities, at the project cost, under the supervision of the State Forest Department.

M/s DHARAMCHAND JAIN
(Mining Lessee)

"DHARAM VILLA"
12-A, Mahatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV
New Delhi-110024
Phone: 011-41612414
Email: mdmpl@rediffmail.com
avinjain999@gmail.com

11)Condition No.xx.(b)

We will protect the boundary of the safety zone of the mining lease, adjacent to habitation/roads, by erecting proper fencing at the project cost.

12)Condition No.xx.(c)

We will maintain the safety zone as a green belt around the mining lease and undertake regeneration activities in this area to ensure the development of a dense canopy, under the supervision of the State Forest Department, in a phased manner and at the project cost.

13)Condition No.xx.(d)

We will maintain the safety zone as per the prescribed norms under the supervision of the State Forest Department.

14)Condition No.xxi.(a)

We will implement the approved scheme for mitigative measures to minimize soil erosion and prevent choking of streams, in consultation with the State Forest Department, in a phased manner within three years from the date of issuance of the final forest clearance, at the project cost.

15)Condition No.xxi.(b)

We will implement the approved Scheme for Planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease, to arrest soil erosion in consultation with the State Forest Department, in a phased manner at the project cost.

16)Condition No.xxi.(c)

We will implement the approved scheme for the construction of check dams and retention/toe walls to arrest the sliding of excavated material along the contours, in a phased manner, at the project cost.

17)Condition No.xxi.(d)

We will implement the approved Scheme for stabilization of overburden dumps through appropriate grading and benching, ensuring that the angle of repose at any given point remains below 28°, in a phased manner and at the project cost.

M/s DHARAMCHAND JAIN
(Mining Lessee)

"DHARAM VILLA"
12-A, Mahatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV,
New Delhi-110024
Phone: 011-41642414
Email: mdmpl@rediffmail.com
avinjain999@gmail.com

18)Condition No.xxi.(e)

We will implement the approved scheme for Topsoil Management to ensure proper preservation and utilization of topsoil, in a phased manner, and at the project cost.

19)Condition No.xxii

We will abide by the provision that the period of diversion of forest land under the present proposal shall be co-terminus with the validity period of the mining lease, as amended under the provisions of the Mines and Minerals (Development and Regulation) Amendment Act, 2015, and the Rules framed thereunder.

20)Condition No.xxiii

To implement the approved scheme for gap plantation and soil & moisture conservation activities to restock and rejuvenate degraded open forests (having a crown density of less than 0.4), located within 100 meters from the outer perimeter of the mining lease, in a phased manner, in consultation with the State Forest Department, at its own cost.

21)Condition No.xxiv

We will implement the approved scheme for desilting of village tanks and other water bodies located within five kilometres of the mining lease boundary, to mitigate the impact of siltation, in a phased manner at the project cost.

22)Condition No.xxv

We will re-grass the mining area and any other areas which may have been disturbed due to mining to restore them to a condition that is fit for the growth of fodder, flora, fauna, etc. in a timely manner as per the Mining plan and Mining Closer Plan approved by IBM.

23)Condition No.xxvi

We will take adequate measures to ensure that no overburden or dump material rolls beyond the designated area and to effectively control soil erosion arising from mining activities.

M/s DHARAMCHAND JAIN
(Mining Lessee)

"DHARAM VILLA"
12-A, Mahatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV,
New Delhi-110024
Phone: 011-41642414
Email: mdmpl@rediffmail.com
avinjain999@gmail.com

24)Condition No.xxvii

We will implement the approved scheme for comprehensive soil and moisture conservation measures in and around the mining lease area in a phased manner in consultation with the State Forest Department and at the project cost.

25)Condition No.xxix

We will deposit the cost of felling of trees as per the guidance of the State Forest Department.

26)Condition No.xxxi

We shall utilize the diverted forest land strictly for the purpose specified in the approved proposal and for no other purpose whatsoever.

27)Condition No.xxxii

We will not establish any labour camp within the forest land.

28)Condition No.xxxiii

We will ensure the provision of alternative fuels, preferably, to the labourers and staff working at the site, in order to prevent any damage to, or additional pressure on, the adjoining forest areas.

29)Condition No.xxxv

We will not make any change in the layout plan of the proposal without obtaining prior approval from the Central Government, and the forest land shall be used only for the purpose specified in the proposal, except for the change in land use permitted under the Ministry's guideline dated 26.12.2024.

30)Condition No.xxxix

The diverted forest land will not be transferred to any other agency, department, or person without prior approval of the Ministry of Environment, Forest & Climate Change, Government of India.

M/s DHARAMCHAND JAIN
(Mining Lessee)

"DHARAM VILLA"
12-A, Mehatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV,
New Delhi-110024
Phone: 011-41542414
Email: mdmpl@rediffmail.com
avinjam999@gmail.com

31)**Condition No.xl**

We will ensure that no damage is caused to the flora and fauna of the adjoining areas during mining activities, and appropriate protective measures will be implemented in consultation with the Divisional Forest Officer, Keonjhar Forest Division.

32)**Condition No.xli**

We will take the adequate measures at the project cost to ensure no damage to the adjoining forest areas during the operation of this project.

33)**Condition No.xlii**

We shall submit an annual self-monitoring report on compliance with the conditions stipulated in the Stage-II approval to the State Government, the concerned Regional Office, and this Ministry by the end of March each year.

34)**Condition No.xlii**

We will comply with any additional conditions that may be stipulated from time to time by the Ministry of Environment, Forest and Climate Change in the interest of conservation, protection, and development of forests and wildlife.

35)**Condition No.xliii**

We will strictly comply with all applicable provisions of the relevant Acts, Rules, Regulations, Guidelines, and Orders issued by the Hon'ble Courts and the National Green Tribunal, including the provisions of the Forest Rights Act, 2006, as amended from time to time and applicable to this project.

36)**Condition No.xlvi**

We shall not violate any of the conditions stipulated in the forest clearance approval. In the event of any violation, we shall abide by the action prescribed in para 1.16 of Chapter 1 of the Consolidated Guidelines, and Clarifications on Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980, and Van (Sanrakshan Evam Samvardhan) Rules, 2023 as issued by this Ministry's letter No. 5-2/2017-FC dated 29.12.2023.

S. N. Mohanty, Agent
Daipahar Fe. & Mn. Mines,
Daipahar, Joda

M/s DHARAMCHAND JAIN
(Mining Lessee)

"DHARAM VILLA"
12-A, Mahatma Gandhi Marg
Ring Road, Lajpat Nagar-IV
New Delhi-110024
Phone: 011-41642414
Email: mdmpl@rediffmail.com
avinjain999@gmail.com

Ref: AVJ/FDP/DFO/2025-26/28

Date – 18.03.2026

To,

The Divisional Forest Officer

Keonjhar Forest Division

Keonjhar, Odisha

Sub.: Submission of Payment towards CA & ACA Schemes..

Ref: Letter No. 2299/6F-Mining-145/2023 dated 21.02.2026.

Dear Sir,

With reference to the above-cited letter on the captioned subject, we have deposited Rs 9,98,98,600.00 (Rupees nine crore ninety-eight lakh ninety-eight thousand six hundred) in favour of ORRISA CAMPA, Account No- 150825893600486, in respect of Dalpahar Iron & Manganese Mine of Shri Avin Jain .

The payment receipt is attached herewith for your kind reference.

Sl No	UTR No	Amount
01	ICICR42026031800501321	9,98,98,600/-

You are kindly requested to acknowledge the receipt of the above payment and take further necessary action.

Thanking You,

Yours faithfully,

Debasish Manas Ranjan Sethy

Mines Manager

For Dalpahar Iron & Manganese Mines

Encl: Bank transaction copy

Mines Manager
Dalpahar Iron & Mn. Mines
M/s. D. C. Jain
Dalpahar

OFFICE OF THE DIVISIONAL FOREST OFFICER, KEONJHAR DIVISION
Phone No- 06766-254315, email ID- dfo.keonjhar@odisha.gov.in

Letter No. 2299 **/6F-Mining-145/2023**
Dated, Keonjhar the 21st **February, 2026**

To

Shri Avin Jain, (Heir of late Shri DC Jain) (Mining Lessee) Dharam Villa,12-A, Mahatma Gandhi Marg, Ring Road, Lajpat Nagar, New Delhi1 10024.

Sub: Proposal for seeking prior approval of the Central Government under Section-2 (1)(ii) of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for 79.367 ha of forest land in favour of Shri Avin Jain (Heir of late Shri DC Jain) for mining of Iron & Manganese Ore in Dalpahar Iron & Manganese Ore mines (Online Proposal No.FP/OR/MIN/9360/2015)-Stage-I approval reg.

X-Sub: Demand of funds towards CA & ACA Schemes.

Ref: Memo No.3670 dated 18.02.2026 of Deputy Conservator of Forests, FD & NO, FC Act, O/o the Principal Chief Conservator of Forests, & HoFF, Odisha, Bhubaneswar.

Sir

With reference to the aforementioned memo on the captioned subject, you are requested to deposit the approved amount of **Rs.9,98,98,600/- (Rupees nine crore ninety-eight lakh ninety-eight thousand six hundred)** only towards the cost of Compensatory Afforestation Scheme & Additional Compensatory Afforestation Scheme in respect of the aforementioned forest diversion proposal through e-portal of MoEF&CC as provided in the https://parivesh.nic.in/ and the proof/evidence of the deposit of fund be submitted to this office for further necessary action at this end.

Details approved of CA/ACA Schemes

Sl. No.	Particulars	Balance amount to be deposited (in Rs)
1	Scheme for Compensatory Afforestation Scheme over an area of 9.80 ha of Non-Forest land identified in Village Champajhar under Banspal Tahasil of BJP Range in Keonjhar District of Keonjhar Forest Division.	62,99,200.00
2	Scheme for Compensatory Afforestation Scheme over an area of 66.745 ha of Non-Forest land identified in Village Gundula under Banspal Tahasil of BJP Range in Keonjhar District of Keonjhar Forest Division.	4,58,53,600.00
3	Scheme for Compensatory Afforestation Scheme over an area of 5.0 ha of Non-forest land identified in Village Binida & Dengana under Ghatagaon Tahasil of Keonjhar Forest Division	79,20,500.00

4	Scheme for Additional Compensatory Afforestation Scheme over an area of 67.49 ha of Degraded Forest land identified in Jyotipur RF under Champua Forest Range of Keonjhar Forest Division to accommodate the plantation of balance seedlings.	3,98,25,300.00
Grand Total		**9,98,98,600.00**

(Rupees nine crore ninety-eight lakh ninety-eight thousand six hundred) only.

Yours faithfully,

21/2/26

for **Divisional forest Officer,**
Keonjhar Division.

21/2

Memo No. 2300 (9) **/Dated** 21.02.2026

Copy submitted to the Regional Chief Conservator of Forests, Rourkela Circle, Rourkela/Principal Chief Conservator of Forests, FD & NO, FC Act, O/o the PCCF & HoFF, Odisha, Bhubaneswar for favour of kind information and necessary action.

21/2/26

for **Divisional forest Officer,**
Keonjhar Division.

21/2

AGENCY COPY

यूनियन बैंक Union Bank

NEFT / RTGS CHALLAN for CAMPA Funds

Date 11-03-2026

Agency Name	MS DHARAMCHAND JAIN
Application No.	5893600486
MoEF/SG File No.	8-31/2015-FC
Location.	ORRISA
Address.	BichakundiKeonjhar
Amount(in Rs)	99898600/-

Amount in Words :Nine Crore Ninety-Eight Lakh Ninety-Eight Thousand Six Hundred Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	ORRISA CAMPA
IFSC Code:	UBIN0996335
Pay to Account No.	150825893600486 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 : 11-03-2026

Agency Name.	MS DHARAMCHAND JAIN
Application No.	5893600486
MoEF/SG File No.	8-31/2015-FC
Location.	ORRISA
Address:	Bichakundi Keonjhar
Amount(in Rs)	99898600/-

Amount in Words :Nine Crore Ninety-Eight Lakh Ninety-Eight Thousand Six Hundred Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	ORRISA CAMPA
IFSC Code:	UBIN0995335
Pay to Account No.	150825893600486 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

ICICI Bank

Payment Summary

Payment of INR 9,98,98,600.00 to ORRISA CAMPA

Reference ID: **2315002946**

To Account: **ORRISA CAMPA**

From Account: **D.C. JAIN MINES**

Amount: **INR 9,98,98,600.00**

Payment Date(dd/MM/yyyy): **18/03/2026**

Remarks: **Differential NPV statutory payment for Dalpahar Iron and Manganes Mines of Shri D C Jain**

Network: **RTGS**

Manual Release Required: **No**

Transaction Status: **Pending For Processing**

M/s DHARAMCHAND JAIN
(Mining Lessee)

"DHARAM VILLA"
12-A, Mahatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV,
New Delhi-110024
Phone: 011-41642414
Email: mdmpl@rediffmail.com
avinjain999@gmail.com

Ref: DCJ/DFO/2026-27/01

DATE: 25.04.2026

To,

THE DIVISONAL FOREST OFFICER,
KEONJHAR,
ODISHA.

SUB : Proposal for seeking prior approval of the Central Government under Section-2 (1)(ii) of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for 79.367 ha of forest land in favour of Shri Avin Jain (Heir of late Shri DC Jain) for mining of Iron & Manganese Ore in Dalpahar Iron & Manganese Ore mines (Online Proposal No. FP/OR/MIN/9360/2015) – Stage-I approval reg.

X SUB: Submission of Payment Confirmation for Compensatory Afforestation Funds.

Dear Sir,

With reference to your Letter No. 4968/6F-Mining-42/2026 dated 21st April 2026 and Memo No. 7956 dated 18.04.2026 this is to inform you that the approved amount of Rs. 1,51,78,800/- (Rupees One Crore Fifty-One Lakh Seventy-Eight Thousand Eight Hundred only) through RTGS (UTR No: ICICR42026042400534838) has been successfully deposited towards the cost of Revised Compensatory Afforestation & Additional Compensatory Afforestation scheme over 16.00 ha degraded forest land identified in Baunsuli RF under Patna range. A copy of the payment receipt is enclosed herewith for your kind reference.

Thanking You,
For Dalpahar Iron and Manganese Ore Mines of Sri Avin Jain

Debasish Manas Ranjan Seth.

Mines Manager

Mines Manager
Dalpahar Iron & Mn. Mines
M/s. D. C. Jain
Dalpahar

OFFICE OF THE DIVISIONAL FOREST OFFICER, KEONJHAR DIVISION
Phone No- 06766-254315, email ID- dfo.keonjhar@odisha.gov.in

Letter No. 4968 **/6F-Mining-42/2026**
Dated, Keonjhar the 21st **April, 2026**

To

Shri Avin Jain, (Heir of late Shri DC Jain) (Mining Lessee) Dharam Villa,12-A, Mahatma Gandhi Marg, Ring Road, Lajpat Nagar, New Delhi110024.

Sub: Proposal for seeking prior approval of the Central Government under Section-2 (1)(ii) of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for 79.367 ha of forest land in favour of Shri Avin Jain (Heir of late Shri DC Jain) for mining of Iron & Manganese Ore in Dalpahar Iron & Manganese Ore mines (Online Proposal No.FP/OR/MIN/9360/2015)-Stage-I approval reg.

X-Sub: Demand of funds towards Additional Compensatory Afforeststion scheme oover 16.00 ha degraded forest land idebntified in Baunsuli RF under Patna Range & differential Compensatory Afforeststion and Additional Compensatory Afforeststion Schemes

Ref: Memo No.7956 dated 18.04.2026 of Chief Conservator of Forests, (Nodal), O/o the Principal Chief Conservator of Forests, & HoFF, Odisha, Bhubaneswar.

Sir

With reference to the aforementioned memo on the captioned subject, you are requested to deposit the approved amount & differential amount of **Rs. 1,51,78,800/- (Rupees one crore fifty-one lakh seventy-eight thousand eight hundred)** only towards the cost of Compensatory Afforeststion & Additional Compensatory Afforeststion Scheme in respect of the aforementioned forest diversion proposal through e-portal of MoEF&CC as provided in the https://parivesh.nic.in/ and the proof/evidence of the deposit of fund be submitted to this office for further necessary action at this end.

Details approved of CA/ACA Schemes

SL No.	Particulars	Amount due as per wage rate @462/-or onetime cost norm matrix 2026-27	Amount already deposited (Rs)	Balance to be deposited (Rs)
1	Scheme for Additional Compensatory Afforestation Scheme over an areaof 16.0 ha of Degraded Forest land identified in Baunsuli RF under Patna Forest Range of Keonjhar Forest Division to accommodate the	1,01,83,900.00	0	1,01,83,900.00

	plantation of balance seedlings.			
2	Scheme for Compensatory Afforestation Scheme over an area of 9.80 ha of Non-Forest land identified in Village Champajhar under Banspal Tahasil of BJP Range in Keonjhar District of Keonjhar Forest Division.	66,14,200.00	62,99,200.00	3,15,000.00
3	Scheme for Compensatory Afforestation Scheme over an area of 66.745 ha of Non-Forest land identified in Village Gundula under Banspal Tahasil of BJP Range in Keonjhar District of Keonjhar Forest Division.	4,81,46,300.00	4,58,53,600.00	22,92,700.00
4	Scheme for Compensatory Afforestation Scheme over an area of 5.0 ha of Non-forest land identified in Village Binida & Dengana under Ghatagaon Tahasil of Keonjhar Forest Division	83,16,500.00	79,20,500.00	3,96,000.00
5	Scheme for Additional Compensatory Afforestation Scheme over an area of 67.49 ha of Degraded Forest land identified in Jyotipur RF under Champua Forest Range of Keonjhar Forest Division to accommodate the plantation of balance seedlings.	4,18,16,500.00	3,98,25,300.00	19,91,200.00
	Gross Total	**11,50,77,400.00**	**9,98,93,600.00**	**1,51,78,800.00**

(Rupees one crore fifty-one lakh seventy-eight thousand eight hundred) only.

Yours faithfully,

21/8/20

Divisional forest Officer,
Keonjhar Division.

PTO

Memo No. 4969 **/Dated** 21.04.26

Copy submitted to the Regional Chief Conservator of Forests, Rourkela Circle, Rourkela/Principal Chief Conservator of Forests, FD & NO, FC Act, O/o the PCCF & HoFF, Odisha, Bhubaneswar for favour of kind information and necessary action.

21/4/26

Divisional forest Officer,
Keonjhar Division.
21/4

AGENCY COPY

NEFT / RTGS CHALLAN for CAMPA Funds

Date : 24-04-2026

Agency Name.	**MS DHARAMCHAND JAIN**
Application No.	**5893600630**
MoEF/SG File No.	**8-31/2015-FC**
Location.	**ORRISA**
Address.	**BichakundiKeonjhar**
Amount(in Rs)	**29770800/-**

Amount in Words :Two Crore Ninety-Seven Lakh Seventy Thousand Eight Hundred Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	**ORRISA CAMPA**
IFSC Code:	**UBIN0996335**
Pay to Account No.	**150825893600630** **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

NEFT / RTGS CHALLAN for CAMPA Funds

Date : 24-04-2026

Agency Name.	**MS DHARAMCHAND JAIN**
Application No.	**5893600630**
MoEF/SG File No.	**8-31/2015-FC**
Location.	**ORRISA**
Address:	**Bichakundi Keonjhar**
Amount(in Rs)	**29770800/-**

Amount in Words :Two Crore Ninety-Seven Lakh Seventy Thousand Eight Hundred Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	**ORRISA CAMPA**
IFSC Code:	**UBIN0996335**
Pay to Account No.	**150825893600630** **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

ICICI Bank

Payment Of INR 2,97,70,800.00 to ORRISA CAMPA

Reference ID	:	**2358936992**
From Account Name	:	**D.C. JAIN MINES**
From Account Number	:	**XXXXXXXX5680**
To Account Name	:	**ORRISA CAMPA**
To Account Number	:	**XXXXXXXXXXX0630**
Payment Date	:	**24/04/2026**
Remarks	:	**Differential amount for ACA Scheme Forest Land vide DFO Keonjhar demand letter no 4882 dtd 18th April 2026 AND 4968 dtd 21st April 2026**
Network	:	**RTGS**
Beneficiary LEI	:	
UTR Number	:	**ICICR42026042400534838**
Put transaction on Hold	:	**N**

Pending On

Printed on 24/04/2026 02:09:52 PM IST

New Payment

(1a)

OFFICE OF THE DIVISIONAL FOREST OFFICER:KEONJHAR DIVISION.

MEMO NO. 2653 Dt. 18.6 2005.

To

The Chief Conservator of Forests (Nodal)
O/O the Principal Chief Conservator of Forests,
Orissa,B H U B A N E S W A R.

Sub:- Diversion of 97.084 ha. of forest land for mining of Iron & Manganese ore in favour of M/S D.C.Jain in Keonjhar District.

Ref:- Letter No.10F(Cons)65/2002-1733/F&E dt.28.01.04 of Dy.Secy. to Govt. F&E Deptt.

In pursuance of the above letter,the user agency has deposited Rs.95,49,120/- being the Net Present Value of the broken up forest area of 16.464 ha. for which the Central Govt. has accorded in principle forwarding of the diversion proposal vide letter No.8-203/2003-FC dt. 25.12.2003.The copy of treasury challan is enclosed herewith for favour of information and necessary action.

Enclosure:- As above.

Sd/-
Divisional Forest Officer,
Keonjhar Division.

Memo No. 2654 dt. 18.6 05.

Copy forwarded to the Conservator of Forests,Rourkela Circle,Rourkela for favour of information with reference to memo No-1734/F&E dt.28.01.04 of the Dy.Secy. to Govt.F&E Deptt.

18/6/05

Divisional Forest Officer,
Keonjhar Division.

DALPAHAR IRON & MANGANESE MINES

NOTE 1—In the case of payments at the treasury, receipts for sums less than Rs.500 do not require the signature of the Treasury Officer, but only of the Accountant in the Treasury. Receipts however, for cash and cheques paid for service stamps should always be signed by Treasury Officer (G. R. 3).

NOTE 2—Particulars of money tendered should be given [illegible] column "Head of account" will be filled in by the Treasury Officer or the Accounts Officer as [illegible] on receipt of the Bank's Daily Sheets

Particulars	Amount Rs.	P.
Coin		
Notes [with details]		
Cheques [with details] D.D. No. 644628 dt. 5.8.05 on S.B.I. Comta D.D. No. 644364 dt. 5.8.05 on S.B.I. Comta	90,00,000	00
	5,49,120	00
	95,49,120	00

DALPAHAR IRON & MANGANESE MINES

ANNEXURE- IV

Avin Jain

"DHARAM VILLA"
12-A, MAHATMA GANDHI MARG (RING ROAD)
LAJPAT NAGAR IV, NEW DELHI - 110 024
TEL. : (O) 6252003 / 3002 (R) 6437519 / 4921
FAX : 6259576 CABLE : DHARAM
E-Mail : avinjain1@yahoo.com

May, 6th 2005

The Divisional Forest Officer,
Keonjhar Division,
Dist. Jaj.
Orissa.

Sub:- Deposition of N.P.V. Pertaining to 15,464 Hq. of brokenup area of M/s. Dharamchand Jain, Keonjhar.

Sir,

Please find enclosed 11 (Eleven) Demand Drafts made in your favour bearing Nos. 642628 to 642637 dated 6th May 2005, for Rs.9,00000/. (Rupees Nine Lacs) each and No. 642638 forRs. 5,49,120 of the same date, on State Bank of India, thus making a total amount of Rs.95,49,120/- (Rupees Ninetyfive lacs fourty nine thousand One hundred twenty only), towards the N.P.V. amount pertaining to the Brokenup area of 15.464 Hq. out of 97.084 Hq. of forest Land for mining of Iron ni Manganese ore.

You are requested to acknowledge the receipt of the same and obliged by issuing necessary instructions in this regard.

Thanking you,

Yours faithfully,
for Dharamchand Jain,

(Avin Jain)
(Legal Heir/Attorney)

Encl: 11 (Eleven) Demand Drafts
as mentioned above.

DALPAHAR IRON & MANGANESE MINES

M/S DHARAMCHAND JAIN
(Mining Lessee)

"DHARAM VILLA"
12-A, Mahatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV,
NEW DELHI-110024
Resi.: 2643719
Off.:26253002
FAX: (011) 262597576
E-mail : mdmpl@rediffmail.com

Ref:

Date: 20.10.2020

The Divisional Forest Officer
Keonjhar Forest Division
Keonjhar

Sub: Proposal for diversion of balance forest land of 84.707 Ha including 4.488 Ha coming within the safety zone with the applied RML area 101.171 Ha located entirely within the Baitarani RF II of Keonjhar district (excluding 16.464 Ha of forest land inclusive of 0.812 Ha of safety zone broken up prior to 1980 already diverted under FC Act, 1980 earlier during original mining lease period) for mining of Iron & Mn Ore in Dalpahar Iron & Mn Mines by M/s D.C Jain mining lease period to be granted executed under MMDR Amendment Act, 2015.

X- Sub: Revised demand for payment of differential amount of NPV

Ref: **1.** F.No. 8-31/2015-FC dated 14.09.2017 and 28.09.2020 of MoEF&CC, Govt. of India and memo No. 965 dated 09.02.2018, our representation No. DCJ/20-21/19 dt 19.07.2020.
2. Your office letter No. 4524/6F-Mining-57/2020 dated 27.07.2020

Sir,

With reference to the above cited subject, we have deposited the differential amount of NPV **Rs 2,36,14,339/-** vide challan having **UTR no. ORBCN 20287023974** on dated **13.10.2020**.

This is for your kind information please.

Thanking You
Yours faithfully

for Dalpahar Iron & Mn Mines

Samarendra Nath Mohanty

(Samarendra Nath Mohanty)

Received
22/10/20

Annexure-6

OFFICE OF THE DIVISIONAL FOREST OFFICER, KEONJHAR DIVISION
Ph. No. 06766-254315, E.mail- dfokjr.od@gov.in

No. 4524 **/6F-Mining- 57/2020**
Dated, Keonjhar the 27.07.2020

To

Sri Avin Jain, Power of Attorney holder,
Dalpahar Iron & Mn. Mines of D.C. Jain
Dharam Villa, 12-A, Mahatma Gandhi Marg,
Ling Road, Lajpat Nagar-IV,
New Delhi-110024.

Sub: Proposal for diversion of balance forest land of 84.707 ha including 4.488 ha coming within the safety zone with the applied RML area 101.171 ha located entirely within the Baitarani RF II of Keonjhar district (excluding 16.464 ha of forest land inclusive of 0.812 ha of safety zone broken up prior to 1980 already diverted under FC Act, 1980 earlier during original mining lease period) for mining of Iron & Mn Ore in Dalpahar Iron & Mn Mines by M/s D.C Jain during mining lease period to be granted executed under MMDR Amendment Act, 2015.

X-Sub: Revised demand for payment of differential amount of NPV.

Ref: F. No. 8-31/2015-FC dated 14.09.2017 of MoEF&CC, Govt. of India and this office memo No. 965 dated 09.02.2018, your representation No. DCJ/20-21/19 dt. 19.07.2020, para 3.4 in chapter- 3 in Hand Book of FC Act, 1980 and Forest (C) Rules- 2003 (Guideline & Clarification).

Sir,

With reference to the aforementioned letter on the captioned subject, this is to intimate that NPV was demanded in respect of Dalpahar Iron & Mn. Mines of D.C. Jain falls within Baitarani Reserved Forest of Rs. 6,18,36,110/-@ Rs. 7,30,000/ha over-84.707 ha virgin forest land (Eco value class-I & canopy density 0.2) & Rs. 95,49,120/- @ 5,80,000/- over-16.464 broken-up forest land (Eco value class-I & canopy density 0.1) in total of Rs. 7,13,85,230/- over 101.171 ha. The demanded amount has been realized in two spells in favour of Ad-hoc CAMPA i.e. for Rs. 95,49,120/- vide treasury Chalan of 05/05, Rs. 6,18,36,110/- through RTGS on dated 17.09.2013. Now, the FAC (reference letter above) has recommended in condition No. "k" *inter alia* states that the NPV rates needs to be revised upwards as the results of the DSS indicate that large part of the proposed area falls in the Medium Density Forest category having crown density of 0.40 to 0.70 and which has been communicated vide F. No. 8-31/2015-FC dated 14.09.2017of MoEF&CC, Govt. of India. As per verification of ML area through DSS, it is found that majority of area falls within the category of Medium Dense Forest (MDF) 0.4- 0.7 density. Hence the density of forest taken for calculation of NPV as more than 0.4 and less than 0.7.

Hence, it is requested to deposit the differential amount of NPV **₹2,36,14,339/- (Rupees two crore thirty six lakh fourteen thousand three hundred thirty nine)** only @Rs. 9,39,000/ ha (Eco value class-I & canopy density 0.4 to 0.7) over 101.171 ha as calculated based on prevailing vegetation and DSS report in the http://fsigeoportal.gov.in. The differential amount of NPV should be deposited through **e-portal** of MoEF&CC as provided in the https://parivesh.nic.in/ and the proof/evidence of the deposit of fund be submitted to this office for further necessary action at this end.

Eco value Class	Canopy density	Area (ha)	NPV amount/ ha (In Rs.)	NPV due (In Rs.)	NPV deposited (In Rs.)	Balance to be deposited. (In Rs.)
I	0.4-0.7	101.171	9,39,000	9,49,99,569	7,13,85,230	**2,36,14,339**

(Rupees two crore thirty six lakh fourteen thousand three hundred thirty nine) only

Yours faithfully,

27/7/20

Divisional Forest Officer.
Keonjhar Division.

Memo No._____/ Dated.

Copy forwarded to the Regional Chief Conservator of Forests, Rourkela Circle, Rourkela/ Principal Chief Conservator of Forests, Forest Diversion and Nodal Officer, FC Act, O/o the Principal Chief Conservator of Forests, Odisha, Bhubaneswar for favour of kind information and necessary action.

Divisional Forest Officer,
Keonjhar Division.

AGENCY COPY

NEFT / RTGS CHALLAN for Ad-HOC CAMPA

Date : 12-10-2020

Agency Name.	DALPAHAR IRON AND MANGANESE ORE MINES
Application No.	5851900152
MoEF/SG File No.	NA
Location.	ORRISA
Address.	Sri Avin Jain, Dharam Villa, 12-A, Mahatma Gandhi Marg (Ring Road)South East
Amount(in Rs)	23614339/-

Amount in Words :Two Crore Thirty-Six Lakh Fourteen Thousand Three Hundred and Thirty-Nine Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	ORRISA CAMPA
IFSC Code:	CORP0000371
Pay to Account No.	150825851900152 Valid only for this challan amount.
Bank Name & Address:	Corporation Bank Lodhi Complex Branch, Block 11,CGO Complex, Phase I, Lodhi Road, New Delhi -110003

- This Challan is strictly to be used for making payment to CAMPA by NEFT/RTGS only

BANK COPY

NEFT / RTGS CHALLAN for Ad-HOC CAMPA

Date : 12-10-2020

Agency Name.	DALPAHAR IRON AND MANGANESE ORE MINES
Application No.	5851900152
MoEF/SG File No.	NA
Location.	ORRISA
Address:	Sri Avin Jain, Dharam Villa, 12-A, Mahatma Gandhi Marg (Ring Road) South East
Amount(in Rs)	23614339/-

Amount in Words :Two Crore Thirty-Six Lakh Fourteen Thousand Three Hundred and Thirty-Nine Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	ORRISA CAMPA
IFSC Code:	CORP0000371
Pay to Account No.	150825851900152 Valid only for this challan amount.
Bank Name & Address:	Corporation Bank Lodhi Complex Branch, Block 11,CGO Complex, Phase I, Lodhi Road, New Delhi -110003

- This Challan is strictly to be used for making payment to CAMPA by NEFT/RTGS only

After making successful payment, User Agencies may send a line of confirmation through Email: helpdeskcampa@corpbank.co.in

UTR NO ORBCH 20287023974

for Rs 23614339/-.

Dated 13-10-2020.

कृते पंजाब नैशनल बैंक
For PUNJAB NATIONAL BANK

शाखा प्रबन्धक/Branch Manager
साऊथ एक्स.-1 नई दिल्ली-49
South Ext-1, New Delhi-49

A-047

12-Oct-20,

OFFICE OF THE DIVISIONAL FOREST OFFICER, KEONJHAR DIVISION

Ph.No. 06766-254315, FAX 06766-254041: email: ofsdp_kjr@rediffmail.com

Office Order No. 2541 **/Mining**

Dated, Keonjhar the 19-6- **, 2010.**

01. Whereas M/s. D.C.Jain has applied for ML/RML under Section- 2 of F.C. Act over 101.171 ha. of land for their Dalpahar Iron and Manganese Mines out of which 101.171 ha. is forest land as per the following classification:

i. Reserve Forest - 101.171 Ha.

Total - **101.171 Ha.**

02. Whereas the Apex Court on the recommendation of Central Empowered Committee have issued order for recovery of NPV for the entire forest area deducting the amount of NPV already paid.

03 Whereas the Divisional Forest Officer is vested with the authority by the Apex Court to issue Demand by 24th of June, 2010 at the appropriate rate depending on Eco-value class and the canopy density of the forest area in question.

04 Whereas the lessee has already paid an amount of Rs. 95,49,120/- towards NPV in respect of forest land over 16.464 ha prior to 28.3.2008.

05. Whereas the forest area in question falls under Class – I of Eco-value class and 0.2 canopy density for which NPV for Rs. 6,18,36,110/- is to be charged at the rate of Rs.7,30,000/- per ha. over an balance area of 84.707 ha.(101.171 ha – 16.464 ha).

06. Now therefore the undersigned by virtue of authority vested by the Apex Court, hereby issue demand notice for payment of differential amount of Rs. 6,18,36,110/- towards NPV within 30 days of issue of this order, failing which the payment along with the interest is to be deposited. The differential amount be deposited **in shape of Demand Draft drawn in favour of Compensatory Afforestation Fund (CAF) Orissa, Account No. CA-1585 in Corporation Bank Lodhi Road, New Delhi.**

It is further ordered that in the event of upward revisions of NPV, an undertaking to pay the differential is to be submitted by the lessee.

(S.K.Mohanty,IFS)
Divisional Forest Officer,
Keonjhar Division.

Memo No 5092 **/Dated.** 19-6-10

Copy forwarded to M/s D.C.Jain, Mine owner, Dalpahar Iron & Manganese Mines,At /Po-Chaibasa, Singhbhum,Jharkhand for information.

Divisional Forest Officer,
Keonjhar Division.

Memo No 5092 **/Dated.** 19-6-10.

Copy forwarded to the Asst. Conservator of Forests, Champua Range for information and necessary action.

Divisional Forest Officer,
Keonjhar Division.

ORIENTAL BANK OF COMMERCE

(A Government of India Undertaking)

Where every individual is committed

E-14 SOUTH EXTENSION,PART –II, NEW DELHI 110049 PHONE 011-26258860/61-FAX01141018252

17.09.2013

ORIENTAL BANK OF COMMERCE
E-14, 1st Floor, South Extn., Part-II
New Delhi-110049
Ph. 26258860 / 61, 41018253

To whom it may concern

This is to certify that Rs.6,18,36,110 (Six crore eighteen lacs thirty six thousand one hundred and ten only) has been transferred to Union Bank of India a/c no-344902010105428 in the a/c of Compensatory Afforestation Fund(CAF) ORRISA vide RTGS by debiting the saving a/c of Mr. Avin Jain a/c no 10592100021560 on 17.09.2013

कृते ओरियन्टल बैंक ऑफ कॉमर्स
For ORIENTAL Bank Of COMMERCE
Senior Manager
E-14, 1st Floor, South Extn., Part-II, New Delhi-49

Senior Manager

OFFICE OF THE DIVISIONAL FOREST OFFICER, KEONJHAR DIVISION

Phone No- 06766-254315, email ID- dfo.keonjhar@odisha.gov.in

No. 13818 /Mining-
Dated, Keonjhar the 08-12-2023

To

Sri Avin Jain,Power of Attorney holder,
Dalpahar Iron & Mn. Mines of D.C. Jain
Dharam Villa, 12-A, Mahatma Gandhi Marg,
Ling Road, Lajpat Nagar-IV,
New Delhi-110024.

Sub: Proposal for prospecting of minerals over 3.802 ha forest land out of Mining Lease area of 101.171 ha of Dalpahar Iron & Manganese Ore Block under Keonjhar District of Keonjhar Forest Division by Shri Dharam Chand Jain.

X-Sub: Demand of differential funds towards Net Present Value (NPV).

Ref: Letter No. FP/OR/SRY/436505/2023 dated 01.12.2023 of IRO, MoEF&CC, Govt. of India, Bhubaneswar.

Sir

With reference to the aforesaid memo on the captioned subject, this is to intimate that the condition No. 1.1(2) of the approval order dated 01.12.2023 of IRO, Govt. of India, MoEF&CC, Bhubaneswar, you are requested to deposit the differential amount of **Rs. 31,85,088/- (Rupees thirty-one lakh eighty-five thousand eighty-eight)** only towards Net Present Value (NPV) over 6.40 ha (64 nos borehole x 0.1 ha/ borehole) forest land involved in the prospecting of exploratory boreholes of 64 nos. at the rate of Rs. 14,36,670/- per ha (Eco value Class- I, Canopy Density- 0.6) as per revised rate fixed by MoEF&CC, Govt. of India vide F. No. 5-3/2011-FC (Vol-I) dated 06.01.2022 & F. No. 5-3/2011-FC (Vol-I) dated 22.03.2022 and as per Site Inspection Report of the undersigned dated 09.09.2023. The above demanded amount has to be deposited in Orissa CAMPA Account only through e-portal **(https://parivesh.nic.in/)** within 30 days from the date of issue of this letter and the proof/evidence of the deposit of fund be submitted to this office for further necessary action at this end.

Particulars	Amount due in Rs.	Amount deposited in Rs.	Balance to be deposited in Rs.
Differential payment of Net Present Value (NPV) over 6.40 ha@ Rs. 14,36,670/-	91,94,688.00	60,09,600.00	31,85,088.00
Total			**31,85,088.00**

(Rupees thirty-one lakh eighty-five thousand eighty-eight) only

Note: The lessee has already been deposited NPV amount Rs. 60,09,600/- @Rs. 9,39,000/- per ha over 6.40 ha forest land.

Yours faithfully,

Divisional Forest Officer,
Keonjhar Division.

Memo No. 13819 **/Dated.** 08.12.2023

Copy forwarded to the Regional Chief Conservator of Forests, Rourkela Circle, Rourkela/ Principal Chief Conservator of Forests, Forest Diversion and Nodal Officer, FC Act, O/o the Principal Chief Conservator of Forests & HoFF, Odisha, Bhubaneswar for favour of kind information and necessary action.

Divisional Forest Officer,
Keonjhar Division.

kotak

Client Code : CAM5082

Customer Acknowledgement

Branch: SE 11 - ND-42

Date : 14.12.2023

We acknowledge the receipt of NEFT/RTGS instructions for an amount of ₹ 31,85,088/- vide cheque number 000090 to be credited to the Account number 4212145237 of Kotak Mahindra Bank Bank.

UTR # KKBKR52023121400909384

Bank Officials Signature

14/12/2023

Bank Ltd. New Delhi 110049 South Extension

Bank Seal

M/s DHARAMCHAND JAIN
(Mining Lessee)

"DHARAM VILLA"
12-A, Mahatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV
New Delhi-110024
Phone: 011-41642414
Email: mdmpl@rediffmail.com
avjain099@gmail.com

Ref: AVJ/FDP/DFO/2025-26/29

Date – 02/04/2026

To,

The Divisional Forest Officer

Keonjhar Forest Division

Keonjhar, Odisha

Sub.: Submission of Payment towards revised differential Net Present Value .

Ref: Letter No. 3368/6F-Mining-145/2023 dated 12.03.2026.

Dear Sir,

With reference to the above-cited letter on the captioned subject, we have deposited Rs 3,12,99,227.00 (Rupees three crore twelve- lakh ninety-nine thousand two hundred-twenty – seven) in favour of ORRISA CAMPA, Account No- 150825893600952, in respect of Dalpahar Iron & Manganese Mine of Shri Avin Jain .

The payment receipt is attached herewith for your kind reference.

Sl No	UTR No	Amount
01	ICICR42026040200559240	3,12,99,227/-

You are kindly requested to acknowledge the receipt of the above payment and take further necessary action.

Thanking You,

Yours faithfully,

Debasish Maras Ranjan Sethy.

Mines Manager

For Dalpahar Iron & Manganese Mines

Mines Manager
Dalpahar Iron & Mn. Mines
M/s. D. C. Jain
Dalpahar

Encl: Bank transaction copy

OFFICE OF THE DIVISIONAL FOREST OFFICER, KEONJHAR DIVISION
Phone No- 06766-254315, email ID- dfo.keonjhar@odisha.gov.in

Letter No. 3368 **/6F-Mining-145/2023**
Dated, Keonjhar the 12th **March, 2026**

To

Shri Avin Jain, (Heir of late Shri DC Jain) (Mining Lessee) Dharam Villa,12-A, Mahatma Gandhi Marg, Ring Road, Lajpat Nagar, New Delhi110024.

Sub: Proposal for seeking prior approval of the Central Government under Section-2 (1)(ii) of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for 79.367 ha of forest land in favour of Shri Avin Jain (Heir of late Shri DC Jain) for mining of Iron & Manganese Ore in Dalpahar Iron & Manganese Ore mines (Online Proposal No.FP/OR/MIN/9360/2015)-Stage-I approval reg.

X-Sub: Demand of revised differential funds towards Net Present Value (NPV).

Ref:
1. Memo No.3670 dated 18.02.2026 of Deputy Conservator of Forests, FD & NO, FC Act, O/o the Principal Chief Conservator of Forests, & HoFF, Odisha, Bhubaneswar.
2. Letter No. 8-31/2015FC (E-91138) dated 13.02.2026 of the MoEF & CC, Govt. of India, New Delhi.
3. This office letter No.2304 dated 21.02.2026.

Sir,

With reference to the aforesaid letters on the captioned subject, this is to intimate that, in complying to the Condition No.vii of the stage-I approval order dated 13.02.2026, you are requested to deposit the amount of **Rs.3,12,99,227/-(Rupees three crore twelve lakh ninety nine thousand two hundred twenty-seven)** only towards the differential amount of Net Present Value (NPV) over 79.367 ha of forest land in favour of Shri Avin Jain (Heir of late Shri DC Jain) for mining of Iron & Manganese Ore in Dalpahar Iron & Manganese Ore mines at the rate of Rs.14,36,670/- per ha (Eco value Class- I, Canopy Density- 0.4-0.7) as per revised rate fixed by MoEF&CC, Govt. of India guideline dated 29.11.2023. The above demanded amount has to be deposited in Orissa CAMPA Account only through e-portal **(https://parivesh.nic.in/)** within 30 days from the date of issue of this letter and the proof/evidence of the deposit of fund be submitted to this office for further necessary action at this end.

Further, it is to mentined here that, the lessee has already deposited NPV amount in respect of aforementioned project is depicted below for reference.

PTO

1. *The lessee has already deposited NPV amount Rs.7,95,39,873/- @Rs.9,39,000/- per ha over 84.707 ha forest land. Out of 84.707 ha forest land , 5.34 ha of un-diverted forest land and subsequently, lapsed vide proceeding No.7084,7092,7100 and 7108 all dated 09.07.2013 of the Steel & Mines Department Govt. of Odisha.*

2. *The lessee has deposited differential Net Present Value (NPV) amount of Rs.31,85,088/- @Rs.14,36,670/- per ha over 6.40 ha in respect of Prospecting Proposal No. FP/OR/SRY/436505/2023.*

3. *The lessee has already deposited Total amount of Rs.8,27,24,961.00 (Rs.7,95,39,873.00 + Rs.31,85,088.00) towards NPV in respect of aforesaid project., Further, the earlier demand letters and payment receipt paid by the user agency are enclosed herewith for reference.*

The details of NPV is to be paid by the user agency has furnished below:-

Particulars	Amount due in Rs. (Rs.14,36,670/- per ha	Amount deposited in Rs.	Balance to be deposited in Rs.
Differential payment of Net Present Value (NPV) over 79.367 ha @ Rs.14,36,670/-	11,40,24,187.90	8,27,24,961.00	3,12,99,226.90 Or say 3,12,99,227.00
Total			**3,12,99,227.00**

(Rupees three crore twelve lakh ninety nine thousand two hundred twenty-seven) only

Note: The demand letter issued vide this office letter No.2304 dated 21.02.2026 is hereby cancelled.

Encl: As above.

Yours faithfully,

12/3/26

Divisional Forest Officer,
Keonjhar Division.

Memo No. 3369 (2) **/ Dated.** 12.03.2026

Copy forwarded to the Regional Chief Conservator of Forests, Rourkela Circle, Rourkela/Principal Chief Conservator of Forests, Forest Diversion and Nodal Officer, FC Act, O/o the Principal Chief Conservator of Forests & HoFF, Odisha, Bhubaneswar for favour of kind information and necessary action.

12/3/26

Divisional Forest Officer,
Keonjhar Division.

AGENCY COPY

यूनियन बैंक Union Bank of India

NEFT / RTGS CHALLAN for CAMPA Funds

Date : 30-03-2026

Agency Name.	MS DHARAMCHAND JAIN
Application No.	5893600952
MoEF/SG File No.	8-31/2015-FC
Location.	ORRISA
Address.	BichakundiKeonjhar
Amount(in Rs)	31299227/-

Amount in Words :Three Crore Twelve Lakh Ninety-Nine Thousand Two Hundred and Twenty-Seven Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	ORRISA CAMPA
IFSC Code:	UBIN0996335
Pay to Account No.	150825893600952 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 of India

NEFT / RTGS CHALLAN for CAMPA Funds

Date : 30-03-2026

Agency Name.	MS DHARAMCHAND JAIN
Application No.	5893600952
MoEF/SG File No.	8-31/2015-FC
Location.	ORRISA
Address:	Bichakundi Keonjhar
Amount(in Rs)	31299227/-

Amount in Words :Three Crore Twelve Lakh Ninety-Nine Thousand Two Hundred and Twenty-Seven Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	ORRISA CAMPA
IFSC Code:	UBIN0996335
Pay to Account No.	150825893600952 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

ICICI Bank

Payment Of **INR 3,12,99,227.00** to **ORRISA CAMPA**

Reference ID	:	**2333196286**
From Account Name	:	**D.C. JAIN MINES**
From Account Number	:	**XXXXXXXX5680**
To Account Name	:	**ORRISA CAMPA**
To Account Number	:	**XXXXXXXXXXX0952**
Payment Date	:	**02/04/2026**
Remarks	:	**Differential payment of Net Present Value over 79.367Ha vide demand letter no. 3368 dtd 12 March 2026**
Network	:	**RTGS**
Beneficiary LEI	:	
UTR Number	:	**ICICR42026040200559240**
Put transaction on Hold	:	**N**

Pending On

Printed on 02/04/2026 03:59:35 PM IST

New Payment

M/s DHARAMCHAND JAIN
(Mining Lessee)

"DHARAM VILLA"
12-A, Mahatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV,
New Delhi-110024
Phone: 011-41642414
Email: mdmpl@rediffmail.com
avinjain999@gmail.com

Ref: DCJ/DIMM_FDP/2023-24/2602 Dtd: 26.02.2024

To

The Divisional Forest Officer,
Keonjhar Forest Division
District. Keonjhar
Odisha – 758001

Sub: Proposal for diversion of non-forestry use of balance forest land of 84. 707 ha in favour of M/s D.C. Jain for mining of Iron and Manganese Ore in Dalpahar Iron & Manganese Ore Mines located in Baitarani RF-II by M/s D.C. Jain- regarding

Ref: i) Your Office Memo No.4068/6f-Mining dated 08.05.2023
ii) Memo No. 8853 dtd 08.05.2023 of Conservator of Forests (Nodal)
iii) Our compliance submitted vide letter no DCJ/DIMM/FDP/2023-24/0602 , Dtd:09.02.2024

Sir,

In reference to the subject and in continuation to our earlier letter submitting the compliance we would like to further provide details in compliance to the specific condition no. (vii) of your letter referred above with the relevant justification to your good office for onward processing of our proposal.

(vii): Compliance with regards to financial provision as imposed need to be submitted. Why the amount as demanded has not been deposited and what conservation plan with revised budgetary provision was deposited on 10" March, 2021.

The revised Site Specific Wildlife Conservation Plan has been approved by the PCCF Wildlife & CWW, Odisha vide letter no. 13358/CWLW-FDWC-FD-0144-2021 dtd. 14.12.2023 and the payment of Rs. 491.46 lakhs towards financial outlay has been deposited in the State Campa Account vide RTGS UTR No. KKBKR52024011500724506, 15.01.2024.

The delay in deposit of the funds towards the Site Specific Wildlife Conservation Plan was due to the following facts which may be considered by your good office.

During the time the demand letter for deposit of Funds towards Site Specific Wildlife Conservation plan with a financial outlay of Rs.250.254 lakhs (Rs.64.734 lakhs to be implemented by UA & Rs.185.20 lakhs was made by your good office vide letter no . 8804/Mining dated 29.12.2014, the said mining lease covered an area over 101.171Ha in five blocks namely Block A, B1, B2,B3 & C.

Subsequently four out of the aforesaid five blocks (Block B1, B2,B3 & C.) were declared as lapsed in 2013. Subsequently the Mining Lease over 89.961 Ha in Block A was declared as lapsed in 2015. The lessee filed a petition before the High Court of Odisha against the lapsing

M/s DHARAMCHAND JAIN
(Mining Lessee)

"DHARAM VILLA"
12-A, Mahatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV,
New Delhi-110024
Phone: 011-41642414
Email: mdmpl@rediffmail.com
avinjain999@gmail.com

order and in 2019, the Hon'ble High Court of Odisha passed an order in favour of the lessee and the subsequently State Govt. order for revival of the lease over 89.961Ha in Block A.

The lessee did not pursue the renewal of the four lapsed leases and therefore the State Government vide proceedings dated 30.05.2023 declared the leases over Block B1, B2, B3 & C as lapsed and possession handed over to the Steel & Mines Dept on 31.05.2023.

The Supplementary Lease deed was executed over 89.961Ha in Block A on 27.04.2023 for the extended period as per Section 8A(3) valid upto 08.06.2036.

The lessee had pursued for various clearances for the executed Block A only i.e., 89.961 Ha and had obtained approval for Mining Plan from IBM, Environment Clearance from SEIAA , CTO from SPCB Odisha,

On submission of documents in pursual of the Forest Diversion proposal , it was pointed out by your good office that the previous SSWCP approved by the PCCF Wildlife & CWW, Odisha in 27.10.2014 with a financial outlay of Rs.250.254 lakhs (Rs.64.734 lakhs to be implemented by UA & Rs.185.20 lakhs to be implemented by your good office had become invalid and infructuous and therefore your good office vide letter no 8991/ Mining , dtd 03.08.2023 had advised us to revise the SSWCP as per current wage rates an as per the new guidelines of the MoEF& CC.

Based on your instructions the new Site Specific Wildlife Conservation Plan was prepared and approved by the PCCF Wildlife & CWW, Odisha vide letter no 13358 dtd. 14.12.2023 Accordingly your good office issued a demand for depositing the said funds vide letter no 14034/Mining dtd. 16.12.2023 which was deposited in the State CAMPA Account vide RTGS UTR No. KKBKR52024011500724506, 15.01.2024.

The delay in the payment is attributed to the legal battles in the Hon'ble High Court & Revision authorities regarding the lapsing orders issued by the Dept. of Steel & Mines, Government of Odisha.

For your kind information please.

Thanking You,

For Dalpahar Iron & Manganese Mines

For Dalpahar Iron & Manganese Mines

Authorised Signatory

Authorised Signatory

AGENCY COPY

यूनियन बैंक Union Bank of India

आन्ध्रा Andhra

NEFT / RTGS CHALLAN for CAMPA Funds

Date : 12-01-2024

Agency Name.	DALPAHAR IRON AND MANGANESE ORE MINES
Application No.	5851900780
MoEF/SG File No.	NA
Location.	ORRISA
Address.	Sri Avin Jain, Dharam Villa, 12-A, Mahatma Gandhi Marg (Ring Road)South East
Amount(in Rs)	49146000/-

Amount in Words :Four Crore Ninety-One Lakh Forty-Six Thousand Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	ORRISA CAMPA
IFSC Code:	UBIN0996335
Pay to Account No.	150825851900780 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 of India

आन्ध्रा Andhra

NEFT / RTGS CHALLAN for CAMPA Funds

Date : 12-01-2024

Agency Name.	DALPAHAR IRON AND MANGANESE ORE MINES
Application No.	5851900780
MoEF/SG File No.	NA
Location.	ORRISA
Address:	Sri Avin Jain, Dharam Villa, 12-A, Mahatma Gandhi Marg (Ring Road) South East
Amount(in Rs)	49146000/-

Amount in Words :Four Crore Ninety-One Lakh Forty-Six Thousand Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	ORRISA CAMPA
IFSC Code:	UBIN0996335
Pay to Account No.	150825851900780 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***

KKBKRS20240115007 2
4506

Bank Ltd. New Delhi 110049 South Extension

15/01/2024

OFFICE OF THE DIVISIONAL FOREST OFFICER, KEONJHAR DIVISION
Phone No- 06766-254315, email ID- dfo.keonjhar@odisha.gov.in

No. 14034 **/6F- Mining-145/2023**
Dated, Keonjhar, the 16th **December, 2023**

To

Sri Avin Jain, Power of Attorney Holder,
Dalpahar Iron & Manganese Mines of D.C. Jain,
Dhram Villa, 12-A, Mahatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV, New Delhi-110024.

Sub: Approval of revised Site Specific Wildlife Conservation Plan in respect of Dalpahar Iron & Manganese Mines of D.C. Jain (now Sri Avin Jain is the Power of Attorney Holder) in the district of Keonjhar, Odisha.

X-Sub: Demand of scheme funds towards approved Site Specific Conservation Plan.

Ref: Memo No. 13358 dated 14.12.2023 of Conservator of Forests (ET), O/o the Principal Chief Conservator of Forests, (WL), CWLW, Odisha, Bhubaneswar.

Sir

With reference to the aforementioned memo on the captioned subject, this is to intimate that the Conservator of Forests (ET), O/o the Principal Chief Conservator of Forests, (WL), CWLW, Odisha, Bhubaneswar has approved the Site Specific Conservation Plan in respect of Dalpahar Iron & Manganese Mines of D.C. Jain (now Sri Avin Jain is the Power of Attorney Holder) in the district of Keonjhar, Odisha with a financial outlay of **Rs. 491.46 lakh.** Hence, you are requested to deposit the said approved amount of **Rs. 491.46 lakh** (Rupees four crore ninety-one lakh forty-six thousand) only towards scheme for Site Specific Wildlife Conservation Plan through **e-portal** of MoEF&CC as provided in the **https://parivesh.nic.in/** and the proof/evidence of the deposit of fund be submitted to this office for further necessary action at this end. Further, it is intimated that the PCCF (WL) has imposed the following conditions at the time of aforesaid approval which has to be abided by the User Agency.

- Activities in the project area as per Chapter- IV of the Plan will be executed by the project proponent under the guidance of DFO, Keonjhar (T)/ Bonai Forest Division, as the case may be.
- The plan period is five years and will be revised by concerned DFO at least one year before expiry of its implementation. The User Agency will bear the cost of such plan on its approval. Further, the User Agency will bear additional cost, if any, towards enhancement of wage rate and escalation of price of materials at the time of implementation of this plan. In case of any deviation, it will be delay as per law for violations of Forest (Conservation) Act, 1980, Environmental (Protection) Act, 1986, and Wildlife Protection Act, 1972.

Yours faithfully,

Divisional Forest Officer,
Keonjhar Division.

15/12

PTO

Memo No. 14035 **/Dated.** 16-12-2023

Copy forwarded to The Divisional Forest Officer, Bonai Division for favour of kind information and necessary action.

Divisional Forest Officer,
Keonjhar Division.

15/12

Memo No. 14036 **/Dated.** 16-12-2023

Copy forwarded to the Regional Chief Conservator of Forests, Rourkela Circle for favour of kind information and necessary action.

16/12/23

Divisional Forest Officer,
Keonjhar Division.

15/12

Memo No. 1437 **/Dated.** 16-12-2023

Copy forwarded to the Principal Chief Conservator of Forests, Forest Diversion and Nodal Officer, FC Act, O/o the Principal Chief Conservator of Forests & HoFF, Odisha, Bhubaneswar/ Principal Chief Conservator of Forests, (WL), CWLW, Odisha, Bhubaneswar for favour of kind information and necessary action.

16

Divisional Forest Officer,
Keonjhar Division.

15/12

GB

OFFICE OF THE DIVISIONAL FOREST OFFICER, KEONJHAR DIVISION.

Ph. No.06766-254315, FAX 06766-254041: email: ofsdp_kjr@rediffmail.com

No. 6632 / Mining,
Dated, Keonjhar the 6 th August, 2011.

To

Sri Avin Jain
(Legal heir of Late D.C. Jain)
Dalpahar Iron & Mn. Mines,
At:- Serenda, P.O. Barbil,
Dist. Keonjhar.

Sub:- Implementation of Regional Wildlife Management Plan.

Ref:- This Office letter No.7275 dated.31.12.2009

Sir,

As per letter No.22297/F&E dated.30.12.2005 and letter No.6497/F&E. dated.23.04.2008 of Government of Orissa, Forest & Environment Department, the user agency shall contribute to the State Government for the implementation of Regional Wildlife Management Plan prepared for Bonai and Keonjhar Divisions. Accordingly, you are requested to deposit the following amount at an early date to clear the Audit objections.

Cost towards Wildlife Mangement Plan
Over 101.171 ha. @ Rs.20,000/- per ha. = Rs.20,23,420.00

(Rupees twenty lakhs twenty three thousand four hundred twenty) only.

The amount should be deposited in RTGS/NEFT mode in State Specific CAMPA account and the proof/evidence of the deposit be submitted to this Office for taking further action at this end.

An early action in the matter is requested.

Divisional Forest Officer,
Keonjhar Division.

Memo No. 6633 / Dated. 6-8-11
Copy forwarded to the Range Officer, Champua Range for information and necessary action.

Divisional Forest Officer,
Keonjhar Division.

ओरियन्टल बैंक ऑफ़ कॉमर्स
ORIENTAL BANK OF COMMERCE का उपक्रम)
E-14, Ist Floor, South Extn., Part-II
New Delhi - 110049
Ph.: 26258860/61, 41018253

ओ.बी.सी

ORIENTAL BANK OF COMMERCE
(A GOVERNMENT OF INDIA UNDERTAKING)

23/9/2011

Mr. Avin Jain
12 Ring Road
Lajpat Nagar IV
New Delhi.

W.L. management
D.C Jain

Sir, Re: SB A/c 10592100021560

This is to certify that a cheque No 857737 dt- 23/9/2011 for Rs. 20,23,420/ in fav. of RTGS - in fav. of MOEF Govt of India A/c No 34490101007049 uwon bank of India is debited in A/c 10592100021560 on 23/9/2011

Thanking

For ORIENTAL BANK OF COMMERCE

प्रधान कार्यालय : ई-ब्लाक, कनॉट प्लेस, नई दिल्ली-110001 H.O. : E-Block, Connaught Place, New Delhi-110001
दूरभाष/Telephone : 23417121, 23416691, 23415598, 23416021, 23416171
E-mail : obc@obcindia.com तार का पता / Telegraphic Address : 'बैंकहूरी' / 'BANKHOORI'
Website : www.obcindia.com

OF-81/S.P.

M/s DHARAMCHAND JAIN
(Mining Lessee)

"DHARAM VILLA"
12-A, Mahatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV,
New Delhi-110024
Phone: 011-41642414
Email: mdmpl@rediffmail.com
avinjain999@gmail.com

Ref. No.: DCJ / 13 / 2023-24 /2908

Date: 29.08.2023

To
The Divisional Forest Officer.
Keonjhar Forest Division
Keonjhar, Odisha

Sub: Demand of funds towards Regional Wildlife Management Plan of DalpaharIron & Manganese Mines of D.C. Jain. –Payment reg

Ref: Your office letter no. 8993/6F-Mining -57/2020 dtd: 03.08.2023
Letter No. 10F(con)108/2015/126159/F&E dated 05.12.2018 of Govt. of Odisha, Forest and Environment Department.

Sir,

In reference to the subject and letters cited above we would like to inform that we have deposited the differential amount Rs.55, 77,582/- (Rupees fiftyfive lakh seventy seven thousand five hundred eighty two) only towards the balance RegionalWild Life Management plan as per letter No. 10F(con)108/2015/126159/F&E dated 05.12.2018of Special Secretary to Govt. Forest &Environment Department, Odisha, Bhubaneswar vide RTGS No. KKBKR52023082900619959 dtd 29.08.2023 in the ORRISA CAMPA account no. 150825851900623, IFSC Code UBIN0996335, Union Bank Of India ,FCS Centre,21/1, III Floor, Jelitta Towers, Mission Road, Bengaluru-560027 as per the challan generated through e-portal of MoEF&CC.

The proof/evidence of the deposit of the fund towards Regional Wildlife Management Plan of DalpaharIron & Manganese Mines of D.C. Jainis herewith submitted for further necessary action at your end.

Thanking You,

Yours truly
For D.C.Jain

Authorised Signatory
Dalpahar Iron & Manganese Mines.

Encl: As above

kotak

Customer Acknowledgement

Branch: SOUTH EXT.-II, NEW DELHI.

Date : 29/08/2023

We acknowledge the receipt of NEFT/RTGS instructions

for an amount of ₹ 55,77,582/- vide

cheque number 000056 to be credited to

the Account number 9213145237. of

KOTAK MAHINDRA BANK Bank.

UTR # KKBKR52023082900619959

Kotak Mahindra Bank Ltd. Br. Code 0165 South Extension New Delhi Block-C

RECEIVED 29 AUG 2023

Bank Officials
Signature

Bank Seal

With Date & Time
of Request

AGENCY COPY

यूनियन बैंक Union Bank of India

आन्ध्रा Andhra | कार्पोरेशन Corporation

NEFT / RTGS CHALLAN for CAMPA Funds

Date : 28-08-2023

Agency Name.	DALPAHAR IRON AND MANGANESE ORE MINES
Application No.	5851900623
MoEF/SG File No.	NA
Location.	ORRISA
Address.	Sri Avin Jain, Dharam Villa, 12-A, Mahatma Gandhi Marg (Ring Road)South East
Amount(in Rs)	5577582/-

Amount in Words :Fifty-Five Lakh Seventy-Seven Thousand Five Hundred and Eighty-Two Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	ORRISA CAMPA
IFSC Code:	UBIN0996335
Pay to Account No.	150825851900623 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 of India

आन्ध्रा Andhra | कार्पोरेशन Corporation

NEFT / RTGS CHALLAN for CAMPA Funds

Date : 28-08-2023

Agency Name.	DALPAHAR IRON AND MANGANESE ORE MINES
Application No.	5851900623
MoEF/SG File No.	NA
Location.	ORRISA
Address:	Sri Avin Jain, Dharam Villa, 12-A, Mahatma Gandhi Marg (Ring Road) South East
Amount(in Rs)	5577582/-

Amount in Words :Fifty-Five Lakh Seventy-Seven Thousand Five Hundred and Eighty-Two Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	ORRISA CAMPA
IFSC Code:	UBIN0996335
Pay to Account No.	150825851900623 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

KKBKR52023082900619959
AMOUNT-55,77,582/-
DATE - 29-08-2023

Kotak Mahindra Bank
M-3
Ground Floor
South Ext.
Part - II
New Delhi-110049

OFFICE OF THE DIVISIONAL FOREST OFFICER, KEONJHAR DIVISION
Phone No- 06766-254315, email ID- dfokjr.od@gov.in

No. 8993 / 6F-Mining-57/2020
Dated, Keonjhar the 03rd August, 2023

To

The Avin Jain, Power of Attorney Holder,
Dalpahar Iron & Mananganese Mines of D.C. Jain,
Dharam Villa, 12-A, Mahatma Gandhi Marg,
Ring road, Lajpat Nagar-IV, New Delhi-110024.

Sub: **Demand of funds towards Regional Wildlife Management Plan of Dalpahar Iron & Manganese Mines of D.C. Jain.**

Ref: Letter No. 10F(con)108/2015/126159/F&E dated 05.12.2018 of Govt. of Odisha, Forest and Environment Department.

Sir,

You are requested to deposit the differential amount Rs.55,77,582/- (Rupees fifty five lakh seventy seven thousand five hundred eighty two) only towards the balance Regional Wild Life Management plan as per letter No. 10F(con)108/2015/126159/F&E dated 05.12.2018 of Special Secretary to Govt. Forest & Environment Department, Odisha, Bhubaneswar. The demanded amount has to be deposited through e-portal of MoEF&CC as provided in the **http://forestsclearance.nic.in/** and the proof/evidence of the deposit of fund be submitted to this office for further necessary action at this end.

Regional Wild Life Management plan of Keonjhar-Bonai over 89.961 ha* (Block-A) Mining lease area (as per present lease deed) @ Rs. 82,000/- per ha amount to be deposited.	=	Rs.73,76,802.00
Amount already deposited @Rs.20,000/- per ha over 89.961 ha* Mining lease area (as per old lease deed)	–	Rs.17,99,220.00
Balance amount to be deposited	=	**Rs.55,77,582.00**

(Rupees fifty five lakh seventy seven thousand five hundred eighty two) only.

* **Original lease was 101.171 ha for which Rs.20,23,420/- was deposited @Rs.20,000/- per ha the then prevailing rate of RWLMP. But lease over 11.21 ha in 4 blocks B1, B2, B3 & C (out of 101.171 ha) has been declared as lapsed vide proceeding No.7084/SM, 7092/SM, 7100/SM & 7108/SM all dated 09.07.2013 of Steel & Mines Department, Govt. of Odisha respectively. So remaining lease area is 89.961 ha over which differential amount @Rs.82,000/- per ha is demanded excluding Rs.20,000/-per ha which was already paid.**

Yours faithfully,

03/08/23

Divisional Forest Officer,
Keonjhar Division.

PTO

Memo No. 8994(3) **/ Dated.** 03-08-2023

Copy submitted to the Regional Chief Conservator of Forests, Rourkela Circle, Rourkela / Principal Chief Conservator of Forests, FD&NO, FC Act, O/o the PCCF, Odisha, Bhubaneswar / Principal Chief Conservator of Forests (WL) & CWLW, Odisha, Bhubaneswar for favour of kind information.

03/08/23

Divisional Forest Officer,
Keonjhar Division.

M/s DHARAMCHAND JAIN
(Mining Lessee)

"DHARAM VILLA"
12-A, Mahatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV,
New Delhi-110024
Phone: 011-41642414
Email: mdmpl@rediffmail.com
avinjain999@gmail.com

Ref: DCJ/DFO/2026-27/02 **DATE: 25.04.2026**

To,

THE DIVISONAL FOREST OFFICER,

KEONJHAR,

ODISHA.

SUB: Proposal for seeking prior approval of the Central Government under Section-2 (1)(ii) of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for 79.367 ha of forest land in favour of Shri Avin Jain (Heir of late Shri DC Jain) for mining of Iron & Manganese Ore in Dalpahar Iron & Manganese Ore Mines (Online Proposal No. FP/OR/MIN/9360/2015) – Stage-I approval reg. Regarding payment of alternative habitat/home for the avifauna.

X SUB: Submission of Payment Confirmation for Demand of funds towards approved Scheme for creation and maintenance of alternative habitat/home for avifauna.

Dear Sir,

With reference to your Letter No. 4882/6F-Mining-42/2026 dated 18th April 2026 and Memo No. 3429 dated 16.04.2026 this is to inform you that the approved amount of Rs. 1,45,92,000/- (One Crore Forty-Five Lakh Ninety-Two Thousand Rupees only.) through RTGS (UTR No: ICICR42026042400534838) has been successfully deposited towards the cost of creation and maintenance of alternative habitat/home for avifauna whose nesting trees are to be cleared in Dalpahar Iron & Manganese Ore Mines of Shri Avin Jain.

Further, an approved amount of Rs. 7,30,000/- (Rupees Seven Lakh Thirty Thousand only) has been deposited through RTGS (UTR No: ICICR42026042500516192) towards the maintenance of alternative habitat/home for avifauna in the following bank details

Bank Name: Bank of India,

Account No. 540010110018378,

IFSC Code: BKID0005400.

Thanking You,

For Dalpahar Iron and Manganese Ore Mines of Sri Avin Jain

Debasish Manas Ranjan Sethy.

Mines Manager

Mines Manager
Dalpahar Iron & Mn. Mines
M/s. D. C. Jain
Dalpahar

OFFICE OF THE DIVISIONAL FOREST OFFICER, KEONJHAR DIVISION
Phone No- 06766-254315, email ID- dfo.keonjhar@odisha.gov.in

Letter No. 4882 **6F-Mining-42/2026**
Dated, Keonjhar the 18th **April, 2026**

To

Shri Avin Jain, (Heir of late Shri DC Jain) (Mining Lessee) Dharam Villa,12-A, Mahatma Gandhi Marg, Ring Road, Lajpat Nagar, New Delhi110024.

Sub: Proposal for seeking prior approval of the Central Government under Section-2 (1)(ii) of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for 79.367 ha of forest land in favour of Shri Avin Jain (Heir of late Shri DC Jain) for mining of Iron & Manganese Ore in Dalpahar Iron & Manganese Ore Mines (Online Proposal No.FP/OR/MIN/9360/2015)-Stage-I approval reg. Regarding payment of Alternative habitat/ home for the avifauna.

X-Sub: Demand of funds towards approved Scheme for creation and maintenance of alternative habitat/home for avifauna, whose nesting trees are to be cleared in Dalpahar Iron & Manganese Ore Mines of Shri Avin Jain (Heir of late Shri DC Jain).

Ref: Memo No.3429 dated 16.04.2026 of Chief Conservator of Forests (WL), O/o the Principal Chief Conservator of Forests (WL & CWLW), Odisha, Bhubaneswar. **(Copy enclosed).**

Sir,

With reference to the aforementioned memo on the captioned subject, this is to intimate that, in compliance to the condition No. 2(xxxvi) of Stage-I approval order of the MoEF&CC, GoI, New Delhi dated 13.02.2026 in respct of aforementioned forest diversion proposal, the Principal Chief Conservator of Forests (WL) & Chief Wildlife Warden, Odisha, Bhubaneswar has technically approved the Scheme for creation and maintenance of alternative habitat / home for avifauna, whose nesting trees are to be cleared in your Dalpahar Iron & Manganese Ore Mines with a total financial outlay of **Rs.145.920/- Lakhs (Rupees One Crore Forty-Five Lakh Ninety-Two Thousand) only.** The copy of the aforesaid approved scheme is enclosed for reference.

Hence, you are requested to deposit the approved amount of **Rs.145.920/- Lakhs (Rupees One Crore Forty-Five Lakh Ninety-Two Thousand)** only through e-portal of MoEF&CC as provided in the https://parivesh.nic.in/ and the proof/evidence of the deposit of fund be submitted to this office for further necessary action at this end.

Further, as per point No.16 of the approved Scheme for creation and maintenance of alternative habitat/home for avifauna, whose nesting trees are to be cleared in Dalpahar Iron & Manganese Ore Mines, it is requested to deposit the aforesaid 5% plan cost i.e. **Rs. 7.296 lakh or Rs.**

7.30 lakh (Rupees Seven Lakh Thirty Thousand) only in the following account of the undersigend and submit the copy of its proof for further action at this end. The details of the saving bank account is mentioned below:-

Customer Name	**Deposit Scheme, DFO, Keonjhar Division.**
Bank Name	**Bank of India**
Bank Account No.	**540010110013378**
IFSC Code	**BKID0005400**

Encl:- As above.

Yours faithfully,

18/04/26

Divisional forest Officer,
Keonjhar Division.

17/4

Memo No. 4883 **/Dated** 18.04.26

Copy submitted to the Regional Chief Conservator of Forests, Rourkela Circle, Rourkela/Principal Chief Conservator of Forests (WL & CWLW), Odisha, Bhubaneswar/ Principal Chief Conservator of Forests, FD & NO, FC Act, O/o the PCCF & HoFF, Odisha, Bhubaneswar for favour of kind information and necessary action.

18/04/26

Divisional forest Officer,
Keonjhar Division.

17/4

AGENCY COPY

NEFT / RTGS CHALLAN for CAMPA Funds

Date : 24-04-2026

Agency Name.	**MS DHARAMCHAND JAIN**
Application No.	**5893600630**
MoEF/SG File No.	**8-31/2015-FC**
Location.	**ORRISA**
Address.	**BichakundiKeonjhar**
Amount(in Rs)	**29770800/-**

Amount in Words :Two Crore Ninety-Seven Lakh Seventy Thousand Eight Hundred Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	**ORRISA CAMPA**
IFSC Code:	**UBIN0996335**
Pay to Account No.	**150825893600630** **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

NEFT / RTGS CHALLAN for CAMPA Funds

Date : 24-04-2026

Agency Name.	**MS DHARAMCHAND JAIN**
Application No.	**5893600630**
MoEF/SG File No.	**8-31/2015-FC**
Location.	**ORRISA**
Address:	**Bichakundi Keonjhar**
Amount(in Rs)	**29770800/-**

Amount in Words :Two Crore Ninety-Seven Lakh Seventy Thousand Eight Hundred Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	**ORRISA CAMPA**
IFSC Code:	**UBIN0996335**
Pay to Account No.	**150825893600630** **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

ICICI Bank

Payment Of INR 2,97,70,800.00 to ORRISA CAMPA

Reference ID	:	**2358936992**
From Account Name	:	**D.C. JAIN MINES**
From Account Number	:	**XXXXXXXX5680**
To Account Name	:	**ORRISA CAMPA**
To Account Number	:	**XXXXXXXXXXX0630**
Payment Date	:	**24/04/2026**
Remarks	:	**Differential amount for ACA Scheme Forest Land vide DFO Keonjhar demand letter no 4882 dtd 18th April 2026 AND 4968 dtd 21st April 2026**
Network	:	**RTGS**
Beneficiary LEI	:	
UTR Number	:	**ICICR42026042400534838**
Put transaction on Hold	:	**N**

Pending On

Printed on 24/04/2026 02:09:52 PM IST

New Payment

ICICI Bank

Payment Of INR 7,30,000.00 to DEPOSIT SCHEME,D.F.O,KEONJHAR DIVISION

Reference ID	:	**2359863330**
From Account Name	:	**D.C. JAIN MINES**
From Account Number	:	**XXXXXXXX5680**
To Account Name	:	**DEPOSIT SCHEME,D.F.O,KEONJHAR DIVISION**
To Account Number	:	**XXXXXXXXXXX8378**
Payment Date	:	**25/04/2026**
Remarks	:	**5percent of plan cost Rs14592000 towards creation and maintenance cost of alternative habitat for avifauna vide DFO demand letter no 4882 dtd 18th April 2026**
Network	:	**RTGS**
Beneficiary LEI	:	
UTR Number	:	**ICICR42026042500516192**

Printed on 25/04/2026 12:54:07 PM IST

Put transaction on Hold : **N**

Pending On

New Payment

OFFICE OF THE COLLECTOR & DISTRICT MAGISTRATE: KEONJHAR
AT/PO-KEONJHAR, DISTRICT: KEONJHAR,ODISHA, PIN-758001
(REVENUE SECTION)
e-mail: revenue.kjr@gmail.com

No. 2616 /Rev/Dt. 31 / 03 /2026
XIX- 36 /2026

After careful consideration of the Alienation Proposal submitted by the Tahasildar, Banspal vide Alienation Case No.09/2026 and in exercise of the powers conferred vide Revenue & D.M. Department Notification No. 42899/R&DM/ dt.07.11.2009, read with L.No. 22958/ R&DM/ dt.04.08.2014, No. 29089/ R&DM/ dt.29.09.2014 and No.31312/ R&DM/ dt.24.10.2014, sanction is hereby accorded for alienation of the non-forest Govt. land measuring 66.750 Ha. or Ac.164.927 in village-Gundula under Banspal Tahasil as per the land schedule indicated below is hereby accorded in favour of State Forest, Environment & Climate Change Department for raising compensatory afforestation to the extent of forest land proposed to be used for non-forestry use against 79.367Ha. forest land in Keonjhar Forest Division proposed to be diverted for mining of Iron and Manganese Ore in Dalpahar Iron & Manganese Ore Mines located in Baitarani RF-II, District Keonjhar of Shri Avin Jain (Heir of late Dharamchand Jain) on payment of premium/land cost of **Rs.1,93,03,056/- (Rupees One Crore Ninety-Three Lakh Three Thousand Fifty-Six)** only by the user Agency subject to the terms and conditions as indicated below.

Land Schedule
Tahasil:-Banspal

Name of village	Khata No	Plot No	Total area as per RoR (in Ha)	Area applied for alienation(in Ha)	Kisam
Gundula	103 (AAA)	97(P)	16.9600	4.7150	Parbat-II
		99(P)	14.8800	2.7310	Parbat-II
		100(P)	16.0000	10.5700	Parbat-II
		101(P)	16.0000	6.3340	Parbat-II
		102	16.0000	16.0000	Parbat-II
		195	16.0000	16.0000	Parbat-II
		196(P)	16.0000	10.3950	Parbat-II
			07 Plots Total	**66.7450**	

Premium Payable

1	Premium of the land measuring 66.7450Ha. or Ac.164.927@ Rs.1,17,040/- per acre in village-Gundula i.e. Rs.1,17,040/- x Ac.164.927	1,93,03,056.08 or say
	TOTAL	**1,93,03,056/-**

(Rupees One Crore Ninety-Three Lakh Three Thousand Fifty-Six) only

Contd...P/2

Term& conditions

1. The land shall be utilized exclusively for the purpose for which it is alienated and shall not be transferred or otherwise disposed of.

2. The State Forest Environment & Climate Change Department shall take such precautionary measures as necessary to keep the land free from encroachment. If the land or any portion of it is not utilized within threeyears for the purpose for which it is alienated, the same shall revert to Government in Revenue & Disaster Management Department free from all encumbrances and without payment of compensation for the land or for any improvement that might have been made thereto.

3. The land shall be utilized exclusively for the purpose for which it is alienated and shall not be transferred or otherwise disposed of.

4. The Forest & Environment Department shall take such precautionary measures as necessary to keep the land free from encroachment .If the land or any portion of it is not utilized within three years for the purpose for which it is alienated, the same shall revert to Government in Revenue & Disaster Management Department free from all encumbrances and without payment of compensation for the land or for any improvement that might have been made thereto.

5. Infringement of any of the conditions of the alienation shall result in immediate resumption of the land by the Government in Revenue& Disaster Management Department free from all encumbrances.

6. The Project Proponent /User Agency i.e. Shri Avin Jain(Heir of late D.C.Jain) shall deposit the premium/land cost of **Rs.1,93,03,056/- (Rupees One Crore Ninety-Three Lakh Three Thousand Fifty-Six)** only with the Tahasildar, Banspal.

7. The User Agency will have to pay the amount over and above the premium already assessed , if any calculated and demanded, for any reason, in future.

8. The Tahasildar to realize the premium/land cost i.e. **Rs.1,93,03,056/- (Rupees One Crore Ninety-Three Lakh Three Thousand Fifty-Six)** only from the User Agency and take follow up action i.e. correction of RoRs etc. after realization of the premium/land cost.

31/3/26

Collector, Keonjhar

Memo No. 2617 /Rev/Dt 31/03/26

Copy forwarded to the Under Secretary to Government, Revenue & D.M. Department, Odisha, Bhubaneswar/ Under Secretary, Board of Revenue, Odisha, Cuttack/ Under Secretary to Government, Forest Environment and Climate Change Department, Odisha, Bhubaneswar/ Secretary to RDC (ND) Odisha, Sambalpur for information and necessary action.

31/3/26

Addl. District Magistrate,
Keonjhar

Contd...P/3

Memo No. 2618 /Rev/Dt 31/03/26

Copy forwarded to the Divisional Forest Officer, Keonjhar for information and necessary action with reference to his L.No.2298/6F–Mining-145/2023 dt.21.02.2026. He is requested to take over possession of the land from the Tahasildar, Banspal.

31/3/26

Addl. District Magistrate,
Keonjhar

Memo No. 2619 /Rev/Dt 31/03/26

Copy forwarded to the Sub-Collector, Keonjhar for information and necessary action with reference to his letter No.4010/Rev. dt.26.03.2026.

31/3/26

Addl. District Magistrate,
Keonjhar

Memo No. 2620 /Rev/Dt 31/03/26

Copy forwarded to Shri Avin Jain(Heir of late D.C.Jain) (Mining Lessee), Dharam Villa,12-A, Mahatma Gandhi Marg,Ring Road, Lajpat Nagar, New Delhi-10024 for information and necessary action.

31/3/26

Addl. District Magistrate,
Keonjhar

Memo No. 2621 /Rev/Dt 31/03/26

Copy forwarded to the Tahasildar, Banspal for information and necessary action. **He is directed to realize the premium/land cost Rs.1,93,03,056/- (Rupees One Crore Ninety-Three Lakh Three Thousand Fifty-Six)** only **from the User Agency and take follow up action i.e. correction of RoRs etc. after realization of the premium/land cost.** The Alienation Case Record No.09/2026 is returned herewith, the receipt of which may be acknowledged.

Copy to Guard File.(Lease Branch)

31/3/26

Addl. District Magistrate,
Keonjhar

GF 16/4/26

Through Special Messenger

OFFICE OF THE TAHASILDAR, BANSPAL

No. 1000 /Rev. dated 15 /04/2026

To

The Divisional Forest Officer, Keonjhar Division.

Sub:- Alienation of non forest Government land for compensatory afforestation- **Submission of R.O.R. thereof.**

Ref :- District Office Memo No.2612/Rev.dt.31.03.2026 & District Office Memo No.2618/Rev.dt.31.03.2026.

Sir,

In inviting a kind reference to the letter on the subject cited above, I am to say that the Collector, Keonjhar has been pleased to sanction the alienation of the following schedule of non-forest Government land in favour of State Forest, Environment & Climate Change Department for raising Compensatory Afforestation to the extent of forest land proposed to be used for non-forestry use against 79.367 Ha. forest land in Keonjhar Forest Division proposed to be diverted for mining of Iron and Manganese Ore in Dalpahar Iron & Manganese Ore Mines Located in Baitrarni RF-II, District Keonjhar of Shri Avin Jain (Heir of Late Dharamchand Jain) subject to the terms .and conditions as cited in the sanctioned order.

01. Alienation Case No.08/2026
Sanctioned vide District Office Order No. 2610/Rev. dtd. 31.03.2026

LAND SCHEDULE

Name of the Mouza- Champajhar

Khata No.	Plot No.	Total area (in Hc.)	Proposed Area (in Hc.)	Kisam
24 (AAA)	42/171	13.5500	7.3100	Parbat-II
	42/193	2.4900	2.4900	Parbat-II
TOTAL	**2 Plots**	**16.0400**	**9.8000**	

02. Alienation Case No.09/2026
Sanctioned vide District Office Order No. 2616/Rev. dtd. 31.03.2026

LAND SCHEDULE

Name of the Mouza- Gundula

Khata No.	Plot No.	Total area (in Hc.)	Proposed Area (in Hc.)	Kisam
103 (AAA)	97 (P)	16.9600	4.7150	Parbat-II
	99 (P)	14.8800	2.7310	Parbat-II
	100 (P)	16.0000	10.5700	Parbat-II
	101 (P)	16.0000	6.3340	Parbat-II
	102	16.0000	16.0000	Parbat-II
	195	16.0000	16.0000	Parbat-II
	196 (P)	16.0000	10.3950	Parbat-II
TOTAL	**7 Plots**	**111.8400**	**66.7450**	

(Contd...P/2...)

After receiving of sanction orders alongwith alienation case record referred above, the R.O.R. has been prepared by this Office as per rule 20 , 21 & 22 of " Orissa Survey & Settlement Rules, 1962" for which the Khata & Plots have been changed in Bhulekh Software and the details of schedule of land are given below:-

LAND SCHEDULE

Name of the Mouza- Champajhar

Khata No.	Plot No.	Total area (in Hc.)	Kisam
24/5	42/220	7.3100	Parbat-II
	42/193	2.4900	Parbat-II
TOTAL	**2 Plots**	**9.8000**	

LAND SCHEDULE

Name of the Mouza- Gundula

Khata No.	Plot No.	Total area (in Hc.)	Kisam
103/1	97/721	4.7150	Parbat-II
	99/722	2.7310	Parbat-II
	100/723	10.5700	Parbat-II
	101/724	6.3340	Parbat-II
	102	16.0000	Parbat-II
	195	16.0000	Parbat-II
	196/725	10.3950	Parbat-II
TOTAL	**7 Plots**	**66.7450**	

The original R.O.R. bearing No.24/5 & R.O.R. bearing No.103/1 in respect of Mouza- **Champajhar** & **Gundula** respectively are enclosed herewith and the receipt of the same may kindly be acknowledged.

Yours faithfully,

Encl : **As above**

15/4/2026

TAHASILDAR, BANSPAL

Memo No. 1001 /Rev.dated 15 /04/2026

Copy submitted to the Sub-Collector, Keonjhar for favour of kind information and necessary action.

15/4/2026

TAHASILDAR, BANSPAL

(Contd...P/2...)

Memo No. 1002 /Rev.dated 15 /04/2026

Copy submitted to the Addl. District Magistrate, Keonjhar for favour of kind information and necessary action.

15/4/2026

TAHASILDAR, BANSPAL

Memo No. 1003 /Rev.dated 15 /04/2026

Copy forwarded to Shri Avin Jain, (Heir of late Shri D.C. Jain) (Mining Lessee) Dharama Villa,12-A, Mahatma Gandhi Marg, Ring Road, Lajpat Nagar, New Delhi-10024 for information and necessary action.

15/4/2026

TAHASILDAR, BANSPAL

Memo No. 1004 /Rev.dated 15 /04/2026

Copy to Revenue Inspector, Taramakanta/Kanjipani for information and necessary action. They are directed to hand over possession of the aforementioned land to the authorised Official of the Divisional Forest Officer, Keonjhar Division and report compliance.

15/4/2026

TAHASILDAR, BANSPAL

Schedule I Form No.39-A

ଖତିୟାନ

ମୌଜା	: ଗୁଣଜା	ତହସିଲ	: ବାଂଶପାଳ
ଥାନା	: କାଙ୍କୁପାଣି	ତହସିଲ ନମ୍ବର	: 05
ଥାନା ନମ୍ବର	: 72	ଜିଲ୍ଲା	: କେନ୍ଦୁଝର

ଜମିଦାରଙ୍କ ନାମ ଓ ଖେୱାଟ ବା ଖତିୟାନର କ୍ରମିକ ନମ୍ବର	ଓଡିଶା ସରକାର ପ୍ରଥମ ଭାଗ ଖେୱାଟ ନମ୍ବର 1
୧)ଖତିୟାନର କ୍ରମିକ ନଂ	103/1
୨) ପ୍ରଜାର ନାମ, ପିତାର ନାମ , ଜାତି ଓ ବାସସ୍ଥାନ	ରାଜ୍ୟ ଜଙ୍ଗଲ ପରିବେଶ ଓ ଜଳବାୟୁ ପରିବର୍ତ୍ତନ ବିଭାଗ ଓଡିଶା

୩)ସ୍ୱତ୍ୱ						
୪)ବେଗ	ଜଳଜର	ଖଜଣା	ସେସ	ନିସ୍ତାର ସେସ ଓ ଅନ୍ୟାନ୍ୟ ସେସ ଯଦି କିଛି ଥାଏ	ମୋଟ	୫) କ୍ରମବର୍ଦ୍ଧନଶୀଳ ଖଜଣାର ହିସବଗଣା
		0.00	0.00	0.00	0.00	

୬) ବିଶେଷ ଅନୁସଙ୍ଗ ଯଦି କିଛି ଥାଏ	Alienation Case No. 09/2026 (ଦା.ଖା କେଶ ନଂ 1043/2026) ଓ ଜିଲାପାଳ, କେନ୍ଦୁଝରଙ୍କ ଆଦେଶ ସଂଖ୍ୟା 2616/Rev. Dt. 31.03.2026 ହୁ.ମୁ. ପ୍ଲଟ ନଂ 97/721 ରକବା ହେ 4.7150, 99/722 ରକବା ହେ 2.7310, 100/723 ରକବା ହେ 10.5700, 101/724 ରକବା ହେ 6.3340, 102 ରକବା ହେ 16.0000, 195 ରକବା ହେ 16.0000, 196/725 ରକବା ହେ 10.3950 ଖା.ଖା. 103 ରୁ ।

BLANK SPACE FOR STAMPING

COURT OF THE TAHASILDAR BANSPAL

ଅନ୍ତିମ ପ୍ରକାଶନ ତାରିଖ :24/09/1981

ଖଜଣା ଧାର୍ଯ୍ୟ ତାରିଖ :

Addl. Tahasildar
Banspal

ଖତିୟାନର କ୍ରମିକ ନଂ : 103/1		ମୌଜା : ପୁଣ୍ଡଳା				ଜିଲ୍ଲା : ବେହୁରତ
ପ୍ଲଟ ନମ୍ବର ଓ ବର୍ଗର ନାମ	ଜିମନ ଓ ପ୍ଲଟର ଚତୁଃସୀମା	ଜିମନର ବିସ୍ତାରିତ ବିବରଣୀ ଓ ମୌଜିଦି	ପରିମାଣ			ମନ୍ତବ୍ୟ
			ଏକର	ଡି	ବେହୁର	
୬	୮	୯	୧୦		୧୧	୧୨
97/721	ଉର୍ବର ଦୁଇ		11	651	4.7150	
99/722	ଉର୍ବର ଦୁଇ		6	7484	2.7310	
100/723	ଉର୍ବର ଦୁଇ		26	119	10.5700	
101/724	ଉର୍ବର ଦୁଇ		15	651	6.3340	
102	ଉର୍ବର ଦୁଇ		39	536	16.0000	
195	ଉର୍ବର ଦୁଇ		39	536	16.0000	
196/725	ଉର୍ବର ଦୁଇ		25	686	10.3950	
7 ପ୍ଲଟ			164	9274	66.7450	

Addl. Tahasildar
Banspal

ରାଷ୍ଟ୍ରୀୟ ସୂଚନା ବିଜ୍ଞାନ କେନ୍ଦ୍ର ,ଓଡିଶା

08/04/2026

Schedule I Form No.39-A

ଖତିୟାନ

ମୌଜା	: ଚମାଝର	ତହସିଲ	: ବଂଶପାଳ
ଥାନା	: ନୟାକୋଟ	ତହସିଲ ନମ୍ବର	: 05
ଥାନା ନମ୍ବର	: 71	ଜିଲ୍ଲା	: କେନ୍ଦୁଝର

ଜମିଦାରଙ୍କ ନାମ ଓ ଖେୱାଟ ବା ଖତିୟାନର କ୍ରମିକ ନମ୍ବର	ଓଡିଶା ସରକାର ପ୍ରଥମ ଭାଗ ଖେୱାଟ ନମ୍ବର 1
୧)ଖତିୟାନର କ୍ରମିକ ନଂ	24/5
୨) ପ୍ରଜାର ନାମ, ପିତାର ନାମ , ଜାତି ଓ ବାସସ୍ଥାନ	ଗାଜ୍ୟ ଜଙ୍ଗଲ ପରିବେଶ ଓ ଜଳବାୟୁ ପରିବର୍ତ୍ତନ ବିଭାଗ ଓଡିଶା

୩)ସ୍ୱତ୍ୱ						
୪)ଦେୟ	ଜଳକର	ଖଜଣା	ସେସ	ନିସ୍ତାର ପେସ ଓ ଅନ୍ୟାନ୍ୟ ସେସ ଯଦି କିଛି ଥାଏ	ମୋଟ	୫) କ୍ରମବର୍ଦ୍ଧନଶୀଳ ଖଜଣାର ବିବରଣୀ
		0.00	0.00	0.00	0.00	

୬) ବିଶେଷ ଅନୁଦଙ୍ଗ ଯଦି କିଛି ଥାଏ	Alienation Case No. 08/2026 (ଦା.ଖା ବେଶ ନଂ 1044/2026) ଓ ଜିଲ୍ଲାପାଳ, କେନ୍ଦୁଝରଙ୍କ ଆଦେଶ ସଂଖ୍ୟା 2610/Rev. Dt. 31.03.2026 ହୁ.ମୁ. ପ୍ଲଟ ନଂ 42/220 ରକବା ହେ 7.3100, 42/193 ରକବା ହେ 2.4900 ଖା.ଖା. 24 ରୁ ।

BLANK SPACE FOR STAMPING

ଅନ୍ତିମ ପ୍ରକାଶନ ତାରିଖ :25/09/1981

ଖଜଣା ଧାର୍ଯ୍ୟ ତାରିଖ :

COURT OF THE TAHASILDAR BANSPAL

Addl. Tahasildar
Banspal

ଖତିୟାନର ଜମିର ନଂ : 24/5		ମୌଜା : ଚମାଝର				ଜିଲ୍ଲା : ଢେଙ୍କାନାଳ
ପ୍ଲଟ ନମ୍ବର ଓ ଚକର ନାମ	ଜମିର ଓ ପ୍ଲଟର ଶ୍ରେଣୀ	ବିସମାର ବିଘାରିତ ବିବରଣୀ ଓ ମୌଜୁଦି	ରକବା			ମନ୍ତବ୍ୟ
			ଏକର	ଡି	ଡେସିମଲ	
୨	୮	୯	୧୦		୧୧	୧୨
42/220	ଚଉଡ ପୁରା		18	063	7.3100	
42/193	ଚଉଡ ପୁରା		6	1529	2.4900	
2 ପ୍ଲଟ			24	2159	9.8000	

Addl. Tahasildar
Banspal

ତାମ୍ବୁୀୟ ସୂଚନା ବିଜ୍ଞାନ କେନ୍ଦ୍ର ,ଓଡିଶା

08/04/2026

OFFICE OF THE COLLECTOR & DISTRICT MAGISTRATE: KEONJHAR
AT/PO-KEONJHAR, DISTRICT: KEONJHAR,ODISHA, PIN-758001
(REVENUE SECTION)
e-mail: revenue.kjr@gmail.com

No. 2610 /Rev/Dt. 21 / 03 /2026
XIX- 35 /2026

After careful consideration of the Alienation Proposal submitted by the Tahasildar, Banspal vide Alienation Case No.08/2026 and in exercise of the powers conferred vide Revenue & D.M. Department Notification No. 42899/R&DM/ dt.07.11.2009, read with L.No. 22958/ R&DM/ dt.04.08.2014, No. 29089/ R&DM/ dt.29.09.2014 and No.31312/ R&DM/ dt.24.10.2014, sanction is hereby accorded for alienation of the non-forest Govt. land measuring 9.8000 Ha. or Ac.24.216 in village-Champajhar under Banspal Tahasil as per the land schedule indicated below is hereby accorded in favour of State Forest, Environment & Climate Change Department for raising compensatory afforestation to the extent of forest land proposed to be used for non-forestry use against 79.367Ha. forest land in Keonjhar Forest Division proposed to be diverted for mining of Iron and Manganese Ore in Dalpahar Iron & Manganese Ore Mines located in Baitarani RF-II, District Keonjhar of Shri Avin Jain (Heir of late Dharamchand Jain) on payment of premium/land cost of **Rs.35,42,801/-(Rupees Thirty-Five Lakh Forty-Two Thousand Eight Hundred One)** only by the user Agency subject to the terms and conditions as indicated below.

Land Schedule
Tahasil-Banspal

Name of village	Khata No	Plot No	Total area as per RoR (Area in Ha)	Area applied for alienation (Area in Ha)	Kisam
Champajhar	24(AAA)	42/171(P)	13.5500	7.3100	Parbat-II
		42/193	2.4900	2.4900	Parbat-II
			Total	**9.8000**	

Premium Payable

1	Premium of the land measuring 9.8000Ha. or Ac.24.216@ Rs.1,46,300/- per acre in village-Baragoda i.e. Rs.1,46,300/- X Ac.24.216	35,42,800.80 or say
	TOTAL	**35,42,801/-**

(Rupees Thirty-Five Lakh Forty-Two Thousand Eight Hundred One) only

Contd...P/2

Term& conditions

1. The land shall be utilized exclusively for the purpose for which it is alienated and shall not be transferred or otherwise disposed of.

2. The State Forest Environment & Climate Change Department shall take such precautionary measures as necessary to keep the land free from encroachment. If the land or any portion of it is not utilized within threeyears for the purpose for which it is alienated, the same shall revert to Government in Revenue & Disaster Management Department free from all encumbrances and without payment of compensation for the land or for any improvement that might have been made thereto.

3. The land shall be utilized exclusively for the purpose for which it is alienated and shall not be transferred or otherwise disposed of.

4. The Forest & Environment Department shall take such precautionary measures as necessary to keep the land free from encroachment .If the land or any portion of it is not utilized within threeyears for the purpose for which it is alienated, the same shall revert to Government in Revenue & Disaster Management Department free from all encumbrances and without payment of compensation for the land or for any improvement that might have been made thereto.

5. Infringement of any of the conditions of the alienation shall result in immediate resumption of the land by the Government in Revenue& Disaster Management Department free from all encumbrances.

6. The Project Proponent /User Agency i.e. Shri Avin Jain(Heir of late D.C.Jain) shall deposit the premium/land cost of **Rs.35,42,801/- (Rupees Thirty-Five Lakh Forty-Two Thousand Eight Hundred One)** only with the Tahasildar, Banspal.

7. The User Agency will have to pay the amount over and above the premium already assessed , if any calculated and demanded, for any reason, in future.

8. The Tahasildar to realize the premium/land cost i.e. **Rs.35,42,801/- (Rupees Thirty-Five Lakh Forty-Two Thousand Eight Hundred One)** only from the User Agency and take follow up action i.e. correction of RoRs etc. after realization of the premium/land cost.

Collector, Keonjhar

Memo No. 2611 /Rev/Dt 31/03/2026

Copy forwarded to the Under Secretary to Government, Revenue & D.M. Department, Odisha, Bhubaneswar/ Under Secretary, Board of Revenue, Odisha, Cuttack/ Under Secretary to Government, Forest Environment and Climate Change Department, Odisha, Bhubaneswar/ Secretary to RDC (ND) Odisha, Sambalpur for information and necessary action.

31/3/26

Addl. District Magistrate,
Keonjhar

Contd...P/3

Memo No. 2612 /Rev/Dt 31/03/26

Copy forwarded to the Divisional Forest Officer, Keonjhar for information and necessary action with reference to his L.No.2298/6F–Mining-145/2023 dt.21.02.2026. He is requested to take over possession of the land from the Tahasildar, Banspal.

31/3/26
Addl. District Magistrate,
Keonjhar

Memo No. 2613 /Rev/Dt 31/03/26

Copy forwarded to the Sub-Collector, Keonjhar for information and necessary action with reference to his letter No.4010/Rev. dt.26.03.2026.

31/3/26
Addl. District Magistrate,
Keonjhar

Memo No. 2614 /Rev/Dt 31/03/26

Copy forwarded to Shri Avin Jain(Heir of late D.C.Jain) (Mining Lessee), Dharam Villa,12-A, Mahatma Gandhi Marg,Ring Road, Lajpat Nagar, New Delhi-10024 for information and necessary action.

31/3/26
Addl. District Magistrate,
Keonjhar

Memo No. 2615 /Rev/Dt 31/03/26

Copy forwarded to the Tahasildar, Banspal for information and necessary action. **He is directed to realize the premium/land cost Rs.35,42,801/- (Rupees Thirty-Five Lakh Forty-Two Thousand Eight Hundred One) only from the User Agency and take follow up action i.e. correction of RoRs etc. after realization of the premium/land cost.** The Alienation Case Record No.08/2026 is returned herewith, the receipt of which may be acknowledged.

Copy to Guard File.(Lease Branch)

31/3/26
Addl. District Magistrate,
Keonjhar

GF 16/4/26

Through Special Messenger

OFFICE OF THE TAHASILDAR, BANSPAL

No. 1000 /Rev. dated 15 /04/2026

To

The Divisional Forest Officer, Keonjhar Division.

Sub:- Alienation of non forest Government land for compensatory afforestation- **Submission of R.O.R. thereof.**

Ref :- District Office Memo No.2612/Rev.dt.31.03.2026 & District Office Memo No.2618/Rev.dt.31.03.2026.

Sir,

In inviting a kind reference to the letter on the subject cited above, I am to say that the Collector, Keonjhar has been pleased to sanction the alienation of the following schedule of non-forest Government land in favour of State Forest, Environment & Climate Change Department for raising Compensatory Afforestation to the extent of forest land proposed to be used for non-forestry use against 79.367 Ha. forest land in Keonjhar Forest Division proposed to be diverted for mining of Iron and Manganese Ore in Dalpahar Iron & Manganese Ore Mines Located in Baitrarni RF-II, District Keonjhar of Shri Avin Jain (Heir of Late Dharamchand Jain) subject to the terms .and conditions as cited in the sanctioned order.

01. Alienation Case No.08/2026
Sanctioned vide District Office Order No. 2610/Rev. dtd. 31.03.2026

LAND SCHEDULE

Name of the Mouza- Champajhar

Khata No.	Plot No.	Total area (in Hc.)	Proposed Area (in Hc.)	Kisam
24 (AAA)	42/171	13.5500	7.3100	Parbat-II
	42/193	2.4900	2.4900	Parbat-II
TOTAL	**2 Plots**	**16.0400**	**9.8000**	

02. Alienation Case No.09/2026
Sanctioned vide District Office Order No. 2616/Rev. dtd. 31.03.2026

LAND SCHEDULE

Name of the Mouza- Gundula

Khata No.	Plot No.	Total area (in Hc.)	Proposed Area (in Hc.)	Kisam
103 (AAA)	97 (P)	16.9600	4.7150	Parbat-II
	99 (P)	14.8800	2.7310	Parbat-II
	100 (P)	16.0000	10.5700	Parbat-II
	101 (P)	16.0000	6.3340	Parbat-II
	102	16.0000	16.0000	Parbat-II
	195	16.0000	16.0000	Parbat-II
	196 (P)	16.0000	10.3950	Parbat-II
TOTAL	**7 Plots**	**111.8400**	**66.7450**	

(Contd...P/2...)

After receiving of sanction orders alongwith alienation case record referred above, the R.O.R. has been prepared by this Office as per rule 20 , 21 & 22 of " Orissa Survey & Settlement Rules, 1962" for which the Khata & Plots have been changed in Bhulekh Software and the details of schedule of land are given below:-

LAND SCHEDULE

Name of the Mouza- Champajhar

Khata No.	Plot No.	Total area (in Hc.)	Kisam
24/5	42/220	7.3100	Parbat-II
	42/193	2.4900	Parbat-II
TOTAL	**2 Plots**	**9.8000**	

LAND SCHEDULE

Name of the Mouza- Gundula

Khata No.	Plot No.	Total area (in Hc.)	Kisam
103/1	97/721	4.7150	Parbat-II
	99/722	2.7310	Parbat-II
	100/723	10.5700	Parbat-II
	101/724	6.3340	Parbat-II
	102	16.0000	Parbat-II
	195	16.0000	Parbat-II
	196/725	10.3950	Parbat-II
TOTAL	**7 Plots**	**66.7450**	

The original R.O.R. bearing No.24/5 & R.O.R. bearing No.103/1 in respect of Mouza- **Champajhar** & **Gundula** respectively are enclosed herewith and the receipt of the same may kindly be acknowledged.

Yours faithfully,

Encl : **As above**

15/4/2026

TAHASILDAR, BANSPAL

Memo No. 1001 /Rev.dated 15 /04/2026

Copy submitted to the Sub-Collector, Keonjhar for favour of kind information and necessary action.

15/4/2026

TAHASILDAR, BANSPAL

(Contd...P/2...)

Memo No. 1002 /Rev.dated 15 /04/2026

Copy submitted to the Addl. District Magistrate, Keonjhar for favour of kind information and necessary action.

15/4/2026

TAHASILDAR, BANSPAL

Memo No. 1003 /Rev.dated 15 /04/2026

Copy forwarded to Shri Avin Jain, (Heir of late Shri D.C. Jain) (Mining Lessee) Dharama Villa,12-A, Mahatma Gandhi Marg, Ring Road, Lajpat Nagar, New Delhi-10024 for information and necessary action.

15/4/2026

TAHASILDAR, BANSPAL

Memo No. 1004 /Rev.dated 15 /04/2026

Copy to Revenue Inspector, Taramakanta/Kanjipani for information and necessary action. They are directed to hand over possession of the aforementioned land to the authorised Official of the Divisional Forest Officer, Keonjhar Division and report compliance.

15/4/2026

TAHASILDAR, BANSPAL

Schedule I Form No.39-A

ଖତିୟାନ

ମୌଜା	: ଗୁଣଜା	ତହସିଲ	: ବାଂଶପାଳ
ଥାନା	: କାଙ୍କୁପାଣି	ତହସିଲ ନମ୍ବର	: 05
ଥାନା ନମ୍ବର	: 72	ଜିଲ୍ଲା	: କେନ୍ଦୁଝର

ଜମିଦାରଙ୍କ ନାମ ଓ ଖେୱାଟ ବା ଖତିୟାନର କ୍ରମିକ ନମ୍ବର	ଓଡିଶା ସରକାର ପ୍ରଥମ ଭାଗ ଖେୱାଟ ନମ୍ବର 1
୧)ଖତିୟାନର କ୍ରମିକ ନଂ	103/1
୨) ପ୍ରଜାର ନାମ, ପିତାର ନାମ , ଜାତି ଓ ବାସସ୍ଥାନ	ରାଜ୍ୟ ଜଙ୍ଗଲ ପରିବେଶ ଓ ଜଳବାୟୁ ପରିବର୍ତ୍ତନ ବିଭାଗ ଓଡିଶା

୩)ସ୍ୱତ୍ୱ						
୪)ବେଗ	ଜଳଜର	ଖଜଣା	ସେସ	ନିସ୍ତାର ସେସ ଓ ଅନ୍ୟାନ୍ୟ ସେସ ଯଦି କିଛି ଥାଏ	ମୋଟ	୫) କ୍ରମବର୍ଦ୍ଧନଶୀଳ ଖଜଣାର ହିସବଗଣା
		0.00	0.00	0.00	0.00	

୬) ବିଶେଷ ଅନୁସଙ୍ଗ ଯଦି କିଛି ଥାଏ	Alienation Case No. 09/2026 (ଦା.ଖା କେଶ ନଂ 1043/2026) ଓ ଜିଲାପାଳ, କେନ୍ଦୁଝରଙ୍କ ଆଦେଶ ସଂଖ୍ୟା 2616/Rev. Dt. 31.03.2026 ହୁ.ମୁ. ପ୍ଲଟ ନଂ 97/721 ରକବା ହେ 4.7150, 99/722 ରକବା ହେ 2.7310, 100/723 ରକବା ହେ 10.5700, 101/724 ରକବା ହେ 6.3340, 102 ରକବା ହେ 16.0000, 195 ରକବା ହେ 16.0000, 196/725 ରକବା ହେ 10.3950 ଖା.ଖା. 103 ରୁ ।

BLANK SPACE FOR STAMPING

COURT OF THE TAHASILDAR BANSPAL

ଅନ୍ତିମ ପ୍ରକାଶନ ତାରିଖ :24/09/1981

ଖଜଣା ଧାର୍ଯ୍ୟ ତାରିଖ :

Addl. Tahasildar
Banspal

ଖତିୟାନର କ୍ରମିକ ନଂ : 103/1		ମୌଜା : ପୁଣ୍ଡଳା				ଜିଲ୍ଲା : ବେହୁରତ
ପ୍ଲଟ ନମ୍ବର ଓ ବର୍ଗର ନାମ	ଜିମନ ଓ ପ୍ଲଟର ଚତୁଃସୀମା	ଜିମନର ବିସ୍ତାରିତ ବିବରଣୀ ଓ ମୌଜିଦି	ପରିମାଣ			ମନ୍ତବ୍ୟ
			ଏକର	ଡି	ବେହୁର	
୬	୮	୯	୧୦		୧୧	୧୨
97/721	ଉର୍ବର ଦୁଇ		11	651	4.7150	
99/722	ଉର୍ବର ଦୁଇ		6	7484	2.7310	
100/723	ଉର୍ବର ଦୁଇ		26	119	10.5700	
101/724	ଉର୍ବର ଦୁଇ		15	651	6.3340	
102	ଉର୍ବର ଦୁଇ		39	536	16.0000	
195	ଉର୍ବର ଦୁଇ		39	536	16.0000	
196/725	ଉର୍ବର ଦୁଇ		25	686	10.3950	
7 ପ୍ଲଟ			164	9274	66.7450	

Addl. Tahasildar
Banspal

ରାଷ୍ଟ୍ରୀୟ ସୂଚନା ବିଜ୍ଞାନ କେନ୍ଦ୍ର ,ଓଡିଶା

08/04/2026

Schedule I Form No.39-A

ଖତିୟାନ

ମୌଜା	: ଚମାଝର	ତହସିଲ	: ବଂଶପାଳ
ଥାନା	: ନୟାକୋଟ	ତହସିଲ ନମ୍ବର	: 05
ଥାନା ନମ୍ବର	: 71	ଜିଲ୍ଲା	: କେନ୍ଦୁଝର

ଜମିଦାରଙ୍କ ନାମ ଓ ଖେୱାଟ ବା ଖତିୟାନର କ୍ରମିକ ନମ୍ବର	ଓଡିଶା ସରକାର ପ୍ରଥମ ଭାଗ ଖେୱାଟ ନମ୍ବର 1
୧)ଖତିୟାନର କ୍ରମିକ ନଂ	24/5
୨) ପ୍ରଜାର ନାମ, ପିତାର ନାମ , ଜାତି ଓ ବାସସ୍ଥାନ	ଗାଜ୍ୟ ଜଙ୍ଗଲ ପରିବେଶ ଓ ଜଳବାୟୁ ପରିବର୍ତ୍ତନ ବିଭାଗ ଓଡିଶା

୩)ସ୍ୱତ୍ୱ						
୪)ଦେୟ	ଜଳକର	ଖଜଣା	ସେସ	ନିସ୍ତାର ପେସ ଓ ଅନ୍ୟାନ୍ୟ ସେସ ଯଦି କିଛି ଥାଏ	ମୋଟ	୫) କ୍ରମବର୍ଦ୍ଧନଶୀଳ ଖଜଣାର ବିବରଣୀ
		0.00	0.00	0.00	0.00	

୬) ବିଶେଷ ଅନୁଦଙ୍ଗ ଯଦି କିଛି ଥାଏ	Alienation Case No. 08/2026 (ଦା.ଖା ବେଶ ନଂ 1044/2026) ଓ ଜିଲ୍ଲାପାଳ, କେନ୍ଦୁଝରଙ୍କ ଆଦେଶ ସଂଖ୍ୟା 2610/Rev. Dt. 31.03.2026 ହୁ.ମୁ. ପ୍ଲଟ ନଂ 42/220 ରକବା ହେ 7.3100, 42/193 ରକବା ହେ 2.4900 ଖା.ଖା. 24 ରୁ ।

BLANK SPACE FOR STAMPING

ଅନ୍ତିମ ପ୍ରକାଶନ ତାରିଖ :25/09/1981

ଖଜଣା ଧାର୍ଯ୍ୟ ତାରିଖ :

COURT OF THE TAHASILDAR BANSPAL

Addl. Tahasildar
Banspal

ଖତିୟାନର ଜମିର ନଂ : 24/5		ମୌଜା : ଚମାଝର				ଜିଲ୍ଲା : ଢେଙ୍କାନାଳ
ପ୍ଲଟ ନମ୍ବର ଓ ଚକର ନାମ	ଜମିର ଓ ପ୍ଲଟର ଶ୍ରେଣୀ	ବିସମାର ବିଘାରିତ ବିବରଣୀ ଓ ମୌଜୁଦି	ରକବା			ମନ୍ତବ୍ୟ
			ଏକର	ଡି	ଡେସିମଲ	
୨	୮	୯	୧୦		୧୧	୧୨
42/220	ଚଉଡ ପୁରା		18	063	7.3100	
42/193	ଚଉଡ ପୁରା		6	1529	2.4900	
2 ପ୍ଲଟ			24	2159	9.8000	

Addl. Tahasildar
Banspal

ତାମ୍ବୁୀୟ ସୂଚନା ବିଜ୍ଞାନ କେନ୍ଦ୍ର ,ଓଡିଶା

08/04/2026

OFFICE OF THE COLLECTOR & DISTRICT MAGISTRATE: KEONJHAR
AT/PO-KEONJHAR, DISTRICT: KEONJHAR,ODISHA, PIN-758001
(REVENUE SECTION)
e-mail: revenue.kjr@gmail.com

No. 3414 /Rev/Dt. 28 / 04 /2026
XIX- 39 /2026

After careful consideration of the Alienation Proposal submitted by the Tahasildar, Ghatagaon vide Alienation Case No.07/2026 and in exercise of the powers conferred vide Revenue & D.M. Department Notification No. 42899/R&DM/ dt.07.11.2009, read with L.No. 22958/ R&DM/ dt.04.08.2014, No. 29089/ R&DM/ dt.29.09.2014 and No.31312/ R&DM/ dt.24.10.2014, sanction is hereby accorded for alienation of the non-forest Govt. land measuring 2.9200 Ha. or Ac.7.215 in village-Binida under Ghatagaon Tahasil as per the land schedule indicated below is hereby accorded in favour of State Forest, Environment & Climate Change Department for raising compensatory afforestation to the extent of forest land proposed to be used for non-forestry use against 79.367Ha. forest land in Keonjhar Forest Division proposed to be diverted for mining of Iron and Manganese Ore in Dalpahar Iron & Manganese Ore Mines located in Baitarani RF-II, District Keonjhar of Shri Avin Jain (Heir of late Dharamchand Jain) on payment of premium/land cost of **Rs.12,69,840/- (Rupees Twelve Lakh Sixty-Nine Thousand Eight Hundred Forty)** only by the user Agency subject to the terms and conditions as indicated below.

Land Schedule
Tahasil-Ghatagaon

Name of village	Khata No	Plot No	Total area as per RoR (Area in Ha)	Area applied for alienation (Area in Ha)	Kisam
Binida	312 (AAA)	378(P)	15.3783	2.1000	Parbat-II
		399(P)	6.7786	0.8200	Parbat-II
			02 Plots Total	**2.9200**	

Premium Payable

1	Premium of the land measuring 2.9200Ha. or Ac.7.215@ Rs.1,76,000/- per acre in village-Binida i.e. Rs.1,76,000/- x Ac.7.215	12,69,840/-
	TOTAL	**12,69,840/-**

(Rupees Twelve Lakh Sixty-Nine Thousand Eight Hundred Forty) only

Contd...P/2

Term& conditions

1. The land shall be utilized exclusively for the purpose for which it is alienated and shall not be transferred or otherwise disposed of.

2. The State Forest Environment & Climate Change Department shall take such precautionary measures as necessary to keep the land free from encroachment. If the land or any portion of it is not utilized within three years for the purpose for which it is alienated, the same shall revert to Government in Revenue & Disaster Management Department free from all encumbrances and without payment of compensation for the land or for any improvement that might have been made thereto.

3. The land shall be utilized exclusively for the purpose for which it is alienated and shall not be transferred or otherwise disposed of.

4. The Forest & Environment Department shall take such precautionary measures as necessary to keep the land free from encroachment .If the land or any portion of it is not utilized within three years for the purpose for which it is alienated, the same shall revert to Government in Revenue & Disaster Management Department free from all encumbrances and without payment of compensation for the land or for any improvement that might have been made thereto.

5. Infringement of any of the conditions of the alienation shall result in immediate resumption of the land by the Government in Revenue& Disaster Management Department free from all encumbrances.

6. The Project Proponent /User Agency i.e. Shri Avin Jain(Heir of late D.C.Jain) shall deposit the premium/land cost of **Rs.12,69,840/- (Rupees Twelve Lakh Sixty-Nine Thousand Eight Hundred Forty)** only with the Tahasildar, Ghatagaon.

7. The User Agency will have to pay the amount over and above the premium already assessed , if any calculated and demanded, for any reason, in future.

8. The Tahasildar to realize the premium/land cost i.e. **Rs.12,69,840/- (Rupees Twelve Lakh Sixty-Nine Thousand Eight Hundred Forty)** only from the User Agency and take follow up action i.e. correction of RoRs etc. after realization of the premium/land cost.

Collector, Keonjhar

Memo No. 3415 /Rev/Dt 28.04.26

Copy forwarded to the Under Secretary to Government, Revenue & D.M. Department, Odisha, Bhubaneswar/ Under Secretary, Board of Revenue, Odisha, Cuttack/ Under Secretary to Government, Forest Environment and Climate Change Department, Odisha, Bhubaneswar/ Secretary to RDC (ND) Odisha, Sambalpur for information and necessary action.

Addl. District Magistrate,
Keonjhar

Contd... P/3

Memo No. 3416 /Rev/Dt 28.04.26

Copy forwarded to the Divisional Forest Officer, Keonjhar for information and necessary action with reference to his L.No.2297/6F–Mining-145/2023 dt.21.02.2026. He is requested to take over possession of the land from the Tahasildar, Ghatagaon.

28/4/26

Addl. District Magistrate,
Keonjhar

Memo No. 3417 /Rev/Dt 28.04.26

Copy forwarded to the Sub-Collector, Keonjhar for information and necessary action with reference to his letter No.4516/Rev. dt.08.04.2026.

28/4/26

Addl. District Magistrate,
Keonjhar

Memo No. 3418 /Rev/Dt 28.04.26

Copy forwarded to Shri Avin Jain(Heir of late D.C.Jain) (Mining Lessee), Dharam Villa,12-A, Mahatma Gandhi Marg,Ring Road, Lajpat Nagar, New Delhi-10024 for information and necessary action.

28/4/26

Addl. District Magistrate,
Keonjhar

Memo No. 3419 /Rev/Dt 28.04.26

Copy forwarded to the Tahasildar, Ghatagaon for information and necessary action. **He is directed to realize the premium/land cost Rs.12,69,840/- (Rupees Twelve Lakh Sixty-Nine Thousand Eight Hundred Forty)** only **from the User Agency and take follow up action i.e. correction of RoRs etc. after realization of the premium/land cost.** The Alienation Case Record No.07/2026 is returned herewith, the receipt of which may be acknowledged.

Copy to Guard File.(Lease Branch)

28/4/26

Addl. District Magistrate,
Keonjhar

OFFICE OF THE TAHASILDAR, GHATGAON

No 1414 /Rev Dated- 5.5.2026

To.

The Divisional Forest Officer,
Keonjhar Division

Sub- Alienation of Non-Forest Govt Land for compensatory afforestation. Submission of R.O.R. thereof

Ref- District office Memo No 3416/Rev. dt-28.04.2026 & District office Memo No 3422/Rev. dt-28.04.2026

Sir,

In inviting a kind reference to the letter on the subject cited above, I am to say that the Collector, Keonjhar has been pleased to sanction the alienation of the following schedule of non-forest Government land in favour of State Forest, Environment & Climate Change Department for raising Compensatory Afforestation to the extent of forest land proposed to be used for non-forestry use against 79.367 Ha. forest land in Keonjhar Forest Division proposed to be diverted for mining of Iron and Manganese Ore in Dalpahar Iron & Manganese Ore Mines Located in Baitrarni RF-II, District Keonjhar of Shri Avin Jain (Heir of Late Dharamchand Jain) subject to the terms .and conditions as cited in the sanctioned order.

1. **Alienation Case No.07/2026**

Sanctioned vide District Office Order No. 3414/Rev. dtd. 28.04.2026

LAND SCHEDULE

Name of the Mouza- Binida

Name of the village	Khata No.	Plot No.	Total area (In Hc)	Proposed Area (in HC)	Kissam
BINIDA	**312 (AAA)**	**378(P)**	**15.3783**	**2.1000**	**Parbata-II**
		399(P)	**6.7786**	**0.8200**	**Parbata-II**
	Toatl	**2Plots**	**22.1569**	**2.9200**	

2. **Alienation Case No.08/2026**

Sanctioned vide District Office Order No.3420/Rev. dtd. 28.04.2026

LAND SCHEDULE

Name of the Mouza- Dengana

Name of the village	Khata No.	Plot No.	Total area (In Hc)	Proposed Area (in HC)	Kissam
Dengana	**151 (AAA)**	**559**	**7.4868**	**2.0800**	**HUDI**

After receiving of sanction orders along with alienation case record referred above, the R.O.R. has been prepared by this Office as per rule 20, 21 & 22 of " Orissa Survey &

ଘଟିଆନ

Settlement Rules, 1962" for which the Khata & Plots have been changed in Bhulekh Software and the details of schedule of land are given below -

LAND SCHEDULE

Name of the Mouza- Binida

Khata No	Khata No	Plot No	Total area (In Hc)	Kissam
BINIDA	312/2	378/3696	2.1000	Parbata-II
		399/3697	0.8200	Parbata-II
	Total	2Plots	2.9200	

LAND SCHEDULE

Name of the Mouza- Dengana

Khata No	Khata No.	Plot No.	Total area (In Hc)	Kissam
Dengana	151/2	559/1314	2.0800	Hudi
	Total	1Plots	2.0800	

The original R.O.R. bearing Khata No 312/2 & R.O.R. bearing Khata No151/1 in respect of Mouza- Binida & Dengana respectively are enclosed herewith and the receipt of the same may kindly be acknowledged.

Encl : As above

Yours faithfully,

5/5/26

Tahasildar Ghatagaon

Memo No. 1415 /Rev Dated- 5.5.2026.

Copy submitted to the Sub-Collector, Keonjhar for favour of kind information and necessary action.

5/5/26

Tahasildar Ghatagaon

Memo No. 1416 /Rev Dated- 5.5.2026.

Copy submitted to the Addl. District Magistrate, Keonjhar for favour of kind information and necessary action.

5/5/26

Tahasildar Ghatagaon

Memo No. 1417 /Rev Dated- 5.5.2026.

Copy forwarded to Shri Avin Jain, (Heir of late Shri D.C. Jain) (Mining Lessee) Dharama Villa,12-A, Mahatma Gandhi Marg, Ring Road, Lajpat Nagar, New Delhi-10024 for information and necessary action.

5/5/26

Tahasildar Ghatagaon

Memo No. 1418 /Rev Dated- 5.5.2026.

Copy to Revenue Inspector, Pandapada for information and necessary action. He is directed to hand over possession of the aforementioned land to the authorised Official of the Divisional Forest Officer, Keonjhar Division and report compliance.

5/5/26

Tahasildar Ghatagaon

Schedule I Form No.39-A

ଖତିୟାନ

ମୌଜା : ବେଙ୍ଗଣା

ଥାନା : ପଟାପଡା

ଥାନା ନମ୍ବର : 92

ତହସିଲ : ଘଟଗାଁ

ତହସିଲ ନମ୍ବର : 6

ଜିଲ୍ଲା : କେନ୍ଦୁଝର

ଜମିଦାରଙ୍କ ନାମ ଓ ଖେଷ୍ଟାଟ ବା ଖତିୟାନର କ୍ରମିକ ନମ୍ବର	ଓଡିଶା ସରକାର ।
୧)ଖତିୟାନର କ୍ରମିକ ନଂ	151/2
୨) ପ୍ରଜାର ନାମ, ପିତାର ନାମ , ଜାତି ଓ ବାସସ୍ଥାନ	ରାଜ୍ୟ ଜଙ୍ଗଲ ଓ ପରିବେଶ ବିଭାଗ , ଓଡିଶା ସରକାର
୩)ସ୍ୱତ୍ୱ	ବିରାଗିୟ

୪)ଦେୟ	ଜଳକର	ଖଜଣା	ସେସ	ନିସ୍ତାର ସେସ ଓ ଅନ୍ୟାନ୍ୟ ସେସ ଯଦି କିଛି ଥାଏ	ମୋଟ	୫) କ୍ରମବର୍ଦ୍ଧନଶୀଳ ଖଇଣାର ବିବରଣୀ
		0.00	0.00	0.00	0.00	

୬) ବିଶେଷ ଅନୁସଙ୍ଗ ଯଦି କିଛି ଥାଏ	Alienation Case No-8/2026 ହୁକୁମ ମୁତାବକ ପ୍ଲଟ ନଂ 559 ରକବା ଏ 5.1397 ଡି କୁ ପୁରାତନ ଖାତା ନଂ 151 ରୁ ଆସିଲା ।

BLANK SPACE FOR STAMPING

ଅନ୍ତିମ ପ୍ରକାଶନ ତାରିଖ :

ଖଜଣା ଧାର୍ଯ୍ୟ ତାରିଖ :

ତହସିଲଦାର
ଘଟଗାଁ

05/05/2026

ଖତିୟାନର କ୍ରମିକ ନଂ : 151/2		ମୌଜା : ତେନ୍ତଣା				ଜିଲ୍ଲା : କେନ୍ଦୁଝର
ପ୍ଲଟ ନମ୍ବର ଓ ଡକର ନାମ	ଜିସମ ଓ ପ୍ଲଟର ଖଇଣା	ଜିସମର ବିସ୍ତାରିତ ବିବରଣୀ ଓ ଚୌହଦି	ରକବା			ମନ୍ତବ୍ୟ
			ଏକର	ଡି	ହେକ୍ଟର	
୬	୮	୯	୧୦		୧୧	୧୨
559/1314	ହୁଡି		5	1397	2.0800	
1 ପ୍ଲଟ			5	1397	2.0800	

Schedule I Form No.39-A

ଖତିୟାନ

ତହସିଲ : ଘଟଗାଁ

ତହସିଲ ନମ୍ବର : 6

ଜିଲ୍ଲା : କେନ୍ଦୁଝର

ମୌଜା : ବିନିନ୍ଦା

ଥାନା : ପଣ୍ଡାପଡା

ଥାନା ନମ୍ବର : 91

ଜମିଦାରଙ୍କ ନାମ ଓ ଖେତ୍ତାଟ ବା ଖତିୟାନର କ୍ରମିକ ନମ୍ବର	ଓଡିଶା ସରକାର 1
୧)ଖତିୟାନର କ୍ରମିକ ନଂ	312/2
୨) ପ୍ରଜାର ନାମ, ପିତାର ନାମ , ଜାତି ଓ ବାସସ୍ଥାନ	ରାଜ୍ୟ ଇଙ୍ଗର ଓ ପରିବେଶ ବିଭାଗ , ଓଡିଶା ସରକାର

୩)ସ୍ୱତ୍ୱ	ବିରାଗିୟ					
୪)ଦେୟ	ଜଡଜର	ଖଜଣା	ସେସ	ନିସ୍ତାର ସେସ ଓ ଅନ୍ୟାନ୍ୟ ସେସ ଯଦି କିଛି ଥାଏ	ମୋଟ	୫) କ୍ରମବର୍ଦ୍ଧନଶୀଳ ଖଜଣାର ବିବରଣୀ
		0.00	0.00	0.00	0.00	

୬) ବିଶେଷ ଅନୁସଙ୍ଗ ଯଦି କିଛି ଥାଏ	Alienation Case No-7/2026 ହୁକୁମ ମୁତାବକ ପ୍ଲଟ ନଂ 378 ଉଜରା ଏ 5.1892, ପ୍ଲଟ ନଂ 399 ଉଜରା ଏ 2.0262 କୁ ଖାରଜ କରି ପୁରାତନ ଖାତା ନଂ 312 ରୁ ଆସିଲା ।

BLANK SPACE FOR STAMPING

ଅନ୍ତିମ ପ୍ରକାଶନ ତାରିଖ :

ଖଜଣା ଧାର୍ଯ୍ୟ ତାରିଖ :

ଜିଲ୍ଲା ସୂଚନା ଅଧିକାରୀ, କେନ୍ଦୁଝର

ଖତିୟାନର କ୍ରମିକ ନଂ : 312/2		ମୌଜା : ବିନିନ୍ଦା				ଜିଲ୍ଲା : କେନ୍ଦୁଝର
ପ୍ଲଟ ନମ୍ବର ଓ ଚକର ନାମ	କିସମ ଓ ପ୍ଲଟର ଖଚଣା	କିସମର ବିସ୍ତାରିତ ବିବରଣୀ ଓ ଚୌହଦି	ଚକବା			ମନ୍ତବ୍ୟ
			ଏକର	ଡ଼ି	ହେକ୍ଟର	
୭	୮	୯	୧୦		୧୧	୧୨
378/3696	ପର୍ବତ ଦୁଇ		5	1892	2.1000	
399/3697	ପର୍ବତ ଦୁଇ		2	0262	0.8200	
2 ପ୍ଲଟ			7	2154	2.9200	

ତହସିଲଦାର
ଚେଗାଁ

OFFICE OF THE COLLECTOR & DISTRICT MAGISTRATE: KEONJHAR
AT/PO-KEONJHAR, DISTRICT: KEONJHAR,ODISHA, PIN-758001
(REVENUE SECTION)
e-mail: revenue.kjr@gmail.com

No. 3420 /Rev/Dt. 28 / 04 /2026
XIX- 40 /2026

After careful consideration of the Alienation Proposal submitted by the Tahasildar, Ghatagaon vide Alienation Case No.08/2026 and in exercise of the powers conferred vide Revenue & D.M. Department Notification No. 42899/R&DM/ dt.07.11.2009, read with L.No. 22958/ R&DM/ dt.04.08.2014, No. 29089/ R&DM/ dt.29.09.2014 and No.31312/ R&DM/ dt.24.10.2014, sanction is hereby accorded for alienation of the non-forest Govt. land measuring 2.0800 Ha. or Ac.5.139 in village-Dengana under Ghatagaon Tahasil as per the land schedule indicated below is hereby accorded in favour of State Forest, Environment & Climate Change Department for raising compensatory afforestation to the extent of forest land proposed to be used for non-forestry use against 79.367Ha. forest land in Keonjhar Forest Division proposed to be diverted for mining of Iron and Manganese Ore in Dalpahar Iron & Manganese Ore Mines located in Baitarani RF-II, District Keonjhar of Shri Avin Jain (Heir of late Dharamchand Jain) on payment of premium/land cost of **Rs.9,04,464/- (Rupees Nine Lakh Four Thousand Four Hundred Sixty-Four)** only by the user Agency subject to the terms and conditions as indicated below.

Land Schedule
Tahasil-Ghatagaon

Name of village	Khata No	Plot No	Total area as per RoR (Area in Ha)	Area applied for alienation (Area in Ha)	Kisam
Dengana	151 (AAA)	559(P)	7.4868	2.0800	Hudi
			Total	**2.0800**	

Premium Payable

1	Premium of the land measuring 2.0800Ha. or Ac.5.139 @ Rs.1,76,000/- per acre in village-Dengana i.e. Rs.1,76,000/- x Ac.5.139	9,04,464/-
	TOTAL	**9,04,464/-**

(Rupees Nine Lakh Four Thousand Four Hundred Sixty-Four) only

Contd...P/2

Term& conditions

1. The land shall be utilized exclusively for the purpose for which it is alienated and shall not be transferred or otherwise disposed of.

2. The State Forest Environment & Climate Change Department shall take such precautionary measures as necessary to keep the land free from encroachment. If the land or any portion of it is not utilized within three years for the purpose for which it is alienated, the same shall revert to Government in Revenue & Disaster Management Department free from all encumbrances and without payment of compensation for the land or for any improvement that might have been made thereto.

3. The land shall be utilized exclusively for the purpose for which it is alienated and shall not be transferred or otherwise disposed of.

4. The Forest & Environment Department shall take such precautionary measures as necessary to keep the land free from encroachment .If the land or any portion of it is not utilized within three years for the purpose for which it is alienated, the same shall revert to Government in Revenue & Disaster Management Department free from all encumbrances and without payment of compensation for the land or for any improvement that might have been made thereto.

5. Infringement of any of the conditions of the alienation shall result in immediate resumption of the land by the Government in Revenue& Disaster Management Department free from all encumbrances.

6. The Project Proponent /User Agency i.e. Shri Avin Jain(Heir of late D.C.Jain) shall deposit the premium/land cost of **Rs.9,04,464/- (Rupees Nine Lakh Four Thousand Four Hundred Sixty-Four)** only with the Tahasildar, Ghatagaon.

7. The User Agency will have to pay the amount over and above the premium already assessed , if any calculated and demanded, for any reason, in future.

8. The Tahasildar to realize the premium/land cost i.e. **Rs.9,04,464/- (Rupees Nine Lakh Four Thousand Four Hundred Sixty-Four)** only from the User Agency and take follow up action i.e. correction of RoRs etc. after realization of the premium/land cost.

Collector, Keonjhar

Memo No. 3421 /Rev/Dt 28.04.26

Copy forwarded to the Under Secretary to Government, Revenue & D.M. Department, Odisha, Bhubaneswar/ Under Secretary, Board of Revenue, Odisha, Cuttack/ Under Secretary to Government, Forest Environment and Climate Change Department, Odisha, Bhubaneswar/ Secretary to RDC (ND) Odisha, Sambalpur for information and necessary action.

28/4/26

Addl. District Magistrate,
Keonjhar

Contd...P/3

Memo No. 3422 /Rev/Dt 28.04.26

Copy forwarded to the Divisional Forest Officer, Keonjhar for information and necessary action with reference to his L.No.2297/6F–Mining-145/2023 dt.21.02.2026. He is requested to take over possession of the land from the Tahasildar, Ghatagaon.

28/4/26

Addl. District Magistrate,
Keonjhar

Memo No. 3423 /Rev/Dt 28.04.26

Copy forwarded to the Sub-Collector, Keonjhar for information and necessary action with reference to his letter No.4516/Rev. dt.08.04.2026.

28/4/26

Addl. District Magistrate,
Keonjhar

Memo No. 3424 /Rev/Dt 28.04.26

Copy forwarded to Shri Avin Jain(Heir of late D.C.Jain) (Mining Lessee), Dharam Villa,12-A, Mahatma Gandhi Marg,Ring Road, Lajpat Nagar, New Delhi-10024 for information and necessary action.

28/4/26

Addl. District Magistrate,
Keonjhar

Memo No. 3425 /Rev/Dt 28.04.26

Copy forwarded to the Tahasildar, Ghatagaon for information and necessary action. **He is directed to realize the premium/land cost Rs.9,04,464/- (Rupees Nine Lakh Four Thousand Four Hundred Sixty-Four) only from the User Agency and take follow up action i.e. correction of RoRs etc. after realization of the premium/land cost.** The Alienation Case Record No.08/2026 is returned herewith, the receipt of which may be acknowledged.

Copy to Guard File.(Lease Branch)

28/4/26

Addl. District Magistrate,
Keonjhar

OFFICE OF THE TAHASILDAR, GHATGAON

No 1414 /Rev Dated- 5.5.2026

To.

The Divisional Forest Officer,
Keonjhar Division

Sub- Alienation of Non-Forest Govt Land for compensatory afforestation. Submission of R.O.R. thereof

Ref- District office Memo No 3416/Rev. dt-28.04.2026 & District office Memo No 3422/Rev. dt-28.04.2026

Sir,

In inviting a kind reference to the letter on the subject cited above, I am to say that the Collector, Keonjhar has been pleased to sanction the alienation of the following schedule of non-forest Government land in favour of State Forest, Environment & Climate Change Department for raising Compensatory Afforestation to the extent of forest land proposed to be used for non-forestry use against 79.367 Ha. forest land in Keonjhar Forest Division proposed to be diverted for mining of Iron and Manganese Ore in Dalpahar Iron & Manganese Ore Mines Located in Baitrarni RF-II, District Keonjhar of Shri Avin Jain (Heir of Late Dharamchand Jain) subject to the terms .and conditions as cited in the sanctioned order.

1. **Alienation Case No.07/2026**

Sanctioned vide District Office Order No. 3414/Rev. dtd. 28.04.2026

LAND SCHEDULE

Name of the Mouza- Binida

Name of the village	Khata No.	Plot No.	Total area (In Hc)	Proposed Area (in HC)	Kissam
BINIDA	**312 (AAA)**	**378(P)**	**15.3783**	**2.1000**	**Parbata-II**
		399(P)	**6.7786**	**0.8200**	**Parbata-II**
	Toatl	**2Plots**	**22.1569**	**2.9200**	

2. **Alienation Case No.08/2026**

Sanctioned vide District Office Order No.3420/Rev. dtd. 28.04.2026

LAND SCHEDULE

Name of the Mouza- Dengana

Name of the village	Khata No.	Plot No.	Total area (In Hc)	Proposed Area (in HC)	Kissam
Dengana	**151 (AAA)**	**559**	**7.4868**	**2.0800**	**HUDI**

After receiving of sanction orders along with alienation case record referred above, the R.O.R. has been prepared by this Office as per rule 20, 21 & 22 of " Orissa Survey &

Settlement Rules, 1962" for which the Khata & Plots have been changed in Bhulekh Software and the details of schedule of land are given below -

LAND SCHEDULE

Name of the Mouza- Binida

Khata No	Khata No	Plot No	Total area (In Hc)	Kissam
BINIDA	312/2	378/3696	2.1000	Parbata-II
		399/3697	0.8200	Parbata-II
	Total	2Plots	2.9200	

LAND SCHEDULE

Name of the Mouza- Dengana

Khata No	Khata No.	Plot No.	Total area (In Hc)	Kissam
Dengana	151/2	559/1314	2.0800	Hudi
	Total	1Plots	2.0800	

The original R.O.R. bearing Khata No 312/2 & R.O.R. bearing Khata No151/1 in respect of Mouza- Binida & Dengana respectively are enclosed herewith and the receipt of the same may kindly be acknowledged.

Encl : As above

Yours faithfully,

5/5/26

Tahasildar Ghatagaon

Memo No. 1415 /Rev Dated- 5.5.2026.

Copy submitted to the Sub-Collector, Keonjhar for favour of kind information and necessary action.

5/5/26

Tahasildar Ghatagaon

Memo No. 1416 /Rev Dated- 5.5.2026.

Copy submitted to the Addl. District Magistrate, Keonjhar for favour of kind information and necessary action.

5/5/26

Tahasildar Ghatagaon

Memo No. 1417 /Rev Dated- 5.5.2026.

Copy forwarded to Shri Avin Jain, (Heir of late Shri D.C. Jain) (Mining Lessee) Dharama Villa,12-A, Mahatma Gandhi Marg, Ring Road, Lajpat Nagar, New Delhi-10024 for information and necessary action.

5/5/26

Tahasildar Ghatagaon

Memo No. 1418 /Rev Dated- 5.5.2026.

Copy to Revenue Inspector, Pandapada for information and necessary action. He is directed to hand over possession of the aforementioned land to the authorised Official of the Divisional Forest Officer, Keonjhar Division and report compliance.

5/5/26

Tahasildar Ghatagaon

Schedule I Form No.39-A

ଖତିୟାନ

ମୌଜା : ବେଙ୍ଗଣା

ଥାନା : ପଟାପଡା

ଥାନା ନମ୍ବର : 92

ତହସିଲ : ଘଟଗାଁ

ତହସିଲ ନମ୍ବର : 6

ଜିଲ୍ଲା : କେନ୍ଦୁଝର

ଜମିଦାରଙ୍କ ନାମ ଓ ଖେଷ୍ଟାଟ ବା ଖତିୟାନର କ୍ରମିକ ନମ୍ବର	ଓଡିଶା ସରକାର ।
୧)ଖତିୟାନର କ୍ରମିକ ନଂ	151/2
୨) ପ୍ରଜାର ନାମ, ପିତାର ନାମ , ଜାତି ଓ ବାସସ୍ଥାନ	ରାଜ୍ୟ ଜଙ୍ଗଲ ଓ ପରିବେଶ ବିଭାଗ , ଓଡିଶା ସରକାର
୩)ସ୍ୱତ୍ୱ	ବିରାଗିୟ

୪)ଦେୟ	ଜଳକର	ଖଜଣା	ସେସ	ନିସ୍ତାର ସେସ ଓ ଅନ୍ୟାନ୍ୟ ସେସ ଯଦି କିଛି ଥାଏ	ମୋଟ	୫) କ୍ରମବର୍ଦ୍ଧନଶୀଳ ଖଇଣାର ବିବରଣୀ
		0.00	0.00	0.00	0.00	

୬) ବିଶେଷ ଅନୁସଙ୍ଗ ଯଦି କିଛି ଥାଏ	Alienation Case No-8/2026 ହୁକୁମ ମୁତାବକ ପ୍ଲଟ ନଂ 559 ରକବା ଏ 5.1397 ଡି କୁ ପୁରାତନ ଖାତା ନଂ 151 ରୁ ଆସିଲା ।

BLANK SPACE FOR STAMPING

ଶେଷ ମୁଦ୍ରଣ ତାରିଖ :

ଖଜଣା ଧାର୍ଯ୍ୟ ତାରିଖ :

ତହସିଲଦାର
ଘଟଗାଁ

05/05/2026

ଖତିୟାନର କ୍ରମିକ ନଂ : 151/2		ମୌଜା : ତେନ୍ତଣା				ଜିଲ୍ଲା : କେନ୍ଦୁଝର
ପ୍ଲଟ ନମ୍ବର ଓ ଡକର ନାମ	ଜିସମ ଓ ପ୍ଲଟର ଖଇଣା	ଜିସମର ବିସ୍ତାରିତ ବିବରଣୀ ଓ ଚୌହଦି	ରକବା			ମନ୍ତବ୍ୟ
			ଏକର	ଡି	ହେକ୍ଟର	
୬	୮	୯	୧୦		୧୧	୧୨
559/1314	ହୁଡି		5	1397	2.0800	
1 ପ୍ଲଟ			5	1397	2.0800	

Schedule I Form No.39-A

ଖତିୟାନ

ତହସିଲ : ଘଟଗାଁ

ତହସିଲ ନମ୍ବର : 6

ଜିଲ୍ଲା : କେନ୍ଦୁଝର

ମୌଜା : ବିନିନ୍ଦା

ଥାନା : ପଣ୍ଡାପଡା

ଥାନା ନମ୍ବର : 91

ଜମିଦାରଙ୍କ ନାମ ଓ ଖେତ୍ତାଟ ବା ଖତିୟାନର କ୍ରମିକ ନମ୍ବର	ଓଡିଶା ସରକାର 1
୧)ଖତିୟାନର କ୍ରମିକ ନଂ	312/2
୨) ପ୍ରଜାର ନାମ, ପିତାର ନାମ , ଜାତି ଓ ବାସସ୍ଥାନ	ରାଜ୍ୟ ଇଙ୍ଗର ଓ ପରିବେଶ ବିଭାଗ , ଓଡିଶା ସରକାର

୩)ସ୍ୱତ୍ୱ	ବିରାଗିୟ					
୪)ଦେୟ	ଜଡଜର	ଖଜଣା	ସେସ	ନିସ୍ତାର ସେସ ଓ ଅନ୍ୟାନ୍ୟ ସେସ ଯଦି କିଛି ଥାଏ	ମୋଟ	୫) କ୍ରମବର୍ଦ୍ଧନଶୀଳ ଖଜଣାର ବିବରଣୀ
		0.00	0.00	0.00	0.00	

୬) ବିଶେଷ ଅନୁସଙ୍ଗ ଯଦି କିଛି ଥାଏ	Alienation Case No-7/2026 ହୁକୁମ ମୁତାବକ ପ୍ଲଟ ନଂ 378 ଉଜରା ଏ 5.1892, ପ୍ଲଟ ନଂ 399 ଉଜରା ଏ 2.0262 କୁ ଖାରଜ କରି ପୁରାତନ ଖାତା ନଂ 312 ରୁ ଆସିଲା ।

BLANK SPACE FOR STAMPING

ଅନ୍ତିମ ପ୍ରକାଶନ ତାରିଖ :

ଖଜଣା ଧାର୍ଯ୍ୟ ତାରିଖ :

ଜିଲ୍ଲା ସୂଚନା ଅଧିକାରୀ, କେନ୍ଦୁଝର

ଖତିୟାନର କ୍ରମିକ ନଂ : 312/2		ମୌଜା : ବିନିନ୍ଦା				ଜିଲ୍ଲା : କେନ୍ଦୁଝର
ପ୍ଲଟ ନମ୍ବର ଓ ଚକର ନାମ	କିସମ ଓ ପ୍ଲଟର ଖଚଣା	କିସମର ବିସ୍ତାରିତ ବିବରଣୀ ଓ ଚୌହଦି	ଚକବା			ମନ୍ତବ୍ୟ
			ଏକର	ଡ଼ି	ହେକ୍ଟର	
୭	୮	୯	୧୦		୧୧	୧୨
378/3696	ପର୍ବତ ଦୁଇ		5	1892	2.1000	
399/3697	ପର୍ବତ ଦୁଇ		2	0262	0.8200	
2 ପ୍ଲଟ			7	2154	2.9200	

ତହସିଲଦାର
ଚେଗାଁ

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS (WILDLIFE)
& CHIEF WILDLIFE WARDEN, ODISHA
Government of Odisha, Forest, Environment & Climate Change Department
PRAKRUTI BHAWAN, PLOT NO.1459, SAHEED NAGAR, BHUBANESWAR- 751007
Phone: 0674-2602250, Website: www.wildlife.odisha.gov.in, Email: odishawildlife@gmail.com

No. 13558 / CWLW-FDWC-FD-0144-2021
Dated, Bhubaneswar the 14 December, 2023

To

Sri Avin Jain, Power of Attorney Holder,
Dalpahar Iron & Manganese Mines of D.C.Jain,
Dhram Villa, 12-A, Mahatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV, New Delhi – 110024

Sub: Approval of revised Site Specific Wildlife Conservation Plan in respect of Dalpahar Iron & Manganese Mines of D.C.Jain (now Sri Avin Jain is the Power of Attorney Holder) in the district of Keonjhar, Odisha

Sir,

I am directed to convey the approval of PCCF (WL) & CWLW, Odisha for the Site Specific Wildlife Conservation Plan at financial outlay of ₹491.46 lakh (Rupees four crore ninetyone lakh fortysix thousand) only as per the details of activities mentioned in Chapter-IV & VI of the Plan in compliance to the condition stipulated vide Condition No.(vii) of the Letter dated 12.08.2021 of MoEF&CC, New Delhi in File No.8-31/2015FC.

(i)	In project impact area in Keonjhar Division:	₹286.26 lakh
(ii)	In project impact area in Bonai Division:	₹205.20 lakh
	Total:	₹491.46 lakh

A sum of ₹491.46 lakh (Rupees four crore ninetyone lakh fortysix thousand) only shall be deposited in State CAMPA fund only through e.portal (https://parivesh.nic.in) for implementation of various activities within the project impact area by the Forest Department through concerned DFOs.

2. Activities in the project area as per Chapter-IV of the Plan will be executed by the project proponent under the guidance of DFO, Keonjhar/ Bonai Forest Division, as the case may be.

3. The Plan period is five years and will be revisited by concerned DFOs at least one year before expiry of its implementation. The User Agency will bear the cost of such Plan on its approval. Further, the User Agency will bear additional cost, if any, towards enhancement of wage rate and escalation of price of materials at the time of implementation of this Plan. In case of any deviation, it will be dealt as per law for violations of Forest (Conservation) Act 1980, Environment (Protection) Act 1986 and Wildlife (Protection) Act 1972.

Yours faithfully

14/12/2023

Conservator of Forests (ET)

Encl: Copy of approved SSWLCP

Memo. No. 15559 /dt. 12/12/2023

Copy forwarded for information and necessary action to the: -

1. OSD-cum-Special Secretary to Government of Odisha, FE&CC Department, Bhubaneswar with reference to that Deptt. Memo No. FE-DIV-FLD-0101-2021- 16578/FE&CC dt 17.09.2021
2. Scientist 'D' , Government of India, MoEF&CC, New Delhi with reference to his office Letter dated 12.08.2021 in File No.8-31/2015FC.
3. PCCF (FD & NO, FC Act), O/o PCCF & HoFF, Odisha, Bhubaneswar
4. Regional Chief Conservator of Forests, Rourkela Circle alongwith a copy of approved SSWLCP with reference to his office Memo. No.3968 dt. 02.12.2023
5. Divisional Forest Officer(s), Keonjhar/ Bonai Division alongwith copy of the approved SSWLCP

12/12/2023

Conservator of Forests (ET)

Site Specific Wildlife Conservation Plan

DALPAHAR IRON & MANGANESE ORE MINES, (JODA SECTION, CHAMPUA RANGE)
OF
D.C JAIN

Divisional Forest Officer, Keonjhar

DALPAHAR IRON & MANGANESE MINES

Table of Contents

SL No.	Particulars	Page No.
1	Description of the project	3-4
2	Executive Summary	5
3	Mitigation measures	6-8
4	Financial provision of works in zone of influence implemented by Bonei forest ivision	6-8
2	Chapter-I- Introduction	11-13
3	Chapter-II: Project and Impact Area description	14-28
4	Chapter-III: Probable Impacts of the Project on Flora and Fauna	29--33
5	Chapter-IV: Mitigation Measures required	34-48
6	Chapter- V: Animal Passage Plan	49
7	Chapter-VI: Financial Implications and Monitoring	50-58
8	Chapter-VII: List of Maps and Annexures	59

Plates

1	Topo Map showing Location of Project Area, Normal Impact Area, and Extended Impact Area	PLATE NO-1
2	Location of the project area with reference to WL Sanctuaries, National Parks, Elephant Reserves and Elephant corridors	PLATE NO-2

Annexures

1	Copy of Letter No.2260/SEIAA, Dt.19.08.2021 of State le Environment Impact Assessment Authority, Odisha, Bhubaneswa	Annexure-I
2	Copy of Letter No. 8991/6F-Mining-57/2020, Dated, 03rd August, 2023, of the Divisional Forest Officer, Keonjhar Forest Division requiring to revisit the Site Specific wildlife Conservation Plan.	Annexure-II
3	Copy of Cost Norm for Urban Plantation.	Annexure-III
4	Letter No.3957 dated 28.04.2022 of Government of Odisha Steel & Mines Department	Annexure-IV (Series)
5	Map showing Location of man –animal conflict ,and movementof Mega wild animals and other details.	Annexure-V (Series)

Description of the project

- The original lease was granted by Government of Odisha in letter No.III(A)MG 101/84- 6179, dated 05.06.1984, over an area of 101.171 Ha. Comprising of 5 blocks Block- No. A(89.961 ha), B1 (0.607 ha), B2 (7.689 ha), B3 (1.012 ha) & C(1.902 ha)
- Subsequently, the Govt. has declard the blocks No. B1, B2, B3 & C as lapsed. (Total area 11.210 ha)
- Now FC is sought for the Block – A (89.961 Ha) for Non-forestry use.
- Validity Period of Mining Lease is upto 08.06.2036 as per letter no.3957/SM dated 28.04.2022 of Steel &Mines Department ,Govt of Odisha
- The entire area is coming within Baitarani Reserved Forest.

Why this SSWLCP?

- Earlier Site Specific Wildlife Conservation Plan was prepared and approved by PCCF (Wildlife) and Chief Wildlife Warden, Odisha in Memo No.9070/1WL (C) SSP-44/2014, Dt. 27th November, 2014.
- It is envisased in Point no (vii)of the letterNo. File No.8-31/2015FC dated 12.08.2021 of MoEFCC,(FC Division),Govt of India, "Similarly SSWLCP especially with regards to financial provisions may be updated and submitted for further consideration of the Ministry".
- Basing on the extension of Mining Lease (till 2036) and afresh Environment Clearance, the DFO, Keonjhar Forest Division instructed vide letter no 8991 dated 03.08.2023 that, "the Site Specific Wildlife Conservation Plan in respect of the above mining lease will be revisited as per current wage rate & current wildlife scenario as per existing guidelines issued by the Principal Chief Conservator of Forests (WL) & CWLW, Odisha, Bhubaneswar. So afresh Site Specific Wildlife Conservation Plan over 89.961 ha is to be prepared."

- As per EC condition vide letter no 2260/SEIAA dated19.08.2021 (SEIAA file no: 55644/46-NCMB1/02-2021) of State level Environment impact Assessment Authority Odisha Bhubaneshwar.

Condition VIII:Green Belt Development

- (iv):The project proponent shall undertake all precautionary measures for conservation and protection of endangered flora and fauna and Schedule 1 species during mining operation. A wildlife Conservation plan shall be prepared for the same clearly delineating action to be taken for conservation of flora and fauna. The plan shall be approved by chief Wildlife Warden of the state Govt.
- (v) And implemented in consultation with the state forest and Wildlife Department. A copy of Wildlife Conservation plan and its implementation status (annual) shall be submitted to the Regional Office of the Ministry.

EXECUTIVE SUMMARY

Dalpahar Iron & Mn Ore Mines in five blocks (Block-A, B1, B2, B3, C) was leased out to Dharam Chand Jain, in 1986 for 20 years out of which four leases (B1, B2, B3, C) have been declared lapsed and possession handed over to State Govt in 2023.The valid lease over Block– A (89.961Ha) for which Supplementary lease deed has been executed for the period upto 2036 is now operated by Sri. D.C.Jain's son and legal heir Sri Avin Jain with his registered Office at New-Delhi.

1. The total Project area of the mine is 89.961Ha and the entire area is part of Baitarani Reserved Forest. There is no human habitation within the Project Area.
2. The lease area of Dalpahar Iron and Manganese Ore Mines is located on the Topo Sheet No. 73G/5 (New - F45N5) (1:50,000) and bounded by
   - Latitude – 21° 58'05" N and 21° 56'43" N
   - Longitude – 85° 23'00" E and 85° 24'00" E

3. **Conditions imposed under EC regarding SSWLCP**

EC has been granted by State Level Impact Assessment Authority (SEIAA), Odisha, Bhubaneswar, vide Letter No. 2260 /SEIAA, Dt.19.08.2021. As per the said order

Conditions under (VIII) Green Belt Development.

(iv) The Project Proponent shall undertake all precautionary measures for conservation and protection of endangered flora and fauna and Schedule-I species during mining operation. A Wildlife Conservation Plan shall be prepared for the same clearly delineating action to be taken for conservation of flora and fauna. The Plan shall be approved by Chief Wildlife Warden of State Government.

(v) And implemented in consultation with the State Forest and Wildlife Department. A copy of Wildlife Conservation Plan and its implementation status (annual) shall be submitted to the Regional Office of the Ministry.

Hence this Plan has been prepared.

4. **Impact Area: Total Impact area is 348.81 Sq. Km.**

Around 15% of the Impact area is in Bonai Forest Division and 85% of the area is within Keonjhar Forest Division.

There are 14 villages of Keonjhar district and 19 villages of Sundargarh district within the Impact Area.

MITIGATION MEASURES

A. TO BE IMPLEMENTED BY PROJECT PROPONENT

I. For Keonjhar Forest Division:

1. Anti poaching-cum-Anti-depredation Squad:- One hired vehicle along with Driver and POL will be provided by the Project Proponent for the Squad for protection of Forest and Wildlife.

2. Jana Surakshya Gaja Rakshya :- Solar fencing (2 Kms per village) in 4 villages to be taken up either on Community mode or VSS mode or private farmers land as per Socio- economic – politico dynamics of the village. The Subsidy component in either case to be borne by the User Agency.

3. Solar Street Lights:-50 nos. of Solar Street lights will be installed in the surrounding 14 villages with early warning system (SIM Based) as per advice and approval of the DFO.

   Provision of one barefoot Solar mechanic for maintenance of such solar lights by the department in the impact area for 5 years.

4. Optimizer:- Optimizers for Range offices for better management and upkeep of records along with monitoring of elephants and CA plantations.

5. Thermal Drone :- 2 nos. Thermal drone cameras for daily elephant monitoring and mines inspection in Barbil and Champua Range

6. Trap Camera:- Camera traps (50 nos) along with battery cost for elephant and other wildlife monitoring

7. EPT:-
   Creation of Trench along the Railway Track for funnelling elephants to coming crossing point.

   Elephant are very often cross the railway track at the following sites. Goods trains are always plying in the stretch. Hence, there is life risk of elephants. So, it is necessary to check their movements towards railway line by creating Elephant proof treanch. This trench is proposed to be dug out over 2 Km at Unchabali to Namira.

   The GPS co-ordinates of the said site is decipted below:-

Sl No.	Name of the Place	Pillar No	GPS Co-ordinates
1	Starting Point	18/13	N 21°53'5.310" E 85°25'58.958"
2	Ending Point	21/16	N 21°51'40.546" E 85°26'07.901"

8. Construction of Ramp in Joda Section & Bamebari Section

Pillar no.19/5 of Railway GPS Co-ordinates N 21°52' 52.24",
E 85°25°48.70"
Pillar no.20/21 of Railway GPS Co-ordinates N 21°52' 10.28",
E 85°26°11.90"
Pillar no.22/15 of Railway GPS Co-ordinates N 21°51' 11.40",
E 85°26°09.89"
Pillar no.24/6 of Railway GPS Co-ordinates N 21°50' 22.74",
E 85°26°02.20"
Pillar no.25/18 of Railway GPS Co-ordinates N 21°49' 46.16",
E 85°26°08.03"

9. Erection of Signages

To promote coexistence with wildlife and to aware people, good quality sign boards with display of wildlife features should be placed along the Project premises, road etc. Fluorescent Sign Boards with good write ups about movement of wild animals will be provided on in order to make aware the passers-by about occurrence of accident if they confront with wildlife. The sinages will be posted at the 13nos. sites.

Divisional Forest Officer
Keonjhar Division

A. PROPOSED MITIGATION MEASURES WITHIN THE IMPACT AREA

KEONJHAR FOREST DIVISION

1. Plantation of Fodder species:- 5,000 seedlings of Siali, Ficus spp, Jamun, Arjun etc. will be planted to provide fodder for the elephants in urban plantation mode. The cost for 5000 nos.seedlings Rs.29,57,000/-.(Cost Norm attached)
2. Check dam Across Sundra Nala: - Two Check dams will be constructed across Sundara Nala in the buffer zone @Rs.15.00 lakhs each.
3. Anti-poaching-cum-Anti-depredation squad: It is proposed to constitute Anti-poaching-cum-Anti-depredation Squad consisting of 10 (ten) persons. Total expenditure proposed for 5 years is Rs.81,80,000/-.
4. Deployment of Gajasathi:- Engagement of Gajasathi @ 5 nos per village in 20 villages through VSS @ Rs.75,250 per year per village
   Total Cost for Rs.75,250X20X5 = Rs.75,25,000/-
5. Livelihood Generation in peripheral village through VSS especially vermicompost, etc.
   Proposed cost shall be 20.0 lakhs
6. Community Grain Bin:
   It is seen that Elephants are raided the villages and damaged the crop kept inside the houses. Hence, it is warranted to construction a Community Grain inHaridajodi and Jamtara villages to protect the paddy and other crops of the villagers.
7. Creation of Awareness:-Man-Elephant conflict will be reduced by creating awareness in the forest fringe villages. The user agency proposes to support various activities in these villages @Rs.1.00 lakh per year, and total expenditure of Rs.5.00 lakhs.
8. Monitoring &evaluation :- The implementation of this Plan needs to be monitored and evaluated at regular intervals. The user agency proposes to contribute Rs. 3.00 lakhs for the purpose.
9. Escallation of Cost and Unforeseen: - In order to meet the additional requirement of cost due to escalation of prices, wages etc. 20% of the cost is provided. The cost on this account will be Rs.57.624lakhs.

The proposed cost for implementation of this plan is Rs. 345.744lakhs and the amount will be deposited with the Forest Dept.

This plan is prepared for a period of 5 years and after completion of the plan period the objectives as well as the achievements will be reviewed and further steps as required will be taken. However interim revision can also be made basing on the actual need.

Divisional Forest Officer
Keonjhar Division

FINANCIAL PROVISION OF WORKS IN ZONE OF INFLUENCE IMPLEMENTED BY BONAI FOREST DIVISION

1-Protection & Enforcement Activities

(a) Establishment of Portable Highway camp shed at sensitive location (including water supply, solar light system, bedding facilities, boundary/barricading facility etc.)01 No- 15.00 Lakhs

(b)(1) Engagement of 05 Squad members for assisting staff in protection, wildlife monitoring and anti-depredation activities (@Rs.352.00 per Manday)- x 05 members x 12 months x 05 years .05 No- 30.00 Lakhs

(c) Equipment to monitor elephant movement and to be used in anti depredation activities etc. 30.00Lakhs

2-Wildlife Habitat Management

(a) Habitat enrichment with plantation of Bamboo (preferably through bamboo seed balls) 20 Ha - 8.80 Lakhs

(b) Provision of creation of new water bodies 01 No- 10.00 Lakhs

(c) Construction of Check dam along the nallah - 01 No- 15.00 Lakhs

3-Human Elephant Conflict Mitigation

(a) Installation of Solar Street lamp/light in elephant affected villages and its maintenance- 80 Nos- 32.00Lakhs

(b) Installation of Solar Street lamp/light with early warning system in elephant affected villages and its maintenance- 20 nos- 20.00 Lakhs

(c) Provision of distribution of torch lights to the household of surrounding villagesS00 nos 15.00 Lakhs

(d) Signage on both side of track/road/railway

(e)(1) Signage with speed limit -20 nos- 06.00 Lakhs

(f)(2) Signage with awareness and warning for wildlife 20 nos- 06.00 Lakhs

Public support & Awareness

(a) Training and awareness to VSS members, students in educational institution, Village level Volunteers for Wild Life Conservation & Protection 25.00Lakhs

1 Escallation of Cost and Unforesaen: - In order to meet the additional requirement of cost due to escalation of prices, wages etc. 20% of the cost is provided. The cost on this account will be Rs 49.96.akhs.

2 The proposed cost for implementation of this plan is Rs 299. 76 lakhs and the amount will be deposited with Forest Dept.

3 This plan is prepared for a period of 5 years and after completion of the plan period the objectives as wel as the achievements will be reviewed, and further steps as required will be taken.How ever interim revision can also be made basing on the actual need.

• The total Plan cost is projected at **Rs.645.504Lakh (Rupees Six Crore Forty-Five lakhs Fifty Thousand Four hundred only). (Keonjhar Division 345.744 lakh +Rs. 299.76 lakhs for Bonai Division)**

Divisional Forest Officer
Keonjhar Division

CHAPTER- I

INTRODUCTION

It shall cover brief description of the project, its cost, location (beat, section, range in addition to district, block, GP etc.), nature and extent of land required, Conditions imposed in Stage-I or EC regarding SSWLCP.

Description of the project

Mining Lease was granted for a period of 20 years in the name of Dalpahar Iron Mines in favour of Shri Dharam Chand Jain for mining of Iron ore over an area of 101.570 ha. in Baitarani Reserve Forest near Dalpahar village under Barbil Tehasil of Keonjhar District vide Govt. Proceeding No. III(A)MG, 101/84-6179 MG dated.05.06.1984.

The granted mining lease was reduced to 101.171 ha in five blocks following survey and demarcation by the Govt. Of Odisha, Mining & Geology Department and executed on 09.06.1986 in five blocks (Block-A, Block-B1, Block-B2, Block-B3 & Block-C) over 101.171 ha for a period of 20 years with validity from 09.06.1986 to 08.06.2006. Manganese wasadded as 2nd mineral in the Mining Lease along with Iron in 1995by Govt. of Odisha, Department of Steel & Mines on consideration of the application of lessee and the supplementary lease deed was executed 25.05.2000 over 101.171 ha.

The total mining lease area of Dalpahar Iron& Manganese ore mines of M/s. D.C. Jain over101.171 ha falls within Baitarani Reserve Forest.

The M.L. area is located within :-

Latitude : 21°58'05"N to 21°58'43"N and
Longitude : 85°23'00"E to 85°24'00"E
of survey of India Toposheet No. 73 G/5.

With regard to Forest Clearance, final approval over 16.464 Ha including Safety Zone of 0.887 ha and which was broken prior to 1980 as depicted in the Joint Verification Report (out of originally proposed 97.084 ha) covering all the five leases for Mining of Iron & Manganese ore was accorded by Government of India, Ministry of Environment & Forests vide No.8-103/2000-FC dated, 14.11.2005 under section 2 of Forest (Conservation) Act, 1980. The copy of the Stage-II approval is enclosed at Page No.196-197/DP.

The total diverted broken up forest area over 16.464 ha is divided into **10.594 ha in Block-A**, 0.607 ha in Block-B1, 5.097 ha in Block B2, and 0.166 ha in Block C) within the total mining lease area of 101.171 ha.

The area over 1.902 ha of Block-C, 0.607 ha of Block-B1, 1.012 ha of Block-B3 & 7.689 ha af Block-B2 was declared lapsed by the State Govt., Steel & Mines Department on dated 19.12.2013. The lapsing order was challenged before the Revision Authority, Ministry of Mines, Govt. of India who stayed the order of the State Govt and not to take any coercive measures against the Project Proponent .

In this regard necessary clarifications on the status of the lease with respect to area was sought for from the Deputy Director Mines, Joda Circle who submitted his clarification that the aforesaid area stands valid till final disposal of the revision application by the Revisional Authority vide his letter dated 15.10.2014. In the meantime, Govt. of India, Ministry of Mines intimated the Secretary, Steel & Mines Deptt. Govt. of Odisha and Divisional Forest Officer, Keonjhar that the Lessee is at liberty to pursue its proposal of Forest Diversion before the concerned Authority of the State Govt. and MoEF. This order was intimated to the Forest & Environment Deptt. Govt. of Odisha subsequently.

In the light of above correspondence, the earlier proposal submitted over 101.17 ha of Forest land by the user agency was considered by the DFO, Keonjhar Division compliances sought from the lessee and forwarded to the higher quarters for necessary approval under section-2 (ii) of Forest Conservation Act, 1980.

It is pertinent to mention that NPV of Rs. 9,49,99,569/- (Rs.7,13.85,230/- + differential amount of Rs.2.36,14.339/-). as demanded over 101.171 ha has been alreadypaid by the lessee.

Forest land over 16.464 ha, has been diverted under section-2 of Forest (Conservation) Act, 1980 vide F.No. 8-103/2000-FC dated. 14.11.2005 and balance forest land over 84.707 ha: is covered under general approval under section 2(iii) for inclusion in the mining lease vide F.No.11- 51/2015-FC dated 01.04.2015 of Govt. of India. MoEF & CC.

Later on the mining lease over 89.961 ha in village - Dalpahar Block-A was also declared as lapsed w.e.f. 01.09.1997 by the State Govt. on 01.05.2015 (for non-working) which was challenged by the lessee before the Hon'ble High Court of Orissa. The Hon'ble High Court of Orissa passed a final order dated 26.02.2019 wherein the lapsing order of the State Govt. dated 01.05.2015 was quashed and set aside and the matter was remanded back to the State Govt. Accordingly in pursuance to the direction of the Hon'ble High Court of Orissa, the State Govt, vide proceeding dated 06.09.2019 accepted the legal status of the said lease as well as validity of the lease period and ordered for "not" declaring the said mining lease over Block-A - 89.961 ha as lapsed.

Based on the above the Govt. of Odisha in Steel & Mines Department extended the validity period of mining lease over 89.961 ha in Block-A up to 08.06.2036 vide letter No.3957/SMdated 28.04.2022 subject tofulfilment of some prescribed conditions.

The supplementary lease deed was executed for Dalpahar Iron & Manganese Mines over 89.961Ha (Block-A) on 27.04.2023.

As referred above, the lessee while processing the diversion proposal during 2013-14 after being allowed to by the authorities had prepared a "Site Specific Wildlife Conservation Plan" which was approved by PCCF (Wildlife) and Chief Wildlife Warden, Odisha in Memo No.9070/1WL (C) SSP-44/2014, Dt. 27th November, 2014.

But this approved Site Specific Wildlife Conservation Plan in 2014 loses its relevance in the light of the grounds stated above and especially with the lessee pursuing the

proposal over 89.961 Ha in Block A only after the lapsing and handing over possessions of the other four leases in Block B1,B2, B3 & C and further with the recent norms of revisiting the SSWCP every five years .

Dalapahar mining lease area falls within Keonjhar Forest Division of Keonjhar District. The renewal of mining lease is for 89.961 Ha. The entire area is within Baitarani Reserved Forest.

The project area:

District and State	: Keonjhar, Odisha
Forest Division	: Keonjhar & Sundergarh
Sub-Division	: Champua
Forest Range	: Champua
Forest Section	: Joda
Village in the vicinity	: Dalpahar
Mining lease area	: 89.961Ha

The lease area of Dalapahar Iron and Manganese Ore Mines can be located on the Topo Sheet No. 73G/5 (1: 50000) (New Sheet No. F45N5) and bounded by

- Latitude - 21° 58'05" N and 21° 58'43" N
- Longitude - 85° 23'00" E and 85° 24'00" E

The lease area is a part of Keonjhar Forest Division in Keonjhar District and falls entirely in Baitarani Reserved Forest. The entire belt is very rich in mineral deposits such as Iron Ore and Manganese Ore and with Keonjhar District being an Industrial Belt, number of Industries have come up in the district. Presence of Wildlife along with Industries and Mining activities create a conflicting situation but with adequate mitigative measures they can co-exist.

Conditions imposed in Stage-I or EC regarding SSWLCP

EC has been granted by State Level Impact Assessment Authority (SEIAA), Odisha, Bhubaneswar, vide Letter No. 2260 /SEIAA, Dt.19.08.2021, prescribed the following conditions.

Conditions under (VIII) Green Belt Development:

(iv) The Project Proponent shall undertake all precautionary measures for conservation and protection of endangered flora and fauna and Schedule-I species during mining operation. A Wildlife Conservation Plan shall be prepared for the same clearly delineating action to be taken for conservation of flora and fauna. The Plan shall be approved by Chief Wildlife Warden of State Government.

(v) And implemented in consultation with the State Forest and Wildlife Department. A copy of Wildlife Conservation Plan and its implementation status (annual) shall be submitted to the Regional Office of the Ministry.

Therefore its almost nine years since the Site Specific Wildlife Conservation Plan was approved over 101.171Ha (which is no longer applicable) this new Site Specific Wildlife Conservation Plan is prepared keeping the current guidleines in view and over the revised area of 89.961Ha.

CHAPTER-II

Project and Impact Area – Description of the project area and its impact area covering location, land use, human habitations, flora fauna, forests, other habitats and movement patterns of the mega fauna, Wildlife corridors, HWC details in the area, Other projects or their impact area in the impact area of the project proposed.

Project Area: The total land required for the project is 89.961 ha. and the entire land is Reserved Forest.

Impact Area :The impact area extends to parts of Bonai forest Division in Sundargarh district.

Calculation of Area of the Impact area

Total Lease Area = 89.961 Ha. (or 0.8996 Sq. Km)

Average radius of the Lease Area = $\sqrt{0.8996 \times \frac{7}{22}} = 0.535$ km.

Therefore the average radius of the Impact area is 10.535 Km.

Total ImpactArea = 22/7 x $(10.6475)^2$= 348.81 Sq. Km.

Around 15% of the Impact area is in Bonai Forest Division and 85% of the area is within Keonjhar Forest Division.

Human habitations:

There are 14 villages of Keonjhar district within impact area and 19 villages of Sundargarh district.

List of Villages

Keonjhar District	Sundargarh District
1. Jalahari 2. Bichha Khundi 3. Chilkapata 4. Khandabandha 5. Jiling 6. Chormalda 7. Banshpani 8. Khuntapani 9. Lakrapani 10. Bhalberha 11. Jajang 12. Jarhibahal 13. Patberha 14. Gurda	1. Dalita 2. Gambhamali 3. Betajhar 4. Mandojorha 5. Gonua 6. Sunaposi 7. Kenamenta 8. Pataberha 9. Deogarh 10. Mutukudar 11. Gidei 12. Karapani 13. Malda 14. Gopisahi 15. Jadipada 16. Oraghat 17. Sankhaparha 18. Kakmang 19. Ghorhaburhani

There is no displacement.

Forests within the impact area:

i. The project is a part of Baitarani RF

ii. Siddhamath RF : 2.50 Km West

iii. Chamakpur Protected Forest : 6.00 km East.

Flora & Fauna

Flora of the Project Area

Local Name	Botanical Name	Family Name
	TREES	
Acasia	*Acacia auriculoformes*	Mimosaceae
Achu	*Morinda pubescens*	Rubiaceae
Amba (Mango)	*Mangifera indica*	Anacardiaceae
Ambata	*Cordia dichotoma / myxa*	Ehretiaceae
Amla	*Emblica officinalis*	Euphorbiaceae
Arjun	*Terminalia arjuna*	Combretaceae
Asan	*Terminalia tomentosa*	Combretaceae
Aswatha	*Ficus religiose*	Moraceae
Bahada	*Terminalia belerica*	Combretaceae
Banapalas	*Schrebera swieteniodes*	Oleaceae
Bandhan	*Ougeinia oojeneneis*	Papilionaceae
Bara	*Ficus benghalensis*	Moraceae
Barakoli	*Ziziphus mauritiana*	Rhamnaceae
Bel	*Aegle marmelos*	Rutaceae
Bhalia	*Semicarpus anacardium*	Anacardiaceae
Bheru	*Chloroxylon swietiana*	Meliaceae
Bija/Piasal	*Pterocarpus marsupium*	Fabaceae
Bodeka	*Hymenodictyon excelsum*	Rubiaceae
Chakunda(Sana)	*Cassia siamea*	Ceasalpiniaceae
Chakunda(Bada)	*Samanea saman*	Mimosaceae
Champa	*Michelia champece*	Magnoliaceae
Char	*Buchnania lanzan*	Anacardiaceae
Chhatian	*Alstonia scholaris*	Apocynaceae
Cypress	*Cupressus sempervirens*	Cupressaceae
Dimiri	*Ficus glomerata*	Moraceae
Dimiri	*Ficus racemosa*	Moraceae
Dhaman	*Grewia elastica /asiatica*	Tiliaceae
Dhaman	*Grewia tiliaefolia*	Tiliaceae
Dhaura	*Anogeissus latifolia*	Combretaceae
Eucalyptus	*Eucalyptus hybrid*	Myrtaceae
Gambhari	*Gmelina arboria*	Verbenaceae
Genduli	*Sterculia urens*	Sterculiaceae
Gliricidia	*Gliricidia sepium/maculata*	Febaceae
Golden Cassia	*Cassia floribunda*	Ceasalpiniaceae
Gurudu	*Gardenia gumifera / latifolia*	Rubiaceae
Gurbel	*Meyne laxifolia*	Rubiaceae
Haldu	*Adina cordifolia*	Rubiaceae
Harida	*Terminalia chebula*	Combretaceae

Local Name	Botanical Name	Family Name
Jamun	*Syzygium cumini*	Myrtaceae
Jhaun	*Casuarina equisetifolia*	Casuarinaceae
Kadamba	*Anthocephalus cadamba*	Rubiaceae
Kamalagundi	*Mallotus philippensis*	Euphorbiaceae
Kanchan	*Bauhinia purpurea*	Ceasalpiniaceae
Kanchan	*Bauhinia reecemosa*	Ceasalpiniaceae
Kanchan	*Bauhinia variegata*	Ceasalpiniaceae
Kapacia	*Kydia calycina*	Malvaceae
Karada	*Cleistanthus collinus*	Euphorbiaceae
Karanja	*Pongamia pinnata/glabra*	Papilionaceae
Kashi	*Bridelia retusa*	Euphorbiaceae
Kendu	*Diospyrus melanoxylon*	Ebenaceae
Kendu(Mankada)	*Diospyrus embryopteris*	Ebenaceae
Kharkas	*Trema orientalis*	Ulmaceae
Kodal	*Sterculia villosa*	Sterculiaceae
Halda	*Diospyrus montana*	Ebenaceae
Khirani	*Mimusops elengi*	Sapotaceae
Krushnachuda	*Dilonix regia*	Papilonaceae
Kumbhi	*Careya arborea*	Myrtaceae
Kusum	*Schleichera oleosa*	Sapindaceae
Mahala	*Ailanthus excelsa*	Simarubaceae
Mahaneem	*Melia dubia*	Meliaceae
Mahul	*Madhuca indica*	Sapotaceae
Moi	*Lannea grandis*	Anacardiaceae
Mohi	*Lannea coromendelica*	Anacardiaceae
Moi(Sarupati)	*Garuga pinnata*	Burseraceae
Mudhukunda	*Pterospermum acerifolium*	Sterculiaceae
Mundi	*Mitragyna parviflora*	Rubiaceae
Neem	*Azadirachta indica*	Meliaceae
Pader	*Bischofia javanica*	Euphorbiaceae
Palkuruwan	*Wrightia arborea*	Apocynaceae
Palas	*Butea monosperma*	Papilionaceae
Panas	*Artocarpus heterophyllus / integrifolia*	Moraceae
Panikusum	*Aphanamixis polystachya*	Meliaceae
Putranjiva	*Putranjiva roxburghii*	Euphorbiaceae
Patuli	*Lagerstroemia speciosa*	Lythraceae
Rai	*Dillenia pentagyna*	Dilleniaceae
Radhachude	*Peltophorum pterocarpum/ ferrugineum*	Ceasalpiniaceae
Ramphal /Atta	*Annona reticulata*	Annonaceae
Red Bead tree	*Adenethera pavonina*	Mimosaceae
Rohini/ Som	*Soymida febrifuga*	Meliaceae
Sahada	*Streblus asper*	Moraceae
Sajana / Drumstick	*Moringa oleifera*	Moringaceae
Sal	*Shorea robusta*	Dipterocarpaceae
Semul	*Bombax ceiba*	Bombacaceae
Sidha	*Lagerstroemia parviflora*	Lythraceae
Simakayan	*Pithecellobium dulce*	Mimosaceae
Simaruba	*Simarouba glauca*	Simaroubaceae
Siris/ Tentra	*Albizzia lebbek*	Mimosaceae

Local Name	Botanical Name	Family Name
Siris (dhaka)	*Albizzia procera*	Mimosaceae
Sissoo	*Dalbergia sissoo*	Papilonaceae
Sissoo(Kala)	*Dalbergie latifolia*	Papilonaceae
Subabul	*Leucaena leucocephala*	Mimosaceae
Sunari	*Cassia fistula*	Ceasalpiniaceae
Teak	*Tectona grandis*	Verbenaceae
Tentuli	*Tamarindus indica*	Ceasalpiniaceae
Kanta bahul/Kat-ber	Ziziphus xyloprus/ Rhamnus xylopyrus	Rhamnaceae
HERBS/SHRUBS		
Anantamula	*Hemidesmus indicus*	Asclepiadaceae
Agave	*Agave americana*	Agavaceae
Arakha	*Celotropis procera*	Asclepiadaceae
Balbidanga	*Embelia robusta*	Myrsinaceae
Banabasanga	*Wendlandia tinctoria*	Rubiaceae
Beeanga	*Adhatoda vasica*	Acanthaceae
Begunia	*Vitex negundo*	Verbinaceae
Bhenta	*Limonia acidissima*	Rutaceae
Bouganvillea	*Bougainvillea spectabilis*	Nyctaginaceae
Dankari	*Clerodendrum infortunatum*	Verbinaceae
Dankari	*Clerodendrum viscosum*	Verbinaceae
Dhatki	*Woodfordia fruticosa*	Lythraceae
Fern	*Pteris vittata*	Pteridaceae
Kurei	*Holarrhena antidysenterica*	Apocynaceae
Lakankuli	*Uvaria hamiltonii*	Annonaceae
Mumuri	*Antidesma diandrum*	Euphorbiaceae
Modimodica	*Helicteres isora*	Sterculiaceae
Nagaairi	*Lantana camara*	Verbinaceae
Siju	*Euphorbia nivulia*	Euphorbiaceae
Telkuria	*Ixora arborea/parviflora*	Rubiaceae
CLIMBERS		
Alundi	*Combretum decandrum/ roxburghii*	Combretaceae
Baidanka	*Mucuna monosperma*	Papilionaceae
Bichhuati	*Urtica dioica*	Euphorbiaceae
Muturi	*Smylax macrophylla*	Liliaceae
Siali	*Bauhinia vahlii*	Papilionaceae
Satabari	*Asparagus racemosus*	Liliaceae
Gilo	*Caesalpinia decapetala*	Ceasalpiniaceae
Gila	*Entada scandens*	Mimosaceae
Lahara	*Mikania micrantha*	Asteraceae
GRASS/BAMBOOS & PALMS		
Bamboo Palm	*Chamaedorea seifrizii*	Arecaceae
Sallabaunsa	*Dendrocalamus strictus*	Gramineae(Poaceae)
Bamboo (Kanta)	*Bambusa arundenaceae*	Gramineae(Poaceae)
Reed grass	*Arundo donax*	Gramineae(Poaceae)
Kachi grass	*Cymbopogon caesius*	Gramineae(Poaceae)
Khara grass	*Imperata cylindrical*	Gramineae
Khajur	*Phoenix acaulis*	Arecaceae

Local Name	Botanical Name	Family Name
Baunsa grass	*Saccharum munja*	Gramineae(Poaceae)
Phulabandhuni	*Thysanolaena maxima*	Gramineae
Bamboo grass	*Thysanolaena maxima*	Gramineae

Impact Area:

The impact area extends over several Forest Blocks. The important Forest Blocks have been indicated earlier.

Due to the presence of the Forest Blocks, the Flora and Fauna are quite diverse.

Flora of the Impact Area:

The following are the important Flora of the Impact area:

Local Name	Botanical Name	Family Name
	TREES	
Acasia	*Acacia auriculoformes*	Mimosaceae
Sikakai	*Acacia concinna*	Mimoseacea
Red Bead tree	*Adenethera pavonina*	Mimoseaceae
Haldu	*Adina cordifolia*	Rubiaceae
Bel	*Aegle marmelos*	Rulaceae
Mahala	*Ailanthus excelsa*	Simarubaceae
Ankula	*Alangium lamarckii / salvifolium*	Alangiaceae
Ghodalangia	*Albizzia chinensis*	Mimosaceae
Siris/ Tentra	*Albizzia lebbek*	Mimosaceae
Tinia	*Albizzia odoratissima*	Mimosaceae
Siris (dhala)	*Albizzia procera*	Mimosaceae
Chhatian	*Alstonia scholeris*	Apocynaceae
Rama phal Atta	*Annona reticulate*	Annonaceae
Phasi	*Anogeissus acuminata*	Combretaceae
Dhaura	*Anogeissus latifolia*	Combretaceae
Kadamba	*Anthocephalus cadamba*	Rubiaceae
Panikusum	*Aphanamixis polystachya*	Meliaceae
Panas	*Artocarpus heterophyllus / integrifolia*	Moreceae
Jeutha,/Barhal	*Artocarpus lacucha*	Moraceae
Neem	*Azadirachta indica*	Meliaceae
Kanchan	*Bauhinia purpurea*	Ceasalpiniaceae
Kanchan	*Bauhinia reacemosa*	Ceasalpiniaceae
Kanchan	*Bauhinia variegata*	Ceasalpiniaceae
Pader	*Bischofia javanica*	Euphorbiaceae
Semul	*Bombax ceiba*	Bombacaceae
Salai	*Boswellia serrata*	Burseraceae
Kashi	*Bridelia retusa*	Euphorbiaceae
Char	*Buchnania lanzan*	Anacardiaceae
Palas	*Butea monosperme*	Papilionaceae
Badopatri	*Cellicarpa arborea*	Verbenaceae
Kumbhi	*Careya arborea*	Myrtaceae
Sunari	*Cassia fistula*	Ceasalpiniaceae

Local Name	Botanical Name	Family Name
Chakunda(Sana)	*Cassia siamea*	Ceasalpiniaceae
Bheru	*Chloroxylon swietiana*	Meliaceae
Karada	*Cleistanthus collinus*	Euphorbiaceae
Kantapalas	*Cochlospermum gossypium*	*Cochlospermaceae*
Ambata	*Cordia dichotoma / myxa*	Ehretiaceae
Sissoo(Kala)	*Dalbergia latifolia*	Papilonaceae
Sissoo	*Dalbergia sissoo*	Papilonaceae
Rai	*Dillenia pentagyna*	Dilleniaceae
Krushnachuda	*Dilonix regia*	Papilonaceae
Kendu(Mankada)	*Diospyrus embryopteris*	Ebenaceae
Kendu	*Diospyrus melanoxylon*	Ebenaceae
Halda	*Diospyrus montana*	Ebenaceae
Amla	*Emblica officinalis*	Euphorbiaceae
Eucalyptus	*Eucalyptus hybrid*	Myrtaceae
Bara	*Ficus benghalensis*	Moraceae
Dimiri	*Ficus glomarata*	Moraceae
Dimiri	*Ficus racemosa*	Moraceae
Aswatha	*Ficus religiosa*	Moraceae
Gurudu	*Gardenia gumifera / latifolia*	Rubiaceae
Moi(Sarupatri)	*Garuga pinnata*	Bureraceae
Giricidia	*Giricidia sepium/maculata*	Fabaceae
Gambhari	*Gmelina arboria*	Verbenaceae
Dhaman	*Grewia elastica /asiatica*	Tiliaceae
Dhaman	*Grewia tiliaefolia*	Tiliaceae
Bodaka	*Hymenodictyon excelsum*	Rubiaceae
Kapecia	*Kydia calycina*	Malvaceae
Sidha	*Lagerstroemia parviflora*	Lythraceae
Patuli	*Lagerstroemia speciosa*	Lythraceae
Mohi	*Lannea coromandelica*	Anacardiaceae
Moi	*Lannea grandis*	Anacardiaceae
Subabul	*Leucaena leucocephala*	Mimosaceae
Mahul	*Madhuca indica*	Sapotaceae
Kamalagundi	*Mallotus philippensis*	Euphorbiaceae
Amba (Mango)	*Mangifera indica*	Anacardiaceae
Mahaneem	*Melia dubia*	Meliaceae
Gurbel	*Meyna laxiflora*	Rubiaceae
Champa	*Michelia champaca*	Magnoliaceae
Khirani	*Mimusops elengi*	Sapotaceae
Mundi	*Mitragyna parviflora*	Rubiaceae
Achu	*Morinda pubescens*	Rubiaceae
Sajana / Drumstick	*Moringa oleifera*	Moringaceae
Bandhan	*Ougeinia oojeneusis*	Papilionaceae
Radhachuda	*Peltophorum ferrugineum*	Ceasalpiniaceae
Simakayan	*Pithecellobium dulce*	Mimosaceae
Karanja	*Pongamia pinnata/glabra*	Papilionaceae
(Raj) Moi	*Proteumserratum / Bursera serrata*	Burseraceae

Local Name	Botanical Name	Family Name
Bija/Piasal	*Pterocarpus marsupium*	Fabaceae
Muchukunda	*Pterospermum acerifolium*	Sterculiaceae
Putranjiva	*Putranjiva roxburghii*	Euphorbiaceae
Chakunda(Bada)	*Samanea saman*	Mimosaceae
Kusum	*Schleichera oleosa*	Sapindaceae
Banapalas	Schrebera swieteniodes	Oleaceae
Bhalia	Semicarpus anacardium	Anacardiaceae
Sal	*Shorea robusta*	Dipterocarpaceae
Simaruba	*Simarouba glauca*	Simaroubaceae
Rohini/ Som	*Soymida febrifuga*	Meliaceae
Ambada	*Spondias pinnata*	Anacardiaceae
Genduli	*Sterculia urens*	Sterculiaceae
Kodal	*Sterculia villosa*	Sterculiaceae
Sahada	*Streblus asper*	Moraceae
Jamun	*Syzygium cumini*	Myrtaceae
Tentuli	*Tamarindus indica*	Ceasalpiniaceae
Teak	*Tectona grandis*	Verbenaceae
Arjun	*Terminalia arjuna*	Combretaceae
Bahada	*Terminalia belerica*	Combretaceae
Harida	*Terminalia chebula*	Combretaceae
Asan	*Terminalia tomentosa*	Combretaceae
Kharkas	*Treme orientalis*	Ulmaceae
Palkuruwan	*Wrightia arborea*	Apocynaceae
Kantabara	*Xantolis tomentosa*	Sapotaceae
Barakoli	*Ziziphus mauritiana*	Rhamnaceae
Kanta bahul/Kat-ber	*Ziziphus xyloprus/ Rhamnus xylopyrus*	Rhamnaceae
HERBS/SHRUBS		
Basanga	*Adhatoda vasica/ zeylanica*	Acanthaceae
Agave	*Agave americana*	Agavaceae
Murmuri	*Antidesma diandrum*	Euphorbiaceae
Bouganvillea	*Bougainvillea spectabilis*	Nyctaginaceae
Arakha	*Calotropis procera*	Asclepiadaceae
Dankari	*Clerodendrum infortunatum*	Verbinaceae
Dankari	*Clerodendrum viscosum*	Verbinaceae
Balbidanga	*Embelia robusta*	Myrsinaceae
Siju	*Euphorbia nivulia*	Euphorbiaceae
Modimodica	*Helicteres isora*	Sterculiaceae
Anantamula	*Hemidesmus indicus*	Asclepiadaceae
Kurei	*Holarrhena antidysenterica*	Apocynaceae
Telkuria	*Ixora arborea/parviflora*	Rubiaceae
Nagaairi	*Lantana camara*	Verbinaceae
Bhenta	*Limonia acidissima*	Rutaceae
Fern	*Pteris vittata*	Pteridaceae
Lakankuli	*Uvaria hamiltonii*	Annonaceae
Begunia	*Vitex negundo*	Verbinaceae
Banabasanga	*Wendlandia tinctoria*	Rubiaceae

Local Name	Botanical Name	Family Name
Dhatki	*Woodfordia fruticosa*	Lythraceae
Pokasunga	*Chromolaena odorata*	Asteraceae
Kukurpelia	*Grewia hirsuta*	Tiliaceae
CLIMBERS		
Atundi	*Combretum decandrum/ roxburghii*	Combretaceae
Baidanka	*Mucuna monosperma*	Papilionaceae
Bichhuati	*Urtica dioica*	Euphorbiaceae
Muturi	*Smylax macrophylla*	Liliaceae
Siali	*Bauhinia vahlii*	Papilionaceae
Satabari	*Asperagus racemosus*	Liliaceae
Gilo	*Caesalpinia decapetala*	Ceasalpiniaceae
Gila	*Entada scandens*	Mimosaceae
Lahara	*Mikania micrantha*	Asteraceae
Palas lai	*Butea superba*	Papilonaceae
GRASS / BAMBOOS & PALMS		
Bamboo Palm	*Chamaedorea seifrizii*	Arecaceae
Saliabaunsa	*Dendrocalamus strictus*	Gramineae(Poaceae)
Bamboo (Kanta)	*Bambusa arundenaceae*	Gramineae(Poaceae)
Reed grass	*Arundo donax*	Gramineae(Poaceae)
Kachi grass	*Cymbopogon caesius*	Gramineae(Poaceae)
Khara grass	*Imperata cylindrical*	Gramineae
Khajur	*Phoenix acaulis*	Arecaceae
Khejur	*Phoenix sylvestris*	Arecaceae
Baunsa grass	*Seccharum munja/spontaneum*	Gramineae(Poaceae)
Phulabandhuni	*Thysanolaena maxima*	Gramineae
Baunsa ornamental	*Cephalostachyum pergracile*	Gramineae(Poaceae)

Fauna Found/Reported within Project Area

Zoological Name	Common Name	Schedule
MAMMALS		
Axis axis	Spotted deer	II
Bandicota bengalensis	Lesser bandicota rat	-
Bandicota indica	Large bandicota rat	-
Canis aureus	Jackal	I
Canis lupus pallipes	Wolf	I
Elephas maximus	Elephant	I
Felis chaus	Jungle cat	I
Funambulus pennati	Palm Squirrel	-
Golunda elliotl	Indian Bush Rat	-
Herpestes eduardsil	Mongoose	-
Hyaena hyaena	Stripped Hyaena	I
Hystyrix indica	Porcupine	I
Lepus nigricollis	Indian hare	II
Macaca mulatta	Rhesus macaque	II
Muntiacus muntjak	Barking Deer	II
Mus booduga	Indian Field Mouse	-

Mus musculus castaneus	Common House Mouse	-
Nesokia indica	Mole rat	-
Rattus rattus rufescens	Common House Rat	-
Sus scrofa cristatus	Wild Boar	II
	BIRDS	
Acridotheres tristis tristis	Common myna	II
Bubulcus ibis	Cattle egret	-
Columba livia	Blue rock pigeon	-
Copsychus saularis	Oriental Magpie	II
Coracias benghalensis	Indian Roller	II
Corvus splendens	House Crow	-
Cynocitta cristata	Blue Jay	-
Dicrurous adsimilis	Drongo	-
Egretta garzetta	Little egret	-
Eudynamis Scolopaceus	Cuckoo	-
Megalaima haemacephala indica	Crimson breasted Barbet	-
Micropternus brachyurus	Wood pecker	II
Milvus migrans	Black-eared Indian Kite	I
Passer domesticus	Sparrow	-
Ploceus philippinus	Baya	-
Prinia socialis	Ashy Prinia	-
Psittacula krameri	Rose-ringed Parakeets	II
Pycnonotus barbatus	Common Bulbul	-
Tyto alba	Barn Owl	I
	REPTILES	
Calotes versicolor	Garden Lizard	-
Cnemaspis indica	Indian Day Gecko	-
Eutropis carinata	Grass skink	-
Eutropis multifasciata	Common skink	-
Hemidactylus flaviviridis	Yellow bellied House Gecko	-
Hemidactylus leschenaultii	Tree/Bank Gecko	-
Ptyas mucosus	Rat snake	I
Varanus bengalensis	Yellow Monitor Lizard	I
Varanus flavescencs	Monitor Lizard	I
Vipera russelli	Russell's Viper	I
	AMPHIBIANS	
Bufo melanostictus	Indian Toad	-
Bufo fergusonii	Ferguson's Toad	-
Rana tigrina	Indian Bull Frog	-
Rhacophorous maculates	Tree Frog	-

Fauna Found/Reported within Impact Area

Zoological Name	Common Name	Schedule
	MAMMALS	
Axis axis	Spotted deer	II
Bandicota bengalensis	Lesser bandicota rat	-
Bandicota indica	Large bandicota rat	-
Canis aureus	Jackal	I
Canis lupus pallipes	Wolf	I
Elephas maximus	Elephant	I
Felis chaus	Jungle cat	I

Funambulus pennati	Palm Squirrel	-
Golunda ellioti	Indian Bush Rat	-
Harpestes eduardsii	Mongoose	-
Hyaena hyaena	Stripped Hyaena	I
Hystyrix indica	Porcupine	I
Lepus nigricollis	Indian hare	II
Macaca mulatta	Rhesus macaque	II
Melursus ursinus	Sloth Bear	I
Muntiacus muntjak	Barking Deer	II
Mus booduga	Indian Field Mouse	-
Mus musculus castaneus	Common House Mouse	-
Nesokia indika	Mole rat	-
Presbytis entellus	Hanu Manked	II
Pteropus giganlius	Indian flying fox	-
Pteropus melenotus	Black flying fox	-
Rattus rattus rufescens	Common House Rat	-
Sus scrofa cristatus	Wild Boar	II
Viverricula indica	Small Indian Civet	I
Vulpes bengalensis	Indian Fox	I
	BIRDS	
Accipiter badius	Shikra	-
Acridotheres tristis tristis	Common myna	II
Ardiola greyli	Pond heron	-
Bubu bubu	Horned owl	II
Bubulcus ibis	Cattle egret	-
Columba livia	Blue rock pigeon	-
Copsychus saularis	Oriental Magpie	II
Coracias benghalensis	Indian Roller	II
Corvus splendens	House Crow	-
Cynocitta cristata	Blue Jay	-
Dendrocygna javanica	Whistling teal	-
Dicrurous adsimilis	Drongo	-
Dinopium benghalens	Flameback woodpecker	II
Egretta garzetta	Little egret	-
Eudice malabarica	Indian silver bill	-
Eudynamis Scolopaceus	Cuckoo	-
Leptocoma zeylonica	Purple rumped sunbird	-
Lonchura punctuleta	Scaly breasted munia	-
Megalaima haemacephala indica	Crimson breasted Barbet	-
Micropternus brachyurus	Wood pecker	II
Milvus migrans	Black-eared Indian Kite	I
Motecilla cinerea	Grey wagtail	-
Parus cinereus	Cinereous tit	-
Passer domesticus	*Sparrow*	-
Pavo cristatus	*Peacock*	I
Phalacrocorex fuscicollis	*Indian cormorant*	-
Ploceus philippinus	Baya	-
Prinia socialis	Ashy Prinia	-
Psittacula krameri	Rose-ringed Parakeets	II
Pycnonotus barbatus	Common Bulbul	-
Rhipidura albicollis	White throated fantail	-

Sturnia pagodarum	Bramhiny starling	-
Tyto alba	Barn Owl	I
Vanellus indicus	Red Wattled Lapwing	-
Zosterops palpebrosus	Oriental white eye	-
REPTILES		
Ahaetulla nasuta	Green vine snake	-
Amphiesma stolata	*Buff striped keelback (Matibirad)*	-
Bungarus caruleus	*Common Indian Krait*	*I*
Calotes versicolor	*Garden Lizard*	-
Chameleon zeylanicus	*Chameleon*	*I*
Cnemaspis indica	*Indian Dey Gecko*	-
Dendrelaphis tristis	*Tree/Bronze Snake*	*II*
Echis carinatus	*Saw scaled Viper*	*II*
Eryx johni	*Jhon's/Brown Sand Boa*	*I*
Eutropis carinata	*Grass skink*	-
Eutropis multifasciata	*Common skink*	-
Geochelone elegans	Indian Star Tortoise	-
Hemidactylus flaviviridis	Yellow bellied House Gecko	-
Hemidactylus leschenaultii	Tree/Bank Gecko	-
Lycodon aulicus	Common Wolf Snake	-
Naja naja	Cobra	I
Ptyas mucosus	Rat snake	I
Python molurus	Indian python	I
Testudo elegans	Star Turtle	-
Typhlops diardi diardi	Blind snake	-
Typhlops porrectus	Slender Worm Snake	-
Varanus bengalensis	Yellow Monitor Lizard	I
Varanus flavescencs	Monitor Lizard	I
Vipera russelli	Russell's Viper	I
AMPHIBIANS		
Bufo melanostictus	Indian Toad	-
Bufo fergusonii	Ferguson's Toad	-
Rana tigrina	Indian Bull Frog	-
Rhacophorous maculeles	Tree Frog	-
Hoplobatrachus tigerinus	Bull Frog	-
Polypedates maculatus	Tree frog	-
Euphlyctis hexadactylus	Green frog	-

Schedule – I Species of Animals present in the Impact Area:

Sl. No.	Scientific name	Common Name
1	*Canis aureus*	Jackal
2	*Canis lupus pallipes*	Wolf
3	*Elephas maximus*	Elephant
4	*Felis chaus*	Jungle cat
5	*Hyaena hyaena*	Stripped Hyaena
6	*Hystyrix indica*	Porcupine
7	Melursus ursinus	Sloth Bear

8	*Viverricula indica*	Small Indian Civet
9	*Vulpes bengalensis*	Indian Fox
10	*Milvus migrans*	Black-eared Indian Kite
11	*Pavo cristatus*	Peacock
12	*Tyto alba*	Barn Owl
13	*Bengarus caruleus*	Common Indian Krait
14	*Chameleon zeylenicus*	Chameleon
15	*Eryx johni*	Jhon's/Brown Sand Boa
16	*Naja naja*	Cobra
17	*Ptyas mucosus*	Rat snake
18	*Python molurus*	Indian python
19	*Varanus bengalensis*	Yellow Monitor Lizard
20	*Varanus flavescencs*	Monitor Lizard
21	*Vipera russelli*	Russell's Viper

Movement pattern of Mega wildlife in the impact area:

This area is subjected to heavy biotic pressure and ongoing mining activities. The vegetation of the area is completely disturbed. The district originally was having excellent contiguous forest and therefore contained very rich fauna. Due to various reasons the forest areas are now scattered and available in pockets interspersed with human habitations. The wild animals are now rarely seen except elephants.

The Mega wild animals like elephants have been found to be roaming in Baitarani PRF and Chamakpur Protected Forest areas. But beyond the impact zone the elephants have been moving around Kalika Prasad Reserve Forest, Jamudhalk KF and Chautia KF, Katabelinkala KF, Kalinga KF and Brahmanijhari KF areas.

During the paddy harvesting season elephants are found to be roaming around the nearby villages. Information collected from recorded data as well as interaction with the local people indicate that, movement of elephants is noticed around Jyothispur RF, Bramhanijhari KF, Baitarani PRF, Kalika Prasad RF, Jamudhalk KF, Chautia KF,Katbelinkala KF, Kalinga KF and the villages surrounding these forest areas.The details of recorded data are furnished in the subsequent para.

Wildlife corridors:

There is no Elephant corridor within the impact area.

Human Wildanimal Conflict details in the area during last three years.

(a) **Information of Death of Elephants**

Range	Beat	No of deaths
Barbil	Rugudihi	1
Champua	Gumura	2

Champua	Joda	3
Champua	Khandabandh	1
Champua	Jurudi	4
Champua	Malda	1
TOTAL		12

(b) **Information of Human Death& Injury due to Wild Animal Attack**

Range	Beat	No of deaths
Barbil	Roida	1
Barbil	Rugudihi	1
Barbil	Thakurani	1
Barbil	Dubuna	1
Champua	Khandebandh	2
TOTAL		6

(c)**House Damage by Elephants**

Range	Beat	No of deaths
Barbil	Bhadrasahi	1
Barbil	Rugudihi	12
Champua	Joda	15
TOTAL		28

(d) **Crop Damage by Elephants**

Range	Beat	No of deaths
Barbil	Kendudihi	2
Barbil	Rugudihi	20
Barbil	Dubuna	14
Champua	Jurudi	19
Champua	Malda	7
TOTAL		62

Most of the man-elephant conflict takes place during crop harvesting season.

Other projects & their impact area in the impact area of the project proposed

1	TISCO-BAMEBARI-2 MN MINE
2	NATIONAL ENTERPRISES_SANINDPUR IR&MN
3	TISCO_MALDA B5
4	SN MOHANTY_GANUA IRON-MN
5	TISCO_MALDA B1
6	TISCO_MALDA B2
7	RUNGTA ORAGHAT IRON MINE
8	RUNGTA SANINDPUR IRON MINE
9	MG MOHANTY GANUA IRON & MN MINE (B2)
10	RUNGTA MINES LTD. KOLMONG MN
11	P.K. AHLUWALIA GANUA IRON & MN MINE-23.3
12	BC DOGRA GANUA
13	NE-ADAGHAT
14	SA_HALIM_ORAGHAT
15	BC DOGRA_DALITA
16	PAWAN KUMAR AHLUWALIA IRON & MN GANUA-B6
17	ZENITH IRON & MN MINE GONUA
18	MG MOHANTY IRON & MN MINE PATABEDA-19
19	MG MOHANTY PATABEDA IRON MINE-26
20	MG MOHANTY PATABEDA IRON MINE-14
21	KC PRADHAN GANUA IRON & MN MINE
22	NEELANCHAL ISPAT NIGAM LIMITED KOIDA
23	MATADIN SHARDA DALITA MN MINE
24	MATADIN SHARDA MANDAJODA MN MINE ML-56
25	KMC-54 JURURI IRON & MN MINE
26	KMC-73 JURURI IRON MINE
27	OMC-BANSPANI IRON
28	SERAZUDIN-BALDA IRON MINE
29	TARINI MINERAL-JURURI IRON&MN
30	TISCO-JODAEAST IRON MINE
31	TISCO-JODAWEST MN MINE
32	TISCO-MANMORA MN MINE
33	TISCO-KHANDBANDH IRON MINE
34	BHANJA MINERAL-INGANJHARAN IRON & MN
35	B.C. DEB INGANJHARAN IRON & MN
36	MALARAI -JALHARI IRON & MN MINES
37	ESSEL UNCHABALI IRON & MN MINE
38	ESSEL KASIA IRON & DOLOMITE
39	TISCO-BANEIKALA (BAMEBARI BLOCK-1) MN
40	R.B. DAS-DALPAHAR IRON-MN MINES
41	R.P. SAO & SONS GUALI IRON MINES
42	TISCO BAMEBARI (BLOCK-3) JORIBAHAL MN
43	B.D. PATNAIK KALAPARBAT IRON MINES
44	PATNAIK -JARIBAHAL IRON-MN
45	TISCO TIRING PAHAR MN MINES
46	MESCO-ROIDA-I IRON MINE
47	H G PANDYA JAJANG IRON MN MINE
48	S.N.MOHANTY-UNCHABALI IRON & MN
49	DHARAMCHAND JAIN SIDHAMATH IRON &MN

50	MINERALTRADING SYNDICATE BHULBEDA IRON
51	KJS AHLUWALIA NUAGAON IRON
52	K N RAM ROIDA-II IRON MINE
53	SOROJINI PRADHAN BAITARANI IRON MINE
54	SOROJINI PRADHAN INGANJHARAN IRON MINE
55	K C PRADHAN CHAMAKPUR IRON MINE
56	KC PRADHAN-LAKRAGHAT IRON MINE
57	R B DAS KUNDRUPANI IRON & MN
58	SC PADHI GURUBEDA IRON MINE
59	SN PAUL KATASAI MN MINE
60	R P SAO CHORMALDA MN MINE
61	KUSHALESWAR MINERALS-RAIKIA-KALAPARBAT
62	PATNAIK-JARIBAHAL IRON MINES
63	OMDC_KOLHAROIDA
64	TB-LAL-JAJANG-IRON ORE MINE
65	OMC_BPJ
66	OMC_ROIDA78
67	IDC_ROIDA_IRON_Mn
68	OMC_SGBK_KOIDA
69	OMC_TIRINGPAHAR
70	OMC_MAHAPARBAT
71	OMC_KHANDBAND
72	RUNGTA_KATASAHI_MN_MINE
73	ESSEL JAJANG JURURI IRON & MN MINE
74	RUNGTA JAJANG IRON ORE MINE
75	RUNGTA SILJODA MN MINE
76	SD SARMA_RAIKA
77	OCL KUNDAPOSI IRON MINE
78	NARAYANI SONS SURUGUTURIA IRO ML-99
79	SERAJUDIN_GURUDA
80	S N DASMOHAPATRA KATASAHI MN MINE
81	OMDC_BHADRASAHI
82	DEEPAK STEEL KHANDBANDH IRON ORE MINE
83	FACOR KATASHI BLOCK-A MANGANESE MINE
84	FACOR KATASAHI BLOCK-B MANGANESE MINE
85	DC-JAIN-DALITA-IRON-ORE-MINE-BLOCK-A
86	DC-JAIN-DALITA-IRON-ORE-MINE-BLOCK-B2
87	DC-JAIN-DALITA-IRON-ORE-MINE-BLOCK-B3
88	DC-JAIN-DALITA-IRON-ORE-MINE-BLOCK-C
89	KMC-12 JALAHARI IRON ORE MINE
90	SHRI METALIKS Ltd. KHANDBAND IRON MINE
91	KMC-27 JALAHARI IRON ORE MINE
92	RBT LTD. KATASAHI & RUDUKELA MN MINE
93	OMC-SERENDA BHADRASAHI

CHAPTER-III

Probable Impacts of the Project on Flora and Fauna- Under this likely impacts of project and ancillary activities on flora and fauna on movement of mega fauna shall be discussed.

A. **Project Impact on environment in general:**

Mining operationsresults in high degree of environmental impacts, which can extend well beyond the extent of mineralised areas. An assessment of the environmental and health impact of air pollution caused by the emission of particulate matter, Sulphur Dioxide (SO_2) and Oxides of Nitrogen (NO_x) due to the operation of mines result in the healthhazards to the exposed population. The environmental problem associated with Iron and Manganese ore during mining, storage, handling and transportation results in severe impact.

Possible impacts:

The following Impacts are anticipated in the project area and project impact area on the Human population, Flora & Fauna.

i. **Impact on soil:**

Top Soil:Topsoil occurs over the ore and waste rock surfaces which will be removed at the time of ore excavation. The thickness of top soil varies from location to location from nil on exposed out crop and steeply sloping surfaces, to about 0.5 m in valleys and depression.

During initial development of mine and subsequently top soil and alluvium is to be separately taken out to be stored exclusively in a dump for future use for taking up plantations.

Major part of the forest land will come under the mining pit setting aside the safety zone. Therefore soil erosion will take place which may cause formation of Gullies and Ravines leading to furtherdestruction of Forest as well as wild-life habitat. The possibility of land slide also cannot be ruledout.

Overburden : The over burden will be removed by mechanised means. Hydraulic shovel type excavators will be used for removal of over burden. Transportation of overburden will be done by dumpers.

ii. **Impact on vegetation**:

Loss of Vegitation: Due to excavation for mining, the existing vegetation (Trees, Shrubs, Herbs/climbers, Grasses and medicinal plants) over the area will disappear in phases as per progress of the mined out area. Similarly, due to influx of labour force, there may be a sudden spurt in demand of small timber and fire wood thereby shifting the additional biotic pressure on the surrounding forests causing further destruction of forests within the impact area. This will lead to depletion of quantity and quality of flora.

Reduction in wildlife habitats: Due to the mining activities 89.961ha. of forest area will bediverted for mining useduring life of the mine. Most of the forests with in the mining area will be destroyed and this area will also not be available for use by the wild animals. Thus Wild-Life Habitat to the extent will be reduced. Besides the biotic pressure which was absorbed by the forests of this area will now be shifted to the adjoing forest areas within the impact area. Hence the forests of the impact area will be subjected to further depletion.

Impact on Vegetation in general: The vegetation within the project area will be almost destroyed except safety zone. Even the areas taken up for plantation will not be available for the wild animals immediately. Due to desiccation condition caused by digging of large mine pits, the vegetation around the mine pits may also be destroyed.

iii. **Impact onWater regime**

Impact on Water (Loss of Moisture): Due to mining activity there will be large scale evaporation from the exposed soil and moisture retention capacity of the soil along the periphery of the mine pits will be reduced and cause dessication which may lead to further destruction of vegetation. The sub-soil water of the surrounding area will also be reduced. Due to the process of dewatering and releasing huge quantities of water in to the natural drainage system the Sub-soil water as well as the ground water in the area may reduce posing the problem of water scarcity.

Water accumulation: Due to excavation, huge quantity of waterwill be accumulated in the mine pits.As a result of which wild animals will be attracted and ultimately may be trapped in the pits which will be fatal for them.

Water pollution: The water accumulated in the mine pit along with slurry will be pumped out from the mine pit and released to the natural drainage system. Such activity will pollute the natural water source of the area.

Beside the water source available within the mining area is likely to be muddy due to presence of large amount of dust and broken up soil. Some oily substance may also be released from various machineries and vehicles and contaminate the water in the mine area. The local water source is also likely to be contaminated due to excessive plying and cleaning of heavy vehicles and machineries. Use of Slurry pumps for de-watering purpose and releasing of the said water along with Slurry in the natural drainage system will contaminate the natural streams and pose health hazards for the humanpopulation as well as animals

iv. **Impact on Air** :

Due to the mining process such as drilling, blasting, transportation, movement of heavy machineries and transport vehicles the Particulate Matter in the air may increase around the mine activity. However, steps should be taken reduce the same.

Dust hazards: The mining process will generate large amount of dust. The activities which produce dust are:

- Drilling, blasting, excavation and transportation of overburden;
- Drilling, blasting, excavation and transportation of Ore;
- Construction and demolition activities like construction of extraction path/road, workshop, land cleaning, handling of debries and materials etc.;
- Loading, unloading of mineral and movement of vehicles and equipments;
- Wind erosion;
- Movement of vehicles on haul roads at the time of transportation of mineral and overburden.

The dust generated in the mining process will create respiratory problems in wild animals as well as human beings. Large amount of dust will settle on the Grasses and other fodder plants making the fodder plants unfit for consumption.

v. **PollutantsQuantum& Impact :**

The pollutants which are likely to be generated in the mining process are:

- Washing away of silt and other fine particles from the dumps which will also pollute the water source.

- There is likelihood of abandoning used batteries, filter materials containing oily sludge containing hazardous materials.
- Used oils may also be scattered carelessly within the project area.
- Cleaning and washing of of the Vehicles and Machineries may also generate oily sludge and greasy materials.
- Other pollutants such as used Polythene bags, Tin foils, Aluminium foils, left over food materials, packing cases etc will also be generated within the project area.
- Huge quantities of dust will be generated in the mining process.
- Due to the Blasting operation some poisonous gases may be generated.

vi. **Noise Pollution:**

The proposed mining operation will be open cast mechanized method. In this open cast mechanized mining, various sources of noise in the area are attributable mainly due to drilling, blasting, operation of compressor, loading and haulage, operation of diesel pump and vehicular traffic.

The various sources of noise mentioned above shall only be periodical and is limited to a fixed period of operation. In addition to this, the transportation of ores might cause a little effect on the noise level.

Adverse effects of noise can either be audible, physiological, or behavioural. Auditory effects can be direct loss of hearing or threshold shift in decibel.

vii. **Impact on Animals:**

The impact on animals will be mostly loss of cover, shortage of fodder, health hazards, physical threat due to movement of large number of HEMM and Transport vehicles.

viii. **Qualitative changes in Wildlife habitat pattern:**

The mining operation in and around the project area brings about a drastic change in the qualitative habitat. The changes which are perceived in the habitat quality are:

➢ **Physiographic change of the habitat:**

It has been estimated that, even after backfilling of the area 5.0647 Ha will still remain as a pit which will act as an Waterbody.

- **Other Changes in the wild life habitat pattern in the study area due to project implementation:.**

There are a number of Reserved Forestsas well as several Forest kissam Land within the Zone of Influence. Due to the mining operation there will be some disturbance in the surrounding area, particularly within the Reserved Forests situated in the Impact Zone.

As per the base line data of fauna, there is no endangered fauna within the projectarea. However, Schedule-I &II Mammals such as Elephants, Sloth Bear, Jackal, Small Indian Civet, and Reptiles like Python, Rat Snake, Monitor lizzard found within the impact area may be affected by project implementation..

i. **Threats to forest Fauna:** Due to ongoing mining activities in and around the project area, the wildlife habitat has been disturbed and therefore important wild animals are not present in the area. However some animals along with elephants are found in parts of the Reserved Forests within the impact area. The elephants in particular visit the agriculture land during paddy crop season. Due to the implementation of the project the threats to wildlife can be perceived as:

1. Direct Threat
2. Indirect Threat

Direct threat is killing and hunting of wild animals due to various reasons such as to collect wild animal meat, accidental killing due to movement of large number of vehicles, machineries and equipments.

Forest fire also poses a direct threat as a number of small and medium animals are trapped and killed in the forest fire, and some times the large animals are also trapped.

Indirect threat is due to shrinkage and degradation of habitat, Shortage of Food and water. The animals in search of food and water try to enter in to habitations. Most of the man animal conflict takes place due to indirect threat.

ii. **Vehicular traffic and its impact**:

For the mining operation, a large number of Heavy Earth Moving Machineries and Transport Vehicles will move in the area which may pose obstruction for free movement of animals in the area.

The impact on fauna due to increase of vehicles can be perceived to be:

- Accidental killing of wild animals.
- Poaching of wildlife.
- Scarcity of food and fodder.
- Killing of animals due to accidental forest fire.

CHAPTER-IV

Mitigation measures required - In this mitigation measures required need to be detailed to counter the adverse impacts of the project along with the financial implication.

Previous SSWLCP 2014 : Earlier, the Site Specific Wildlife Conservation Plan was approved by PCCF (Wildlife) and CWLW in his Memo No. 9070/1WL (C) SSP-44/2014, Dt. 27th Nov.2014. The provisions of the previous Site Specific Wildlife Conservation Plan was:

For implementation by Project Proponent:

1. Plantation 16,000 seedlings (1600 x10 Ha =16000) @69,450/- = Rs.6.945 lakhs
2. Anti-poaching / anti-depredation squads and also forest fire protection around the year, for this purpose (3 x 5000 x 12 x 10years = 18.00 lakhs)
3. Solar Electric fencing around the mine pit. Rs.12.00 lakhs
4. Creation of awareness = Rs.2.00 lakhs.
5. Provision of hire vehicle and fuel consumption as will be required by Divisional Forest officer for Rapid Responce Team at Division level and also provision for Wildlife monitoring Equipments and data processing equipments. = Rs.5.00 lakhs.
6. Health Camp for villagers and cattle immunization = Rs.10.00 lakhs.
   (Total cost Rs.53.945 lakhs + 20% escalation Rs.10.789 lakhs = Rs.64.734 lakhs)

For Implementation by Forest Department

1. Improvement of Forest cover by ANR gap Plantation over 50.00 ha. @ 22,200/- per ha. (Rs.11.10 lakhs).
2. Soil and moisture conservation activities. Check-dams, Percolation pits etc. (Rs.10.00 lakhs)
3. Creation of Water Body (One) (Rs.10.00 lakhs).
4. Fire watchers- 5Nos. (5000 x 5 x 5 months x 10 years= Rs.12.50 lakhs.
5. Fire fighting Equipments= Rs.0.50 lakhs
6. Fire line creation 10 km = Rs.4.00 lakhs)
7. Corpus fund: Ex-gratia for elephant anti-depredation & Compassionate grant (Rs.20.00 lakhs).
8. Supply of Grain Bins (Rs.5.00 lakhs)
9. Anti Poaching Squad 5 nos. and logistic support= Rs.50.00 lakhs)
10. Provision of mobile Solar Fencing around the villages wherever necessary= (Rs.5.00 lakhs)
11. Creation of Awareness (Rs.5.00 lakhs)
12. Training and Capacity Building (Rs.5.00 lakhs)

13. Monitoring and Evaluation = Rs.2.00 lakhs.
14. Intelligence Collection (Rs.3.00 lakhs)
15. Logistic Support = (Rs.10.00 lakhs)
16. Unforseen expenditure – Rs.1.50 lakhs

(Total cost Rs.154.60 lakhs + 20% escalation Rs.30.92 lakhs = Rs.185.52 lakhs)

PROPOSED SITE SPECIFIC WILDLIFE CONSERVATION PLAN

A. PROPOSED MITIGATION MEASURES WITHIN PROJECT SITE

(To be implemented by the project proponent within the project area)

Due to operation of various mining activities, the Wild life present within the lease area will be threatened. Besides the Wild-life habitat is reduced to the extent of forest area involved in the project. The Site Specific Wildlife Conservation Plan therefore aims at providing safe passage to the existing wild animals from the lease area to the nearby Forest areas and improving the habitat in the surrounding areas. Certain measures are also required to be taken with in the mining area.

The proposed measures can be taken within the project area by the proponent. Based on the perceived threats to wildlife as per the foregoing chapter, the certainsteps are taken to address almost all such threats.

This Plan is proposed for 5 years on the presumption that, the habitat improvement in the proposed area canbe achieved to the desired level. After 5 years this Plan can be reviewed and extended or modified if required.

The following steps will be taken within the lease area.

i. **Safe passage to Existing Wild-life**

It is very important save the existing wild animals available within the lease area and to divert them to safer locations. The Mine workers and Officials will be sensitized to drive away the existing animals/fauna to the adjoining Forest area. The Forest Department staff can also be contacted in emergencies.

ii. **Restoration of habitat**

Some portion of the project area will be takeup for habitat restoration.

These areas include Safety zone, OB dumps and avenue plantations.

Besides the above the following steps are further taken;

1. A 7.5 m wide safety zone will be maintained around the mine lease area as per Guidelines of Government of India.
2. Vegetation of the surrounding area will not be damaged in any case.
3. Slopes of active dump areas would be put under greenery with suitable local species of herbs, shrubs, trees and grasses which may fulfill the requirement of medicine, fodder and needs of the inhabitants as well as prevent the dust nuisance.
4. Creation of green belt along the dumping areas, avenue plantationand Safety zone area.

iii. **Solid Waste Management**

Top Soil:

Top soil generated during the mining period, shall be stored temporarily over the designated location. Arrangements for watering the top soil dump through internal perforated pipes shall be made to maintain moisture level in the soil.

Over Burden:

The Overburden will be stored in dumps for future use for backfilling. All dumps will be terraced and provided with garland drains and toe wall. The height of each terrace will be maintened at 15 metres and ultimate slope of the dump is maintained at less than 30 degrees. Each terrace shall have inward slope with catch drains. The catch drains of the individual terrace shall be connected to the garland drain. During monsoon months, these catch drains will pass through settling tanks to avoid wash offs.

Dump stabilisation:The dump stabilisation process will involve

- Segregation of materials
- Water sprinkling
- Regular compaction
- Terracing at dead end
- Construction retaining walls
- Provision of garland drains around the dumps leading to settling tank through a series of check dams.
- Coir-matting of dump slopes wherever required shall be undertaken in order to prevent rain-wash-offs. The dump slopes will thereafter be vegetated.
- Besides the above proposed steps the overburden will be filled back in the mine pits and plantations will be taken up as per Mine Closure Plan.

Garbage Management

The steps which are to be taken for Garbage management are as follows.

i. Entry of non-biodegradable materials which are likely to produce Garbage such as Polythene bags, Aluminium foils, Tin foils etc. are restricted in to the Mining area.

ii. The Garbage generated in the Mining area are regularly collected and segregated in-to Bio-degradable and non-degradable materials.

iii. The non-degradable materials if any are sent for recycling.

iv. The Bio-degradable substances are put in the Compost pits for conversion in-to manure. The Manure obtained from these pits will be utilised for plantation purpose.

This aspect has been proposed as compliance to Environment Impact Assessment Report, hence no additional funds are proposed for this.

iv. **Soil and water conservation**

For enhancing seepage of water and to reduce soil erosion the rain water will be chanalised through garland drains provided around the dumps to the settling tanks through a series of check dams. The dewatering process from the mine pit will involve chanalising the water along with slurry to pass through similar garland drains and settling tanks. The treated water will be utilized for spraying the haul roads for suppressionof dust.

In the safety zone the rain water will be diverted through easy gradient drains to minimise soil erosion. Check-dams will be provided on the natural channels in order to prevent soil erosion in the safety zone.

These activities have been proposed in the Mining Plan.

v. **Control of Dust**

The important dust control measures which will be taken within the lease area will be:

- Wet drilling practice will be followed.
- Spreading of dust is minimised by use of suitable explosive.
- Regular sprinkling of water on haul roads.
- Regular water sprinkling to be done on Ore Stacks.
- Over loading at the time of transport to be avoided.
- Trucks carrying fine dust materials will be covered with Tarpaulins/ Poly-sheets to minimize spreading of dust during transportation.
- Regular road maintenance will be taken up.
- OB dumps will be planted with grasses and other suitable soil binding species.
- Dust extraction system will be installed in the crusher plant.
- Green belts will prevent spreading of fugitive dust.

All these dust control measures have been proposed as a requirement in the approved Mining Plan and therefore special provision is not made for this activity in this Plan.

vi. **Control of water pollution.**

The water pollution will be controlled by treatment of water before releasing the same to the natural drainage system
The discharged water will be collected in sump pits and channelled to treatment plant. The treatment plant will consist ofSedimentation pond.
The treated water instead of releasing to the natural drainage system will be used in dust suppression on haul roads, washing of dumpers and dozers etc.
Oil and Grease recovered in the process will be stored in drums and auctioned.
Surface runoff will be collected through garland drains and diverted to sedimentation tanks. There after the overflow will be diverted to the natural drainage system.
The HEMMs and vehicles are washed at a designated area and effluent routed through drains to settling tanks fitted with grease trap. The clear water generated will be used for dust suppression on roads and irrigation of plantation.
All these measures are required to be complied in the approved Mining Plan and Environment Management Plan, therefore special provision is not made for this in this Plan.

vii. **Noise control**

The following measures will be taken to keep the noise at the minimum possible level:

- Proper designing of plant & machinery by providing in-built mechanisms like silencers, mufflers and enclosures for noise generating parts and shock absorbing pads at the foundation of vibrating equipment.
- Routine maintenance of equipment.
- Enclosures for Ore dressing unit etc.
- Rational deployment of noise generating plant and machinery.
- Greenbelts around the quarry, infrastructure sites, servicebuilding area
- Provision of isolation for vibrating equipment (both fixed and mobile) foundation.
- Regular monitoring of noise levels at various points.

These steps are taken as per provision of Environment Impact Assessment and

Management Management Plan. Hence no special provision is made for this.

viii. **Fall of animals in the mining pits.**

In order to prevent accidental fall of animals in the mine pits the following steps shall be taken.

- In the previous Plan an amount of Rs.12.00 lakhs was prposed for Solar Electric fencing of Theentire mining lease area.

Other Measures to be taken by Project Proponent (User Agency):

CURRENT PLAN

KEONJHAR FOREST DIVISION

1-Anti poaching-cum-Anti-depredation Squad:

One hired vehicle along with Driver and POL will be provided by the Project Proponent for the Squad for protection of Forest and Wildlife.

2-Jana Surakshya GajaRakshya :-

This activity will be taken up in 2 villages along with maintenance for 5 years.Solar fencing (2 Kms pervillage) to be taken up either on Community mode or VSS mode or private farmers land as per Socio- economic – politico dynamics of the village. The Subsidy component in either case to be borne by theUser Agency.

3-Solar Street Lights:

42nos. of Solar Street lights will be installed in the surrounding villages as per advice and approval of the DFO to create psychological barrier for the animals and to get pro-active support from the people. Proposed cost is @ Rs.25,000/- and total cost Rs.10.50 lakhs.

B. PROPOSED MITIGATION MEASURES WITHIN THE IMPACT AREA

(Interventions to be adopted by DFO)

This Site Specific Wildlife Conservation Plan aims at reducing the perceived threats as described earlier, within the impact area as well asbeyond. These activities beyond the Mining project area shall be implemented by the DFO/Forest Department.

KEONJHAR FOREST DIVISION

A. Habitat Improvement

It is proposed to improve the wild life habitat within the Impact Area with the following activities.

1-Plantation of Fodder species:

It is proposed to take up plant 5,000 seedlings of Siali, Ficus spp, Jamun, Arjun etc. to provide fodder for the elephants in urban plantation mode.

The cost for 5000 seedlings in urban plantation mode is Rs.29,57,000/-.

2-Check dam Across Sundra Nala:

2 nos Check dams will be constructed in the buffer zone @Rs.30.00 lakhs.

B. Measures for Protection of Wildlife and reduce Man-Animal Conflict:

3-Anti-poaching-cum-Anti-depredation squad: In order to assist the regular Forest staff for protection of Wild life, it is proposed to constitute Anti-poaching-cum-Anti-depredation Squad consisting of 10 (ten) persons. This squad will work along with Forest Department staff.

	Particulars	Amount
1	Wages of squad members – @13,412.00 / month, 13412 x 10 x 12 months = Rs.16,09,440/-	16,09,440/-
2	Hire charges of vehicles @31,000/- per month – Rs.3,72,000/-	To be borne by the user agency
3	POL for vehicles/ boats/ trawlers@12,000/- per month.	
4	Recharging of Mobile sets – 500x12x1	6,000/-
5	Contingency per year	20,560/-
	COST PER YEAR	16,36,000/-

The annual expenditure for a Squad consisting of 5 members as per prescribed Norm is Rs.16,36,000.00 Hence Total expenditure proposed for 5 years is Rs.81,80,000/-.

4-Deployment of Gajasathi:

20 nos. of Gajasathi will be deployed @ 5 Gajasathi per village/VSS in 20 villages for protection of Human lives and also elephants. They will also keep watch on elephant movement and resolve the issues of Human-Animal conflict. The requirement of funds will be as follows:

1	Financial to each selected VSS @ Rs.60,000/- per year					60,000/-
2	Supply of Uniforms for Gajasathi					
	a.	T. Shirt	2 nos.	@350/-	5 persons per village	3500/-
	b.	Cap	1 no	@50/-		250/-
	c.	Water Bottle	1 no	@100/-		500/-
		Sub Total		500/-	Per person	4250/-
	d	Training of each VSS/EDC			2500/-	2500/-
	e.	Equipments for each VSS			8500/-	8500/-
Total Funds required per VSS per year						**75,250**

Total Cost for 5 years:- Rs.75250/- x 20 nos. x 5 years = Rs.75,25,000/-

5-Grain Bins:

100 nos. of Grain Bins @3,500/- will be distributed in the surrounding villages for safe storage of crop. Total cost Rs.3.50 lakhs.

10-Livelihood generation in peripheral village through VSS especially vermicompost, etc.

Livelihood interventions shall be adopted to reduce dependence on forest such as Vermi compost through partner NGO in elephant movement areas. Proposed cost will be Rs.20.00 lakhs.

11. Community Grain Bin:

It is seen that Elephants are raided the villages and damaged the crop kept inside the houses. Hence, it is warranted for construction of a Community Grain Bin to protect the paddy and other crops of the villagers.

12-Creation of Awareness:

Man-Elephant conflict will be reduced by creating awareness in the forest fringe villages about the behaviour of the animals and the procedure to tackle the emergency. The local people can be educated in this regard. Such awareness can be created through Workshops and PRA excercises and involvement of VSS.
The user agency proposes to support various activities in these villages @Rs.1.00 lakh per year, and total expenditure of Rs.5.00 lakhs.

13-Monitoring & evaluation

The implementation of this Plan needs to be monitored and evaluated at regular intervals. Such monitoring and evaluation can be undertaken along with the Wildlife

Management Plans of the adjoining areas. The user agency proposes to contribute Rs. 3.00 lakhs for the purpose.

14-Escallation of Cost and Unforeseen:

In order to meet the additional requirement of cost due to escalation of prices, wages etc. 20% of the cost is provided. i.e. 20% of Rs.288.12lakh will be provided by the project proponent. The cost on this account will be Rs.57.624lakhs.

Divisional Forest Officer
Koonjhar Division

OBJECTIVE OF MANAGEMENT AND MITIGATION STRATEGIES

OBJECTIVE OF MANAGEMENT:

The main objective of this plan is to reduce various stresses occurring due to implementation of this project in this particular locality having wildlife importance. The site- specific Wildlife Conservation Plan will suggest measures to mitigate such stress and if possible, how to avoid certain activities which could reduce the negative influence. Wildlife management consists of promoting welfare factors, arresting or reducing the impacts of decimating factors and neutralizing harmful effects of limiting factors that keep the animal population lower than the carrying capacity of the area. It also aims at management of human dimensions relating to regulation of habitat use, sufferance from animal damages, livelihood issues and taking people as partners in conservation management Such concerns are reflected in the prescriptions. The management of ZoI will target optimization and maintenance of wildlife habitat and biodiversity, involving local people as far as practicable and aim to avoid / minimize or mitigate the adverse impacts of the project activity. Small animals &larger ones like deer and elephants make use of the area regularly, as the area is undisturbed. Large animals will be disturbed from the area once the Plant commences with full expansion. The displaced animals should not be left as refugee. Their rehabilitation would be the major objective of the plan. To fulfill all these requirements, the plan focused on improving forage and browse volume by increasing food plant diversity with vertical and horizontal cover. These will arrest habitat destruction and fragmentations and also prevent soil erosion and loss of biodiversity. Keeping natural water resource free from negative impact of the project activity will also be targeted.

Objective of management to mitigate the threats to the wildlife is covering the following aspects:

1. To conserve a viable population of Wildlife in general and the Pachyderm in particular in their natural habitat.
2. Conservation, Protection and Improvement of the flora and fauna in and around the Project area in a sustainable basis despite production of Steel and other ancillary activities.

3. To conserve the natural biodiversity, aesthetic and geo-morphological value of the area through appropriate management of site, habitat and landscape.
4. To reduce the dependency of local people on the forest resources of the Zoi through culturally, socially, economically acceptable and ecologically sustainable and viable alternatives by undertaking eco-development programmes.
5. To reduce man-animal conflict by ensuring contiguity of habitat in the buffer zoneby improving forest cover in long term basis.

STRATEGIES TO MITIGATE AND MINIMIZE ADVERSE IMPACTS:

FOR ROHAI DIVISION

Protection & Enforcement Activities

Establishment of portable highway camp shed

Patrolling squad on highways/roads required short resting places along the highway. It is proposed to construct portable camp sheds (using Pre-fabricated materials) with all logistic facilities like Water supply, Tube well, solar light, bedding facilities, boundary / barricading facilities also. It is proposed to have one such Highway camp along NH-215 or any other sensitive location as decided by Range Officer after due field verification.

Anti-depredation/ Protection Squad:

They will be engaged throughout the year to minimize depredation activities from wild animals especially from elephants. The trackers will be selected from local villages throughout the area well conversant with animal behaviours, particularly, elephants. The jobof the trackers will be primarily to gather data on number of elephants, their location, their line of movement and the quantum and nature of depredation being done. Such data can be collected by pursuing elephants in morning hours along their spoors, when animals are on retreat to secluded spots (deep valleys, close to water or dense woods). Information obtained can be soon relayed to the Range officer, area Forester and concerned villagers.. Regular tracking will help to map movement routes, identify intensity of depredation from which the nature of movement, whether benign or deliberate can be inferred. If the depredation is repetitive, a drive will be organized. This squad may also be engaged in the protection activities in order to assist the ground staffs. The overall aspect of protection

from poaching, illegal conversion of woods, encroachments, wildlife trafficking etc. could be monitored on a regular basis. The safety of people and animals are prime concern of this squad. They will be provided with hired vehicle, fuel, mobile recharge facilities, medical expenses, uniform etc.

Equipment to monitor elephant movement and to be used in anti-depredation activities etc.:

The equipment including drones, post mortem kits, dual testing voltage tester, non-contact high voltage detector, camera traps, mobile and tracking devices, smart stick, metal detector, snare cutting callipers etc. are the most necessary attributes which are proposed to be used in providing better monitoring to elephant movement/passage and to be used in anti-depredation activities in Bonai Forest Division.

Wildlife Habitat Management

Habitat enrichment with plantation of Bamboo (preferably through bamboo seed balls)/Fruit bearing species/ Fodder Plantation:

Most of the forest patches are now devoid of continuous bamboo patches, for which preferred food species by Elephants is in a scarce condition inside the forest areas. Similarly due to absence of sufficient food sources, movement of elephant is diverted towards fringe village areas which in turns lead to Human-Elephant Conflicts. Therefore it is proposed to improve their natural habitats by providing sufficient Bamboo Patches/Fruit Bearing Species/Fodder Plantation in AR mode and subsequently improving the palatability of other wildlife also. Initiative should be taken through thronging of Seed balls of bamboo and other fodder species inside the forest areas. Area near to habitation is required to be avoided. The seeds are to be collected and broadcasted in appropriate ratio. Palatability of species by animals especially liked by elephant is to be given due importance. Most importantly priority should be given towards recent trend of movement in Mendhamaruni PRF, Khajuridihi PRF, Ganua PRF areas.

Creation of Water Bodies

During summer most of the streams except some major water sources remain dry for which the wild animals often face difficulty to get water deep inside the forest. During this time the wild animal come close to the human habitation in search of water as a result, the chance of human-wildlife conflict gets

increased. Hence, to resolve the water scarcity inside the forest area during the pinch period, it is proposed to create 01 no. of artificial water hole of size (60 m × 40 m × 5 m).

Construction of Check dam along the nallah:

In order to mitigate water crisis for the wild animals particularly in summer season of Koira Range areas, there is provision for construction of 1 no. of RCC check dam in Koira Range as it is coming in the buffer zone area of the project. It is useful to check the runoff water at this location for improvement of flora and fauna of the forest area. Several wildlife movements have been noticed in the above proposed check dam areas which will be helpful to cater to the improvement of flora and fauna in those areas. The final location of the construction site will be decided at the suitable location of the entire nallah considering flow of water at a particular feasible time.

Human Elephant Conflict Mitigation

Installation of Solar Street lamp/light along with early warning system in elephant affected villages and its maintenance:

From the study, it was evident that in the Zone of Influence (ZoI), the main problem is man-animal conflict, particularly with the mega herbivore i.e., elephant. Elephants make their frequent depredation to the nearby villages located in the ZOI of the project area, especially from dusk to dawn. One of the causes of conflict occur in the wee hours when the whole area become darker, due to absence of a regular stretch of lighted areas around the villages, because of lack of electric supply. It results in direct confrontation between the people and the elephant, which usually hide itself in dark and bushy areas. Hence, taking into account the whole scenario of conflict, there is a provision to install solar powered street light along with early warning system most preferably at strategic locations around the elephant affected village areas in Bonai Forest Division. As these lights can work even without electricity, it will help the villagers to get rid of elephant attack. The solar lights will be provided at the required strategic locations in the ZoI of the project area considering the elephant movement.

Installation Deployment of Gaja Saathi: A participatory approach:

Bonai Forest Division is very much important in respect of Human- Elephant conflict due to frequent movement of elephant. It is proposed to deploy Gajasathi in 05 units (One VSS

unit or village unit consisting of 05 members) @ Rs. 80000/unit to keep a watch on elephant movement and take appropriate steps to resolve Human- Wildlife Conflict

Provision of distribution of Grain Bins to the house-hold of surrounding villages of project area for storage of food materials in order to mitigate the Human-Elephant Conflict:

The surrounding livelihood of the project area mostly comprises of lower middle class people and low economic class people. They are mostly fond of their social custom sucha as to consume desi liquor and to store the same in to their houses along with other food grains. Normally they don't have any luxurious houses, infact small kuccha houses are mostly prevalent there where they use to live. Being fond of these desi liquor and food grains, elephants mostly come nearer to these fringe village areas in a frequent manner. Subsequently there is always a chance of Human-Elephant Conflict, by which lots of mishap/destruction will going to be observed. In order to mitigate these issues, there is a proposal for distribution of eco friendly grain bins to the surrounding fringe villages/house holds so that with a proper storage facility the attraction of elephant may be avoided in some extent. The food grains could be stored safely as well as their social customs too. On the other hand we can motivate/aware them towards avoiding the storage of desi liquor to some extent also.

Provision of distribution of high-powered torches at surrounding conflict villages in order to mitigate human-elephant conflicts

In the wee hours the elephants mostly come out of the habitat and depredate the paddy area as well as storage place in villages. To trace out their presence in each village, it is proposed have sufficient number of high-powered torches, so that it will be delivered to the villagers as well as forest staffs in order to get proper coordination amongst themselves during tracing the elephant movement.

Signage on both side of track/road:

To promote coexistence with wildlife and to aware people, good quality sign boards with display of wildlife features should be placed along the Project premises, road etc. Fluorescent Sign Boards with good write ups about movement of wild animals will be provided on in order to make aware the passers-by about occurrence of accident if they confront with wildlife.

Public support and Awareness

Training and awareness to VSS units, students in educational institutions, Village level Volunteers for Wild life Conservation & Protection

There is a urgent need to select village level volunteews through EDC/VFMC towardsproviding grass root level support in the field of wildlife conservation and protection. There should be efforts to find out the local indigenous people who will be the true solution finder during managing conflict situations with wildlife and other protection activities inside forest. They should be provided with proper training and motivation for which a massive awarenesscould be distributed towards wildlife conservation and protection. In this initiative schools/colleges should be taken as a base unit to provide all kind of training activities so that we could reach each individual very easily and subsequently a better understanding could be generated between the village level people and other field staffs.

CHAPTER - V

Animal Passage Plan – In case of linear projects and other projects affecting movement of wildlife species the details of structures and their locations should be mentioned as per prescriptions of "Eco Friendly Measures to Mitigate Impacts of Linear Infrastructure on Wildlife" issued by Government of India.

NOT APPLICABLE.

PROPOSED PLANKEONIHAR FOREST DIVISION

TO BE EXECUTED BY THE PROJECT PROPONENT

Particulars	Amount
Anti poaching-cum-Anti-depredation Squad: One hired vehicle along with Driver and POL will be provided by the Project Proponent for the Squad for protection of Forest and Wildlife.	To be borne by the Project Proponent
Jana Rakshya Gaja Surakshya :- This activity will be taken up in 4 villages along with maintenance for 5 years. Solar fencing (2 Kms per village) to be taken up either on Community mode or VSS mode or private farmers land as per Socio-economic – politico dynamics of the village.	To be borne by the Project Proponent
Solar Street lights: 50 nos of Solar Street lights to be installed in the surrounding 14 villages with early warning system as per advice and approval of the DFO. Provision of one barefoot Solar mechanic for maintenance of such solar lights by the department in the impact area for 5 years.	To be borne by the Project Proponent
Optimizer Optimizers for Range offices for better management and upkeep of records along with monitoring of elephants and CA plantations.	To be borne by the Project Proponent
Thermal Drone 2 nos. Thermal drone cameras for daily elephant monitoring and mines inspection in Barbil and Champua Range	To be borne by the Project Proponent
Trap Camera Camera traps(50 nos) along with battery cost for elephant and other wildlife monitoring	To be borne by the Project Proponent
EPT Creation of Trench along the Railway Track for funnelling elephants to coming crossing point of 2 Km.	To be borne by the Project Proponent
Ramp Construction of Ramp in Joda Section & Barnebari Section	To be borne by the Project Proponent
Erection of Signages To promote coexistence with wildlife and to aware people, good quality sign boards with display of wildlife features should be placed along the Project premises, road etc.	To be borne by the Project Proponent

* Rapid Response Team ; The project proponent shall provide one vehicle with equipments in consultation with DFO, namely Dzo for mid-night duties. The PP will also bear the cost of remuneration of the driver, POL & other incidentals. Further, the PP will also provide one squad of 10 members as Lightly Skilled wage rate.

Principal Chief Conservator of Forests
(Wildlife) & Chief Wildlife Warden

The Signages will be posted at the following sites:-

Sl No.	Piller No.	GPS Co-ordinates	Name of the Site
1	18/5	N 21°53'18.6" E 85°26'04.03"	Jagannathpur
	18/6	N 21°53'16.42" E 85°26'03.86"	
2	20/8	N 21°52'23.77" E 85°26'07.26"	Unchabali
	20/9	N 21°52'22.99" E 85°26'08.63"	
3	21/10	N 21°51'53'.91" E 85°26'06.11"	Unchabali
	21/11	N 21°51'51.29" E 85°26'08.11"	
4	23/1	N 21°51'02.80" E 85°26'08.69"	Jalpapoi
	23/2	N 21°50'0.62" E 85°26'08.33"	
5	25/17	N 21°49'46.55' E 85°26'06.97"	Saradapanka
	25/18	N 21°49'46.16' E 85°26'08.03"	
6	394/23B to 395/28B	N 22.043403 E 85.439008	Bachu Hatting
7	401/57 to 402/16	N 21.986310 E 85.432504	Khuntupani
8	403/67B to 404/21	N 21.980486 E 85.424511	Bansapani (Behera Hatting)
9	405/1 to 405/5	N 21.973835 E 85.426941	Creach Hatting
10	405/67 to 405/75	N 21.967201 E 85.429806	Creach Hatting (Near Village)
11	413/1 to 413/11	N 21.924178 E 85.437279	Bandhubeda (I)
12	414/1 to 414/19	N 21.916968 E 85.435606	Bandhubeda (II)
13	406/57 to 407/25	N 21.963928 E 85.419481	Apahatu

Divisional Forest Officer
Keonjhar Division

TO BE EXECUTED BY THE FOREST DEPARTMENT

(KEONJHAR FOREST DIVISION)

Sl. No.	Particulars	Estimated cost (In lakhs)
1.	Plantation of 5,000 seedlings of Sal, Siali, Ficus spp, Jamun, Banana, Arjun etc along Karo river on urban plantation mode. The cost for 5000 seedlings in urban plantation mode is Rs.29,57,000/-.(cost norm attached)	29.57
2.	2 nos. of Check Dam to be constructedacross Sundra Nala in the buffer area @15.00 lakhs each.	30.00
3.	Engagement of Anti-poaching Squad to assist the regular Forest staff, 10 persons for 5 years. (Vehicle and POL to be borne by the User Agency) @16,36,000/- per year.	81.800
4.	Engagement of Gaja Sathi (@5 nos. in 20 villages) through VSS. @Rs.75,250per yeer per village. Rs.75,250/- x 20 x 5 = Rs.75,25,000/-	75.25
5	Distribution of 100 nos. of Grain Bins @3,500/-	3.50
6	Livelihood generation in peripheral village through VSS especially vermicompost etc.	20.00
7	Construction of Community Grain Bin at Haridajodi and Jamitra villages	40.00
8	Creation of Awareness	5.00
9	Monitoring & evaluation	3.00
	Total 238.55	288.12
10	Escallation of cost 20% and unforeseen. 47.71	57.624
	GRAND TOTAL 286.26	345.744

(Rupees Three Crore forty-five Lakh seventy-four Thousand &four Hundred Only)

Divisional Forest Officer
Keonjhar Division

KEONJHAR FOREST DIVISIONCASH FLOW STATEMENT FOR 5 YEARS

Sl. No	Particulars of Activity	Requirement of Funds in lakhs					
		1st year	2nd year	3rd year	4th year	5th year	Total
1	Plantation of 5,000 seedlings of Sal, Siali, Ficus spp, Jamun, Banana, Arjun etc along Karo river on urban plantation mode. The cost for 5000 seedlings in urban plantation mode is Rs.29,57,000/-.(cost norm attached)	0.6085	1.546	11.547	8.55	7.3385	29.57
2	2 nos. of Check Dam to be constructedacross Sundra Nala in the buffer area @15.00 lakhs each.	30	0	0	0	0	30
3	Engagement of Anti-poaching Squad to assist the regular Forest staff, 10 persons for 5 years. (Vehicle and POL to be borne by the User Agency) @16,36,000/- per year.	16.36	16.36	16.36	16.36	16.36	81.8
4	Engegement of Gaja Sathi (@5 nos. in 20 villages) through VSS. @Rs.75,250 per year per village. Rs.75,250/- x 20 x 5 = Rs.75,25,000/-	15.116	15.116	15.116	15.116	15.116	75.25
5	Distribution of 100 nos. of Grain Bins @3,500/-	3.5	0	0	0	0	3.5
6	Livelihood generation in peripheral village through VSS especially vermicompost etc.	20	0	0	0	0	20
7	Construction of Community Grain Bin at Haridajodi and Jamitra villages etc.	40	0	0	0	0	40
8	Creation of Awareness	1	1	1	1	1	5
9	Monitoring & evaluation	0	0	1.5	0	1.5	3
	Sub-Total	**126.585**	**34.022**	**45.523**	**41.026**	**41.3145**	**288.12**
10	Escallation of cost 20% and unforeseen.	25.3169	6.8044	9.1046	8.2052	8.2629	57.624
	TOTAL	**151.901**	**40.8264**	**54.6276**	**49.2312**	**49.5774**	**345.744**

(Rupees Three Crore forty-five Lakh seventy-four Thousand &four Hundred Only)

Divisional Forest Officer
Keonjhar Division

Financial provision of works in Zone of Influence

Implemented by Bonai Forest Division

Sl. No.	Management Interventions	Area in ha./ Unit in no./ RKM	Unit cost (RS. in Lac.)	Total Amount (Rs. in Lac.)
1	**Protection & Enforcement Activities**			
	(a) Establishment of Portable Highway camp shed at sensitive location (including water supply, solar light system, bedding facilities, boundary/barricading facility etc.)	1 No.	15.00	15.00
	(b)(1) Engagement of 05 Squad members for assisting staff in protection, wildlife monitoring and anti-depredation activities (@Rs.352.00 per Monday)- x 05 members x 12 months x 05 years	5 Nos.	32.00	32.00
	(c) Equipment to monitor elephant movement and to be used in anti depredation activities etc.	LS	30.00	30.00
2	**Wildlife Habitat Management**			
	(a) Habitat enrichment with plantation of Bamboo(preferably through bamboo seed balls)	20 ha.	0.44	8.80
	(b) Provision of creation of new water bodies	01 No.	10.00	10.00
	(c) Construction of Check dam along the nallah	01 No.	15.00	15.00
3	**Human Elephant Conflict Mitigation**			
	(a) Installation of Solar Street lamp/light in elephant affected villages and its maintenance	80 Nos.	0.40	32.00
	(b) Installation of Solar Street lamp/light with early warning system in elephant affected villages and its maintenance	20 Nos.	1.00	20.00
	(c) Deployment of Gaja Saathi on year basis- A participatory approach (05 units of 05 memebers each@Rs.80000/unit/year)	5 Nos.	4.00	20.00

Divisional Forest Officer
Bonai Division

	(d) Provision of distribution of Grain Bins to the household of surrounding villages	300 Nos.	0.05	15.00
	(e) Provision of distribution of torch lights to the household of surrounding villages	500 Nos.	0.03	15.00
	(f) Signage on both side of track/road/railway			
	(f)(1) Signage with speed limit	20 Nos.	0.30	6.00
	(f)(2) Signage with awareness and warning for wildlife	20 Nos.	0.30	6.00
4	**Public support & Awareness**			
	(a) Training and awareness to VSS members, students in educational institution, Village level Volunteers for Wild Life Conservation & Protection	LS	25.00	25.00
	Total			249.80
	20% Escalation			49.96
	Grand Total			299.76

Divisional Forest Officer
Bonai Division

Annual Work Programme:

Details of the flow of funds for different years of the plan for ZoI are given below (Rs. In Lac)

Sl. No.	Management Interventions	Area in ha./Unit in no./ RKM	Total Amount (Rs. In Lac.)	Year wise Financial Target (Rs. In Lac.)				
				1st year	2nd year	3rd year	4th year	5th year
1	**Protection & Enforcement Activities**							
	(a) Establishment of Portable Highway camp shed at sensitive location (including water supply, solar light system, bedding facilities, boundary/barricading facility etc.)	1 No.	15.00	15.00	-	-	-	-
	(b)(1) Engagement of 05 Squad members for assisting staff in protection, wildlife monitoring and anti-depredation activities (@Rs.352.00 per Manday)- x 05 members x 12 months x 05 years	5 Nos.	32.00	6.40	6.40	6.40	6.40	6.40
	(c) Equipment to monitor elephant movement and to be used in anti depredation activities etc.	LS	30.00	6.00	6.00	6.00	6.00	6.00
2	**Wildlife Habitat Management**							
	(a) Habitat enrichment with plantation of Bamboo(preferably through bamboo seed balls)	20 ha.	8.80	8.80	-	-	-	-
	(b) Provision of creation of new water bodies	01 No.	10.00	10.00	-	-	-	-
	(c) Construction of Check dam along the nallah	01 No.	15.00	15.00	-	-	-	-
3	**Human Elephant Conflict Mitigation**							
	(a) Installation of Solar Street lamp/light in elephant affected villages and its maintenance	80 Nos.	32.00	6.40	6.40	6.40	6.40	6.40
	(b) Installation of Solar Street lamp/light with early warning system in elephant affected villages and its maintenance	20 Nos.	20.00	10.00	10.00	-	-	-

	(c) Deployment of Gaja Saathi on year basis- A participatory approach (05 units of 05 members each@Rs.80000/unit/year)	5 Nos.	20.00	4.00	4.00	4.00	4.00	4.00
	(d) Provision of distribution of Grain Bins to the household of surrounding villages	300 Nos.	15.00	3.00	3.00	3.00	3.00	3.00
	(e) Provision of distribution of torch lights to the household of surrounding villages	500 Nos.	15.00	3.00	3.00	3.00	3.00	3.00
	(f) Signage on both side of track/road/railway							
	(f)(1) Signage with speed limit	20 Nos.	6.00	3.00	3.00	-	-	-
	(f)(2) Signage with awareness and warning for wildlife	20 Nos.	6.00	3.00	3.00	-	-	-
4	**Public support & Awareness**							
	(a) Training and awareness to VSS members, students in educational institution, Village level Volunteers for Wild Life Conservation & Protection	LS	25.00	10.00	10.00	5.00	-	-
	Total		**249.80**	**103.60**	**54.80**	**33.80**	**28.80**	**28.80**
	20% Escalation		**49.96**	**20.72**	**10.96**	**6.76**	**5.76**	**5.76**
	Grand Total		**299.76**	**124.32**	**65.76**	**40.56**	**34.56**	**34.56**

Divisional Forest Officer
Bonai Division

ABSTRACT OF COST		
SL NO	DIVISION	TOTAL AMOUNT IN LAKHS
1	KEONJHAR	345.744 286.26
2	BONAI	299.76 205.20
	TOTAL AMOUNT IN LAKHS	645.504 491.46

(Rupees Six Crore Forty-Five lakhs Fifty Thousand Four hundred only)
Rupees four crore ninety one lakh forty six thousand only

Divisional Forest Officer
Keonjhar Division

Approved

Countersigned
2/4/2023
Regional Chief Conservator of Forests
Rourkela Circle, Rourkela

Principal Chief Conservator of Forests
(Wildlife) & Chief Wildlife Warden
Odisha, Bhubaneswar

PROJECT IMPACT AREA

CHAPTER- VII

Maps and Annexures- A topo sheet map 1:50000 scale showing project area , Impact area, location of underpass/overpass, movement of mega fauna, location of nearby Protected Areas, Wildlife Corridors etc need to be enclosed. In case of overlap of impact area with other projects an additional map showing location of existing project and its impact area and location of new project and its impact area shall be enclosed. Copy of Stage-I clearance and Environmental Clearance shall be annexed.

MAPS & PLATES ENCLOSED

Sl. No.	Particulars	Plate No.
1	Topo Map showing Location of Project Area, Normal Impact Area, other projects within the normal impact areaand Extended Impact Area	PLATE NO-1
2	Location of the project area with reference to WL Sanctuaries, National Parks, Elephant Reserves and Elephant corridors	PLATE NO-2

APPENDICES:

Annexure-I: Copy of Letter No.2260/SEIAA, Dt.19.08.2021 of State level Environment Impact Assessment Authority, Odisha, Bhubaneswar.

Annexure-II: Copy of Letter No. 8991/6F-Mining-57/2020, Dated, 03rd August, 2023, of the Divisional Forest Officer, Keonjhar Forest Division requiring to revisit the Site Specific wildlife Conservation Plan.

Annexure-III :Copy ofCost Norm for Urban Plantation.

Annexure-IV: Letter No.3957 dated 28.04.2022 of Government of Odisha Steel & Mines Department.

Annexure-V: (Series) :Map showing Location of man –animal conflict ,and movement of Mega wild animals and other details.

Annexure-I

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY
ODISHA, BHUBANESWAR

(Constituted under the EP Act 1986 and EIA Notification, 2006 by the MoEF & CC, Govt. of India)
NISE-2/1, Unit IX, Bhubaneswar-751022, Tel: 0674-2541029, E-mail: seiaaodisha@gmail.com

Letter No. 2260/SEIAA Dt. 19.08.2021

SEIAA File No: 55644/46-NCMB1/02-2021

To

Sri Samarendra Mohanty, (GM),
M/s Dalpahar Iron and Manganese Ore Mines of Sri D.C. Jain,
Dharam Villa, 12-A, Mahatma Gandhi Marg, (Ring Road),
Dist-Keonjhar, Pin-758035

Sub: Proposal of Environmental Clearance for Dalpahar Iron and Manganese Ore Mines for Enhancement in Production Capacity of Iron Ore from 708 TPA to 0.31 MTPA and Manganese Ore 0.094 MTPA over a mining lease area of 89.961 Ha. in Village - Dalpahar, Tahasil- Barbil, District-Keonjhar of M/s Dalpahar Iron and Manganese Ore Mines of Sri D.C. Jain - Environmental Clearance reg.

Ref: Your online application dated 13.02.2021 for issue of EC vide File No: SIA/OR/MIN/55644/2007.

Sir,

This has reference to your online application seeking environmental clearance of the mining proposal for Dalpahar Iron and Manganese Ore Mines for enhancement in production capacity of iron ore from 708 TPA to 0.31 MTPA and manganese ore 0.094 MTPA over a mining lease area of 89.961Ha in Village - Dalpahar, Tahasil- Barbil, District – Keonjhar. The proposal falls in the category 1(a) in the schedule of EIA Notification, 2006 as amended from time to time. The proposal has been appraised on the basis of the documents enclosed with the application, such as form-1, form-2, prefeasibility report, approved mining plan, final EIA /EMP, report of public hearing proceedings, and clarifications furnished to SEIAA /SEAC in response to their observations.

The Project Proposal in nutshell:

1. The proposal is for Environmental Clearance of Dalpahar Iron and Manganese ore mines of Shri D C. Jain for enhancement in production capacity of iron ore upto 0.31 MTPA and Manganese Ore upto 0.094 MTPA along with crushing and

screening plant over an area of 89.961 Ha in Baitarani R.F., Champua Sub Division, Tahasil- Barbil, District-Keonjhar, Odisha.

2. This expansion project falls under category B as per MoEF&CC, Govt. of India notification in this respect, because of mining lease being less than 100 Ha.

3. The project proponent has informed to SEAC, Odisha that earlier ToR for production of Iron ore 0.31 MTPA and Manganese ore 0.094 MTPA along with crushing & screening plant was granted by MoEF&CC, Govt. of India on 23.09.2008. Public hearing for the proposal was held on 26.08.2011 Final EIA/EMP was submitted to MoEF & CC, Govt. of India vide letter dated 05.03.2012., and the proposal was appraised and recommended by the EAC in its meeting held on 20th to 22nd June 2012.

4. The project proponent has informed that the grant of EC was held for policy decision on NEERI carrying capacity study report. Post policy decision on the above, the project proponent appraised the proposal before MoEF&CC, Govt. of India vide its letter dated 19.01.2018, However, MoEF & CC, Govt. of India sought for additional information for compliance vide its letter dated 15th May 2018. The points raised by MoEF & CC, Govt. of India and its compliance submitted by Project Proponent to SEIAA/SEAC as its fall under category B (as per the MoEF & CC, Govt. of India EIA notification dated 14.09.2018 i.e. ≤ 100 Ha mining proposal are considered at respective SEIAA/SEAC) is as follows:

i. Letter from the State Govt. of Odisha w.r.t. validity and veracity of the mine lease.

- PP submitted that the mining lease of Dalpahar area i.e. 101.171 Ha comprises of 5 blocks i.e. Block No. A (89.961Ha), B1 (0.607 Ha), B2 (7.689 Ha), B3 (1.012 Ha) & C (1.902 Ha). The said blocks were granted over 101.171 Ha vide letter No. III (A)MG.101/846179 dated 05.08.1984 by Govt. of Orissa whereas each blocks as above were executed separately on 09.08.1986 for 20 years.

- Further, State Govt. has declared all the blocks as lapsed u/s 4A of the MMDR Act, 1957. Whereas, Block A (89.961 Ha) got lapsed vide his letter No. 3882/III(A)AM-07/2012/SM. Bhubaneswar dated 01.05.2015.

- Whereas, as per the direction of Hon'ble High Court of Orissa and further hearing at Steel & Mines dept., Govt. of Odisha passed the order vide no.6610/ IV (AB) SM-11/2015/S&M, Bhubaneswar dated 06.09.2019 "xxxxxxx pleased to decided not to declare and record the Iron & Mn mining lease of Late D C Jain (power of attorney Sri Avin Jain) over an area of 89.961 Ha (Block-A) of Keonjhar district as lapsed" xxxxxxxxxx.

- As per the section 8 A (3) of MMDR (Amendment) Act, 2015 the validity of the lease period of 89.961 Ha (Block A) is deemed to be extended up to 08.06.2036.

- Since the lease area is confined to 89.961 Ha, so as per the MoEF&CC notification dated 14th August 2018 Lessee has submitted the compliance to SEIAA/SEAC, Odisha.

ii. Validity and veracity of Forest clearance dated 01.04.2015 from the FC division of the Ministry and status of deposition of NPV.

- Further, Project Proponent has informed that 18.484 Ha of broken up forest land (out of 101.171 Ha) was granted by MoEF&CC, Govt. of India vide letter F.No.8-103/2000-FC dated 14.09.2005 under Section-2 of FC Act earlier during the original lease period. Out of this broken up diverted area, 10.584Ha is coming within the Block – A, i.e. within 89.961Ha. NPV for the entire lease area i.e. Rs 9,49,99,599/-has been paid. The Project Proponent stated that, As per circular/guideline of MoEF&CC, Govt. of India vide letter No.11-51/2015-FC, dated. 01.04.2015 the above forest clearance is valid till the expiry of lease i.e., up to 8th June 2036.
- For the balance forest area, general approval accorded under section 2(iii), FC act 1980 as per the MoEF&CC, Govt. of India guidelines dated 1st April 2015.
- Further, for the balance forest area, Forest diversion proposal applied under section 2(ii), FC act 1980 which is under process at MoEF&CC, Govt. of India.
- In recent past EAC/SEAC has recommended the Environmental Clearances to the project having part forest clearance under section 2 (ii) of FC Act, 1980 as per the above guideline. (Ex- Rolda II iron ore Mines of K.N. Ram)

iii. Validity of Mining Plan/Scheme.

- Project Proponent submitted that, Review of Mining plan with progressive mine closure plan (PMCP) over an area of 89.961 Ha (block A) got approved by IBM vide letter No. RMP/A/53-ORI/BHU/2019-20 dated 01.04.2020.

5. With the above compliance, the project proponent has submitted the revised EIA/EMP with latest baseline data (October 2019-December 2019) along with compliance of NEERI recommendations at SEIAA and presented the proposal before SEAC on 13th November 2020.
6. Further, the validity of the Public Hearing (held on 26th August 2011) is concerned; since it is not older than 3 years at the time of submission of proposal (5th March 2012) for grant of Environmental Clearance as per OM dated 29th August 2017.
7. There are instances of the MoEF&CC, Govt. of India EAC exempting public hearing as it was already conducted earlier (Sl. No. 2.44 of EAC minutes held on 15th-16th November 2018). Besides, the Expert Appraisal Committee, Non-Coal Mining in its Minutes of the Meeting held during April 20-21 2020 mentioned the criteria for exemption of Public Hearing i.e.

   i. The project must have undergone a public hearing under EIA Notification, as part of its appraisal earlier for the same capacity and ML area, during life of the project;

   ii. The present proposal shall be with 'No increase in the production capacity and Mining lease;' and

iii. No change in mining namely, mining method, mining plan, mineral transportation, water requirement, reclamation plan.

iv. The Proposal shall not be a violation case.

8. The present proposal has undergone public hearing under EIA notification 2006 for 0.31 MTPA iron ore and 0.094 MTPA Manganese Ore along with crushing and screening plant. There is no increase in production capacity, lease area, mining method, plan for mining, transportation, water requirement. Also the proposal is not a violation case as certified by the DDM, Joda vide its letter dated 12.11.2020.

9. Further, Inline to the above the clarifications on requirement of public hearing has brought out by MoEF&CC, Govt. of India vide OM dated 12th November 2020.

10. Project Proponent submitted that, in pursuance of the Supreme Court order dated 02.08.2017 in CWP no. 114/2014, there is no such demand raised by the DDM, Joda as there was no excess production and the mining operation has been discontinued since August 1995 vide its letter dated 12th November 2020.The details of the past production duly authenticated by DDM, Joda vide its letter dated 05.11.2020 has been furnished.

11. The SEAC, Odisha recommended for specific ToR for this project and SEIAA, Odisha issued ToR vide letter no. 20/SEIAA dated 15.01.2021 for undertaking detailed EIA Study for the project.

12. Project Proponent submitted that, the mine lease area is within latitude 21° 58' 05" - 21° 58' 43" N and Longitude 85°23' 30.47" - 85° 23' 33.77" E. The highest contour within the lease hold area is 723m MSL, which is along the south eastern portion of the lease area while the lowest contour being 553m a MSL in the SW corner of the lease area. NH 215 at a distance of 6.9 kms (W) from the project area. Jaroli railway station exists at 2.7 Km (SE), Banapani is at 3.5KM (NE). Water bodies like Baitarani River is flowing at 4.6 kms from the lease area in eastern side, Suna Nadi- 0.8km (NW), Daiko Nala-3.0 (NE). Entire lease area lies in Baitarani R.F. Other forests area like Sidhamath R.F–West is at 2.1Kms and Chamakpur R.F is at 5.1(E). Karo-Karampada elephant corridor is located at about 16 km from the mine lease area.

13. Project Proponent submitted that, Elephant, Sloth bear and Monitor Lizard are placed under Schedule-I as per Wild Life (Protection) Act, 1972 is found in the Study area. Site specific conservation plan has been prepared and approved by the PCCF (WL) and Chief Wildlife Warden, Odisha vide Memo No. 9070/1WL (C) SSP-44/2014, dated 27th November 2014 with an estimated cost of Rs. 250.254 lakhs which includes Rs.64.374 Lakhs for activities within the project area and Rs.185.520 Lakhs for activities within the project impact area.

14. Project Proponent submitted that, as per the approved mining plan geological resource estimated as 3.80 Million Ton of iron ore & 0.420 Million Ton Mn. Mining method will be other than Fully mechanized. One 100 TPH mobile crushing and one 200 TPH mobile screening unit will be used for sizing of minerals. It has been calculated that a quantity of 553012.8 cum of waste shall be generated from both iron and manganese ore zone during conceptual period. All the waste shall be

utilized for back filling at the end of the mine life. Life of the mine is 12 years as per the present exploration data. Further likely to increase after detail exploration.

15. Project Proponent submitted that, height & width of the bench will be kept at 10m & more than 10m for iron ore zone. Height & width of the bench will be kept at 6 & 10m and 9 & more than 10m in manganese ore zone. Ultimate pit slope will be 37°. NOC from CGWA for 95 m3/day is under process. Manpower is 82 persons on direct basis and more than 100 people on indirect basis. Project cost is Rs 49 crores. Further, PP mentioned that in the post mining stage, out of the total mined out area of 61.648Ha, an area of 4.79Ha will be reclaimed by means of backfilling and plantation. Plantation on dead benches will be carried out over remaining mining area. A total of 89.096Ha (99.03% of the total lease area) will be covered under vegetation in the post mining stage.
16. Project Proponent informed that, the entire mining lease area falls within the Baitarani Reserve Forest. There is no habitation inside the mine lease area. Hence, the question of rehabilitation and resettlement does not arise.
17. Project Proponent has also submitted the Baseline data for the revised EIA/EMP which was carried out systematically and meticulously as per relevant IS codes, CPCB & MoEF&CC guidelines during Post monsoon Season (Oct 2019 – Dec 2019).The existing Ambient Air Quality levels for PM_{10}, $PM_{2.5}$, SO_2 and NO_2 are within the prescribed limits. CO values in the all locations were found to be below detectable limit (DL – 1144 µg/m3). Silica values in the study area are found to be below detectable limit (Detection limit – 0.05mg/m3). The water quality of the collected ground water samples were found to be within the prescribed permissible limits of IS: 10500:2012 Norms for Drinking in the absence of an alternative source. Noise measurements were carried out continuously for a day once in a Season at 8 locations. While comparing with the MoEF & CC Norms, the monitored ambient noise levels are within the limit values. Soil samples were collected from 5 locations to assess the soil quality in and around the mines. Results of the soil samples show that, in the buffer zone, the pH values were ranging between 6.99 – 8.54 and Electrical Conductivity values were ranging between 13.8 – 39.7µmhos/cm. Soils are clay type. In the core zone, pH values were 8.23 and Electrical Conductivity values were 15.2 µmhos/cm. Soils are generally Clay Loam type.
18. Project Proponent submitted that, the resultant added concentrations with baseline figures for PM_{10}, $PM_{2.5}$, after adopting necessary mitigative measures are within the prescribed NAAQ limits of 100, 60 µg/m³ for PM_{10}, $PM_{2.5}$, respectively. For preservation of environment in this mine strict enforcement of management schemes and regular air quality monitoring will be undertaken for taking corrective actions, as needed. By adopting the effective implementation of all the mitigative measures, no adverse impact on Air quality due to the enhanced mining operation in this lease area is expected.
19. Project Proponent submitted that, ground water table is at a depth of more than 500 m RL and mining will be carried out for a maximum 520mRL. Hence, there will be no intersection of ground water table. The rain water falling in the quarry will be

harvested in the sump at the lowest level of the quarry. This sump will act as a settling pond to prevent solids escaping along with discharge, before outlet etc.

20. Project Proponent submitted that, Rs. 70 lakhs has been allocated for various social welfare activities under their CER and CSR programmes for the upcoming 5 years. These activities will be implemented in a time bound manner.
21. Project Proponent also submitted the public hearing point wise compliance with budgetary provision. They have committed to comply the all once mine will come into operation.
22. Project Proponent committed to work towards 'Zero Harm' from their mining activities and carry out Health Risk Assessment (HRA) for identification of workplace hazards and assess their potential risks to health and determine appropriate control measures to protect the health and wellbeing of workers and nearby community. In order to prevent from the Health Hazard, various protection measures like adopting dust sprinkling, development of plantation / green belt, etc. has been proposed to reduce pollution, providing safety / PPE to workers, conducting IME, PME, covering various statutory medical examination, conducting regular awareness training programme, etc., will be provided. A total budgetary provision of Rs. 4.00 lakhs per annum under capital cost and Rs.2.00 lakhs is allocated under recurring cost towards Occupational health and Safety Budget.
23. Project Proponent submitted that, a financial provision of Rs.134 Lakhs is made for various environmental control measures proposed in the report under capital cost and Rs. 55.3 Lakhs per annum is allocated as the recurring cost.
24. Lessee has undertaken that "they will follow the guidelines/policy decision by the MoEF&CC, Govt. of India and State Govt. Odisha in regard to the implementation of the recommendations given by NEERI in its carrying capacity study report in respect to Odisha".
25. The Environment consultant M/s Creative Engineers and Consultants, Chennai along with the proponent has made a presentation on the proposal before the Committee on 28.04.2021.
26. The project proponent furnished additional information / documents on the project to SEAC for necessary compliance to clarification raised by SEAC on 07.06.2021.
27. The SEAC considered the proposal for EC on 28.06.2021 and recommended for grant of Environmental Clearance for the project stipulating various conditions and following additional condition.

    "The Mining activity shall be restricted to 10.564 Ha (diverted land) for which forest clearance has been obtained. Mining activity over the rest of the lease area shall be taken only after obtaining forest clearance for the same".

The State Environment Impact Assessment Authority (SEIAA) after considering the proposal and recommendations of SEAC, Odisha hereby accords Environmental Clearance in favour of the project under the provisions of EIA Notification 2006 and subsequent amendments thereto subject to strict compliance of all stipulated conditions, as follows. Detailed compliance report of these conditions is mandatorily to be submitted

by the project proponent to SEIAA at half yearly intervals by 1st June and 1st December each year

Stipulated Conditions:

Part 'A' : Specific Conditions of Clearance: -

i) This Environmental Clearance is granted with a Condition that "the Mining activity shall be restricted to 10.594 Ha (diverted land) for which forest clearance has been obtained. Mining activity over the rest of the lease area shall be taken only after obtaining forest clearance for the same

ii) Additional air quality monitoring station shall be installed at entry and exit of mines and haulage road, buffer zone and schools and habitations

iii) The mine shall implement the Pollution Control Measures and safeguards as proposed in the Environment Management Plan (EMP) of Environment Impact Assessment (EIA) report

iv) The proponent shall install STP of adequate capacity for treatment of domestic waste water and treated water shall be reused.

v) The proponent shall obtain permission from appropriate authority including WR Deptt, Govt. of Odisha for drawl of ground water.

vi) Adequate mitigation measures shall be taken for dust suppression, environment protection in catchment area

vii) The proponent shall carryout periodical health check-up of employees due to Occupational Health Hazards by occupational health expert, at least once in six months, both for employees as well as people of neighbouring habitation.

viii) The transportation of mineral shall be carried out through the covered trucks. Vehicular emissions shall be kept under control and regularly monitored. The vehicles carrying the mineral shall not be overloaded.

ix) Mineral handling area shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.

x) Garland drains with appropriate size, gradient and length shall be constructed to arrest silt and sediment flows from ore dumps and directly into the water bodies. The water so collected shall be utilized for watering the roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly.

xi) Public Hearing for the project was conducted on 25th August 2011. The proponent shall comply with all the commitments made to the issues raised by the Public during the public hearing.

xii) The proponent shall comply to the NEERI recommendations.

xiii) The mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.

Part 'B' : Standard Conditions:

(I) Statutory compliance:

(i) This Environmental Clearance (EC) is subject to orders/ judgment of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other Court of Law, Common Cause Conditions as may be applicable.

(ii) The Project proponent complies with all the statutory requirements and judgment of Hon'ble Supreme Court dated 2nd August,2017 in Writ Petition (Civil) No. 114 of 2014 in matter of Common Cause versus Union of India & Ors before commencing the mining operations.

(iii) The State Government concerned shall ensure that mining operation shall not be commenced till the entire compensation levied, if any, for illegal mining paid by the Project Proponent through their respective Department of Mining & Geology in strict compliance of Judgment of Hon'ble Supreme Court dated 2nd August, 2017 in Writ Petition (Civil) No. 114 of 2014 in matter of Common Cause versus Union of India & Ors.

(iv) This Environmental Clearance shall become operational only after receiving formal NBWL Clearance from MoEF & CC subsequent to the recommendations of the Standing Committee of National Board for Wildlife, if applicable to the Project.

(v) This Environmental Clearance shall become operational only after receiving formal Forest Clearance (FC) under the provision of Forest Conservation Act, 1980 and subsequent amendments thereto, as applicable for the project.

(vi) Project Proponent (PP) shall obtain Consent to Operate after grant of EC and effectively implement all the conditions stipulated therein. The mining activity shall not commence prior to obtaining Consent to Establish / Consent to Operate from the concerned State Pollution Control Board.

(vii) The PP shall adhere to the provision of the Mines Act, 1952, Mines and Mineral (Development & Regulation), Act, 2015 and rules & regulations made there under. PP shall adhere to various circulars issued by Directorate General Mines Safety (DGMS) and Indian Bureau of Mines from time to time.

(viii) The Project Proponent shall obtain consents from all the concerned land owners, before start of mining operations, as per the provisions of MMDR Act, 1957 and rules made there under in respect of lands which are not owned by it.

(ix) The Project Proponent shall follow the mitigation measures provided in MoEF & CC's Office Memorandum No. Z-11013/57/2014-IA.II (M), dated 29th October, 2014, titled "Impact of mining activities on Habitations-Issues related to the mining Projects wherein Habitations and villages are the part of mine lease areas or Habitations and villages are surrounded by the mine lease area".

(x) The Project Proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of surface water and from CGWA for withdrawal of groundwater for the project.

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

(xii) State Pollution Control Board shall be responsible for display of this EC letter at its Regional Office, District Industries Centre and Collector's office/ Tehsildar's Office for 30 days.

(xiii) The Project Authorities should widely advertise about the grant of this EC letter by printing the same in at least two local newspapers, one of which shall be in vernacular language of the concerned area. The advertisement shall be done within 7 days of the issue of the clearance letter mentioning that the instant project has been accorded EC and copy of the EC letter is available with the State Pollution Control Board and web site of the Ministry of Environment, Forest and Climate Change (www.environmentclearance.nic.in). A copy of the advertisement may be forwarded to the concerned MoEF & CC Regional Office for compliance and record.

(xiv) The Project Proponent shall inform the MoEF & CC/SEIAA, Odisha for any change in ownership of the mining lease. In case there is any change in ownership or mining lease is transferred than mining operation shall only be carried out after transfer of EC as per provisions of the para 11 of EIA Notification, 2006 as amended from time to time.

(II) Air quality monitoring and preservation:

(i) The Project Proponent shall install a minimum of 3 (three) online Ambient Air Quality Monitoring Stations with 1 (one) in upwind and 2 (two) in downwind direction based on long term climatological data about wind direction such that an angle of 120° is made between the monitoring locations to monitor critical parameters, relevant for mining operations, of air pollution viz. PM_{10}, $PM_{2.5}$, NO_2, CO and SO_2 etc. as per the methodology mentioned in NAAQS Notification No. B-29016/20/90/PCM, dated 18.11.2009 covering the aspects of transportation and use of heavy machinery in the impact zone. The ambient air quality shall also be monitored at prominent places like office building, canteen etc. as per the site condition to ascertain the exposure characteristics at specific places. The above data shall be digitally displayed within 03 months in front of the main Gate of the mine site.

(ii) Effective safeguard measures for prevention of dust generation and subsequent suppression (like regular water sprinkling, metalled road construction etc.) shall be carried out in areas prone to air pollution wherein high levels of PM_{10} and $PM_{2.5}$ are evident such as haul road, loading and unloading point and transfer points. The Fugitive dust emissions from all sources shall be regularly controlled by installation of required equipments/ machineries and preventive maintenance. Use of suitable water-soluble chemical dust suppressing agents may be explored for better effectiveness of dust control system. It shall be ensured that air pollution level conform to the standards prescribed by the MoEF&CC/ Central Pollution Control Board.

(III) Water quality monitoring and preservation:

(i) In case, immediate mining scheme envisages intersection of ground water table, then Environmental Clearance shall become operational only after receiving formal clearance from CGWA. In case, mining operation involves intersection of ground water table at a later stage, then PP shall ensure that prior approval from CGWA and

MoEF&CC is in place before such mining operations. The permission for intersection of ground water table shall essentially be based on detailed hydro-geological study of the area.

(ii) Regular monitoring of the flow rate of the springs and perennial nallahs flowing in and around the mine lease shall be carried out and records maintain. The natural water bodies and or streams which are flowing in an around the village, should not be disturbed. The Water Table should be nurtured so as not to go down below the pre-mining period. In case of any water scarcity in the area, the Project Proponent has to provide water to the villagers for their use. A provision for regular monitoring of water table in open dug well located in village should be incorporated to ascertain the impact of mining over ground water table. The Report on changes in Ground water level and quality shall be submitted on six-monthly basis to the Regional Office of the Ministry, CGWA and State Groundwater Department / State Pollution Control Board.

(iii) Project Proponent shall regularly monitor and maintain records w.r.t. ground water level and quality in and around the mine lease by establishing a network of existing wells as well as new piezo-meter installations during the mining operation in consultation with Central Ground Water Authority/ State Ground Water Department. The Report on changes in Ground water level and quality shall be submitted on six-monthly basis to the Regional Office of the Ministry, CGWA and State Groundwater Department / State Pollution Control Board.

(iv) The Project Proponent shall undertake regular monitoring of natural water course/ water resources/ springs and perennial nallahs existing/ flowing in and around the mine lease and maintain its records. The project proponent shall undertake regular monitoring of water quality upstream and downstream of water bodies passing within and nearby/ adjacent to the mine lease and maintain its records. Sufficient number of gullies shall be provided at appropriate places within the lease for management of water. PP shall carryout regular monitoring w.r.t. pH and included the same in monitoring plan. The parameters to be monitored shall include their water quality vis-a-vis suitability for usage as per CPCB criteria and flow rate. It shall be ensured that no obstruction and/ or alteration be made to water bodies during mining operations without justification and prior approval of MoEF&CC / SEIAA, Odisha. The monitoring of water courses/ bodies existing in lease area shall be carried out four times in a year viz. pre- monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the record of monitored data be sent regularly to Ministry of Environment, Forest and Climate Change and its Regional Office, SEIAA, Odisha, Central Ground Water Authority and Regional Director, Central Ground Water Board, State Pollution Control Board and Central Pollution Control Board. Clearly showing the trend analysis on six-monthly basis.

(v) Quality of polluted water generated from mining operations which include Chemical Oxygen Demand (COD) in mines run-off, acid mine drainage and metal contamination in runoff shall be monitored along with Total Suspended Solids (TDS), Dissolved Oxygen (DO), pH and Total Suspended Solids (TSS). The monitored data shall be uploaded on the website of the company as well as displayed at the project site in public domain, on a display board, at a suitable location near the main gate of

the Company. The circular No. J 20012/1 /2006-IA,II (M) dated 27.05.2009 issued by Ministry of Environment, Forest and Climate Change may also be referred in this regard.

(vi) The project proponent shall construct retaining wall and settling pond within the lease area. Further, check dams shall be constructed at strategic locations in which rain water passes in rainy season. Finally the excess superannuated after sedimentation shall be allowed to spill away through stone pitch structure to the nearby valley.

(vii) De-silting of agricultural lands in buffer zone and beyond including nearby Nalas/rivers perennially periodically and perpetually caused due to wash up of minerals/OB/dumps shall be done as per SOP submitted. A legal affidavit shall be submitted within 6 months from the date of issue of Environmental Clearance to this effect with periodicity of de-silting.

(viii) Detail design of the existing retaining wall and the proposed for the expansion from a chartered Civil Engineer shall be submitted within 6 months from the date of issue of Environmental Clearance to ensure that no silt after wash up is escaped from the core / buffer zone of the mines.

(ix) Project Proponent shall plan, develop and implement rainwater harvesting measures on long term basis to augment ground water resources in the area in consultation with Central Ground Water Board/ State Groundwater Department. A report on amount of water recharged needs to be submitted to Regional Office, MoEF&CC annually.

(x) Industrial waste water (workshop and waste water from the mine) should be properly collected and treated in an ETP as proposed so as to conform to the notified standards prescribed from time to time. The standards shall be prescribed through Consent to Operate (CTO) issued by concerned State Pollution Control Board (SPCB). The workshop effluent shall be treated after its initial passage through Oil and grease trap.

(xi) The water balance/water auditing shall be carried out and measure for reducing the consumption of water shall be taken up and reported to the Regional Office of the MoEF & CC and State Pollution Control Board.

(IV) <u>Noise and vibration monitoring and prevention:</u>

(i) The peak particle velocity at 500m distance or within the nearest habitation, whichever is closer shall be monitored periodically as per applicable DGMS guidelines.

(ii) The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right for darkness and minimal noise levels at night. PPs must ensure that the biological clock of the villages is not disturbed; by orienting the floodlights/ masks away from the villagers and keeping the noise levels well within the prescribed limits for day /night hours.

(iii) The Project Proponent shall take measures for control of noise levels below 85 dBA in the work environment. The worker engaged in operations of HEMM, etc. should be provided with ear plugs /muffs. All personnel including laborers working in dusty

areas shall be provided with protective respiratory devices along with adequate training, awareness and information on safety and health aspects. The PP shall be held responsible in case it has been found that workers/ personals/ laborers are working without personal protective equipment.

(V) Mining Plan:

(i) The Project Proponent shall adhere to the working parameters of mining plan which was submitted at the time of EC appraisal wherein year-wise plan was mentioned for total excavation i.e. quantum of mineral, waste, over burden, inter burden and top soil etc.. No change in basic mining proposal like mining technology, total excavation, mineral & waste production, lease area and scope of working (viz. method of mining, overburden & dump management, O.B & dump mining, mineral transportation mode, ultimate depth of mining etc.) shall not be carried out without prior approval of the Ministry of Environment, Forest and Climate Change, which entail adverse environmental impacts, even if it is a part of approved mining plan modified after grant of EC or granted by State Govt. in the form to Short Term Permit (STP), Query license or any other name.

(ii) The Project Proponent shall get the Final Mine Closure Plan along with Financial Assurance approved from Indian Bureau of Mines/Department of Mining & Geology as required under the Provision of the MMDR Act, 1957 and Rules/ Guidelines made there under. A copy of approved final mine closure plan shall be submitted within 2 months of the approval of the same from the competent authority to the concerned Regional Office of the Ministry of Environment, Forest and Climate Change for record and verification.

(iii) The land-use of the mine lease area at various stages of mining scheme as well as at the end-of-life shall be governed as per the approved Mining Plan. The excavation vis-a-vis backfilling in the mine lease area and corresponding afforestation to be raised in the reclaimed area shall be governed as per approved mining plan. PP shall ensure the monitoring and management of rehabilitated areas until the vegetation becomes self-sustaining. The compliance status shall be submitted half-yearly to the MoEF & CC and its concerned Regional Office / SEIAA, Odisha.

(VI) Land reclamation:

(i) The Overburden (O.B.) generated during the mining operations shall be stacked at earmarked OB dump site(s) only and it should not be kept active for a long period of time. The physical parameters of the OB dumps like height, width and angle of slope shall be governed as per the approved Mining Plan as per the guidelines/circulars issued by D.G.M.S w.r.t. safety in mining operations shall be strictly adhered to maintain the stability of top soil/OB dumps. The topsoil shall be used for land reclamation and plantation.

(ii) The reject/waste generated during the mining operations shall be stacked at earmarked waste dump site(s) only. The physical parameters of the waste dumps like height, width and angle of slope shall be governed as per the approved Mining Plan as per the guidelines/circulars issued by DGMS w.r.t. safety in mining operations

shall be strictly adhered to maintain the stability of waste dumps

(iii) The reclamation of waste dump sites shall be done in scientific manner as per the Approved Mining Plan cum Progressive Mine Closure Plan.

(iv) The slope of dumps shall be vegetated in scientific manner with suitable native species to maintain the slope stability, prevent erosion and surface run off. The selection of local species regulates local climatic parameters and help in adaptation of plant species to the microclimate. The gullies formed on slopes should be adequately taken care of as it impacts the overall stability of dumps. The dump mass should be consolidated with the help of dozer/ compactors thereby ensuring proper filling/ leveling of dump mass. In critical areas, use of geo textiles/ geo-membranes / clay liners / Bentonite etc. shall be undertaken for stabilization of the dump.

(v) The Project Proponent shall carry out slope stability study in case the dump height is more than 30 meters. The slope stability report shall be submitted to concerned regional office of MoEF & CC, Govt. of India, Bhubaneswar as well as SEIAA, Odisha.

(vi) Catch drains, settling tanks and siltation ponds of appropriate size shall be constructed around the mine working, mineral yards and topsoil / OB / waste dumps to prevent runoff of water and flow of sediments directly into the water bodies (Nallah/ River/ Pond etc.). The collected water should be utilized for watering the mine area, roads, green belt development, plantation etc The drains/ sedimentation sumps etc. shall be de-silted regularly, particularly after monsoon season, and maintained properly.

(vii) Check dams of appropriate size, gradient and length shall be constructed around mine pit and OB dumps to prevent storm run-off and sediment flow into adjoining water bodies. A safety margin of 50% shall be kept for designing of sump structures over and above peak rainfall (based on 50 years data) and maximum discharge in the mine and its adjoining area which shall also help in providing adequate retention time period thereby allowing proper settling of sediments/ silt material. The sedimentation pits/ sumps shall be constructed at the corners of the garland drains.

(viii) The top soil, if any, shall temporarily be stored at earmarked site(s) within the mine lease only and should not be kept unutilized for long. The physical parameters of the top soil dumps like height, width and angle of slope shall be governed as per the approved Mining Plan and as per the guidelines framed by DGMS w.r.t. safety in mining operations shall be strictly adhered to maintain the stability of dumps. The topsoil shall be used for land reclamation and plantation purpose.

(ix) The mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.

(VII) <u>Transportation:</u>

(i) No Transportation of the minerals shall be allowed in case of roads passing through transportation of the minerals leaving an adequate gap (say at least 200 meters) so that the adverse impact of sound and dust along with chances of accidents could be

mitigated. All costs resulting from widening and strengthening of existing public road network shall be borne by the PP in consultation with nodal State Govt. Department Transportation of minerals through road movement in case of existing village/ rural roads shall be allowed in consultation with nodal State Govt. Department only after required strengthening such that the carrying capacity of roads is increased to handle the traffic load. The pollution due to transportation load on the environment will be effectively controlled and water sprinkling will also be done regularly. Vehicular emissions shall be kept under control and regularly monitored. Project should obtain Pollution Under Control (PUC) certificate for all the vehicles from authorized pollution testing centers.

(ii) The Main haulage road within the mine lease should be provided with a permanent water arrangement for dust suppression. Other roads within the mine lease should be wetted regularly with tanker-mounted water sprinkling system. The other areas of dust generation like crushing zone, material transfer points, material yards etc. should invariably be provided with dust suppression arrangements. The air pollution control equipments like bag filters, vacuum suction hoods, dry fogging system etc. shall be installed at Crushers, belt-conveyors and other areas prone to air pollution. The belt conveyor should be fully covered to avoid generation of dust while transportation. PP shall take necessary measures to avoid generation of fugitive dust emissions.

(iii) Traffic management shall be done as per recommendation of Traffic Management Study Report.

(iv) The Project Proponent shall provide parking plaza for the heavy vehicles within the lease area as recommendation of NEERI.

(VIII) <u>Green Belt Development:</u>

(i) The Project Proponent shall develop greenbelt in 7.5m wide safety zone all along the mine lease boundary as per the guidelines of CPCB in order to arrest pollution emanating from mining operations within the lease. The whole Green belt shall be developed within first 5 years starting from windward side of the active mining area. The development of greenbelt shall be governed as per the EC granted by the Ministry irrespective of the stipulation made in approved mine plan.

(ii) The Project Proponent shall carryout plantation/ afforestation in backfilled and reclaimed area of mining lease, around water body, along the roadsides, in community areas etc. by planting the native species in consultation with the State Forest Department/ Agriculture Department/ Rural development department/ Tribal Welfare Department/ Gram Panchayat such that only those species be selected which are of use to the local people. The CPCB guidelines in this respect shall also be adhered. The density of the trees should be around 2500 saplings per Hectare. Adequate budgetary provision shall be made for protection and care of trees.

(iii) The Project Proponent shall make necessary alternative arrangements for livestock feed by developing grazing land with a view to compensate those areas which are coming within the mine lease. The development of such grazing land shall be done in consultation with the State Government. In this regard, Project Proponent should essentially implement the directions of the Hon'ble Supreme Court with regard to

acquisition of grazing land. The sparse trees on such grazing ground, which provide mid-day shelter from the scorching sun, should be scrupulously guarded/ protected against felling and plantation of such trees should be promoted.

(iv) The Project Proponent shall undertake all precautionary measures for conservation and protection of endangered flora and fauna and Schedule-I species during mining operation. A Wildlife Conservation Plan shall be prepared for the same clearly delineating action to be taken for conservation of flora and fauna. The Plan shall be approved by Chief Wild Life Warden of the State Govt.

(v) And implemented in consultation with the State Forest and Wildlife Department. A copy of Wildlife Conservation Plan and its implementation status (annual) shall be submitted to the Regional Office of the Ministry.

(IX) Public hearing and human health issues:

(i) The Project Proponent shall appoint an Occupational Health Specialist for Regular as well as Periodical medical examination of the workers engaged in the mining activities, as per the DGMS guidelines. The records shall be maintained properly. PP shall also carryout Occupational health check-ups in respect of workers which are having ailments like BP, diabetes, habitual smoking, etc. The check-ups shall be undertaken once in six months and necessary remedial/ preventive measures be taken. A status report on the same may be sent to MoEF&CC Regional Office and DGMS on half-yearly basis.

(ii) A commitment in form of an undertaking for periodical occupational health checkup of the employee and the local people shall be done through an occupational health expert as per the detailed action plan submitted with the proposal within 6 months from the date of issue of Environmental Clearance.

(iii) The Project Proponent must demonstrate commitment to work towards 'Zero Harm' from their mining activities and carry out Health Risk Assessment (HRA) for identification workplace hazards and assess their potential risks to health and determine appropriate control measures to protect the health and wellbeing of workers and nearby community. The proponent shall maintain accurate and systematic records of the HRA. The HRA for neighborhood has to focus on Public Health Problems like Malaria, Tuberculosis, HIV, Anaemia, Diarrhoea in children under five, respiratory infections due to bio mass cooking. The proponent shall also create awareness and educate the nearby community and workers for Sanitation, Personal Hygiene, Hand washing, not to defecate in open, Women Health and Hygiene (Providing Sanitary Napkins), hazard of tobacco and alcohol use. The Proponent shall carryout base line HRA for all the category of workers and thereafter every five years.

(iv) The proponent shall carry out occupational health surveillance which be a part of HRA and include Biological Monitoring where practical and feasible, and the tests and investigations relevant to the exposure (e.g. for Dust a X-Ray chest; For Noise Audiometric; for Lead Exposure Blood Lead, For Welders Full Ophthalmologic Assessment; for Manganese Miners a complete Neurological Assessment by a Certified Neurologist, and Manganese (Mn) estimation in Blood; For Inorganic

Chromium- Fortnightly skin inspection of hands and forearms by a responsible person. Except routine tests all tests would be carried out in a Lab accredited by NABH. Records of Health Surveillance must be kept for 30 years, including the results of and the records of Physical examination and tests. The record of exposure due to materials like Asbestos, Hard Rock Mining, Silica, Gold, Kaolin, Aluminium, Iron, Manganese, Chromium, Lead, Uranium need to be handed over to the Mining Department of the State in case the life of the mine is less than 30 years. It would be obligatory for the State Mines Departments to make arrangements for the safe and secure storage of the records including X-Ray. Only conventional X-Ray will be accepted for record purposes and not the digital one). X-Ray must meet ILO criteria (17 x14 inches and of good quality).

(v) The proponent shall maintained a record of performance indicators for workers which includes (a) there should not be a significant decline in their Body Mass Index and it should stay between 18.5 -24.9, (b) the Final Chest X-Ray compared with the base line X-Ray should not show any capacities,(c) At the end of their leaving job there should be no Diminution in their Lung Functions Forced Expiratory Volume in one second (FEV1),Forced Vital Capacity (FVC), and the ratio) unless they are smokers which has to be adjusted, and the effect of age, (d) their hearing should not be affected. As a proof an Audiogram (first and last need to be presented), (e) they should not have developed any Persistent Back Pain, Neck Pain, and the movement of their Hip, Knee and other joints should have normal range of movement, (f) they should not have suffered loss of any body part. The record of the same should be submitted to the Regional Office, MoEF&CC annually along with details of the relief and compensation paid to workers having above indications.

(vi) The project proponent shall ensure that personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.

(vii) Project Proponent shall make provision for the housing for workers/labors or shall construct labor camps within/outside (company owned land) with necessary basic infrastructure/ facilities like fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche for kids etc. The housing may be provided in the form of temporary structures which can be removed after the completion of the project related infrastructure. The domestic waste water should be treated with STP in order to avoid contamination of underground water.

(viii) The activities proposed in Action plan prepared for addressing the issues raised during the Public Hearing shall be completed as per the budgetary provisions mentioned in the Action Plan and within the stipulated time frame. The Status Report on implementation of Action Plan shall be submitted to the concerned Regional Office of the Ministry along with District Administration.

(ix) Issues raised and recorded in proceedings of public hearing w.r.t. environment / pollution / CER shall be complied by the Mining Authority as per OM F.No.22-65/2017-IA III, dated 30.09.2020 of MoEF&CC, Govt. of India.

(X) Corporate Environment Responsibility (CER):

(i) The activities and budget earmarked for Corporate Environmental Responsibility (CER) as per Ministry's O.M dated 30.09.2020 or as proposed by SEAC should be kept in a separate bank account. The activities proposed for CER shall be implemented in a time bound manner and annual report of implementation of the same along with documentary proof viz. photographs, purchase documents, latitude & longitude of infrastructure developed & road constructed needs to be submitted to Regional Office MoEF&CC annually along with audited statement.

(ii) Project Proponent shall keep the funds earmarked for environmental protection measures in a separate account and refrain from diverting the same for other purposes. The Year wise expenditure of such funds should be reported to the MoEF & CC and its concerned Regional Office / SEIAA, Odisha.

(XI) Miscellaneous:

(i) The Project Proponent shall prepare digital map (land use & land cover) of the entire lease area once in five years purpose of monitoring land use pattern and submit a report to concerned Regional Office of the MoEF&CC.

(ii) The Project Authorities should inform to the Regional Office regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.

(iii) The project proponent shall establish a solar power plant with 30KVA capacity within the lease area as proposed.

(iv) The Project Proponent shall submit six monthly compliance reports on the status of the implementation of the stipulated environmental safeguards to the MoEF&CC & its concerned Regional Office, SEIAA, Odisha, Central Pollution Control Board and State Pollution Control Board.

(v) A separate 'Environmental Management Cell' with suitable qualified manpower should be set-up under the control of a Senior Executive. The Senior Executive shall directly report to Head of the Organization. Adequate number of qualified Environmental Scientists and Mining Engineers shall be appointed and submit a report to RO, MoEF&CC.

(vi) The proponent shall comply all the specific conditions as recommended by CSIR-NEERI on carrying capacity study (as applicable) in time bound manner as proposed.

(vii) The mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.

(viii) The project proponent shall augment infrastructure on drinking water, health care and education in nearby villages as per time bound action plan submitted.

(ix) The project proponent shall obtain permission from DGMS under 106(2b) to carry out blasting operation within the lease area

(x) The concerned Regional Office of the MoEF&CC shall randomly monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the MoEF&CC officer(s) by furnishing the requisite data / information / monitoring reports.

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

Yours faithfully,

Member Secretary

Memo No 2261/SEIAA / Dt. 19-05-2023

Copy to

1. Joint Secretary (Environment), Ministry of Environment, Forests and Climate Change Govt. of India, Indira Paryavaran Bhavan, Jor Bagh Road, Aliganj, New Delhi-110003 for information.
2. Additional Chief Secretary, Forests & Environment Dept., Government of Odisha for information.
3. Member Secretary, State Pollution Control Board, Odisha, Paribesh Bhawan, A/118, Nilakantha Nagar, Unit-8, Bhubaneswar for information.
4. Additional Principal Conservator of Forests, Regional Office (EZ), Ministry of Environment & Forests, A-31, Chandrasekharpur, Bhubaneswar for information.
5. Member Secretary, CGWA, 18/11, Jamnagar House, ManSingh Road, New Delhi-110011 for information.
6. Collector, District Magistrate, Keonjhar, for kind information and necessary action.
7. Secretary, SEAC, Paribesh Bhawan, A/118, Nilakantha Nagar, Unit-VIII, Bhubaneswar for kind information.
8. Guard file for record.

Member Secretary

Annexure - II

OFFICE OF THE DIVISIONAL FOREST OFFICER, KEONJHAR DIVISION
Phone No- 06766-254315, email ID- dfokjr.od@gov.in

No. 8991 / 6F-Mining-57/2020
Dated, Keonjhar the 03rd August, 2023

To

Sri Avin Jain, Power of Attorney Holder,
Dalpahar Iron & Manganese Mines of D.C. Jain,
Dharam Villa, 12-A, Mahatma Gandhi Marg,
Ring road, Lajpat Nagar-IV, New Delhi-110024.

Sub: Revision of Site Specific Wildlife Conservation Plan in respect of Dalpahar Iron & Manganese Mines of D.C. Jain.

Ref: Memo No. 9070/WL dated 27.11.2014 of Principal Chief Conservator of Forests (WL) & CWLW, Odisha, Bhubaneswar.
This office letter No. 8804 dated 29.12.2014.

Sir,

With reference to the letters cited above on the captioned subject,this is to intimate that, you were requested to deposit the approved cost i.e. 185.520 lakh (for activities to be implemented by DFO, Keonjhar Division in the project impact area) towards the Site Specific Wildlife Conservation Plan in respect of your Dalpahar Iron & Manganese Mines of D.C. Jain But, after lapses of 9 years you have not deposited the same in the Orissa CAMPA Account.

Now the Govt. of Odisha in Steel & Mines Department has extended the validity period of mining lease over 89.961 ha in Block-A vide his letter No.3957/SM dated 28.04.2022 up to 08.05.2036 and mining lease deed has been executed with the Collector, Keonjhar over 89.961 ha (in Block-A) of Dalpahar Iron & Manganese Mines of D.C. Jain.

In view of the above, the Site Specific Wildlife Conservation Plan in respect of the above mining lease will be revisited as per current wage rate & current wildlife scenario as per existing guideline issued by the Principal Chief Conservator of Forests (WL) & CWLW, Odisha, Bhubaneswar. So afresh Site Specific Wildlife Conservation Plan over 89.961 ha is to be prepared.

This is for your information and necessary action.

Yours faithfully,

Divisional Forest Officer,
Keonjhar Division.

Memo No. 8992 / Dated. 03-08-2023

Copy submitted to the Regional Chief Conservator of Forests, Rourkela Circle, Rourkela / Principal Chief Conservator of Forests, FD&NO, FC Act, O/o the PCCF, Odisha, Bhubaneswar / Principal Chief Conservator of Forests (WL) & CWLW, Odisha, Bhubaneswar for favour of kind information.

Divisional Forest Officer,
Keonjhar Division.

Annexure-III

COST NORM FOR URBAN PLANTATION FOR 1000 SAPLINGS
(Tall seedling plantation of One year Six months old)
(Labour cost @ 352/- per man day)

Sl No	Items of Work	Preferable period of Execution	Labour in Man day	Labour Cost	Material Cost	Total Cost in Rs.
1	2	3	4	5	6	7
PREVIOUS YEAR (ADVANCE WORK) NURSERY RAISING						
1	Nursery cost (18 month Old Seedling) @Rs.37.97/- part (Rs.10.95 to be released) for 1100 seedlings (1000+100) (Nov to March)	Nov-March	28.5	10032	1568	11600
	TOTAL		**28.5**	**10032**	**1568**	**11600**
2	Monitoring & Supervision charge 5% of the total cost					570
	GRAND TOTAL		**28.5**	**10032**	**1568**	**12170**
0TH YEAR OPERATION						
1	Nursery Cost (1 Yr 6 months old seedlings) part @ Rs.37.97 per seedling (Rs27.02 to be released) for 1100 seedlings (1000+100)	April-Mar	71	24992	4474	29466
	TOTAL		**71**	24992	4474	29466
2	Monitoring & Supervision charge 5% of the total cost					1448.5
	GRAND TOTAL		**71**	24992	4474	30914.5
1ST YEAR OPERATION						
1	Nursery cost (1 year & 6 months old seedling) balance @ Rs.27.02 for 1100 seedling	April-June	14.5	5104	362	5466
2	Alignment & stacking at 4M spacing including clearance sites in avenue & 2.5m X 2.5m in case of block plantation	April-May	15	5280	0	5280
3	Excavation of pits-45cmx45cmx45cm in hard soil with vertical cut edges to make an uniform cube & heaping the excavated soil out side the pits	May-June	52	18304	0	18304
4	Refilling of pits with excavated soil after breaking the clods completely	June	8	2816	0	2816

5	Carriage and transport of saplings from Nursery site to plantation site over an average lead of 10kms @ Rs.6 per seedling for 1100 seedlings	July	0	0	6600	6600
6	(a)Cost of Fym 0.25 CFT per plant @ Rs.15 per cft for 250 cft		0	0	3750	3750
	(b) Cost of Vermicompost 250 gm per plant @ Rs.20 per kg for 250 kg					
	(c) Cost of NPK 50 gm per plant as basal dose @ Rs.24 per kg for 50 kg					
	(d) Cost of Granular Insecticide 10gm per plant @ Rs.80 per kg for 10 kg		0	0	5000	5000
			0	0	1200	1200
			0	0	800	800
7	Planting of sapling after carefully removing from sacks including mixing of Fym, Vermi-compost, Granular Insecticide & Scooping the soil to required depth & pressing the soil around the plants	July-Aug	25	8800	0	8800
8	Cost of chemical fertiliser (Urea/Dap/NPK etc.)		0	0	1200	3750
9	1st weeding around the plant to a radius of 45 cm, application of fertilizer	August	25	8800	0	8800
10	2nd weeding around the plant to a radius of 50 cms	September	20	7040	0	7040
11	Soil working around 0.5 Mt.radius of the plant & application of fertilizer, mulching with available materials	Sept-Oct	32	11264	0	11264
12	Watering for 5 months. 10days per month-from Nov. to March, including cost of water, labour & Transportation through tractor/tanker @ Rs.84 per seedling for 1000 seedlings	November-March	0	0	84000	84000
13	Watch & ward for 9 months from july to march. 270 Days.	July-March	140	49280	0	49280
14	Contigency Expenditure		0	0	455	455
	TOTAL		351.5	116688	103367	222605
15	Monitoring & Supervision charge 5% of the total cost					10887
	GRAND TOTAL		331.5	116688	103367	233492
.Gabion made up of Bamboo twigs @ Rs.272/- per plant extra						
.Gabion made up of iron wire mesh @ Rs.1600/- per plant extra in Urban Areas						

2ND YEAR OPERATION						
1	Cost of sapling-1 Yr & 6 months old for casualty replacement @ Rs.34.84 per seedling for 100 seedlings		0	0	3484	3484
2	Carriage and transport of saplings from Nursery site to plantation site over an average lead of 10kms @ Rs.6 pre seedling for 100 seedlings	July	0	0	600	600
3	Replacement of casualty after reopening the pits & planting of sapling 100 nos. With application of FYM, Vermicompost and granular Insecticides	July-Aug	4	1408	0	1408
4	(a)Cost of FYM 0.25 cft per plant @ Rs.15 per cft for 25 cft for 100 plants		0	0	375	375
	(b) Cost of Granular Insecticide 10gm per plant @ Rs.80 per kg for 1 kg					
	(c) Cost of NPK 50 gm per plant as basal dose @ Rs.24 per kg for 5 kg					
	(d) Cost of Vermi-compost 250 gm per plant @ Rs.20 per kg for 25 kg		0	0	80	80
	(e) Cost of chemical fertilizer					
	(Urea/Dap/NPK etc.)					
			0	0	120	120
			0	0	500	500
				0	1200	1200
5	1st weeding around the plant to a radius of 30 cm & application of fertilizer	August	20	7040	0	6900
6	Soil working around 0.5MT radius & application of fertilizer, Moisture conservation & mulching	August-Sept	24	8448	0	8280
7	2nd Weeding around the plant to radius of 0.5 MT.	Oct-Nov	16	5632	0	5520
8	Watering for eight months 5 days per month including cost of water, labour & transportation through tractor/tankers. (April to June & Nov. To march) @ Rs.67.20 per seedling for 1000 seedling	April-June Nov-March	0	0	67200	67200

9	Watch & Ward for 12 months from April. To March (365 days	April-Mar	186	65472	0	64170
10	Contingency Expenditure		0	0	1380	1380
	TOTAL		**250**	**88000**	**74939**	**161217**
11	Monitoring & Supervision Charge 5% of the total cost					8060
	Grand Total		**250**	**88000**	**74939**	**169277**
*Maintenance of Gabion made up of Bamboo twigs @ Rs. 40.00 per plant extra						
*Maintenance of Gabion made up of iron wire mesh @ Rs. 50.00 per plant extra in urban areas						

3RD YEAR MAINTENANCE						
1	Weeding, Soil working & Manuring	Sept-Oct	20	7040	0	6900
2	Cost of Chemical Fertilizer(Urea/DAP/NPK etc.)		0	0	1200	1200
3	Watch & ward for 12 months from April to March. 365 Days	April-Mar	186	65472	0	65472
	Total		206	72512	1200	73572
4	Monitoring & Supervision charge 5% of the total coost					3613
	Grand Total		206	72512	1200	77185
*Maintenance of Gabion made up of Bamboo twigs @ Rs. 50.00 per plant extra						
*Maintenance of Gabion made up of iron wire mesh @ Rs. 50.00 per plant extra in urban areas						

4TH YEAR MAINTENANCE						
1	Watch & ward for 12 months from April to March. 365 Days	April-Mar	186	65472	0	65472
	Total		186	65472	0	65472
2	Monitoring & Supervision charge 5% of the total coost					3209
	Grand Total		**186**	**65472**	**0**	**68681**

ABSTRACT

Sl	Year of Operation	No of persons	Labour	Material	Monitoring & Supervision	Total
1	PREVIOUS YEAR (ADVANCE WORK) NURSERY RAISING	28.5	10032	1568	570	12170
2	0TH YEAR OPERATION	71	24992	4474	1448.5	30914.5
3	1ST YEAR OPERATION	331.5	116688	103367	10687	230542
4	2ND YEAR OPERATION	250	88000	74939	8060	170999
5	3RD YEAR MAINTENANCE	206	72512	1200	3613	77325
6	4TH YEAR MAINTENANCE	186	65472	0	3209	68681
	TOTAL	**1073**	**377696**	**185548**	**27787.5**	**591032**

Annexure-IV

GOVERNMENT OF ODISHA
STEEL & MINES DEPARTMENT
******

No. 3957 /SM, Bhubaneswar, the 28.04.2022
SM-MCI-MRL-0012-2021

From
Shri Abanikant Pattanaik
Special Secretary to Government.

To,
Shri Avin Jain
(Power of Attorney holder of Shri Dharam Chand Jain)
Dharam Villa
12-A, Mahatma Gandhi Marg,
Ring Road, Lajpat Nagar-IV
New Delhi – 110024
Email: mdmpl@rediffmail.com

Sub: Extension of validity period of mining lease for Iron and Manganese over an area of 89.961 hects in village Dalpahar Block A of Keonjhar under section 8A of the MMDR Amendment Act, 2015 in favour of Sri Avin Jain (Power of Attorney holder of Shri Dharam Chand Jain).

Sir,

I am directed to say that a mining lease for Iron and Manganese over an area of 89.961 hects in village Dalpahar Block A of Keonjhar District was granted for a period of 20 years from 09.06.1986 to 08.06.2006 in favour of Shri Avin Jain (PoA of Dharamchand Jain). The lessee discontinued mining operation w.e.f. 31.08.1995 due to non-availability of Forest Clearance & Environment Clearance. The said lease has been declared as not lapsed vide proceeding No - 6610/SM dated 06.09.2019.

The lessee has obtained the order on 20.04.2022 from the Hon'ble Supreme Court in support of modification of their order dated 16.05.2014 in the matter of W.P. (C)114/2014 Common Cause vs Union of India & Others in respect of the above mining lease.

The Government have been pleased to decide to extend the validity period of above mining lease over 89.961 hects in village Dalpahar Block- A in Keonjhar district under section 8A(3) of the MMDR Act, 1957 as amended by the MMDR Amendment Act, 2015 up to 08.06.2036.

The extension of validity period of lease is subject to following general conditions:

1. The extension of validity is without prejudice to any action under the provisions of the Environment (Protection) Act, Odisha Forest Act or any other law for the time being in force in respect of any violations committed by the lessee during the original period of lease or the period of deemed extension till the date of extension of validity period of lease.
2. The extension of validity period of lease is subject to the final result/ outcome of the case Writ Petition (Civil) No-114/2014 (Common Cause- vrs- Union of India and others) pending in Hon'ble Supreme Court of India.
3. The extension is subject to condition that any terms and conditions of the original lease, if not complied so far, shall be complied by the lessee within such period as may be specified by a competent authority and the lessee shall furnish an undertaking to such effect.
4. The lease is subject to condition that the lessee shall not enter upon any forest of any category to which the provisions of the Forest (Conservation) Act, 1980 are applicable without previous sanction of the competent authority, not fell, cut and use any timber or trees without obtaining the sanction of that authority nor otherwise than in accordance with such conditions as the State Government may prescribe.
5. The lessee/lessees shall not undertake mining operation except under and in accordance to the approvals under the Forest (Conservation) Act,1980 and the Environment (Protection) Act, 1986 and Rules framed thereunder.

6. The resumption of mining operation will be permitted only on production of the valid statutory clearances by the concerned lessees.
7. The lessee shall complete the prospecting operations in accordance with the provisions contained in letter dated 23.12.2010 of Ministry of Mines, Government of India within the time period specified therein and subsequent instructions, rules and regulations if any issued or that may be issued prescribing the timeline.
8. The lessee shall execute the Supplementary Lease Deed (s) for the extended period and the above conditions and undertakings shall form part of such deed.

You are directed to execute the supplementary lease deed accordingly within a period of one year from the date of issue of this letter.

Yours faithfully,

Special Secretary to Government

Memo No. 3958 /SM, Date 28.04.2022

Copy forwarded to Director of Mines, Odisha, Bhubaneswar / Joint Director of Mines, Joda for information and necessary action. The Director of Mines, Odisha may ensure commencement of mining operation immediately after execution of supplementary lease deed as per law with inclusion of the general conditions as above apart from those under Rule 12 of M.C.Rules, 2016.

Special Secretary to Government

Memo No. 3959 /SM, Date 28.04.2022

Copy forwarded to Collector, Keonjhar for information and necessary action. He is authorized to execute the supplementary lease deed with the lessee subject to availability

of the requisite forest clearances with inclusion of the general conditions as above apart from those under Rule 12 of M.C.Rules,2016.

Special Secretary to Government

Memo No. 3960 /SM, Date 28.04.2022

Copy forwarded to Special Secretary to Government, Forest and Environment Department / Member Secretary, Odisha State Pollution Control Board, Bhubaneswar / Regional Controller of Mines, IBM, Bhubaneswar for information.

Special Secretary to Government

Memo No. 3961 /SM, Date 28.04.2022

Copy forwarded to Principal CCF, Odisha, Bhubaneswar / DFO, Keonjhar for information.

Special Secretary to Government

Government of Odisha
Steel and Mines Department
***

PROCEEDING

No. 6610 /S&M, Bhubaneswar date 6-9-2019
IV(AB)SM-11/2015

Sub: Hearing on the issue of lapse of Iron & Manganese mining lease of Sri Avin Jain over an area of 89.961 hects. in village Daipahar Block-A of Keonjhar District pursuant to the order dt.26.02.2019 of the Hon'ble High Court passed in W.P (C) No.993/2015.

ORDER

Whereas, this relates to the hearing on the issue of lapse of the Iron & Manganese mining lease of Sri Avin Jain over an area of 89.961 hects. in village Daipahar Block-A of Keonjhar District.

And whereas, this hearing on the issue of lapse of the Iron & Manganese lease of Sri Avin Jain over an area of 89.961 Hectares in Village-Daipahar Block-"A" of Keonjhar District was taken up pursuant to the order dt.26.02.2019 of the Hon'ble High Court, Orissa passed in W.P (C) No.993/2015 filed by the petitioner challenging the lapse declaration order of the State Government passed in Government Proceedings No.3382 dt.01.05.2015. Vide the said order Hon'ble High Court remitted back the case to the State authority with a direction to the petitioner to appear before the State authority on 25.03.2019 for hearing and simultaneously directed the State authority for taking a fresh decision within a period of 4 (four) months from the date of appearance of the petitioner after giving opportunity of hearing to the parties concerned in line with the decision of the Hon'ble Supreme Court in the case of Common Cause -Vrs- UoI & Others.

And whereas, in this case, the mining lease was originally granted in favour of D.C. Jain vide Government Proceedings No.6179 dt.05.06.1984 for over an area of 101.179 hects. for a period of 20 years. Basing on the approval of the Govt. vide letter No.4852 dt.10.04.1986 the lessee was separated in to five leases and the lessee had to execute five separate lease

Scanned by CamScanner

deeds in order to bring the leases in conformity with the provision of 6(1)(c) of MCR 1960 for 20 years. The lease deeds were executed on 09.06.1986 and registered on 17.06.1986. The present lease is one of those five leases. Subsequently, Manganese ore as 2nd mineral was included in the existing mining lease for coterminous period by execution of supplementary lease deed on 25.05.2000. The lease term over the mining lease hold over an area of 89.961 Hectares was to expire on dt.08.06.2006. Sri Avin Jain, the legal heir and power of attorney holder applied for RML vide application on 01.06.2005 as per Rule 24A(1) of MCR,1960 over an area of 89.961 Hectares.

And whereas, mining operation was continuing during the subsistence of mining lease period up to August, 1995 and mining operation could not be continued due to want of FC.

And whereas, the lessee applied for lease saving application on dt.27.08.2007. The lease saving application was not filed in time u/r 28(2) of MCR,1960. Still, personal hearing was undertaken by the Commission-cum-secretary on dt.23.12.2010 and dt.29.12.2011 and a letter was issued vide No.1660 dt.29.02.2012 for compliance. No compliance was submitted. Hearing on lapse was continued vide Notice No.7009 dt.08.07.2013 up to 13.05.2014.

And whereas, the lessee was also issued with a notice u/r 26(3) of MCR 1960 vide No.7012 dt.08.07.2013 to furnish the deficient documents relating to the RML application dt.01.06.2005 filed by the lessee within a period of 30 days from receipt of the notice. Due to non-submission of documents a further notice bearing No.8286 dt.16.08.2013 was issued u/r 26(1) of MCR 1960 requiring the lessee to show cause why the RML application shall not be refused.

And whereas, in the meantime the MMDR Amendment Act, 2015 was promulgated. The lessee filed a writ petition bearing W.P(C) No.993/2015 challenging the notice u/r 26(1) of MCR 1960 issued by the Govt. with prayer for extension of the lease u/s 8A of the MMDR Amendment Act, 2015.

Scanned by CamScanner

And whereas, due to discontinuance of mining operation for more than a continuous period of two years the State Govt. vide Govt. Proceeding No.3882 dt.01.05.2015 declared the mining lease as lapsed w.e.f. 01.09.1997 u/s 4A of the MMDR Act, 1957 read with Rule 26(1) of MCR 1960.

And whereas, the lessee filed a consolidated petition before the Hon'ble High Court vide W.P (C) No.993 of 2015 challenging the arbitrary action of the Government in initiating a proceeding u/r 26(1) of MCR, 1960 for rejection the RML application when under the amended provision of the Act vide Section 8A of the lease period is valid up to 08.06.2036 and also inter alia challenging the lapse declaration order of the state.

And whereas, considering the prayer, the Hon'ble High Court passed order on dt.26.02.2019 squashing the lapse declaration order of the Government and remanded the case to State Govt. to reconsider the matter in line with the orders dt.04.04.2016 of the Hon'ble Apex Court. The relevant portion of the order is quoted below:

"In view of the decision of the Hon'ble Supreme Court in the case of Common Cause –Vrs- UoI reported in (2016)-11 SCC 455, the order dt.01.05.2015 is required to be quashed and set aside and we do so. The matter remitted back to the authority with a direction that the petitioner will appear before the authority on 25.03.2019 and the authority after giving opportunity of hearing the parties concerned will decide the same by a reasoned order within a period of four months from the date of appearance of the petitioner".

And whereas, the lessee filed show cause and additional show cause replies. The comments of the Director of Mines and DFO were also sought on the said show cause reply. Vide the show cause reply the lessee submitted the following:

i) That mining operation in the lease area has been stopped by the lessee only after August, 2005. Subsequently basing on the order of the Hon'ble Apex Court passed in W.P(C) No.205/1995 the DFO

Scanned by CamScanner

directed the lessee not to take up mining operation in forest land without FC.

ii) That on 06.10.2004, the lessee was granted with a Temporary Working Permission (TWP) for six months by the MoEF to regulate the mining operations over the broken up area of forest land. However, despite of such permission, the lessee was not allowed to carry out the mining operation.

iii) That the lessee has been prevented from continuing mining operation due to want of prior approval of u/s 2 of the FC Act. It is submitted that despite the noticee having been granted a Stage-II approval pertaining to 16.64 Hectares on 14.11.2005, the notice could not commence the mining operation due to want of succession certificate being insisted by the concerned authorities due to the death of the original lessee.

iv) That a bare perusal of the steps taken by the lessee, as submitted chronologically in the show cause, it can be found how from the date of submission of application for diversion of forest land on 24.04.1993 and on 06.10.1993 to pursuing the same at each level would clearly demonstrate that delay in grant of Stage-II approval u/s 2 of FC Act, 1980 cannot be attributed to the lessee rather the delay is beyond the control of the lessee.

v) That after death of late D.C. Jain on 25.01.1997, a Probate application was filed by Satis Jain, executor of the will of D.C. Jain before the Hon'ble High Court, Delhi. The Hon'ble High Court, Delhi vide order dt.05.02.1999 passed in transfer petition (Civil) No.37/99 transferred the probate proceeding to the District Judge Court at Barsat North 24-Pragana. District Judge vide order dt.29.08.2006 allowed the application for issuance of probate in favour of the executor of the will for which filing of succession certificate was delayed.

vi) The process of grant of FC & EC are further delayed due to lapse declaration order of the lease. Concerned authorities did not consider

Scanned by CamScanner

to process the same as the lease was a lapsing lease. Had there been no lapse declaration order, the lessee would have got all the clearances.

vii) That under the amended provisions of the MMDR Act u/s 8A the lease eligible for extension of its validity period up to 2036 i.e. the period of 50 years from the date of the grant of original lease

viii) That the Noticee has been thoroughly diligent and taken all necessary measures to ensure that it obtains all necessary clearances:

(a) **Forest Clearance:** With regards to FC, it has been stated that:

- On 10.04.1986, vide Govt. letter No.4852, the Collector, Keonjhar allowed the lessee to execute the lease deed.
- On 28.01.1988 the Collector Keonjhar granted surface right permission over an area of 1.5 Hectares.
- The DFO, Keonjhar granted forest entry permission over an area of 1.00 Hectares in Dalpahar on 15.01.1993 and lessee started mining operation after such permission.
- On 26.04.1993, the lessee submitted FDP in respect of Dolpahar Mines over an area of 0.98 hects. out of 89.961 Hects. and subsequently on 06.10.1993, the DDM, Joda forwarded the said proposal for diversion to DFO, Keonjhar for processing.
- Vide letter dt.06.01.1997, the DFO, Keonjhar directed the lessee to stop mining operation.
- On 29.01.2000, the DDM, Joda submitted Forest Diversion Proposal to the DFO.
- On 08.02.2000 the DFO, Keonjhar forwarded the FDP to consider of Forest (Nodal) for necessary processing.
- On 28.11.2002, GoI, MoEF & CC granted in principle approval for diversion of 16.469 Hectares broken up forest land till 08.06.2006.

Scanned by CamScanner

- On 17.10.2003 the lessee made payment of compensatory and penal compensation afforestation amounting of Rs.12,81,737 vide Treasury Challan.
- On 06.10.2004, TWP was granted for a period of 6 months to start mining operation over an area of 16.464 Hectares.
- The lessee was asked to furnish legal heirs certificate of D.C. Jain vide letter dt.09.11.2004 of Director of Mines, Odisha.
- On 04.12.2004, the lessee requested for grant of surface right permission over the balance broken up area out of 14.464 Hectares to start the mining operation.
- On 07.01.2005, the lessee submitted legal heir certificate of D.C. Jain to resume the mining operation.
- On 28.12.2005, the Director of Mines, Odisha recommended Govt. for allowing the lessee to resume the mining operation as mining operation was discontinued due to want of FC and the discontinuance was beyond the control of the lessee.
- On 29.03.2005, the lessee had again to file FDP fresh as the lease was going to expire on 08.06.2006.
- On 06.05.2005, the lessee deposited Rs.95,49,120/- as NPV permission to 16.464 Hectares.
- On 14.11.2005 MoEF & CC granted Stage-II approval relating to 16.464 Hectares vide letter No.8-103/2000-FC dt.14.11.2005.
- Lessee vide letter dt.26.11.2005 intimated the State Govt. about Stage-II permission and requested Govt. to grant permission to resume mining permission.
- In reply to the letter dt.26.11.2005, the lessee, the State Govt. vide letter dt.15.12.2005, asked the lessee to submit succession certificate of late D.C. Jain within six months. The lessee could not submit succession certificate as the matter pertaining to the probate

Scanned by CamScanner

of the will executed by the original lessee was pending before the Court of District Delegate, North-24, Praganas, Barsat.

- On 07.03.2006, the DFO directed the lessee to demarcate.
- On 26.04.2006, the DDM, Joda submitted the required documents for processing of the fresh FDP of the lessee to the DFO, Keonjhar.
- On 29.05.2006, the DFO, Keonjhar recommended to the Collector, Keonjhar for grant of permission to resume the mining operation.
- On 23.03.2007, the lessee requested the Assistant Inspector of General (Forest), MoEF to grant TWP over an area of 16.464 Hectares of broken up area till the fresh proposal for grant of forest clearance vide letter dt.23.03.2007.
- On 14.06.2008, DFO, Keonjhar vide its letter No.3611 dt.14.06.2008 informed the lessee to attend the review along with present status report of the project on 25.06.2008 at 10.30 AM at Keonjhar on the issue of disposal of pending diversion proposal, compliance of conditions of Stage-I and Stage-II and progress of compensatory afforestation.
- On dt.11.05.2009, the DFO recommended to the Conservations of Forest for grant of TWP over broken up forest land excluding the safety zone vide letter No.259 dt.11.05.2009.
- On dt.27.12.2012, in reply to application of the lessee, dt.27.07.2012 ORSAC supplied authenticated maps and DGPS survey copies for FC processing.
- Vide letter dt.13.08.2013, the lessee again submitted revised FDP for entire forest land including the safety zone.
- Again on 17.09.2013 the lessee deposited NPV amounting to Rs.6,18,36,110.00.
- On 06.04.2015, the lessee submitted to DFO compliance as to the discrepancies pointed out in the diversion proposal.

Scanned by CamScanner

- On 10.04.2015, the DFO wrote to the Range Officer about his field visit to the lease area of the lessee.
- On 27.07.2015, the PCCF forwarded the DFP to Addl. Chief Secretary, F & E Deptt.
- On dt.15.09.2015, the Special Secretary, F & E Deptt. forwarded the FDP for forest area of 84.707 hects. excluding 16.464 hects. broken up area prior to 1980 already granted with Stage-II FC approval.
- Basing on the observation of FAC on 24.12.2015 MoEF called for compliance from State Govt. on pending litigation before the Hon'ble High Court bearing W. P. (C) No.993/2015 vide letter dt.04.01.2016.
- On dt.14.09.2017 MoEF again reminded the State Govt. about the information sought for vide letter No.04.01.2016.
- On dt.23.09.2017, the Special Secretary, Forest & Environment Deptt. called for all required compliances for the PCCF, Odisha vide letter No.20012 dt.23.09.2017.
- On dt.09.02.2018, the DFO, Keonjhar requested the lessee to deposit differential NPV of Rs.3,41,36,123/- since large part of forest area falls in the medium density category.
- The lessee has not paid the dues claiming that he has not yet been issued with stage-I clearance.
- The FDP is pending before MoEF, Govt. of India for grant.

(b) Mining plan

- Mining plan was first approved on 04.10.1996 for the lease area.
- On dt.11.01.2008, the IBM approved mining plan submitted by the lessee along with PMCP relating to the lease.
- On dt.11.10.2010, the modification of approved mining plan of Daipahar Iron and mine along with PMCP was approved by the IBM after filing of review of mining plan.

Scanned by CamScanner

- Approval of scheme of mining of Daipahar Iron ore mine along with PMCP over an area of 101.171 hects. was made vide letter of IBM dt.24.05.2011.
- After filing of review of mining plan by the lessee, on dt.17.05.2019, the Deputy Controller of mines vide email intimated the lessee to inspect the mine on 20.05.2019 in connection with disposal of application for review of mining plan.
- Although the IBM authorities have conducted inspection on 20.05.2019, as per their programme, no order has been communicated to the lessee on review of mining plan.

(c) Environment Clearance

- On dt.11.07.2007, the lessee applied for issue of ToR to MoEF relating to grant of Environment Clearance. The said application for ToR is found to have been accepted at MoEF vide their letter dt.27.03.2008.
- On dt.29.03.2008, MoEF directed the lessee for undertaking detailed EIA study as per the guideline provided under EIA notification 2006 and issued the ToRs in response to the application for EC filed by the lessee.
- On dt.26.08.2011 public hearing was conducted at Dapahar village, Joda relating to grant of EC of the lease.
- On dt.18.04.2012, the lessee submitted the wildlife management plan for EC.
- Lessee made presentation before Expert Appraisal Committee (EAC), MoEF for appraisal of the mining project for EC.
- On dt.09.05.2013 the MoEF sought information from the noticee pertaining to the status of the application for grant of FC in order to process the EC application of the Noticee. In reply to the same notice vide letter dt.17.05.2013 submitted the required information.

Scanned by CamScanner

- On dt.23/24.04.2018, a meeting of the EAC, MoEF was convened relating to the appraisal of mining project for grant of EC. But the committee sought information from the lessee vide letter No.15.05.2018.

  (i) On the validity of mining lease.

  (ii) On the validity of FC and on the payment of NPV

  (iii) On the validity of mining plan.

  In this regard the lessee has submitted that due to pendency of High Court case and the lapsing hearing at the Govt. level, reply to the said letter has not be submitted.

(d) Consent to operate

As the lessee is not granted Environment Clearance, steps has not been taken to obtain CTO.

And whereas, the DFO, Keonjhar vide his letter No.6884 dt.05.07.2019 viewed the following on the show cause reply of the lessee:

a) DFO in his report vide letter No.6884 dt.05.07.2019 has accepted the filing of FDP by the lessee as claimed by the lessee. Also admitted the fact of payment of NPV except non-payment of revised demand of Rs.3,41,36,123/- vide DFO office letter No.965 dt.09.02.2018. Till date the lessee has not deposited the same. It has also reported that the State-II Forest Clearance granted by MoEF for over 16.464 hects. had already been expired since 08.06.2006. It has also been reported by the DFO at Para-55 of his report that on 13.08.2013, the lessee submitted diversion proposal for total forest area 101.171 hects. During scrutiny of the submitted diversion proposal since discrepancies were notices, the user agency was intimated to comply the discrepancy vide letter No.6248 dt.16.08.2013 but the lessee did not comply the same. But in this regard the comments of DFO, Keonjhar subsequently vide his report at Para-55 that subsequently the lessee had filed FDP on line and complied all the queries raised relating to the proposal on dt.06.04.2015. Basing on which the DFO

Scanned by CamScanner

himself conducted site inspection of the lease on 11.04.2015 and proposal was forwarded to the Govt. of India through the State Government.

b) It has also been reported that as per the guideline issued by MoEF vide F. No.11-43/2013-FC dt.26.02.2019 that compliance under FRA is not required for consideration of in principle approval.

c) But it has been reported that Govt. of India has sought for clarification on 04.01.2016 in 6 Nos. of points. As per No.(e) of the said letter the U.A , the lessee, has not deposited the revised NPV of Rs.3,41,36,123/- demanded vide his official letter No.965 dt.09.02.2018.

And whereas, on perusal of the report of DFO, it has been observed that the lessee vide his show cause admitted that he has not paid the revised demand of NPV. During the hearing the lessee has argued that he has already deposited NPV amounting to Rs.7,13,85,230/-. But due to the lapse of lease and for subsequent hearing, the FDP is not being processed. The lessee submitted that he is willing to deposit the NPV for which the lessee has already furnished undertaking after the lessee has paid NPV initially demanded, that he will pay further NPV if demanded. It is not that the lessee has refused the payment of NPV at any stage. It has been argued by the lessee that it can be put as a condition in Stage-I approval and Stage-I approval should have been granted in favour of the lessee. But it has not been done. It has also been argued by the lessee that when the lapsing issue is under consideration of Govt. and when lapsing of a lease does not amount to permanent closure of the lease grant due to existence of the provision of revival, there is no reason to withhold Stage-I approval on the ground of lapsing which delayed the process of final grant of FC. The reasons adduced by the lessee in this regard cannot be ruled out as baseless.

And whereas, also perused the report furnished by the Director of Mines, Odisha vide his letter No.5209 dt.08.07.2019. Vide the said report the Director of Mines, Odisha has submitted the followings:

Scanned by CamScanner

a) That mining operation in the lease area was discontinued for more than two years w.e.f. 31.08.1995 due to want of Forest Clearance. The lessee has taken necessary steps and processed FDP in respect of the Dalpahar Iron ore mines over 89.961 hects. since 06.10.1993. The DFO directed to stop mining activities in the forest area on 06.01.1997 when the FDP was under consideration.

b) The lessee was granted with TWP over an area of 15.571 (out of total broken up area of 16.464 hects. excluding 0.893 hects. as safety zone area. The lessee was also granted with FC Stage-I for over the broken up area of 16.464 hects. But the same was expired with the expiry of the 1st renewal of the lease.

c) The lessee had also furnished fresh diversion proposal and the same is under consideration. The compliance on the FDP required from Govt. of Odisha by MoEF vide letter dt.04.01.2016 has been complied by the Special Secretary, F & E Deptt. on 23.09.2017. The Addl. PCCF sought for some required information from the DFO, Keonjhar on 10.10.2017 for processing of forest diversion proposal of the lessee. The DFO requested the lessee vide letter dt.09.02.2018 to deposit the NPV 3,41,36,123/- from the entire forest area as most of the forest area falls in the medium density forest category. The Director of Mines, Odisha has viewed that on the above noted grounds the lessee could not obtain the Stage-II forest clearance in respect of his mine which the Director of Mines, Odisha has viewed to be beyond the control of the lessee. It has also been viewed that the lessee has taken all necessary steps to obtain EC in respect of his lease.

And whereas, upon hearing and scrutiny of documents and reports it is observed that:

(i) The lease was discontinued w.e.f. 31.08.1995 due to want of Forest Clearance. Subsequently vide order dt.06.01.1997, the DFO, Keonjhar directed the lessee not to take up mining operation in forest area without clearance from MoEF.

Scanned by CamScanner

(ii) The lessee is found to have taken timely steps to obtain statutory clearances. From the analysis of submission of the claim of the lessee on steps taken with regard to obtaining EC & FC it can clearly be observed that the lessee had taken step for filing DFP in the year 1993 during the renewal. Subsequently the lessee deposited the NPV demanded twice by the Forest Dept. and also filed fresh diversion proposal after the expiry of 1st renewal period. Only the lessee has not paid the revised NPV demanded due to instruction of FAC of MoEF that large part of the land of the lease is coming under medium density forest category. As argued by the lessee that the demanded revised NPV amount can be paid by the lessee after obtaining Stage-I FC as payment of NPV is usually made a condition in stage-I FC grant. It may not be incorrect as claimed by the lessee that while granting Stage-I FC payment of NPV is usually formed a condition to be complied for issue of Stage-II.

(iii) That even after getting TWP for six month w.e.f. 06.10.2004, the lessee could not be able to resume mining operation in the year 06.10.2004 due to death of the original lessee and filing of probate application case. The case was originally filed before Hon'ble High Court, Delhi in 1997. The case was transferred by Hon'ble High Court to the District Judge, Barsat vide order dt.05.02.1999. And the probate proceeding was finalized on 18.12.2006 by the Ld. District Judge, Barsat.

(iv) The reasons of discontinuance as surfaced from the facts and legal submissions made cannot be solely attributed to the lessee.

(v) The lessee in this case has tried a lot to resume mining operation. But due to processing of FDP at different level and time consumed in completing the process, the lessee could not be able to obtain them.

And whereas, from the entire process of hearing, verification of fact on record and analysis of those facts, it is proved to a substantial extent that the discontinuance of mining operation in the above noted lease area has been caused due to want of statutory clearances. The reasons of

Scanned by CamScanner

discontinuance are proved to be beyond the control of the lessee. Therefore, the lease is found not liable for lapsing. Hence, the lease may not be declared as lapsed.

In view of the above, the State Government, after taking in to consideration all material facts and information available on record upon hearing and being invested with power u/r 20(2) of OMMCR 2016, have been pleased to decide not to declare and record the Iron & Manganese mining lease of Sri Avin Jain over an area of 89.961 hects. in village Dalpahar Block-A of Keonjhar District as lapsed without prejudice to any other proceedings pending against the lessee before any court of law or authorities.

By order of the Governor

5.9.15

(B. N. Acharya)
Additional Secretary to Govt.

By Registered Post with A/D

Memo No. 6611 /S&M, Bhubaneswar, date 6.9.2015

Copy forwarded to Sri Avin Jain, "DHARAM VILLA", 12-A, Mahatma Gandhi Marg, Ring Road, Lajpat Nagar-IV, New Delhi -110024 for information and necessary action.

5.9.15

Additional Secretary to Govt.

Memo No. 6612 /S&M, Bhubaneswar, date 6.9.2015

Copy forwarded to the Director of Mines, Odisha, Bhubaneswar / Director of Geology, Odisha, Bhubaneswar / DDM, Joda for kind information and necessary action.

5.9.15

Additional Secretary to Govt.

Memo No. 6613 /S&M, Bhubaneswar, date 6.9.2015

Copy forwarded to the Collector, Keonjhar for kind information and necessary action.

5.9.15

Additional Secretary to Govt.

Scanned by CamScanner

Memo No. [illegible] /SS&M, Bhubaneswar [illegible]

Copy forwarded to the Secretary, [illegible] Control Board, Odisha, Plot No.A-213, Kilakantha Nagar, [illegible] Bhubaneswar-751012 for kind information and necessary action.

[illegible] Secretary to Govt.

Memo No. [illegible] /SS&M, Bhubaneswar, [illegible]

Copy forwarded to the Special Secretary to Govt. Forest and Environment Department for kind information [illegible] necessary action.

[illegible] Secretary to Govt.

Memo No. [illegible] /SS&M, Bhubaneswar

Copy forwarded to the Regional Controller, Indian Bureau of Mines, Plot No. 149, In front of CPWD C[illegible] Complex, Bhubaneswar-751020 for kind information and necessary [illegible]

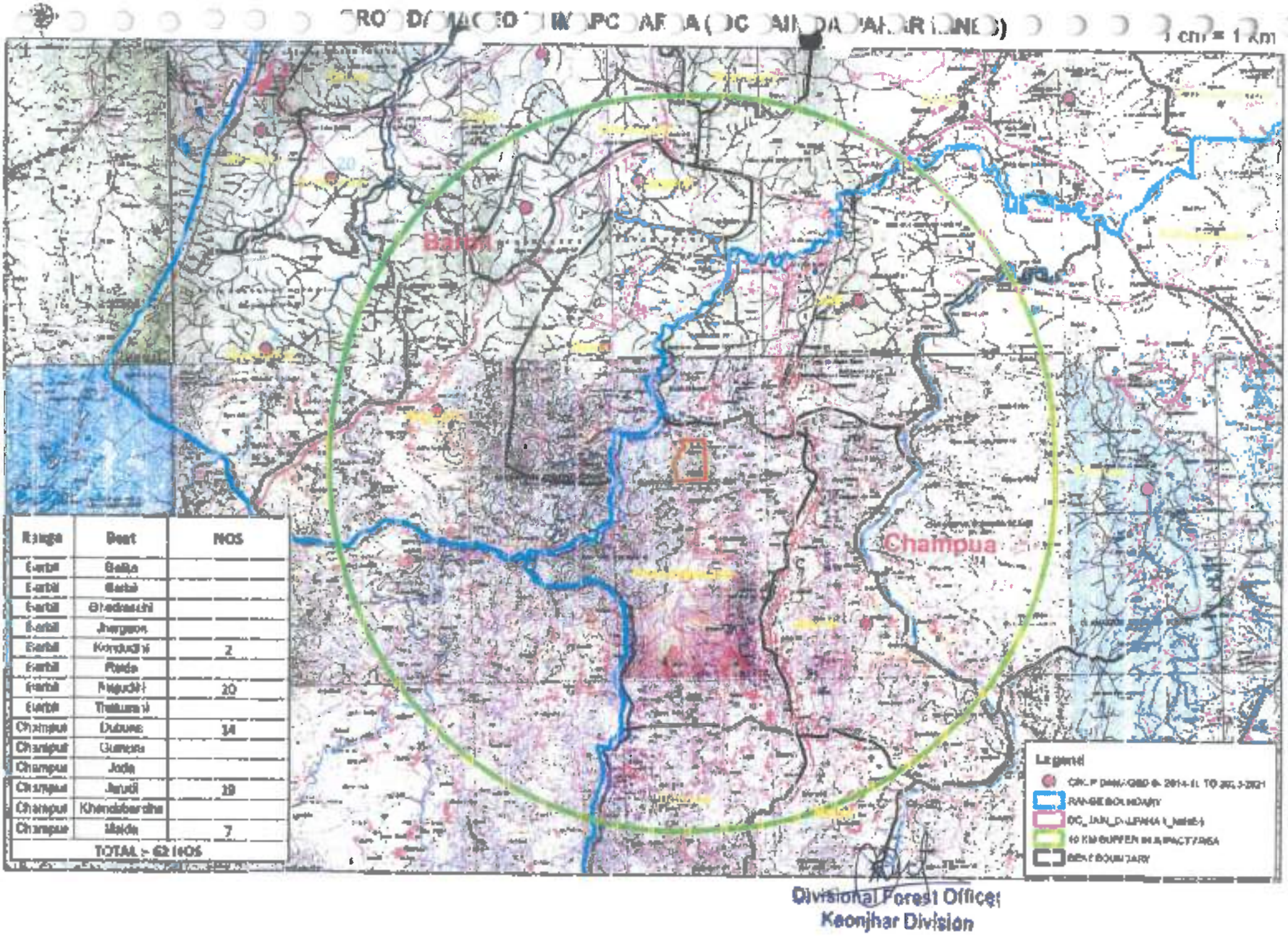
[illegible] Secretary to Govt.

Memo No. [illegible] /SS&M, Bhubaneswar,

Copy forwarded to the Chief Conservator of Forests (C), Ministry of Environment & Forest, Govt. of India, Regional Office (EZ), A-3, Chandrasekharpur, Bhubaneswar-751023 for information and necessary action.

[illegible] Secretary to Govt.

Scanned by CamScanner

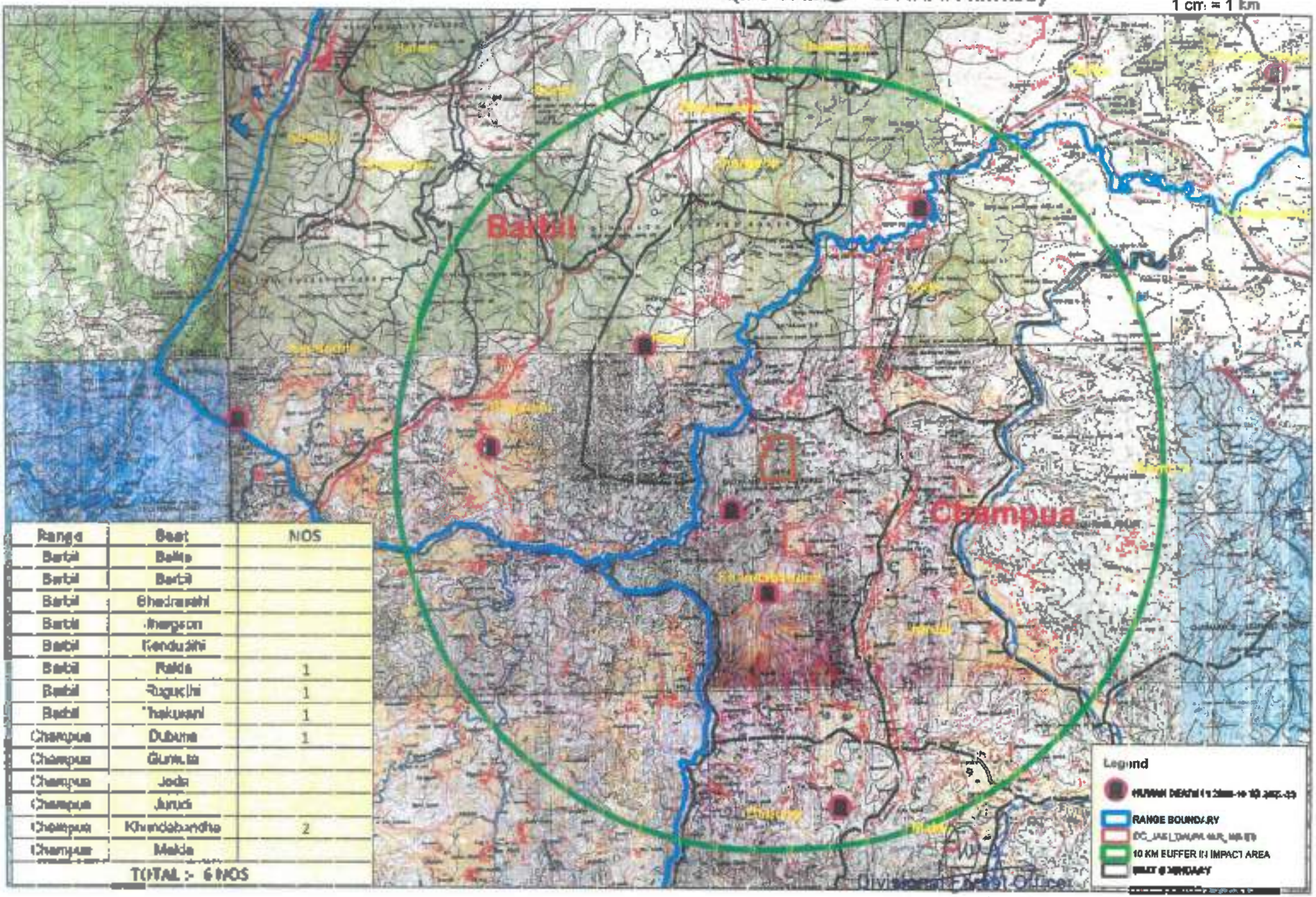


Range	Beat	NOS
Barbil	Balka	
Barbil	Barbil	
Barbil	Bhadrashi	
Barbil	Jhargaon	
Barbil	Kendudihi	2
Barbil	Pada	
Barbil	Rajgadi	20
Barbil	Tentuma	
Champua	Dubuna	14
Champua	Gumaria	
Champua	Jada	
Champua	Jarudi	19
Champua	Khandaberdha	
Champua	Malda	7
TOTAL :- 62 NOS		

Annexure-V

HUMAN DEATH IN IMAPCT AREA(DC JAIN PAHAR MINES)

1 cm = 1 km

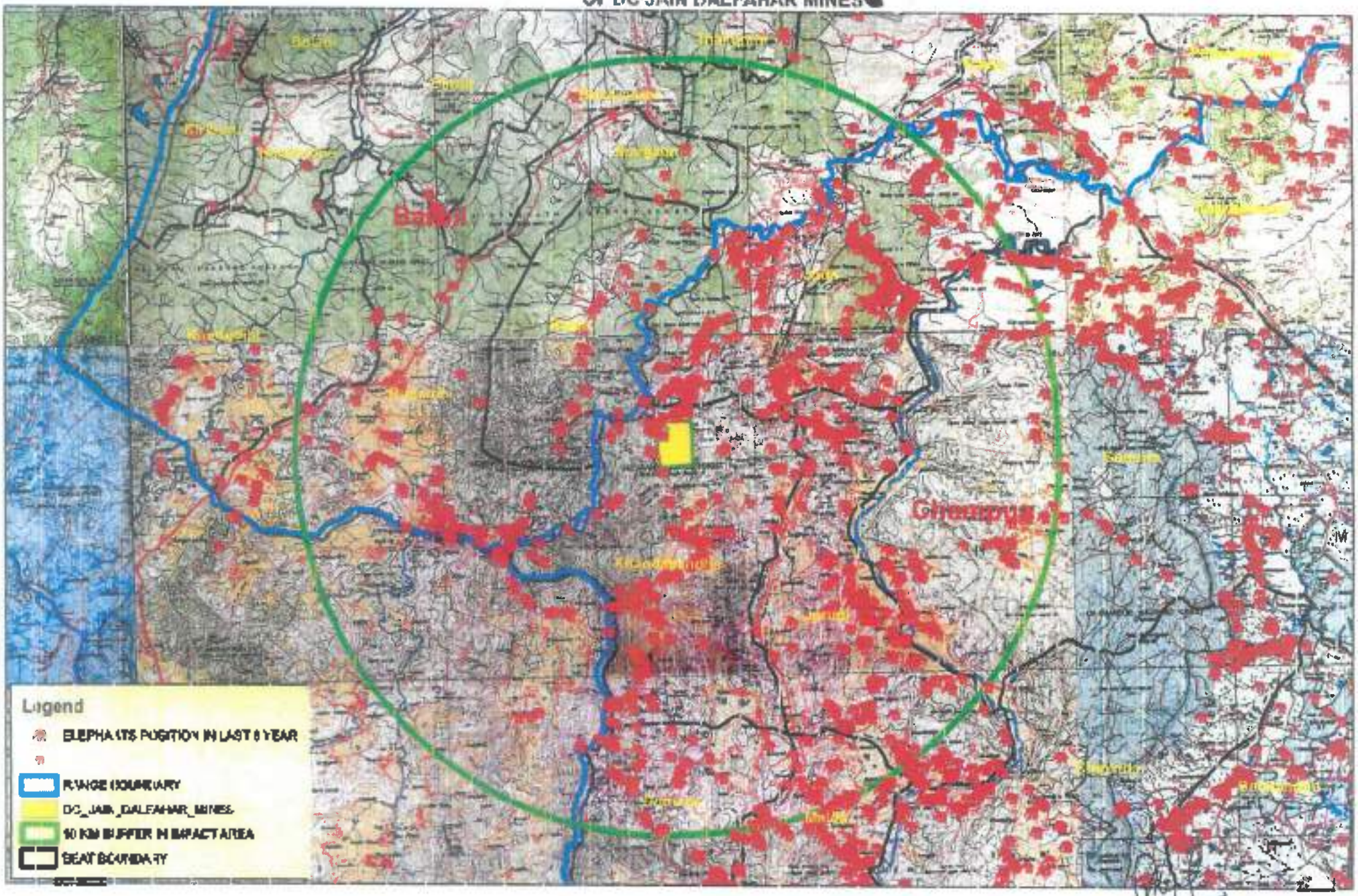


Range	Beat	NOS
Baitil	Balko	
Baitil	Baitil	
Baitil	Bhadrasahi	
Baitil	Jhargaon	
Baitil	Kenduchhi	
Baitil	Palda	1
Baitil	Rajpichi	1
Baitil	Thakurani	1
Champua	Dubuna	1
Champua	Gumuta	
Champua	Jodo	
Champua	Juruda	
Champua	Khandabandha	2
Champua	Makia	
TOTAL :- 6 NOS		

Divisional Forest Officer
Keonjhar Division

1 cm = 1 km

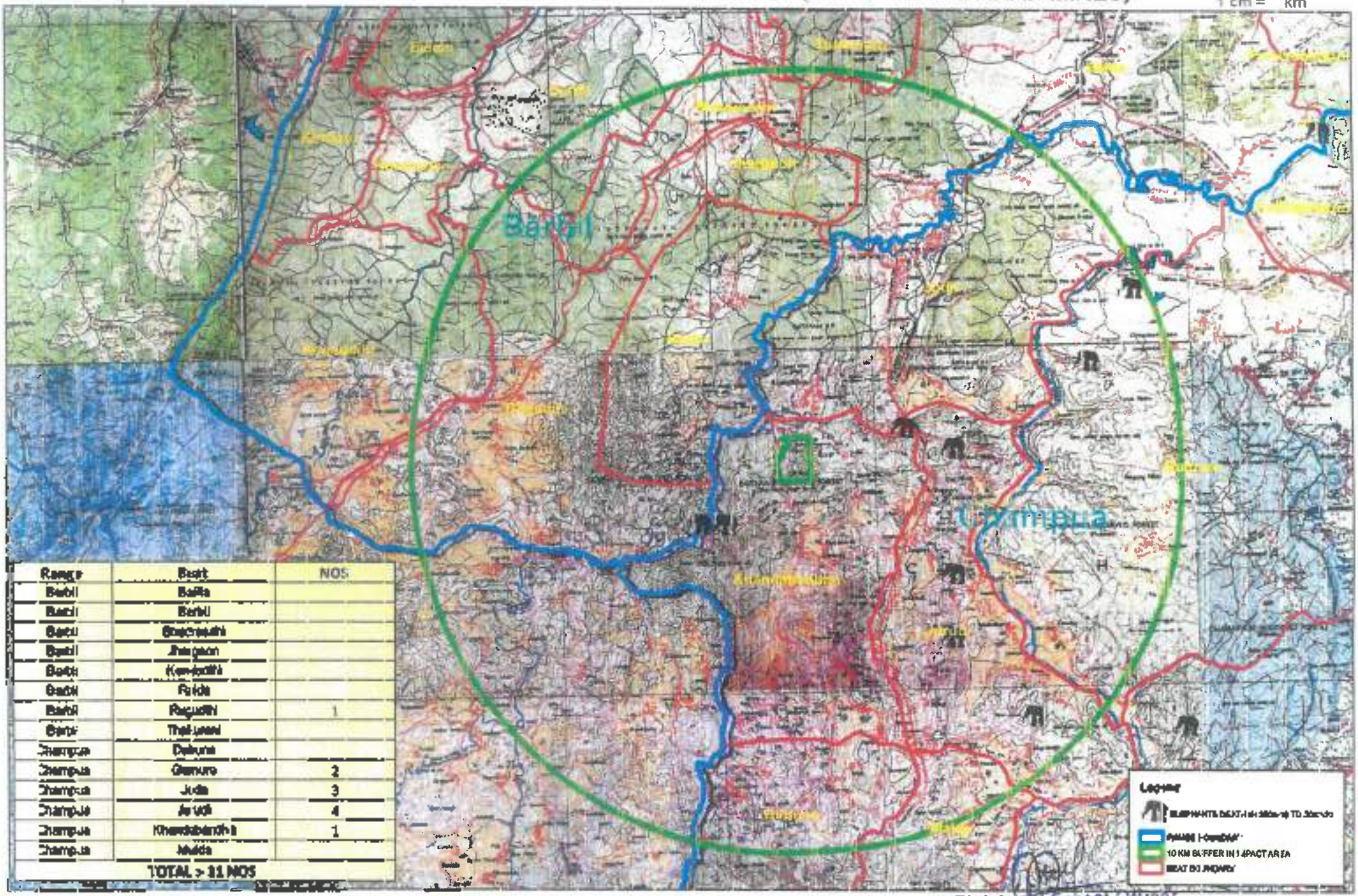
ELEPHANT POSITION IN LAST 8 YEAR IN 10 K. BUFFER AREA OF DC JAIN DALPAHAR MINES



Divisional Forest Officer
Keonjhar Division

ELEPHANT DEATH IN IMPACT AREA (D.C. ... N DALPAHAR MINES)

1 cm = ' km



Range	Beat	NOS
Barbil	Balda	
Barbil	Barbil	
Barbil	Bhaktasahi	
Barbil	Jhargaon	
Barbil	Kendposhi	
Barbil	Purda	
Barbil	Raguthi	1
Barbil	Thakurani	
Champua	Daburia	
Champua	Gamuria	2
Champua	Joda	3
Champua	Jurda	4
Champua	Khandabandhi	1
Champua	Malda	
TOTAL = 11 NOS		

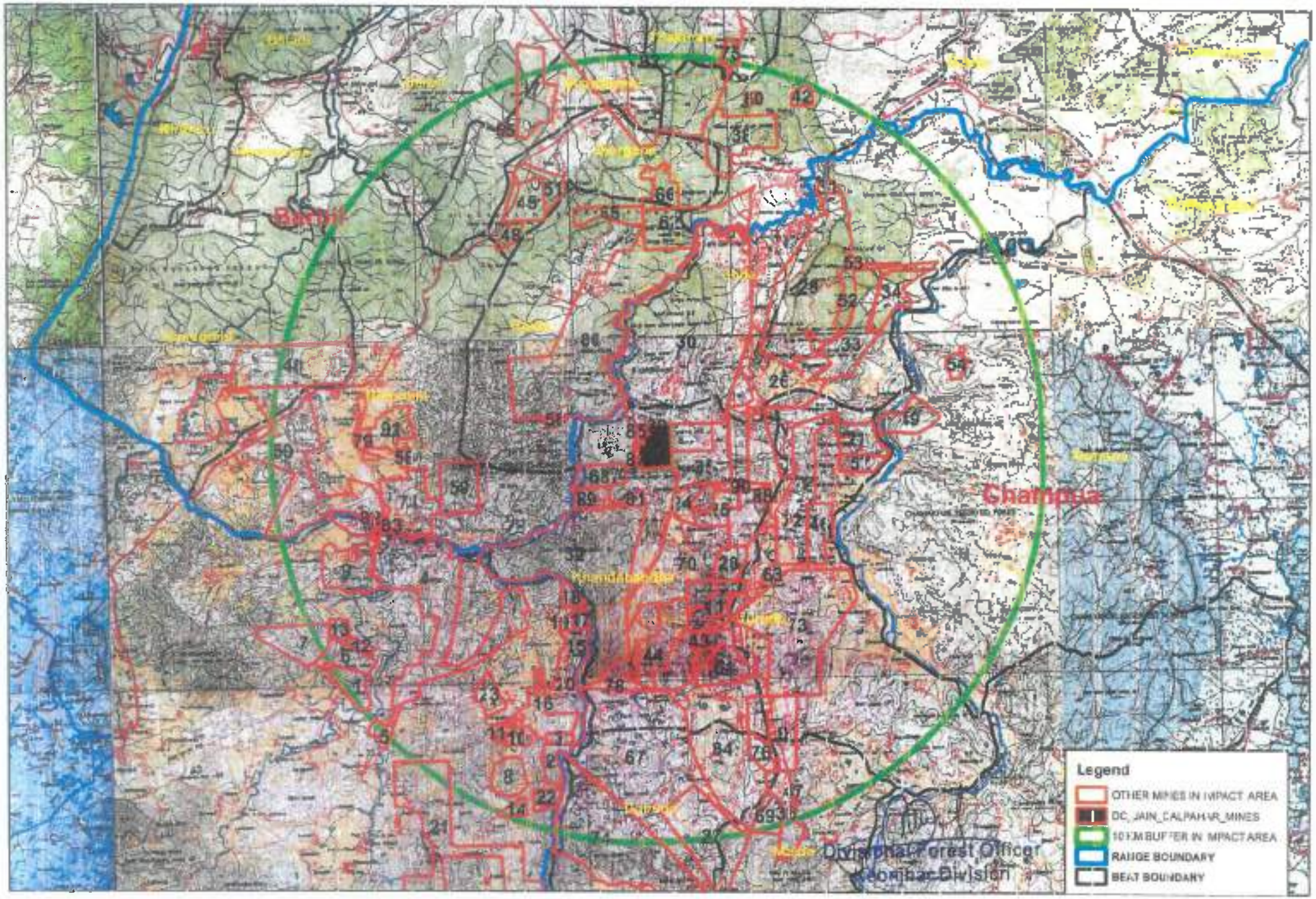
Legend

- ELEPHANTS DEATH (4th March to 30th June)
- PARK / SANCTUARY
- 10 KM BUFFER IN IMPACT AREA
- BEAT BOUNDARY

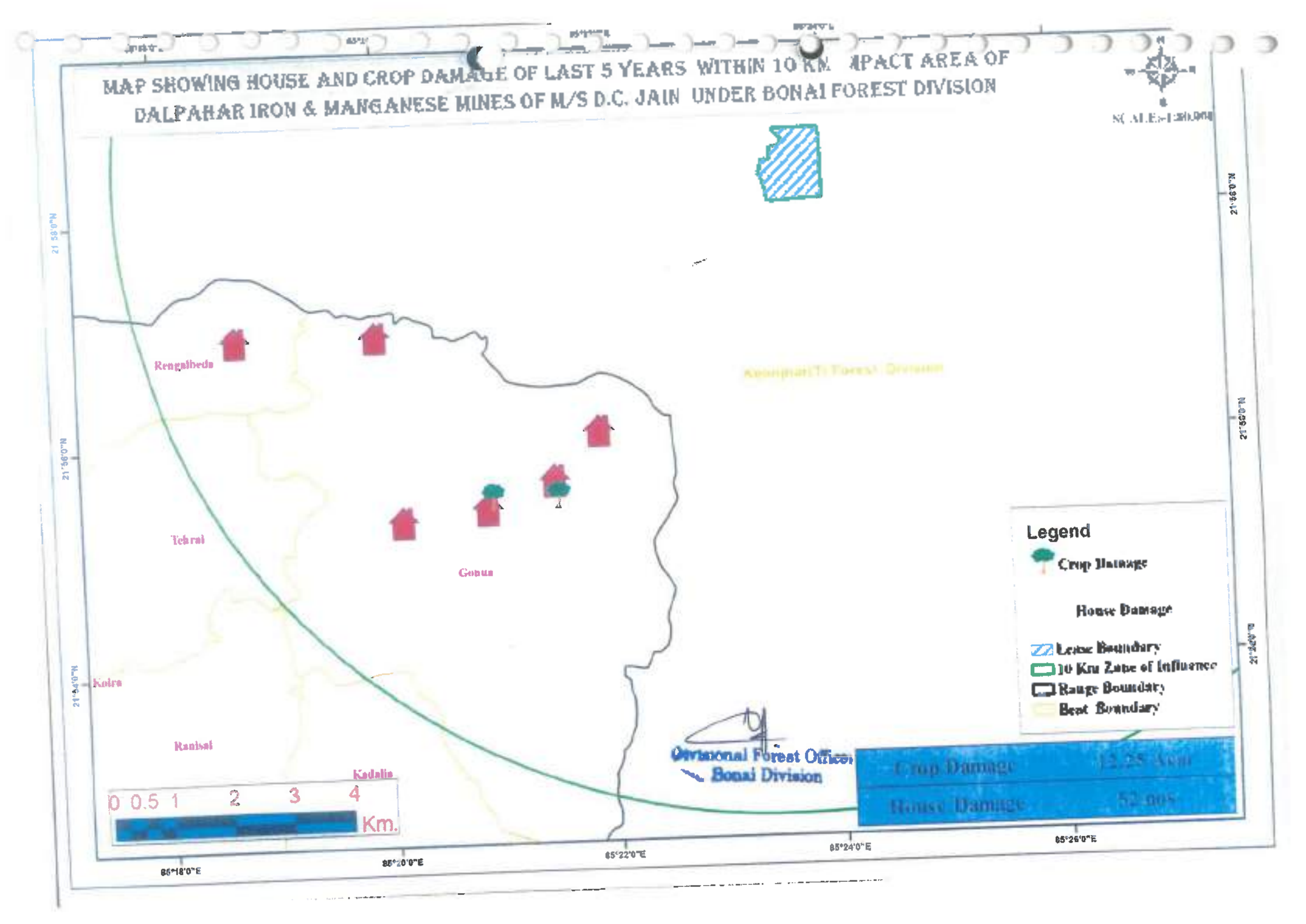
Divisional Forest Officer
Keonjhar Division

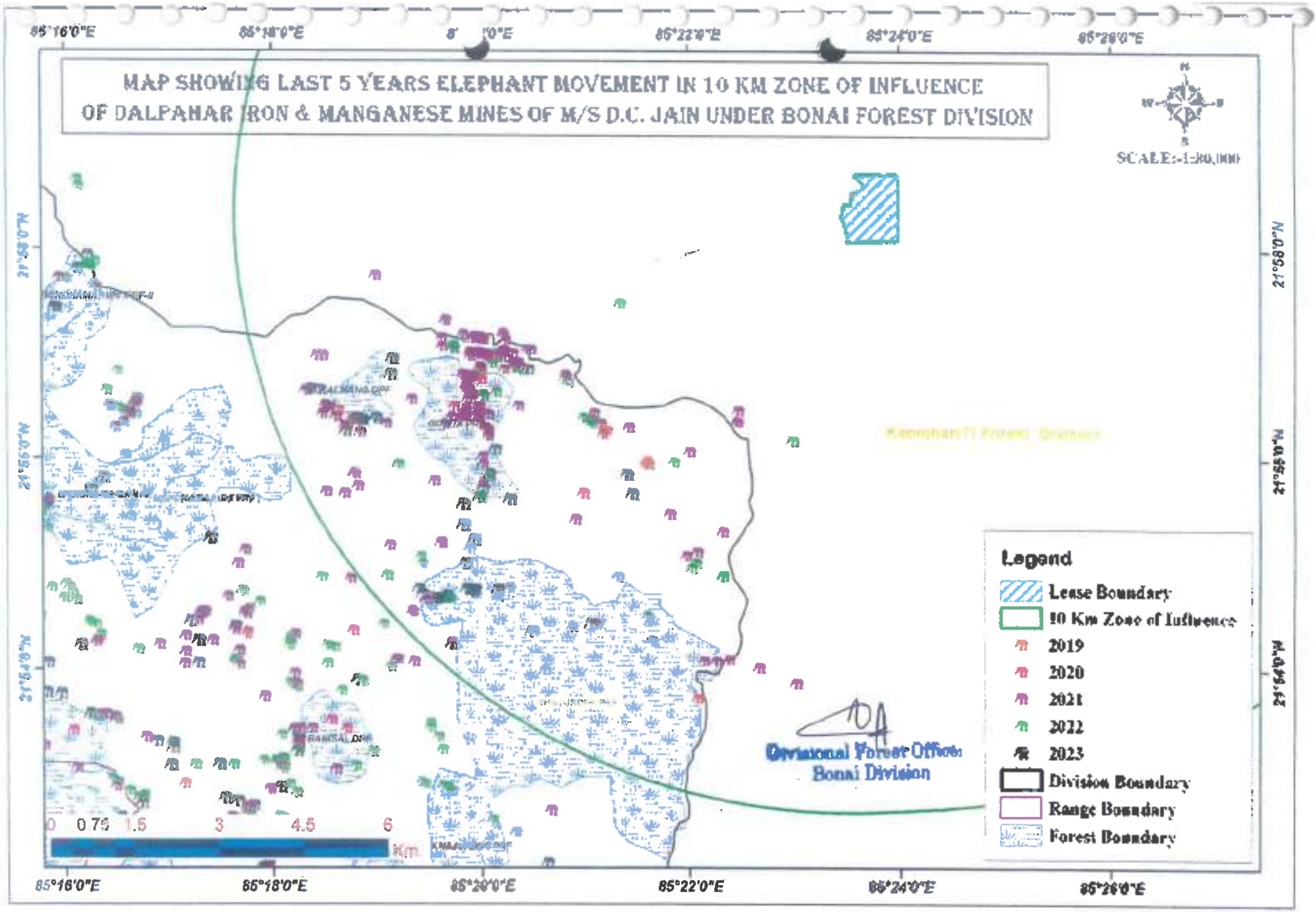
1 cm = 1 km

OTHER MINING IN 10 Km BUFFER AREA OF DC JAIN CALPAHAR MINES

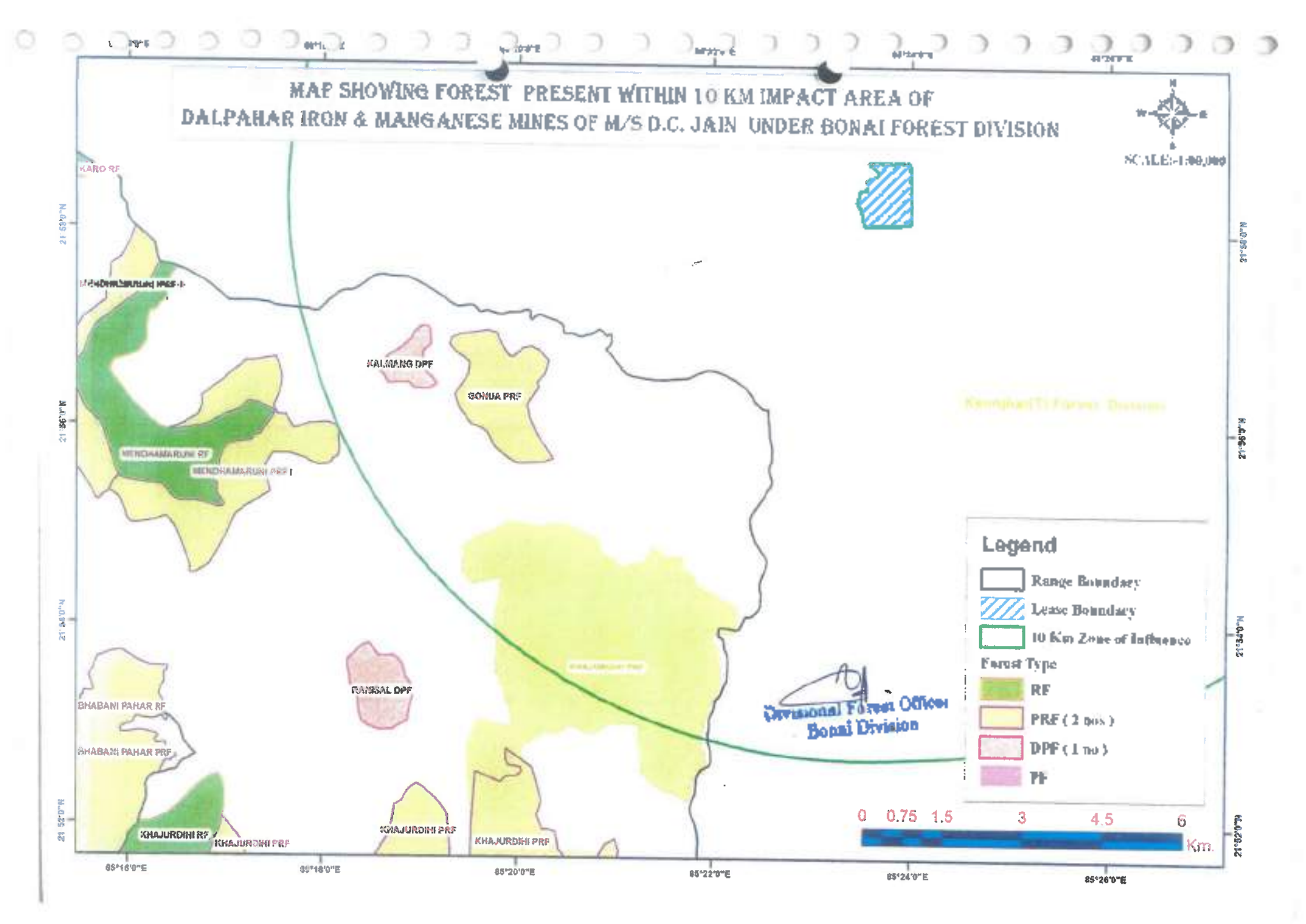


MAP SHOWING HOUSE AND CROP DAMAGE OF LAST 5 YEARS WITHIN 10 KM. IMPACT AREA OF DALPAHAR IRON & MANGANESE MINES OF M/S D.C. JAIN UNDER BONAI FOREST DIVISION

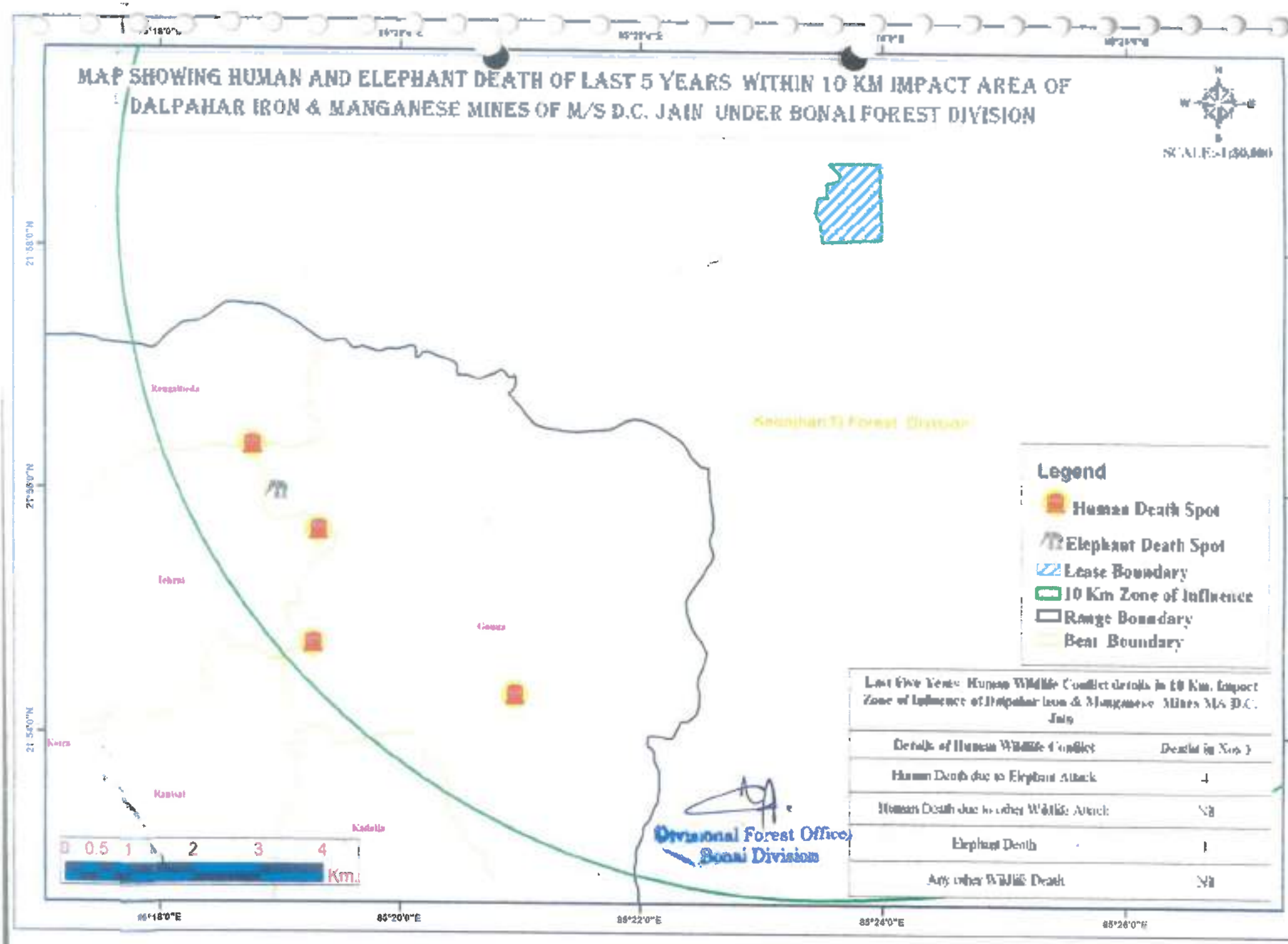



MAP SHOWING LAST 5 YEARS ELEPHANT MOVEMENT IN 10 KM ZONE OF INFLUENCE
OF DALPAHAR IRON & MANGANESE MINES OF M/S D.C. JAIN UNDER BONAI FOREST DIVISION
SCALE:-1:50,000
85°16'0"E
85°18'0"E
85°20'0"E
85°22'0"E
85°24'0"E
85°26'0"E
21°58'0"N
21°56'0"N
21°54'0"N
Legend
Lease Boundary
10 Km Zone of Influence
2019
2020
2021
2022
2023
Division Boundary
Range Boundary
Forest Boundary
0 0.75 1.5 3 4.5 6
Km
Divisional Forest Officer
Bonai Division

MAP SHOWING FOREST PRESENT WITHIN 10 KM IMPACT AREA OF DALPAHAR IRON & MANGANESE MINES OF M/S D.C. JAIN UNDER BONAI FOREST DIVISION

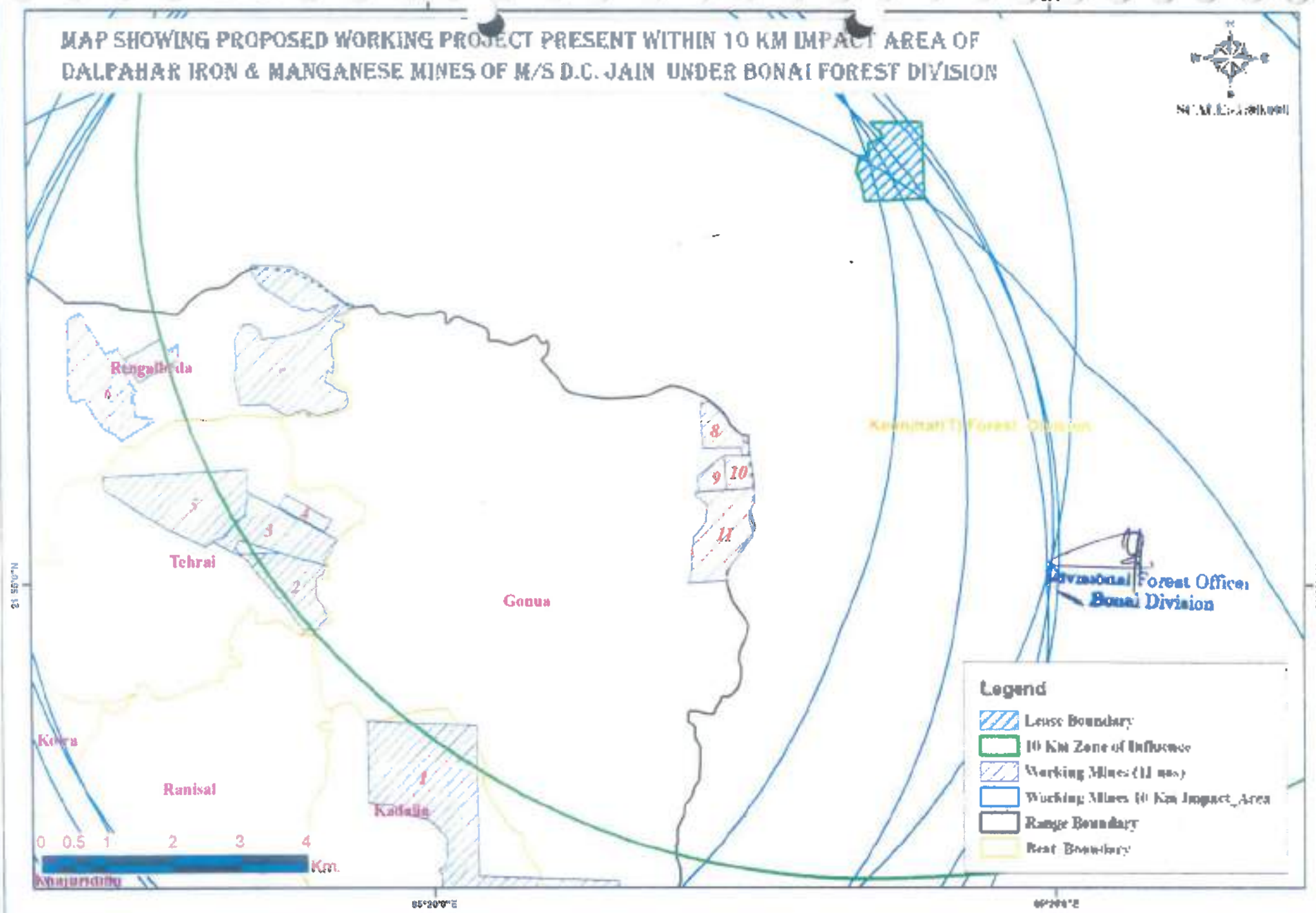


MAP SHOWING HUMAN AND ELEPHANT DEATH OF LAST 5 YEARS WITHIN 10 KM IMPACT AREA OF DALPAHAR IRON & MANGANESE MINES OF M/S D.C. JAIN UNDER BONAI FOREST DIVISION

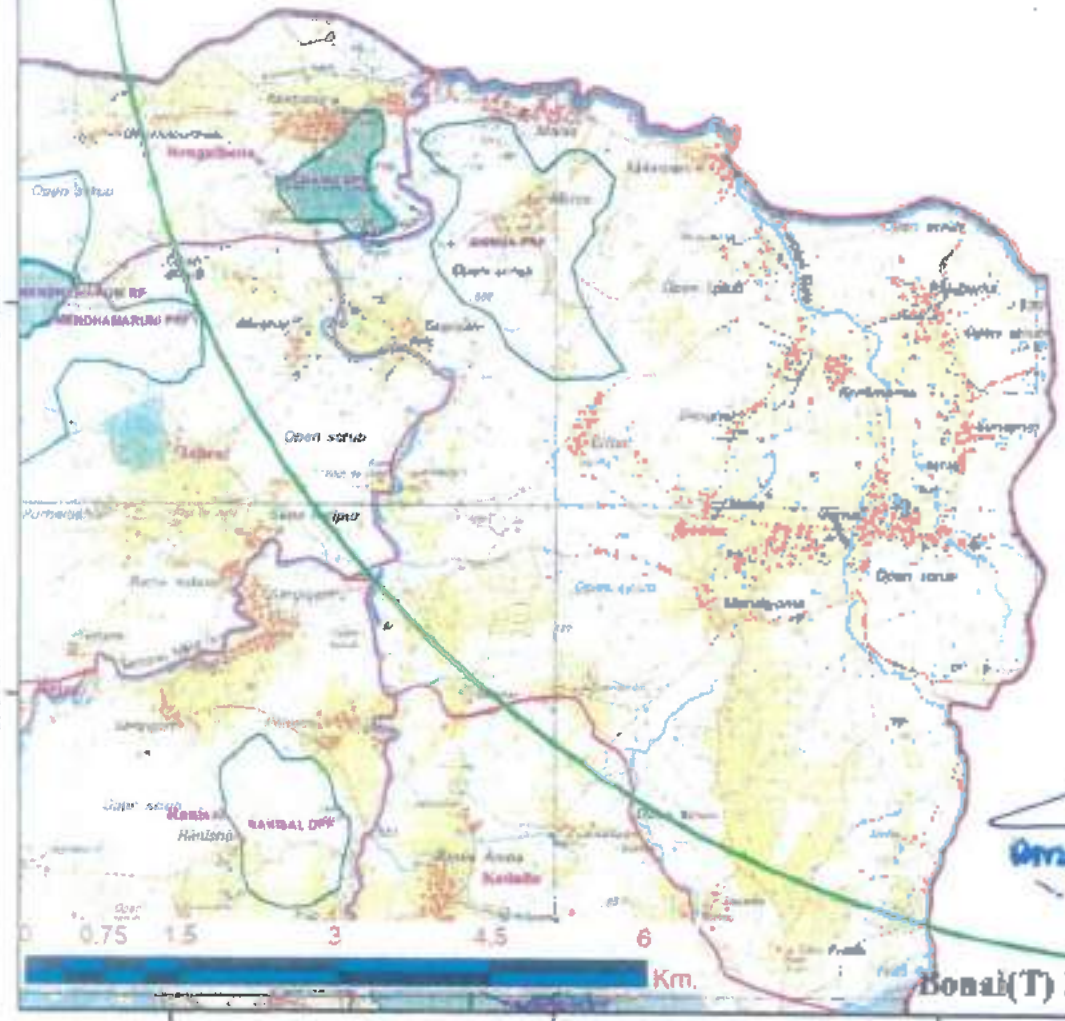


Last Five Years Human Wildlife Conflict details in 10 Km. Impact Zone of Influence of Dalpahar Iron & Manganese Mines M/S D.C. Jain	
Details of Human Wildlife Conflict	Details in Nos.
Human Death due to Elephant Attack	4
Human Death due to other Wildlife Attack	Nil
Elephant Death	1
Any other Wildlife Death	Nil

MAP SHOWING PROPOSED WORKING PROJECT PRESENT WITHIN 10 KM IMPACT AREA OF DALPAHAR IRON & MANGANESE MINES OF M/S D.C. JAIN UNDER BONAI FOREST DIVISION



MAP SHOWING RANGE AND BEAT PRESENT WITHIN 10 KM IMPACT AREA OF DALPAHAR IRON & MANGANESE MINES OF M/S D.C. JAIN UNDER BONAI FOREST DIVISION


Open scrub
Open scrub
Open scrub

TIME-BOUND PLAN FOR RECLAMATION OF THE MINED AND SURRENDER OF THE LAND TO THE STATE GOVERNMENT

FOR DALPAHAHAR MINES

OF

SRI AVIN JAIN.

(In compliance to condition no 4(II) of in principle stage I approval vide letter dated 13/02/2026 in File No:8-31/2015FC(E-91138) of MOEFCC)

PREFACE

Mining activities, particularly in forested and hilly terrain, require careful planning and responsible environmental management to ensure that the natural ecosystem is restored and sustained after extraction of mineral resources. The Dalpahar Iron and Manganese Mines (Block–A), operated by DC Jain Group, are located within the Baitarani Reserve Forest under Barbil Tahasil of Keonjhar District, Odisha. The project area forms part of the mineral-rich iron ore belt of the Singhbhum–Keonjhar–Bonai region and is characterized by undulating terrain, dense sal forests, and seasonal drainage channels forming part of the Baitarani river basin.

The diversion of forest land for mining activities under the provisions of the Forest (Conservation) Act, 1980 is subject to a number of environmental safeguards stipulated by the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India. Among the important conditions of Stage-I Forest Clearance is the requirement that the project proponent prepare and implement a scientifically designed reclamation and ecological restoration plan aimed at minimizing environmental impacts and restoring ecological balance within the mining area.

The present document titled **"Time bound Plan for reclamation of the mined out area and surrender of the land to state government for Dalpahar Iron and Manganese Mines (Block–A)"** has been prepared in compliance with these statutory requirements. The plan provides a comprehensive framework for restoring land disturbed by mining activities through a combination of engineering stabilization measures, soil and moisture conservation structures, vegetation development, and hydrological restoration.

The reclamation strategy outlined in this document emphasizes progressive mine closure practices so that reclamation activities are carried out concurrently with mining operations. This approach minimizes the extent of disturbed land at any given time and facilitates faster recovery of vegetation cover and ecosystem functions. The plan also incorporates watershed management principles and biodiversity conservation measures to ensure that the reclaimed landscape becomes environmentally stable and ecologically productive over the long term.

The preparation of this document has involved a review of baseline environmental conditions, geological characteristics of the mine area, and best practices for mine reclamation adopted in similar mining regions. Particular emphasis has been placed on the restoration of forest vegetation using native species typical of the sal forest ecosystem of Keonjhar district.

The successful implementation of this reclamation plan will contribute significantly to the restoration of ecological balance in the project area and demonstrate the commitment of the project proponent to environmentally responsible mining practices.

Executive Summary

1. Introduction

The Dalpahar Iron and Manganese Mines (Block–A) are located in the mineral-rich region of Keonjhar district in the state of Odisha. The mine lies within the Baturani Reserve Forest under Barbil Tahasil and forms part of the well-known Singhbhum–Keonjhar–Bonai iron ore belt. Mining operations in forest areas inevitably involve disturbances to land, vegetation, soil structure, and drainage systems. Therefore, it is essential that such disturbances are mitigated through well-planned reclamation and ecological restoration measures.

This document presents a **Ten-Year Reclamation & Mines Closure Plan for surrendering the land to the state Government,** prepared in compliance with the conditions stipulated under the Stage-I Forest Clearance granted by the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India. The plan outlines strategies for restoring ecological stability in areas affected by mining activities through engineering stabilization measures, vegetation development, and hydrological management.

2. Objectives of the Reclamation Plan

The primary objectives of the reclamation plan are:

- To restore the physical stability of land disturbed by mining operations
- To rehabilitate soil fertility and promote vegetation growth
- To control soil erosion and sediment transport
- To enhance groundwater recharge and water availability
- To restore forest ecosystems using native plant species
- To ensure environmentally sustainable post-mining land use

The reclamation program is designed to ensure that the mining landscape is gradually transformed into a stable and productive ecosystem capable of supporting vegetation, wildlife habitats, and water resources.

3. Reclamation Strategy

The reclamation strategy for the Dalpahar mining project is based on three fundamental principles:

Progressive Reclamation

Reclamation activities will be carried out simultaneously with mining operations wherever feasible. Areas where mining has been completed will be stabilized and restored immediately rather than waiting until the end of the mine life.

Engineering Stabilization

Engineering measures such as dump terracing, construction of toe walls, drainage channels, and sedimentation ponds will be implemented to ensure stability of mine dumps and slopes.

Ecological Restoration

Vegetation development using native forest species will be undertaken to recreate ecological conditions similar to those existing before mining. Mixed plantations will be established to enhance biodiversity and ecological resilience.

4. Soil and Moisture Conservation Measures

The reclamation plan incorporates a range of soil and moisture conservation structures designed to control surface runoff and enhance groundwater recharge. These include contour trenches, check dams, gully plugs, vegetative barriers, and percolation pits.

Such structures will help reduce soil erosion and improve water retention in reclaimed areas, thereby supporting vegetation growth and ecological restoration.

5. Water Management

Effective water management is essential to prevent sedimentation of nearby streams and maintain the hydrological balance of the mining area. The plan includes construction of garland drains around mine pits and waste dumps to control runoff during monsoon months.

Sedimentation ponds will be established to capture suspended sediments before water is discharged into natural drainage channels. Mined-out pits that remain after completion of mining operations may be converted into water reservoirs capable of supporting fisheries and groundwater recharge.

6. Ecological Restoration and Plantation

The ecological restoration strategy emphasizes the use of native plant species typical of the sal forest ecosystem of Keonjhar district. Major plantation species proposed include Shorea robusta (Sal), Terminalia arjuna (Arjun), Terminalia tomentosa (Asan), Bambusa bambos (Bamboo), Emblica officinalis (Amla), and Azadirachta indica (Neem).

Plantation density will generally range between 1600 and 2000 saplings per hectare depending on site conditions. Mixed plantations will be preferred to monoculture plantations in order to enhance ecological stability and biodiversity.

7. Post-Mining Land Use

The final landscape of the reclaimed mining area will consist of a combination of forested areas, water bodies, and grassland habitats. Stabilized waste dumps will be converted into forest plantations, while mined-out pits with afforestation and may form water reservoirs that contribute to groundwater recharge and wildlife habitat development. The reclaimed land shall be handed over to the state Government at the end of 10^{th} year.

Such post-mining land uses will help integrate the reclaimed mine area with the surrounding forest ecosystem.

8. Environmental Monitoring

An environmental monitoring program will be implemented to evaluate the effectiveness of reclamation measures. Monitoring will focus on air quality, water quality, soil fertility, and vegetation development.

The monitoring results will be periodically reviewed to ensure that reclamation objectives are being achieved and that environmental standards prescribed by regulatory authorities are met.

9. Implementation Schedule and Cost

The reclamation program will be implemented over a ten-year period through phased activities involving dump stabilization, soil conservation measures, plantation development, and environmental monitoring. The estimated cost of reclamation activities is approximately ₹3–4 lakh per hectare, covering engineering works, plantation development, and monitoring.

Adequate financial assurance will be provided by the project proponent to ensure that reclamation activities are completed in accordance with regulatory requirements.

10. Conclusion

The Ten-Year Reclamation and Mine Closure Plan for Dalpahar Iron and Manganese Mines provides a comprehensive framework for restoring ecological balance within the mining area. Through a combination of engineering stabilization measures, soil and moisture conservation practices, and ecological restoration initiatives, the plan aims to transform the disturbed mining landscape into a stable and productive ecosystem.

Successful implementation of this plan will ensure compliance with statutory requirements under the Forest (Conservation) Act, 1980 and demonstrate the commitment of the project proponent towards environmentally responsible mining practices.

Project at a Glance

Sl. No.	Particulars	Details
1	**Name of Project**	Dalpahar Iron & Manganese Mines (Block–A)
2	Project Proponent	Shri Avin Jain
3	**Location**	Baitarani Reserve Forest, Barbil Tahasil
4	District	Keonjhar
5	State	Odisha
6	**Mineral**	Iron Ore and Manganese
7	**Mining Method**	Opencast Mining
8	Total Mining Lease Area	89.961 hectares *(as per FC proposal)*
9	**Forest Land Involved**	89.961 hectares (Reserve Forest)
10	Nearest Town	Barbil
11	Nearest Railway Station	Barbil
12	River Basin	Baitarani River Basin
13	Terrain	Undulating forested hill terrain
14	Average Annual Rainfall	1400–1600 mm
15	Dominant Forest Type	Tropical Moist Deciduous Forest (Sal dominated)
16	Major Plantation Species Proposed	Sal, Asan, Arjun, Bamboo, Amla, Neem
17	Reclamation Strategy	Progressive reclamation with ecological restoration
18	Soil & Moisture Conservation Measures	Contour trenches, check dams, gully plugs
19	Post Mining Land Use	Forest plantation, water reservoirs, wildlife habitat
20	Estimated Reclamation Cost	₹3–4 lakh per hectare
21	Implementation Period	10 years
22	Regulatory Authority	MoEFCC, Government of India

List of Figures

Figure No.	Title
Figure 1	Location Map of Dalpahar Iron & Manganese Mine
Figure 2	Regional Geological Map
Figure 3	Satellite image map
Figure 4	Topographic Map of Mine Lease Area
Figure 5	Drainage Map of the Project Area
Figure 6	Waste Dump Stabilization & Soil and Moisture Conservation Structure map
Figure 7	Phase wise reclamation map
Figure 8	Check Dam Engineering Drawing
Figure 9	Loose boulder structure drawing
Figure 10	Existing Land Use Map
Figure 11	Contour trench design drawing
Figure 12	Graded Earthen Bond
Figure 13	Garland drain Design drawing
Figure 14	Retaining wall designing draw
Figure 15	Settling tank Design drawing

List of Abbreviations

Abbreviation	Full Form
MoEFCC	Ministry of Environment, Forest and Climate Change
FC	Forest Clearance
SMC	Soil and Moisture Conservation
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
PMCP	Progressive Mine Closure Plan
FMCP	Final Mine Closure Plan
IBM	Indian Bureau of Mines
GIS	Geographic Information System
RF	Reserve Forest
PM10	Particulate Matter (10 microns)
PM2.5	Particulate Matter (2.5 microns)

Chapter 1

Project Overview and Mine Description

1.1 Introduction

The Dalpahar Iron and Manganese Mines (Block–A), operated by DC Jain Group, are located within the Baitarani Reserve Forest under Barbil Tahasil of Keonjhar District, Odisha. The mine forms part of the mineral-rich iron ore belt of eastern India and lies within one of the most important mining districts of the country. The proposed mining activities are governed by the statutory provisions of the Forest (Conservation) Act, 1980, the Environment Protection Act, 1986, and the Environmental Impact Assessment (EIA) Notification, 2006.

Mining activities in forested terrain inevitably result in disturbance to landform, vegetation, soil structure, and drainage patterns. Therefore, reclamation planning is an essential component of environmentally responsible mining practices. The present document outlines a comprehensive ten-year reclamation and ecological restoration plan aimed at restoring the disturbed landscape to a stable and productive ecological condition.

The reclamation strategy integrates progressive mine closure measures with ecological restoration techniques so that disturbed areas are rehabilitated simultaneously with mining operations. This approach ensures that the extent of disturbed land is minimized at any given time and that environmental degradation is controlled effectively.

1.2 Location and Accessibility

The Dalpahar mining block is situated in the northern part of Odisha within Keonjhar district. The area lies in the Koira–Barbil mining belt, which is one of the most significant iron ore producing regions of India. The mine lease area is surrounded by forest land and hilly terrain characteristic of the Eastern Ghats geological province.

The site is accessible through a network of mining roads connecting the area to Barbil and Koira towns. The nearest railhead is located at Barbil, which provides connectivity to major industrial centers of eastern India. The region is well connected by road and rail infrastructure developed primarily to support mining and mineral transportation.

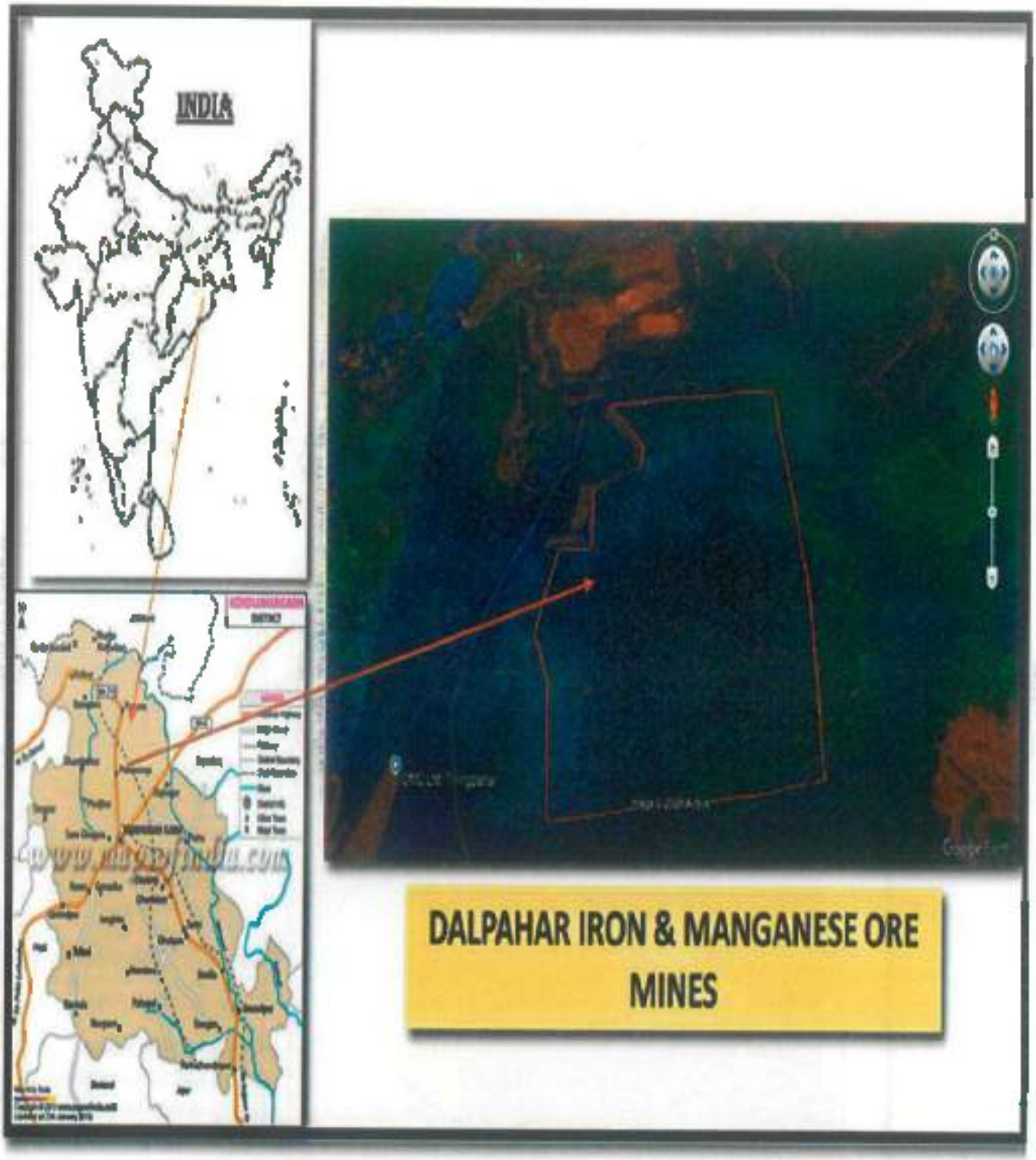


Figure1-Location map

1.3 Geological Setting

The Dalpahar region forms part of the Iron Ore Group of the Singhbhum–Keonjhar–Bonai belt, which is known for its high grade iron ore deposits. The geological formations consist primarily of banded hematite quartzite (BHQ), banded hematite jasper (BHJ), lateritic ore, and associated manganese deposits.

The mineralization occurs within hill ranges composed of ferruginous quartzites and associated lithological units. Weathering processes have resulted in the formation of lateritic iron ore deposits near the surface, which are suitable for open-cast mining.

The terrain is characterized by steep hill slopes, narrow valleys, and undulating plateaus. Such geomorphological conditions necessitate careful planning of mining and reclamation activities to prevent soil erosion and slope instability.

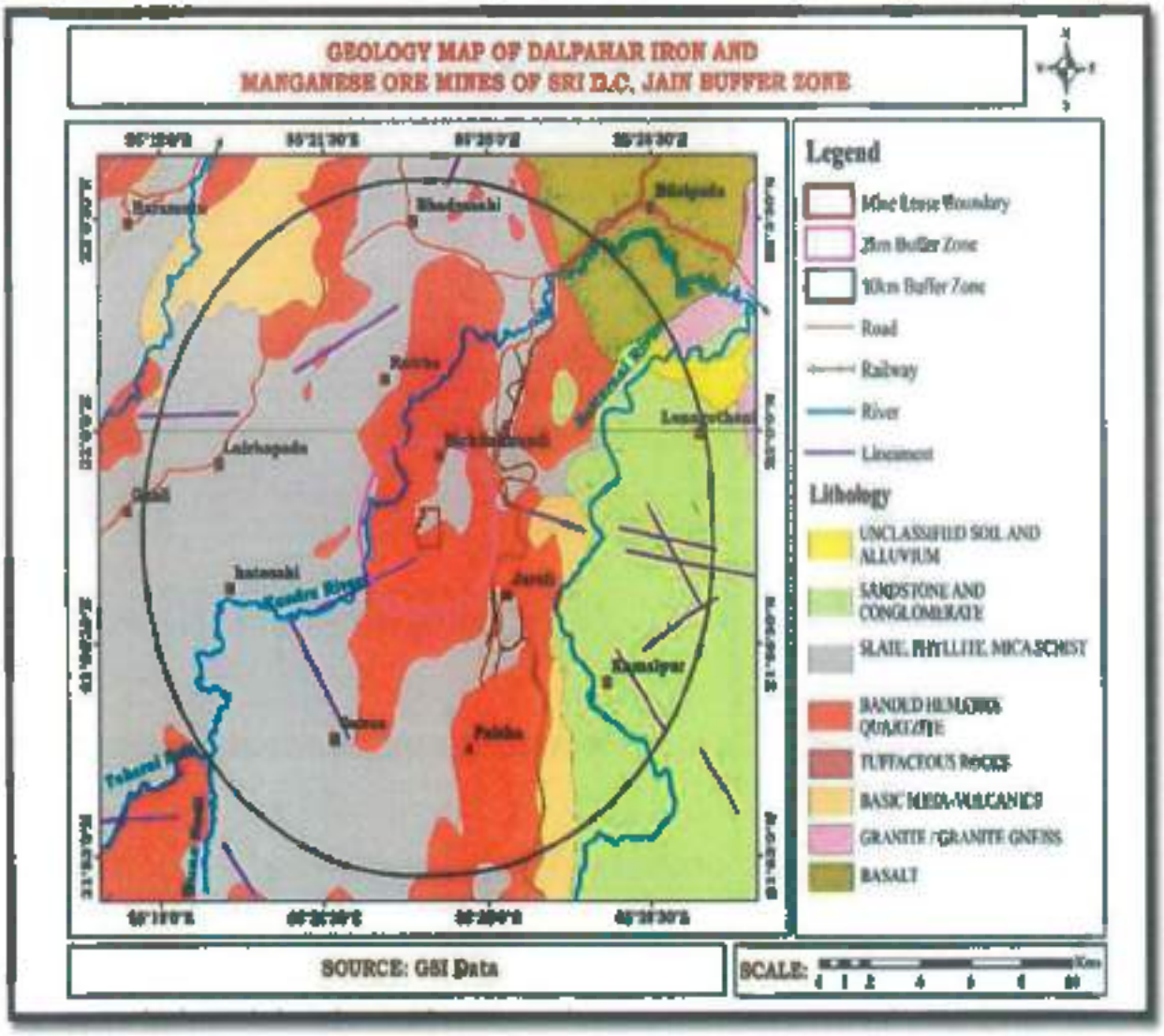


Figure 2: Geology of Core and Buffer Zone of Dalpahar Iron and Manganese Ore Mine

1.4 Climate and Meteorology

The project area experiences a tropical monsoon climate with distinct summer, monsoon, and winter seasons. The average annual rainfall in the region ranges between 1400 mm and 1600 mm, with nearly 80 percent of precipitation occurring during the southwest monsoon between June and September.

Temperatures vary from approximately 10°C during winter months to about 42°C during peak summer. The region experiences moderate humidity levels during monsoon months and relatively dry conditions during winter and summer.

The climatic conditions play a significant role in determining the reclamation strategy. High rainfall intensity during monsoon months increases the risk of soil erosion and sediment transport from mine dumps and exposed slopes. Therefore, soil and moisture conservation measures form a key component of the reclamation plan.

Figure 3: Satellite Data showing 10Km buffer area around the ML.

1.5 Topography and Drainage

The mine area lies within a rugged terrain consisting of hill ridges and valleys. Elevations within the region range from approximately 450 m to 750 m above mean sea level. The slopes are generally steep and covered with forest vegetation.

The area falls within the catchment of the Baitarani River system. Several seasonal nalas originate from surrounding hill slopes and flow towards larger tributaries. During the monsoon season these streams carry substantial runoff, which can transport sediments generated by mining activities if proper drainage management measures are not implemented.

To address this issue, the reclamation plan incorporates drainage control systems such as garland drains, sedimentation ponds, and check dams designed to regulate runoff and minimize sediment discharge into natural water bodies

Figure 4: Topographic map of Mining Lease area

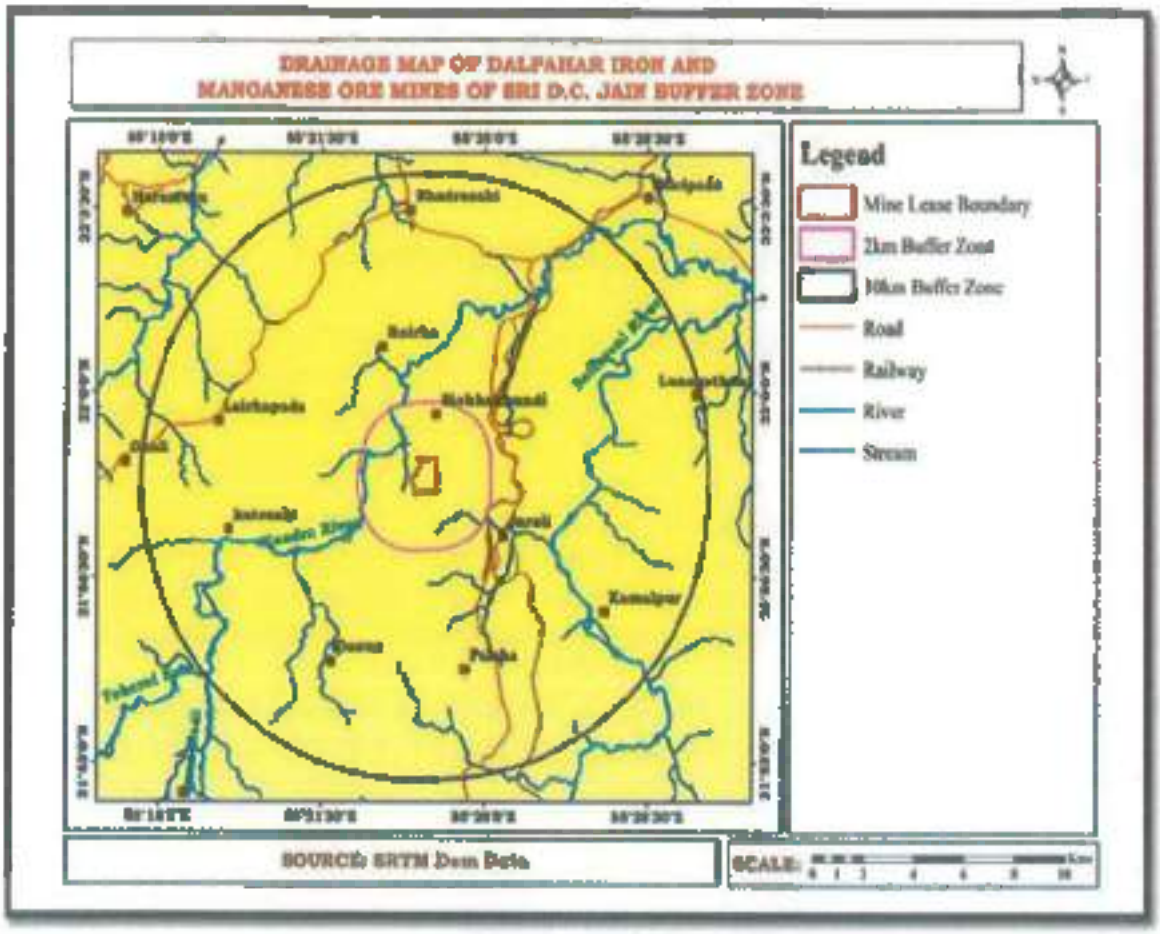


Figure 5: Drainage Map of the area

1.6 Ecological Significance

The Dalpahar region lies within a forested landscape dominated by sal (Shorea robusta) and associated species typical of the eastern Indian deciduous forest ecosystem. The forests support diverse flora and fauna, including several species of ecological and conservation importance.

The broader landscape is also known to support wildlife movement corridors, particularly for elephants and other large mammals. Therefore, ecological restoration and biodiversity conservation are important components of the reclamation strategy.

The restoration plan emphasizes the use of native plant species adapted to local climatic and soil conditions. Mixed plantations will be established to recreate natural forest ecosystems and improve habitat quality in the reclaimed mine areas.

Chapter 2

Statutory and Regulatory Framework

2.1 Overview of Environmental Regulations

Mining activities in India are governed by a comprehensive legal framework aimed at ensuring environmental protection and sustainable resource utilization. The Dalpahar mining project must comply with several statutory provisions, including environmental clearance conditions and forest diversion approvals.

The most relevant legislation applicable to the project includes the Forest (Conservation) Act, 1980, the Environment Protection Act, 1986, and the Environmental Impact Assessment Notification, 2006. These regulations require mining companies to adopt appropriate environmental safeguards and implement reclamation measures to restore disturbed land.

The reclamation plan presented in this report has been formulated in accordance with these statutory provisions and incorporates best practices for mine closure and environmental restoration.

2.2 Forest (Conservation) Act, 1980

The Forest (Conservation) Act, 1980 regulates the diversion of forest land for non-forest purposes, including mining. Under this legislation, prior approval of the Ministry of Environment, Forest and Climate Change (MoEFCC) is required for the use of forest land.

The Dalpahar mining project has been granted Stage-I (in-principle) forest clearance subject to several environmental safeguards. These conditions require the project proponent to undertake soil and moisture conservation measures, stabilization of mine dumps, restoration of forest vegetation, and protection of wildlife habitats.

Compliance with these conditions forms the basis of the present reclamation and restoration plan.

2.3 Environmental Impact Assessment Notification, 2006

The EIA Notification issued under the Environment Protection Act mandates that mining projects obtain environmental clearance from the MoEFCC after conducting detailed environmental impact assessments.

The EIA process requires project proponents to evaluate potential environmental impacts arising from mining operations and propose mitigation measures to minimize these impacts. Reclamation and mine closure planning are important components of this process.

The present document complements the environmental management plan by outlining detailed strategies for restoring land disturbed during mining operations.

2.4 Mine Closure Guidelines

Mine closure planning in India is guided by regulations issued by the Indian Bureau of Mines and other regulatory authorities. These guidelines require mining companies to prepare progressive and final mine closure plans detailing measures for land restoration, waste management, and environmental monitoring.

Progressive mine closure involves implementing reclamation measures concurrently with mining operations. Final mine closure is undertaken after the cessation of mining activities to ensure that the land is restored to a stable and environmentally acceptable condition.

The ten-year reclamation strategy proposed for the Dalpahar mine is consistent with these guidelines and aims to integrate progressive closure measures into the operational phase of the mine.

Chapter 3

Environmental Baseline Conditions

3.1 Land Use and Land Cover

Prior to mining operations, the project area is characterized primarily by forest land dominated by sal and associated species. The vegetation cover plays an important role in maintaining soil stability, regulating hydrological processes, and supporting wildlife habitats.

Mining operations inevitably result in removal of vegetation and disturbance of soil layers. Therefore, proper management of topsoil and restoration of vegetation cover are essential components of the reclamation strategy.

Land use within the mine lease area will be progressively modified during mining operations. The reclamation plan ensures that disturbed areas are restored through regrading, topsoil application, and plantation development.

3.2 Soil Characteristics

Soils in the Dalpahar region are predominantly lateritic with moderate organic matter content. These soils are generally suitable for supporting forest vegetation but become highly susceptible to erosion when exposed.

During mining operations the topsoil layer is stripped and stored separately. This stored topsoil will later be used during reclamation activities to provide a fertile substrate for vegetation growth

Proper topsoil management is essential to maintain soil fertility and facilitate ecological restoration in reclaimed mine areas.

3.3 Hydrology and Water Resources

The hydrology of the region is influenced by seasonal rainfall and surface runoff from surrounding hills. Groundwater availability is limited due to the rocky geological formations present in the area.

Mining activities can alter natural drainage patterns and increase sediment loads in nearby streams if not properly managed. To mitigate these impacts, the reclamation plan includes the construction of drainage channels, sedimentation ponds, and water harvesting structures.

These measures will help regulate surface runoff, reduce sediment transport, and enhance groundwater recharge in the surrounding landscape.

3.4 Biodiversity

The forest ecosystems of Keonjhar district support diverse plant and animal species typical of eastern Indian deciduous forests. The presence of wildlife movement corridors in the region highlights the ecological importance of the area.

Reclamation activities will focus on restoring habitat conditions by establishing mixed plantations of native tree species and creating suitable habitats for wildlife.

Special attention will be given to species that provide ecological benefits such as soil stabilization, shade, and food sources for wildlife.

Chapter 4

Reclamation Objectives and Strategy

4.1 Overall Objectives

The primary objective of the reclamation plan is to restore ecological stability in areas disturbed by mining operations. This will be achieved through a combination of engineering measures, soil conservation practices, and ecological restoration techniques.

The plan seeks to ensure that reclaimed land is capable of supporting sustainable vegetation growth and maintaining environmental functions similar to those present prior to mining.

4.2 Specific Objectives

The specific objectives of the reclamation program include:

- Stabilization of waste dumps and mine slopes
- Restoration of soil fertility through topsoil application
- Development of forest vegetation using native species
- Reduction of soil erosion and sedimentation
- Enhancement of groundwater recharge
- Creation of sustainable post-mining land uses

4.3 Reclamation Strategy

The reclamation strategy is based on three key principles:

Progressive Reclamation

Areas where mining operations have been completed will be reclaimed immediately rather than waiting until the end of the mine life. This approach reduces the total disturbed area at any given time and allows vegetation to establish gradually.

Ecological Restoration

The restoration plan emphasizes the use of native plant species adapted to local environmental conditions. Mixed plantations will be established to recreate natural forest ecosystems and enhance biodiversity.

Sustainable Post-Mining Land Use

The reclaimed landscape will be designed to support a combination of land uses including forest regeneration, water reservoirs, and wildlife habitats. These land uses will ensure that the land remains environmentally stable and socially beneficial after mining operations cease.

Chapter 5

Land Reclamation and Mine Pit Management

5.1 Introduction

Open-cast mining operations inevitably alter the natural landscape through excavation of pits, removal of vegetation, and deposition of overburden material. Proper reclamation of mined-out areas is therefore essential to restore the disturbed terrain to a stable and environmentally acceptable condition. The reclamation plan for Dalpahar Mines aims to progressively rehabilitate mined-out pits through a combination of engineering measures, soil restoration techniques, and ecological rehabilitation.

The guiding principle of mine pit reclamation is to ensure that excavated areas are converted into safe and productive landforms capable of supporting vegetation and other beneficial land uses. The reclamation strategy also seeks to minimize long-term environmental risks such as slope instability, water stagnation, and erosion.

5.2 Progressive Mine Reclamation

Progressive mine closure is a key component of environmentally responsible mining. Under this approach, reclamation activities are initiated as soon as mining operations in a particular section of the mine are completed. This ensures that the total disturbed area at any given time is minimized.

In the Dalpahar mining project, reclamation will be implemented concurrently with mining operations wherever feasible. As soon as ore extraction from a particular bench or pit section is completed, the area will be reshaped and stabilized to prepare it for soil application and plantation development.

This approach significantly reduces the environmental footprint of mining operations and accelerates the recovery of vegetation cover.

5.3 Mine Pit Configuration

The final mine pit configuration will depend on geological conditions, ore body geometry, and operational mining plans. However, from an environmental perspective, it is important that the final pit slopes remain stable and safe.

Typical design parameters for pit slopes will include:

- Overall slope angle between 27° and 30°
- Bench height of 10–12 m
- Bench width of 8–12 m

These design parameters ensure that pit slopes remain stable and resistant to erosion during heavy rainfall events.

5.4 Backfilling Strategy

Where feasible, mined-out areas will be partially backfilled using overburden material generated during mining operations. Backfilling helps restore the original ground profile and reduces the overall depth of final mine pits.

Backfilling operations will be carried out in layers and compacted to prevent settlement and instability. The final surface will be graded to ensure proper drainage and prevent water accumulation.

However, in cases where complete backfilling is not technically or economically feasible, the remaining pit voids will be converted into water reservoirs.

5.5 Final Landform Design

The reclaimed mine area will ultimately consist of a combination of the following landforms:

Landform	Proposed Use
Backfilled areas	Plantation and forest restoration
Top benches	Plantation and Forest restoration
Stabilized dumps	Forest vegetation
Infrastructure areas	Plantation or grassland

The final landform design aims to restore ecological balance while ensuring long-term environmental stability.

Chapter 6

Waste Dump Stabilization Engineering

6.1 Introduction

Waste dumps generated during open-cast mining consist primarily of overburden material removed to expose ore deposits. Improperly designed dumps can lead to slope failures, soil erosion, and sedimentation of nearby water bodies. Therefore, stabilization of waste dumps is a critical component of the mine reclamation strategy.

The waste dump stabilization plan for Dalpahar Mines incorporates both engineering measures and biological stabilization techniques.

6.2 Dump Design Parameters

Waste dumps will be designed using scientifically accepted engineering parameters to ensure long-term stability.

Typical design features include:

Parameter	Value
Maximum dump height	30–35 m
Bench height	10 m
Bench width	10–15 m
Overall slope angle	27–30°

These parameters help distribute load evenly and prevent slope failure.

6.3 Terracing of Dumps

Terracing is one of the most effective methods for stabilizing mine dumps. Under this method, the dump slope is divided into several horizontal benches separated by vertical faces.

Terraces reduce slope length and slow down the velocity of surface runoff. This significantly reduces the risk of soil erosion during heavy rainfall.
Each terrace will be provided with drainage channels to divert runoff safely.

6.4 Toe Wall Construction

Toe walls will be constructed at the base of dumps to prevent the movement of loose materials and provide structural stability.

Toe walls may consist of:

- dry stone masonry
- gabion structures
- reinforced earthen embankments

These structures act as barriers that prevent sliding of dump materials.

6.5 Drainage Management

Surface runoff from dumps can cause severe erosion if not properly controlled. Therefore, a network of drainage channels will be constructed around dump slopes.

The drainage system will include:

- garland drains around dump perimeters
- cross drains along dump benches
- sedimentation ponds at discharge points

These structures will ensure that runoff water is safely diverted without causing erosion.

6.6 Vegetative Stabilization

Engineering measures alone are not sufficient to stabilize dumps over the long term. Vegetation plays an important role in binding soil particles and reducing erosion.

Once dump slopes are stabilized, topsoil will be spread over terraces and grass species will be planted to provide immediate ground cover. Subsequently, tree plantations will be established to create permanent vegetation cover.

Chapter 7

Soil and Moisture Conservation (SMC) Design

7.1 Importance of Soil and Moisture Conservation

Mining activities often expose large areas of soil to erosion. In regions with high rainfall such as Keonjhar district, uncontrolled runoff can result in significant soil loss and sedimentation of nearby streams.

Soil and moisture conservation measures are therefore essential to protect reclaimed land and improve water retention within the landscape.

7.2 Contour Trenches

Contour trenches are shallow excavations constructed along contour lines on slopes. These structures intercept surface runoff and allow water to infiltrate into the soil.

Typical dimensions for contour trenches are:

Parameter	Value
Length	3 m
Width	0.5 m
Depth	0.5 m

Contour trenches are particularly effective in plantation areas where they improve soil moisture availability for young plants.

7.3 Check Dams

Check dams are small barriers constructed across drainage channels to reduce water velocity and trap sediments.

Typical design parameters include:

Parameter	Value
Height	1–1.5 m
Length	2–5 m
Material	Stone masonry

Check dams also promote groundwater recharge by slowing down water flow.

7.4 Gully Plugs

Gully plugs are structures constructed in small erosion channels to prevent further enlargement of gullies. These structures may consist of loose boulders, brushwood, or masonry.

Gully plugs reduce the erosive power of flowing water and help stabilize the surrounding soil.

7.5 Vegetative Barriers

Vegetative barriers such as grasses and shrubs will be planted along slopes and drainage channels to stabilize soil and reduce erosion

Suitable grass species include:

- Vetiver grass
- Cynodon dactylon
- Pennisetum species

These grasses develop extensive root systems that help bind soil particles.

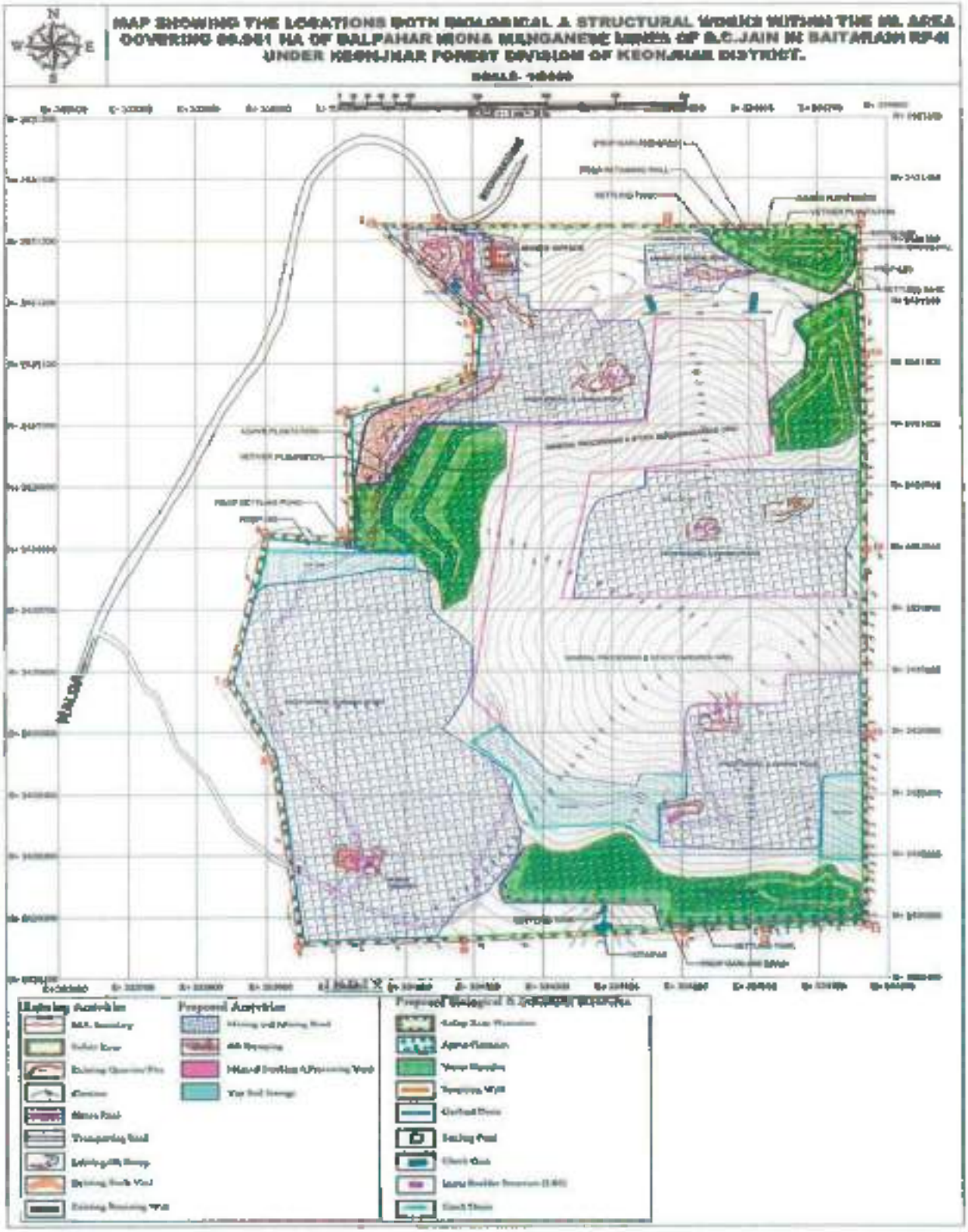


Figure 6: Waste Dump Stabilization & Soil and Moisture Conservation Structure map

Chapter 8

Ecological Restoration and Plantation Strategy

8.1 Objectives of Ecological Restoration

The primary objective of ecological restoration is to recreate a forest ecosystem similar to the natural vegetation that existed prior to mining. Restoration activities will focus on establishing a diverse mixture of native plant species that provide ecological and economic benefits.

The strategy emphasizes the use of indigenous species adapted to local climatic conditions.

8.2 Selection of Plant Species

The following species have been identified as suitable for plantation in the Dalpahar region:

Species	Local Name	Ecological Role
Shorea robusta	Sal	Dominant forest species
Terminalia arjuna	Arjun	River bank stabilization
Terminalia tomentosa	Asan	Timber species
Bambusa bambos	Bamboo	Soil stabilization
Emblica officinalis	Amla	Fruit bearing tree
Azadirachta indica	Neem	Hardy species

These species collectively contribute to ecosystem stability and biodiversity enhancement

---

8.3 Plantation Density

Plantation density will generally 1600 saplings per hectare depending on soil conditions and landform characteristics.

Mixed plantations will be preferred to monoculture plantations in order to increase ecological resilience.

8.4 Plantation Techniques

The plantation program will follow standard forestry practices including:

- pit digging (30 cm × 30 cm × 30 cm)
- Spacing to be adopted (2.5 m x 2.5m)
- application of organic manure
- watering during initial growth stages

Mulching will be applied around young plants to conserve soil moisture.

8.5 Maintenance and Protection

Plantations will be protected from grazing and fire through fencing and regular monitoring. Survival rates will be assessed annually, and replanting will be carried out where necessary.

Fire lines will be created to prevent the spread of forest fires into reclaimed areas.

CHAPTER 9

Water Management and Hydrological Restoration

9.1 Introduction

Water management is a critical component of mine reclamation planning, particularly in regions with high seasonal rainfall such as Keonjhar district. Mining activities often disturb natural drainage patterns and increase surface runoff, which can lead to soil erosion and sedimentation in nearby water bodies if not properly managed. The objective of the water management plan for Dalpahar Mines is to regulate surface runoff, control sediment transport, and enhance groundwater recharge in the surrounding landscape.

The reclamation strategy integrates engineering structures with natural hydrological processes so that the post-mining landscape remains hydrologically stable. Special attention is given to the design of drainage systems around mine pits, waste dumps, and reclaimed slopes.

9.2 Surface Drainage Management

Surface drainage management involves controlling the flow of rainwater over the mine area to prevent erosion and sedimentation. During monsoon months the intensity of rainfall in Keonjhar district can be quite high, leading to rapid runoff from exposed mine surfaces.

To mitigate this risk, a network of **garland drains** will be constructed around mine pits and waste dumps. Garland drains intercept runoff from surrounding slopes and divert it safely towards sedimentation ponds or natural drainage channels. These drains are designed with gentle slopes to maintain controlled water flow and prevent scouring of the channel bed.

Cross-drainage structures such as culverts will also be constructed along haul roads to ensure that runoff water does not accumulate on road surfaces. Proper road drainage helps prevent erosion of road embankments and reduces maintenance requirements.

9.3 Sedimentation Ponds

Sedimentation ponds play an important role in controlling the discharge of suspended solids from mining areas. These ponds are designed to capture runoff water carrying sediments generated from mining operations and allow the suspended particles to settle before the water is released into natural streams.

The design of sedimentation ponds typically includes:

- inlet channels for controlled water entry
- settling basins for sediment deposition
- overflow outlets for discharge of clarified water

Periodic desilting of sedimentation ponds will be carried out to maintain their storage capacity. The collected sediments may be reused for land leveling or dump stabilization.

9.4 Groundwater Recharge

The reclamation plan also aims to enhance groundwater recharge within the mine area and surrounding catchment. Several soil and moisture conservation structures such as contour trenches, check dams, and percolation pits will be constructed to increase water infiltration into the ground.

These structures slow down surface runoff and allow rainwater to percolate into the soil, thereby improving groundwater availability. Improved groundwater recharge benefits local communities and supports vegetation growth in reclaimed areas.

9.5 Integration with Watershed Management

The reclamation plan adopts a watershed-based approach to water management. All drainage and soil conservation structures are designed considering the broader catchment characteristics of the mine area.

By integrating mine reclamation with watershed management principles, the plan ensures that runoff control, groundwater recharge, and sediment management are addressed comprehensively.

Chapter 10

Infrastructure Decommissioning Plan

10.1 Introduction

Mining operations involve the establishment of various infrastructure facilities such as crushing units, workshops, haul roads, and storage yards. At the end of the mine life these facilities must be dismantled or repurposed to ensure that the land can be restored to its natural state.

Infrastructure decommissioning is therefore an important stage of the mine closure process. Proper dismantling and reclamation of these facilities help prevent environmental contamination and allow the land to be integrated into the surrounding ecosystem.

10.2 Dismantling of Mining Equipment

At the end of mining operations, heavy machinery such as crushers, conveyors, drilling equipment, and loading systems will be dismantled and removed from the site. Scrap metal generated during dismantling will be transported to authorized recycling facilities.

Any lubricants, oils, or hazardous materials associated with machinery will be disposed of in accordance with hazardous waste management regulations.

10.3 Rehabilitation of Workshop Areas

Workshops and maintenance facilities used during mining operations may contain contaminated soils due to oil spills or mechanical activities. Such areas will be carefully inspected during the closure phase.

Contaminated soil, if present, will be removed and treated appropriately. Once the area is cleaned, it will be leveled and covered with topsoil before being integrated into the reclamation program.

10.4 Haul Road Rehabilitation

Haul roads constructed for transportation of ore and overburden can occupy significant land area within the mine lease. After mining operations cease, these roads will either be dismantled or converted into access roads for forest management.

Where roads are no longer required, the surface will be ripped to break compaction, followed by spreading of topsoil and plantation development.

10.5 Reclamation of Storage Yards

Areas used for storage of ore, waste materials, or construction supplies will also be reclaimed after closure. The reclamation process will involve removal of debris, leveling of the ground surface, and application of topsoil.

Once prepared, these areas will be included in the plantation program to restore vegetation cover.

10.6 Repurposing Infrastructure

In some cases, certain infrastructure facilities may be repurposed for community or forestry use. For example, administrative buildings or access roads may be utilized by the Forest Department for monitoring reclaimed areas.

Such repurposing can provide long-term benefits to local communities while minimizing waste generated during the closure process.

Chapter 11

Socio-Economic Rehabilitation

11.1 Importance of Socio-Economic Planning

Mine closure planning must consider not only environmental restoration but also the socio-economic impacts on workers and nearby communities. Mining operations often provide employment opportunities and support local economic activities. Therefore, the transition after mine closure should be carefully managed.

The socio-economic rehabilitation plan for Dalpahar Mines aims to create sustainable livelihood opportunities through reclamation activities and post-mining land uses.

11.2 Employment in Reclamation Activities

Reclamation activities such as plantation development, soil conservation works, and maintenance of water structures require significant manpower. These activities provide employment opportunities for local residents and former mine workers during the closure phase.

Workers can be engaged in activities such as:

- plantation and nursery development
- construction of soil conservation structures
- maintenance of reclaimed land

11.3 Community Participation

Community participation is an important element of successful reclamation programs. Local communities will be encouraged to participate in plantation activities and maintenance of soil conservation structures.

Involving local stakeholders helps create a sense of ownership and ensures long-term sustainability of reclamation efforts.

Chapter 12

Environmental Monitoring and Surrender Implementation Protocol

12.1 Introduction

Environmental monitoring is an essential element of the reclamation and closure process for the Dalpahar Iron & Manganese Mines. The purpose of monitoring is not limited to statutory compliance alone; it is also intended to demonstrate that the disturbed land is progressively attaining physical stability, ecological restoration, hydrological balance, and environmental safety.

For a forest land mining project proposed to be surrendered to the Divisional Forest Officer, Keonjhar, the monitoring system must function as a performance verification framework. It must establish, with measurable evidence, that reclamation measures such as backfilling, topsoil application, dump stabilization, plantation, drainage control, and decommissioning have been implemented effectively and are delivering the intended outcomes.

The monitoring program proposed herein therefore integrates conventional environmental parameters with reclamation-specific performance indicators so that readiness for land surrender can be assessed objectively and transparently.

12.2 Objectives of the Monitoring Program

The monitoring program shall be undertaken with the following objectives:

1. To verify implementation of reclamation and closure measures as per the approved schedule.
2. To assess the physical stability of reclaimed landforms, including dumps, benches, and backfilled areas.
3. To evaluate the success of plantation, grassing, and ecological restoration.
4. To monitor the performance of drainage and soil & moisture conservation structures.
5. To assess the status of soil development, water quality, air quality, and noise environment.
6. To identify deficiencies requiring corrective action.
7. To maintain documentary evidence for annual review and final surrender of reclaimed land.
8. To support verification by the Forest Department and other competent authorities.

12.3 Scope of Monitoring

The monitoring program shall cover the following major components:

1. Reclamation progress monitoring
2. Landform and slope stability monitoring
3. Drainage and soil & moisture conservation structure monitoring
4. Plantation and ecological monitoring
5. Soil quality monitoring
6. Surface water and groundwater monitoring
7. Air quality and noise monitoring
8. Infrastructure decommissioning monitoring
9. Geo-tagged photographic and spatial monitoring
10. Corrective action and compliance monitoring

12.4 Reclamation Progress Monitoring

A systematic review of reclamation progress shall be carried out to compare actual achievement against the approved year-wise implementation schedule. This shall include measurement of reclaimed area, planted area, dump stabilization completed, topsoil spreading completed, and utility area restored.

Table 12.1: Reclamation Progress Monitoring

Sl. No.	Parameter	Unit	Frequency	Responsibility	Performance Indicator
1	Area backfilled	ha	Half-yearly	Mine Manager / Survey Team	Achievement against annual target
2	Area dressed and graded	ha	Half-yearly	Mine Manager	Stable reclaimable surface created
3	Area topsoil spread	ha	Half-yearly	Environment Cell	100% of plantation-suitable reclaimed surface
4	Area grassed	ha	Annual	Plantation / Environment Team	Increasing soil cover
5	Area planted	ha	Annual	Plantation In-charge	Achievement against plantation target
6	Area of dump stabilized	ha	Half-yearly	Mine Manager / Civil Team	Dump reclamation progress
7	Utility / infrastructure area reclaimed	ha	Annual	Closure / Engineering Team	Area freed and restored
8	Area proposed ready	ha	Annual from Year	Project Proponent	Cumulative surrender-

Sl. No.	Parameter	Unit	Frequency	Responsibility	Performance Indicator
	for surrender		7 onward		ready area

A year-wise comparison of target versus actual achievement shall be included in the annual reclamation progress report.

12.5 Landform and Geotechnical Stability Monitoring

Physical stability of the reclaimed landscape is a precondition for surrender. This includes stability of dumps, backfilled zones, benches, reclaimed roads, and areas around water retention structures. Monitoring shall be especially rigorous before and after monsoon.

Table 12.2: Landform and Stability Monitoring

Sl. No.	Parameter	Method	Frequency	Responsibility	Trigger for Corrective Action
1	Dump slope condition	Visual inspection and measurement	Pre- and post-monsoon	Mine Manager / Engineer	Crack, bulging, slumping, toe movement
2	Backfilled area settlement	Level check / visual inspection	Half-yearly	Survey Team / Mine Manager	Depression, uneven settlement, fissure
3	Bench stability	Visual inspection	Half-yearly	Mining Engineer	Loose rock, erosion, rockfall risk
4	Erosion gullies	Field measurement	Quarterly in monsoon; half-yearly otherwise	Environment Team	Gully depth >30 cm or widening trend
5	Retaining wall / toe wall condition	Structural inspection	Pre- and post-monsoon	Civil / Engineering Team	Crack, tilt, undercutting, collapse
6	Reclaimed slope runoff behaviour	Field observation during rain events	During monsoon	Environment Team	Bypass flow, scouring, slope cutting
7	Stability of pit edge / water body edge	Visual inspection	Half-yearly	Mine Manager / Safety Team	Edge failure, unsafe approach

An annual Stability Assessment Note shall be prepared and placed on record.

12.6 Monitoring of Drainage and Soil & Moisture Conservation Structures

All drainage and SMC structures are critical for controlling runoff, reducing erosion, and ensuring long-term land stability. Their condition and performance shall be systematically monitored.

Table 12.3: Monitoring of SMC and Drainage Structures

Sl. No.	Structure / Parameter	Frequency	Responsibility	Monitoring Focus	Performance Standard
1	Garland drains	Quarterly; monthly in monsoon	Civil / Environment Team	Flow continuity, choking, erosion	Free-flowing, no breach
2	Catch drains / bench drains	Quarterly	Civil Team	Blockage, side erosion, slope integrity	Functional and connected
3	Check dams	Pre- and post-monsoon	Environment / Civil Team	Structural integrity, sediment retention	Intact and effective
4	Loose boulder check dams / gully plugs	Pre- and post-monsoon	Environment Team	Settlement, washout, bypass erosion	Stable and sediment-trapping
5	Settling tanks / settling ponds	Monthly in monsoon; quarterly otherwise	Environment Cell	Silt load, storage capacity, outlet quality	No overflow failure
6	Contour trenches	Annual before monsoon	Plantation / Environment Team	Silt filling, continuity, recharge function	Functional after cleaning
7	Percolation pits / recharge structures	Half-yearly	Environment Team	Silt accumulation and infiltration	Recharge maintained
8	Culverts / cross-drainage works	Pre-monsoon and after heavy rain	Civil Team	Choking and embankment erosion	Safe passage of runoff

A Drainage and SMC Maintenance Register shall be maintained indicating date of inspection, observations, desilation, repair requirement, and date of compliance.

12.7 Plantation and Ecological Monitoring

Since ecological restoration is central to closure of forest land, plantation monitoring shall be comprehensive and block-specific. Separate monitoring shall be undertaken for backfilled areas, benches, dump terraces, utility areas, safety zone plantations, and undisturbed green belt areas.

Table 12.4: Plantation Monitoring Indicators

Sl. No.	Parameter	Unit	Frequency	Responsibility	Target / Standard
1	Area planted	ha	Annual	Plantation In-charge	As per annual target
2	Number of saplings planted	No.	Annual	Plantation In-charge	Record-based
3	Survival after 1st year	%	Annual	Environment / Plantation Team	Minimum 80%
4	Survival after 3rd year	%	Annual	Environment / Plantation Team	Minimum 75%
5	Survival at surrender stage	%	Annual	Environment Cell	Minimum 70%
6	Average plant height growth	cm / m	Annual	Plantation Team	Increasing trend
7	Ground / grass cover	% area	Annual after monsoon	Environment Cell	Minimum 70% on exposed reclaimed area
8	Casualty replacement completed	% of failed plants replaced	Annual	Plantation Team	100% in next planting season
9	Fire / grazing / browsing damage	No. of affected patches	Seasonal / annual	Plantation Team	Nil or minimized
10	Invasive weed incidence	% area affected	Annual	Environment Team	Controlled / declining trend

12.7.1 Species Diversity and Ecological Recovery

In addition to survival percentage, monitoring shall assess ecological development of reclaimed land through the following indicators:

- number of native species established;
- evidence of natural regeneration;
- colonization by herbs, shrubs, and grasses;
- development of litter layer and humus;
- bird, butterfly, reptile, and small fauna presence, where observable;
- habitat development near water bodies and green belt.

12.7.2 Sampling Method

Plantation survival shall be assessed block-wise using sample plots and full counts where feasible. Seperate records shall be maintained for:

- backfilled plantation area;
- bench plantation area;
- dump plantation area;
- utility/service area plantation;
- safety zone and green belt plantation.

12.8 Soil Quality Monitoring

Monitoring of soil quality is necessary to assess the progressive development of fertility and improvement in growth conditions over reclaimed areas.

Table 12 5: Soil Quality Monitoring

SL No.	Parameter	Frequency	Responsibility	Purpose
1	pH	Annual	Environment Officer / Laboratory	Soil reaction suitability
2	Organic carbon	Annual	Environment Officer / Laboratory	Soil fertility development
3	Available nitrogen	Annual	Environment Officer / Laboratory	Nutrient status
4	Available phosphorus	Annual	Environment Officer / Laboratory	Nutrient status
5	Available potassium	Annual	Environment Officer / Laboratory	Nutrient status
6	Texture / compaction observation	Once in 2 years	Environment Team	Soil development and rootability
7	Moisture retention field condition	Seasonal	Plantation Team	Suitability for vegetation

Soil samples shall be drawn from representative reclaimed blocks and compared year-on-year to assess improvement trends.

12.9 Surface Water and Groundwater Monitoring

Water quality monitoring shall be carried out to determine whether runoff management and reclamation measures are effectively controlling sedimentation and preventing deterioration of water resources.

Table 12.6: Surface Water Monitoring

Sl. No.	Parameter	Frequency	Responsibility	Monitoring Purpose
1	pH	Quarterly	Environment Officer / Approved Laboratory	Genera water quality
2	Total Suspended Solids (TSS)	Quarterly; more frequent in monsoon if required	Environment Officer	Sediment control assessment
3	Total Disso ved Solids (TDS)	Quarterly	Environment Officer	General water quality
4	Turbidity	Quarterly	Environment Officer	Runoff sediment status
5	Iron and manganese, if relevant	Half-yearly	Environment Officer	Mining-related influence
6	Oil and grease, where relevant	Half-yearly	Environment Officer	Workshop / processing area influence
7	Visual silt deposition / flow status	During monsoon	Environment Team	Field performance of drainage control

Surface water monitoring locations shall, as applicable, include:

- upstream nala location,
- downstream nala location,
- settling pond outlet,
- pit water / retained reservoir.

Table 12.7: Groundwater Monitoring

Sl. No.	Parameter	Frequency	Responsibility	Purpose
1	Water level	Pre- and post-monsoon	Environment Officer	Recharge trend
2	pH	Half-yearly	Environment Officer / Laboratory	Water quality
3	TDS / hardness	Half-yearly	Environment Officer / Laboratory	Water suitability
4	Iron / manganese, if needed	Half-yearly	Environment Officer / Laboratory	Mining influence
5	Other general indicators, where relevant	Half-yearly	Environment Officer / Laboratory	Environmental safety

12.10 Air Quality and Noise Monitoring

Air and noise monitoring shall continue through the closure phase to verify that residual impacts remain under control and that reclaimed areas are not subject to excessive dust or operational disturbance.

Table 12.8: Air Quality Monitoring

Sl. No.	Parameter	Frequency	Responsibility	Standard Reference
1	PM10	Quarterly	Environment Officer / Approved Laboratory	Applicable national standards
2	PM2.5	Quarterly	Environment Officer / Approved Laboratory	Applicable national standards
3	Visual dust condition in reclaimed areas	Monthly / quarterly	Environment Team	Wind erosion and dust suppression effectiveness

Table 12.9: Noise Monitoring

Sl. No.	Parameter	Frequency	Responsibility	Purpose
1	Daytime noise level	Quarterly	Environment Officer / Approved Laboratory	Compliance verification
2	Nighttime noise level	Quarterly	Environment Officer / Approved Laboratory	Compliance verification

Monitoring locations shall include active operational zones during operating years, lease boundary, and nearby sensitive points, if any.

12.11 Monitoring of Infrastructure Decommissioning

During the latter years of the closure schedule, monitoring shall focus on removal of infrastructure and restoration of utility areas.

Table 12.10: Decommissioning Monitoring

Sl. No.	Parameter	Frequency	Responsibility	Completion Standard
1	Removal of machinery and equipment	Annual	Engineering / Closure Team	100% from surrender area
2	Removal of scrap and debris	Annual	Engineering Team	100% completed

Sl. No.	Parameter	Frequency	Responsibility	Completion Standard
3	Dismantling / treatment of foundations	Annual	Civil Team	Completed
4	Remediation of contaminated spots	Annual	Environment Team	No uncreated contamination
5	Ripping / loosening of compacted surface	Annual	Closure Team	Completed before topsoil application

12.12 Geo-Tagged Photographic and Spatial Monitoring

To provide visual and verifiable evidence of reclamation progress, geo-tagged photographic and spatial documentation shall be maintained.

The following measures shall be adopted:

1. Fixed photo-monitoring points shall be established for each reclamation block.
2. Photographs shall be taken before reclamation, during execution, after completion, and annually thereafter.
3. Major SMC and drainage structures shall be geo-tagged.
4. A yearly updated reclamation map shall be prepared.
5. Drone imagery or satellite image comparison may be used, wherever available, to document vegetation development and landform stabilization.

These records shall form part of the annual compliance file as well as the final surrender dossier.

12.13 Monitoring Responsibility Matrix

Table 12.11: Responsibility Matrix

Activity	Responsible Officer	Supporting Team / Agency	Frequency
Reclamation area measurement	Mine Manager	Survey Team / Environment Cell	Half-yearly
Dump and slope inspection	Mining Engineer / Mine Manager	Safety Officer	Pre- and post-monsoon
Drainage and SMC structure inspection	Civil / Environment Team	Field Supervisors	Quarterly
Plantation survival assessment	Plantation In-charge	Forestry / Field Team	Annual

Activity	Responsible Officer	Supporting Team / Agency	Frequency
Soil quality testing	Environment Officer	Approved Laboratory	Annual
Water quality testing	Environment Officer	Approved Laboratory	As scheduled
Air and noise monitoring	Environment Officer	Approved Laboratory	Quarterly
Geo-tagged documentation	Survey / Environment Cell	External support, if needed	Annual
Compilation of annual monitoring report	Nodal Compliance Officer	All section heads	Annual

12.14 Corrective Action Thresholds

To ensure effectiveness of reclamation, corrective action shall be initiated whenever monitoring reveals unsatisfactory performance. Indicative trigger levels are given below:

- plantation survival below 80% in the first year or below 70% in later years;
- new erosion gully deeper than 30 cm;
- breach, choking, or hydraulic failure of drains or settling structures;
- dump slumping, settlement, cracking, or toe movement;
- repeated silt discharge from runoff outlets;
- visible contaminated patches in decommissioned utility areas;
- monitored environmental parameter exceeding applicable limit.

Corrective actions may include:

- gap planting and casualty replacement;
- re-grassing and mulching;
- additional topsoil application;
- drain cleaning and reprofiling;
- desilting of settling ponds;
- strengthening of retaining and toe walls;
- repair of failed slope surfaces;
- fencing or restricting access in vulnerable areas;
- remediation of contaminated soil.

All corrective measures shall be recorded in a Corrective Action Register.

12.15 Reporting System

The monitoring program shall be supported by a structured reporting mechanism comprising:

1. Monthly maintenance and inspection register

2. Quarterly environmental monitoring report
3. Pre monsoon inspection report
4. Post-monsoon inspection report
5. Annual plantation survival report
6. Annual reclamation progress and compliance report
7. Final reclamation completion and surrender readiness report

Each annual report shall indicate:

- targets and achievements,
- deficiencies noticed,
- corrective actions undertaken,
- cumulative area reclaimed,
- status of plantation and structures,
- recommendation on surrender readiness of any reclaimed block.

12.16 Monitoring for Surrender Readiness

From the seventh year onward, or from the stage at which substantial reclaimed area becomes available for handover, a dedicated Surrender Readiness Monitoring Exercise shall be carried out annually. This exercise shall evaluate:

- physical stability of reclaimed land;
- plantation survival and vegetative cover;
- condition and performance of SMC structures;
- topsoil application and soil development;
- environmental quality status,
- removal of infrastructure and debris;
- availability of survey maps, geo-tagged photographs, and records;
- conformity with reclamation completion criteria.

Only those areas meeting the prescribed standards shall be included in the surrender proposal to the Divisional Forest Officer, Keonjhar.

12.17 Conclusion

The environmental monitoring protocol proposed for the Dalpahar Iron & Manganese Mines has been designed as an integrated reclamation performance assessment system. By combining environmental quality monitoring with engineering inspection, vegetation assessment, geo-spatial documentation, and compliance verification, the protocol will provide robust evidence that the reclaimed land has attained the level of stability and restoration necessary for surrender to the Divisional Forest Officer, Keonjhar, on behalf of the State Government.

CHAPTER 12A

RECLAMATION COMPLETION CRITERIA

12A.1 Background and Purpose

The reclamation of forest land diverted for mining is required to achieve not only physical closure of disturbed areas but also ecological stabilization and environmental suitability for return to the custody of the Forest Department. In the case of Dalpahar Iron & Manganese Mines (Block–A), the reclaimed land is proposed to be surrendered to the Divisional Forest Officer, Keonjhar, after completion of mining, reclamation, and stabilization measures.

Accordingly, it is necessary to define clear reclamation completion criteria so that the project proponent, regulatory agencies, and the Forest Department can objectively assess whether a reclaimed area has attained the minimum standards necessary for inspection, acceptance, and handover. These criteria are intended to serve as measurable benchmarks for determining closure readiness of individual reclaimed blocks as well as the lease area as a whole.

The reclamation of any land parcel shall be deemed complete only when it has attained physical stability, hydrological safety, ecological establishment, and documentary readiness in accordance with the approved reclamation and post-mining land use plan.

12A.2 Objectives

The specific objectives of defining reclamation completion criteria are as follows:

1. To establish measurable standards for assessing the completion and success of reclamation works.
2. To ensure that reclaimed land is physically stable and environmentally safe.
3. To verify that plantation and ecological restoration measures have been successfully established.
4. To ensure that drainage, erosion control, and soil conservation measures are functional.
5. To provide a transparent basis for internal certification and submission of reclaimed land for surrender to the Divisional Forest Officer, Keonjhar.
6. To facilitate joint inspection, verification, and formal handover of land to the State Government.

12A.3 Broad Conditions for Reclamation Completion

A reclaimed area shall be considered ready for surrender only when the following broad conditions are satisfied:

12A.3.1 Physical Stability

All reclaimed surfaces, including backfilled areas, dump terraces, benches, utility areas, and plantation blocks, shall be stable and free from significant settlement, slope failure, slippage, subsidence, or rockfall hazard.

12A.3.2 Hydrological Stability

The reclaimed land shall have a stable drainage regime. Surface runoff shall be safely conveyed through designed channels, and no uncontrolled erosion, ponding, gully formation, or discharge of excessive sediment shall occur.

12A.3.3 Ecological Establishment

Plantation, grassing, and associated vegetation development shall have been established sufficiently to protect the soil surface, reduce erosion, and initiate ecological recovery using approved native or site-suitable species.

12A.3.4 Environmental Compliance

Environmental monitoring data relating to water, soil, air, and ecological development shall indicate satisfactory performance and compliance with applicable standards and closure commitments.

12A.3.5 Administrative and Documentary Readiness

The reclaimed land shall be properly surveyed, demarcated, geo-referenced, photographed, documented, and certified prior to submission for surrender.

12A.4 Component-wise Reclamation Completion Criteria

12A.4.1 Backfilled Mined-Out Area

Backfilled mined-out areas proposed for reclamation and afforestation shall be treated as complete only when all the following conditions are met:

a. Backfilling has been completed up to the approved design level or safe final landform.
b. The backfilled mass has been properly leveled, compacted, and graded to ensure drainage and prevent localized settlement.
c. Topsoil has been spread uniformly over plantation-suitable surfaces, preferably to an average thickness of 0.20 m or as approved in the reclamation design.
d. No significant cracking, depression, water stagnation, or erosion scar is visible.
e. Plantation and/or grassing has been completed as per approved spacing and species selection.
f. The area has attained the prescribed plantation survival and vegetation cover standards.
g. Surface runoff does not cause sheet erosion, channel formation, or sediment discharge from the reclaimed area.
h. The area is safe for inspection and future management by the Forest Department.

12A.4.2 Bench Reclamation Area

Benches proposed to be stabilized through topsoil application, grassing, shrub establishment, and plantation shall be treated as complete when:

a. The final bench geometry conforms to approved mine closure design.
b. Bench surfaces have been dressed and prepared for stabilization.
c. Topsoil has been spread wherever technically feasible.
d. Bench drains and cross-drainage arrangements are in place and functional.
e. Grassing, shrub planting, or tree plantation has been carried out according to the suitability of the bench width and slope condition.
f. No loose, unstable material remains on accessible edges that may create safety risk.
g. No active erosion scar is present on the bench or on the slope below due to runoff from the bench.

12A.4.3 External Waste Dump Area

The external waste dump area shall be considered successfully reclaimed only when:

a. Final dump profiling conforms to the approved design with stable overall slope and terrace geometry.
b. Terraces / berms have been formed, stabilized, and integrated with drainage measures.
c. Retaining walls, toe walls, garland drains, chute drains, and settling structures have been completed and maintained.
d. No signs of toe failure, slumping, bulging, cracking, or progressive erosion are visible.
e. Topsoil spreading, grassing, and plantation have been undertaken on suitable dump surfaces.
f. Vegetative cover has developed sufficiently to protect the soil surface.
g. Sediment-laden runoff from the dump is effectively controlled through engineered and biological measures.
h. The area remains stable through at least one monsoon cycle after completion of primary reclamation.

12A.4.4 Utility, Processing, and Infrastructure Area

Utility areas such as mineral processing zones, stocking yards, workshops, office complexes, internal roads, electrical substation areas, parking zones, and allied infrastructure shall be treated as reclaimed when:

a. All temporary and non-retained structures, machinery, scrap, debris, concrete waste, and residual materials have been removed.
b. Any contaminated patches caused by oil, grease, or chemical spillage have been remediated.
c. Compacted surfaces have been loosened or ripped where necessary.
d. The area has been graded, top-soiled, and brought under plantation or grass cover in

accordance with final land use
e. The reclaimed area physically integrates with the adjacent restored landscape.

12A.4.5 Safety Zone and Undisturbed Green Belt Area

The safety zone and green belt area shall be considered satisfactory when:

a. Boundary protection and demarcation measures are maintained.
b. Plantation or assisted natural regeneration has established a continuous green cover.
c. Casualty replacement has been carried out.
d. The area is free from major grazing damage, fire damage, or encroachment
e. The green belt functions as an ecological buffer around the lease boundary.

12A.4.6 Soil and Moisture Conservation Structures

The reclamation of an area shall not be treated as complete unless all associated soil and moisture conservation structures are constructed and functioning properly. These shall include retaining walls, garland drains, check dams, contour trenches, loose boulder check dams, settling ponds, percolation pits, and related structures.

Such structures shall be treated as complete when:

a. They have been constructed at approved locations.
b. Their dimensions generally conform to approved designs.
c. They remain structurally sound and hydraulically functional.
d. They are free from breach, collapse, severe undercutting, overtopping damage, or bypass erosion.
e. They are regularly desilted and maintained.

12A.4.7 Pit Lake / Water Reservoir, if Any

If any final mine void is retained as a pit lake or water reservoir, it shall be included in the surrender proposal only when:

a. The retained pit edges and adjoining slopes are stable and safe.
b. Dangerous overhangs or unstable faces have been treated, secured, or isolated.
c. Runoff entry is controlled to minimize excessive siltation.
d. Water quality has been monitored and documented.
e. Safety signage, restricted access measures, or protective barriers have been provided, where necessary.
f. The water body is clearly shown in the final land use map and area statement.

12A.5 Quantitative Completion Standards

For field-level verification, the following minimum performance standards shall be adopted for the Dalpahar reclamation program:

Sl. No.	Parameter	Minimum Completion Standard
1	Backfilling completion	100% of approved reclaimable backfilled area
2	Topsoil spreading	Completed over all plantation-suitable reclaimed surfaces
3	Plantation survival after Year 1	Minimum 80%
4	Plantation survival after Year 3	Minimum 75%
5	Plantation survival at surrender stage	Minimum 70%
6	Vegetative / ground cover	Minimum 70% of exposed reclaimed area
7	Active erosion	No untreated gully deeper than 30 cm or wider than 50 cm
8	Dump stability	No major slumping, cracking, toe movement, or failure
9	Drainage functionality	All drains and SMC structures functional and maintained
10	Infrastructure removal	100% removal from surrender area unless specifically retained
11	Environmental compliance	Within applicable norms / acceptable range
12	Survey documentation	DGPS / geo-referenced map and area statement available
13	Photo documentation	Geo tagged before-during-after photographic evidence available
14	SMC structures	100% completed and functional in the relevant reclamation block

12A.6 Internal Certification Prior to Surrender

Before submitting any reclaimed land for surrender, the project proponent shall undertake an internal certification process. The certification shall be signed by the Mine Manager, Environment Officer, and Plantation / Reclamation In-charge and shall confirm that:

1. reclamation works have been completed as per approved plan;
2. the area has achieved the prescribed physical and ecological standards;
3. drainage and soil conservation structures are functional;
4. all temporary operational encumbrances have been removed;

5. relevant survey, plantation, and monitoring records are available; and
6. the land is ready for joint inspection by the Divisional Forest Officer, Keonjhar, or his authorized representative.

12A.7 Reclamation Completion Statement

At the time of proposing surrender, a Reclamation Completion Statement shall be prepared and appended to the surrender dossier. The statement shall include:

- total lease area;
- total forest land diverted;
- total disturbed area;
- total reclaimed area;
- area-wise breakup of backfilled land, dump plantation, bench plantation, utility area reclamation, safety zone plantation, and water body, if any;
- year-wise reclamation completed;
- plantation and survival statistics;
- SMC structures completed;
- status of infrastructure removal;
- environmental monitoring summary; and
- declaration of readiness for surrender.

12A.8 Conclusion

The reclamation completion criteria defined above are intended to serve as the technical and administrative basis for evaluating closure success in the Dalpahar Iron & Manganese Mines. These criteria will ensure that reclaimed land offered for surrender to the Divisional Forest Officer, Keonjhar, is demonstrably stable, ecologically established, environmentally compliant, and fit for long-term management as restored forest land.

CHAPTER 12B

LAND SURRENDER PROTOCOL TO THE DIVISIONAL FOREST OFFICER, KEONJHAR

12B.1 Background

The Dalpahar Iron & Manganese Mines are located on forest land diverted for mining under the provisions of the Forest (Conservation) Act, 1980. After completion of mining and reclamation, the restored land is required to be surrendered back to the State Government through the Divisional Forest Officer, Keonjhar. Such surrender must be supported by documentary evidence, technical verification, and field inspection demonstrating that the land has been reclaimed in accordance with approved plans and statutory conditions.

This protocol is intended to define the procedure for identification, documentation, inspection, acceptance, and handover of reclaimed land to the Divisional Forest Officer, Keonjhar.

12B.2 Objective

The objective of the land surrender protocol is:

1. to establish a clear and transparent process for surrender of reclaimed land;
2. to ensure that only land satisfying reclamation completion criteria is proposed for handover;
3. to facilitate verification by the Forest Department and other competent authorities;
4. to ensure proper documentation of area, condition, land use, plantation, and structures before handover; and
5. to provide a formal basis for acceptance of restored land by the State Government.

12B.3 Guiding Principles

The surrender of reclaimed forest land shall be governed by the following principles:

a. No land shall be proposed for surrender unless mining activity in that parcel has permanently ceased.
b. Reclamation must be complete, functional, and sustained.
c. The area proposed for surrender must be free from operational encumbrances.
d. The area must be properly surveyed, geo-referenced, and documented.
e. Surrender shall be subject to field verification and acceptance by the competent authority.
f. Mere completion of plantation or civil works shall not by itself constitute handover.

12B.4 Preconditions for Initiating the Surrender Process

The process for surrender of any reclaimed block shall be initiated only after the following preconditions are satisfied:

1. Mining operations in the concerned area have been permanently discontinued
2. Reclamation and stabilization works have been completed as per approved plan.
3. Plantation and ground cover establishment have been carried out and maintained.
4. All temporary infrastructure, machinery, ore stacks, scrap, and debris have been removed from the proposed surrender area.
5. Surface drainage and SMC measures are complete and functional.
6. The area has been surveyed and demarcated.
7. Monitoring records, plantation records, and photographic documentation are available.
8. Internal certification of readiness has been completed by the project proponent.

12B.5 Step-wise Surrender Procedure

12B.5.1 Identification of Reclaimed Parcel

The project proponent shall identify the reclaimed area proposed for surrender based on actual closure progress and compliance with reclamation completion criteria. The proposed area may consist of one consolidated block or multiple reclaimed blocks

The identified parcel shall be shown on:

- lease plan,
- phase-wise reclamation plan,
- post-mining land use map,
- geo-referenced survey map.

12B.5.2 Survey and Demarcation

The area proposed for surrender shall be surveyed using DGPS / Total Station or other approved survey methods. The survey shall establish:

- precise boundary of the surrendered parcel,
- area in hectares,
- geo-coordinates,
- adjacency to lease boundary / safety zone / reclaimed blocks / water body.

Boundary pillars or identifiable reference points shall be verified on the ground before submission to the Forest Department.

12B.5.3 Preparation of Surrender Dossier

A comprehensive surrender dossier shall be prepared for submission to the Divisional Forest Officer, Keonjhar. The dossier shall contain, inter alia, the following:

1. Covering letter seeking inspection and acceptance of reclaimed land.
2. Copy of the relevant approval condition requiring reclamation and surrender.
3. Executive note on closure status of the area proposed for surrender.
4. Area statement indicating:
    - total lease area,
    - total forest land diverted,
    - total disturbed area,
    - total area reclaimed,
    - area proposed for surrender,
    - balance area, if any, yet to be surrendered.
5. DGPS / geo-referenced survey map of the area proposed for surrender.
6. Final reclamation map showing:
    - backfilled area,
    - dump plantation area,
    - bench plantation area,
    - reclaimed utility / road / infrastructure area,
    - safety zone / green belt,
    - water body, if any,
    - major SMC and drainage structures.
7. Plantation details:
    - year-wise plantation statement,
    - species-wise plantation data,
    - spacing adopted,
    - survival percentage,
    - casualty replacement carried out.
8. Statement on topsoil handling and utilization.
9. Statement on dismantling and removal of infrastructure and materials.
10. Environmental monitoring summary covering water, soil, air, plantation, and structure performance.
11. Geo-tagged photographic documentation showing before, during, and after reclamation stages.
12. Internal reclamation completion certificate signed by authorized officers of the company.
13. Any expert or third-party technical report, if available.
14. Declaration that the proposed area is free from operational encumbrances and fit for surrender.

12B.5.4 Submission to Divisional Forest Officer, Keonjhar

The completed surrender dossier shall be formally submitted to the Divisional Forest Officer, Keonjhar, for scrutiny and field verification. A request shall be made for nomination of inspecting officers and scheduling of joint inspection.

A copy of the submission may also be endorsed to other concerned authorities as may be required under the applicable forest clearance and mining closure framework.

12B.5.5 Scrutiny and Joint Field Inspection

Upon receipt of the surrender proposal, the Divisional Forest Officer, Keonjhar, or his authorized officers may undertake a joint field inspection along with representatives of the project proponent and, where considered necessary, representatives of other competent departments.

The joint inspection shall verify:

- area and boundary of the proposed surrender parcel;
- conformity with approved reclamation and post-mining land use plan;
- stability of backfilled areas, benches, and dumps;
- completion and functioning of SMC and drainage structures;
- plantation establishment and survival;
- condition of green belt and safety zone;
- removal of infrastructure, machinery, debris, and waste;
- safety of any retained water body or pit lake;
- availability of site records and photographic evidence.

The inspecting authority may carry out random verification of sample plantation plots, measurements of structures, and cross-checking of geo-tagged points.

12B.5.6 Recording of Deficiencies, if Any

If any shortcoming or deficiency is observed during scrutiny or field inspection, the same shall be recorded and communicated to the project proponent for rectification within a specified timeframe.

Such deficiencies may include, but shall not be limited to:

- poor plantation survival below acceptable threshold;
- active erosion scars or drainage failures;
- incomplete dismantling or debris removal;
- inadequate topsoil cover;
- damaged or non-functional SMC structures;
- mismatch in area statement and field condition;
- unsafe pit edges or unstable slopes;
- incomplete documentation.

The project proponent shall undertake corrective action and submit a compliance report for re-verification.

12B.5.7 Recommendation for Acceptance

After satisfactory rectification of deficiencies, if any, and upon finding the reclaimed land suitable, the Divisional Forest Officer, Kennjhar, may record that the area is fit for acceptance and handover on behalf of the State Government, subject to any further approval procedure applicable under law or departmental practice.

The recommendation may include:

- area accepted for handover;
- present land condition;
- dominant post-mining land use achieved;
- structures or assets, if any, transferred along with land;
- any special post-handover observation or maintenance condition.

12B.5.8 Handover Memo / Record of Surrender

Upon acceptance, a formal Handover Memo / Record of Surrender shall be prepared and signed by the authorized representatives of the project proponent and the Forest Department. The record shall include:

- name of project;
- location and description of land parcel;
- area surrendered;
- coordinates / survey reference;
- present land use and vegetation status;
- details of water body / structures, if any;
- date of handover;
- signatures of authorized representatives.

This document shall constitute the formal record of surrender of the reclaimed land.

12B.6 Documents to Accompany Final Handover

The final handover package shall include the following documents for record and future reference:

1. approved reclamation / closure plan;
2. final survey map and area calculation sheets;
3. plantation register and survival assessment records;
4. SMC structure completion and maintenance register;
5. environmental monitoring reports;
6. decommissioning and debris removal certificate,
7. geo-tagged photo documentation register;
8. internal reclamation completion certificate;
9. joint inspection report;

10. deficiency compliance report, if any; and
11. final handover memo.

12B.7 Post-Handover Responsibility

After formal surrender and acceptance of the land by the Divisional Forest Officer, Keonjhar, the surrendered parcel shall stand restored to the custody of the State Government / Forest Department. However, where any specific condition of acceptance requires transitional maintenance support by the project proponent for a defined period, the same shall be provided as mutually recorded during handover.

If inspection roads, water harvesting structures, check dams, or plantation blocks remain on the surrendered land, their status and future maintenance responsibility shall be clearly mentioned in the handover record.

12B.8 Conclusion

The land surrender protocol provides the necessary administrative and technical framework to ensure that reclaimed forest land at Dalpahar Mines is handed over in a transparent, verifiable, and legally sound manner. By linking land surrender to measurable reclamation outcomes, documented evidence, and joint field inspection, the protocol ensures that only environmentally stable and satisfactorily restored land is returned to the Divisional Forest Officer, Keonjhar, on behalf of the State Government.

12.3 Water Quality Monitoring

Water samples from surface water bodies and pit lakes will be analyzed to assess potential impacts from mining activities.

Key parameters include:

Parameter	Frequency
PH	Quarterly
Total dissolved solids	Quarterly
Heavy metals	Half yearly

Monitoring ensures that water resources remain safe for ecological and community use.

12.4 Soil Quality Monitoring

Soil quality monitoring will focus on parameters such as organic carbon content, nutrient levels, and soil texture. These parameters help assess the fertility of reclaimed land and guide plantation management practices.

12.5 Vegetation Monitoring

Plantation survival rates will be monitored annually. Areas with poor survival will be replanted during the next planting season.

Biodiversity surveys may also be conducted periodically to evaluate ecological recovery in reclaimed areas.

Chapter 13

Implementation Schedule (10-Year Reclamation Plan)

13.1 Introduction

A structured implementation schedule is essential to ensure that reclamation activities are carried out systematically throughout the life of the mine. Progressive reclamation reduces the environmental footprint of mining operations and accelerates the restoration of ecological functions within the disturbed landscape.

The ten-year implementation schedule for Daipahar Mines integrates engineering works, soil conservation measures, plantation development, and monitoring activities. The plan is designed so that reclamation progresses in tandem with mining operations, thereby minimizing the extent of disturbed land at any given time.

13.2 land use pattern

The proposed land used of the ML area over 89.961 ha of Daipahar Iron & Manganese Mines was provided as per approved modified Mining Plan, in which total 81.491 ha will be degrade/utilized due to mining activities and balance 8.47 ha maintained as Safety Zone and greenbelt at the end of the mining lease (in Conceptual Period). The details of land use pattern will be as follows:

Sl.No.	Pattern of Utilization		Area at the end of mines (In Ha.)	Post mines land use (Action will be taken after end of mines)
1	Mining Including Mines Road		40.05	Reclamation by back filling & plantation
2	Waste Dump Yard with Env. Protective Measures (Retaining wall, Garland drain &Settling Pond)		12.89	Rehabilitation by plantation
3	Utility Services (28.551 ha)	Mineral Processing Unity & Stocking Yard with Env. Protective Measures	19.07	Rehabilitation by plantation
		Storage of Topsoil	3.817	Rehabilitation by plantation
		Internal Road for Transporting	2.910	Rehabilitation by plantation
		Infrastructure (Office, Site service, Workshop, Creche, Elect. Substation, Cable, Parking Plaza & etc.)	2.754	Rehabilitation by plantation
	Sub Total		81.491	

4	Undisturbed	5.357	Maintain as green belt
5	Safety Zone Along the ML Boundary	3.113	Maintain as green belt
Grand Total		89.961	

13.3 Phased Implementation Strategy

The reclamation and afforestation activities in the disturbed area shall be initiated from the 3rd year onwards after obtaining the Final Forest Clearance. The total disturbed area of **81.491 ha** will be systematically rehabilitated through a combination of backfilling, afforestation, and plantation measures.

Out of this, an area of **12.89 ha** is proposed for afforestation over the stabilized waste dump.

Further, within the total mined-out area of **40.05 ha**, an extent of **26.50 ha** will be reclaimed through backfilling followed by afforestation. The remaining **13.55 ha**, comprising bench areas, will be reclaimed through afforestation only, after spreading **0.20 m thickness** of topsoil uniformly over the area to support vegetation growth.

In addition, the utility services area covering **28.551 ha**, including mineral processing zones, stacking yards, office premises, and associated infrastructure, is proposed to be developed under plantation only.

The reclamation program will be implemented in three broad phases:

Initial Stabilization (Years 1–2)

During the early years of mining operations, the focus will be on:

- topsoil conservation and storage
- stabilization of initial overburden dumps
- construction of drainage systems
- establishment of soil and moisture conservation structures

- Plantation of Safety Zone Area & undisturbed area

These measures will prevent soil erosion and create suitable conditions for plantation activities in subsequent years.

Ecological Development (Years 3–7)

The second phase of the reclamation program will involve large-scale ecological restoration activities including:

- Plantation development on stabilized dumps
- expansion of soil and moisture conservation structures
- vegetation establishment on reclaimed slopes

This phase will significantly increase vegetation cover in the mining area and improve environmental stability.

Landscape Stabilization (Years 8–10)

The final phase of the reclamation program will focus on long-term stabilization of the restored landscape.

Key activities will include:

- biodiversity enhancement through mixed plantations
- maintenance of soil conservation structures
- removal of infrastructure and carried out plantation of this area
- environmental monitoring and ecosystem assessment

By the end of this phase, the reclaimed mine area is expected to function as a self-sustaining ecological system and shall be handed over to the State Government.

13.4 Year-wise Implementation Plan

Phase	Time periods (Considered from obtaining of final Forest clearance)	Safety Zone Area Plantation (in Ha)	Undisturbed Area Plantation for Green Belt (in Ha)	Mined out Area to be reclaimed & Afforestation (in Ha)	Stabilized Dump Plantation (in Ha)	Utility Services Area (in Ha)	Total Area (in Ha)	Major Activities
I	1st to 2nd year	3.113	5.357	Nill	Nil	Nil	8.47	Safety zone & Undisturbed area plantation, Topsoil storage, dump terracing, soil conservation
II	3rd to 4th year	Nil	Nil	6.275	0.960	Nil	7.235	Reclamation & Afforestation, Dump plantation, drainage control
III	5th to 6th year	Nill	Nil	14.400	2.126	Nil	16.526	Reclamation & Afforestation, Dump plantation,
IV	7th to 8th year	Nil	Nil	11.154	5.763	15.651	32.568	Reclamation & Afforestation, Dump plantation, removal of crusher/screen plants, plantation of iron ore mineral prepossessing and storage area and Forest ecosystem development;
V	9th to 10th Year			8.221	4.041	12.90	25.162	Reclamation & Afforestation, Dump plantation, Removal of all infrastructures, final plantation & monitoring and handing over to the State Government.
	Total	3.113	5.357	40.05	12.89	28.551	89.961	

13.5 Institutional Arrangements

Close and continuous coordination shall be maintained with the Forest Department, especially with the Divisional Forest Officer (DFO), Keonjhar, and his authorized representatives. Such coordination shall include periodic review of reclamation progress, joint field inspections, verification of plantation and soil conservation measures, and guidance on species selection and ecological restoration practices. The Forest Department's inputs shall be duly incorporated to ensure that the reclaimed land aligns with the ecological characteristics of the surrounding Reserve Forest.

In addition, the project proponent shall maintain regular liaison with other relevant regulatory authorities, including the State Pollution Control Board, Ministry of Environment, Forest and Climate Change (MoEF&CC), and mining regulatory agencies, to ensure full compliance with statutory conditions, environmental clearance requirements, and mine closure guidelines.

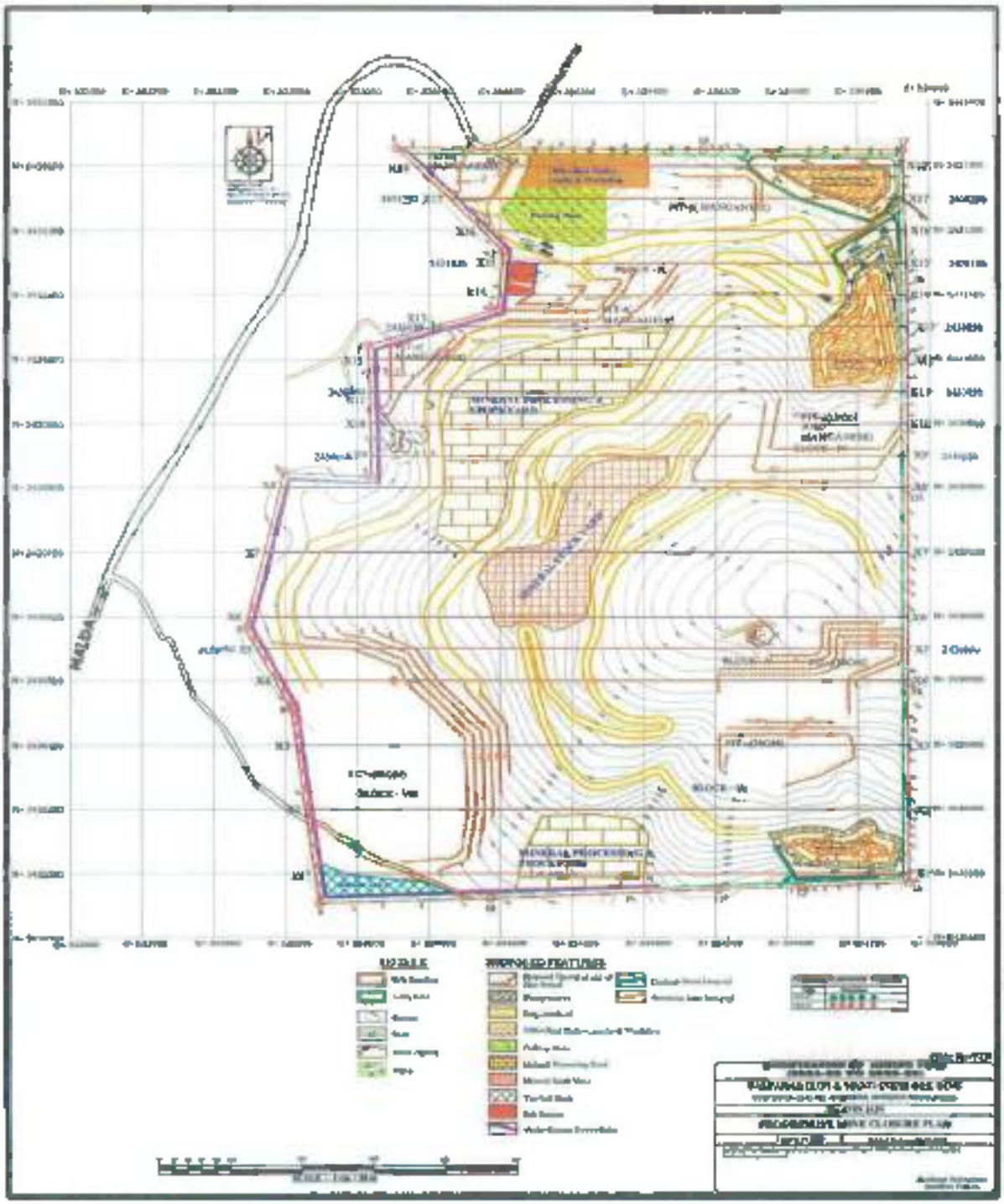


Figure 7: Phase wise reclamation map

Chapter 14

Cost Estimates and Financial Assurance

14.1 Introduction

Mine reclamation requires substantial financial resources for engineering works, plantation development, and environmental monitoring. The project proponent will provide financial assurance to ensure that adequate funds are available for implementing reclamation activities throughout the mine life.

The financial estimates presented here are indicative and based on prevailing costs for reclamation works in mining regions of Odisha.

14.2 Cost Components

The major cost components of the reclamation program include:

- topsoil handling and spreading
- dump stabilization engineering
- soil and moisture conservation structures
- plantation development and maintenance
- environmental monitoring and reporting

14.3 Estimated of Reclamation & afforestation Cost

Activity	Area in ha	Cost per Ha in Lakh	Total Amount in Lakh	Remarks
Back filling of 44.75 cum or 26.5 ha (The estimated cost per Ha Enclosed as **Annexure-1**)	26.50	236.42	6265.11	Out of the mined out area
Topsoil spreading (The estimated cost per Ha Enclosed as **Annexure-2**)	40.05	2.60	104.13	Mined out area (Backfilling area & Benches)
Dump stabilization	12.89	20.23	The financial forecast of these items has already been provided in the scheme imposed in Condition No. 2.xxiv.for appropriate mitigative measures to minimize soil erosion and choking of streams So, no extra budgetary provision has been suggested.	Terracing, Vetiver Plantation and agave plantation on the toe of dump
Plantation development [The estimated cost per Ha Enclosed as **Annexure-3**]	86.823	2.45	212.72	Excluding Safety Zone area of 3.138 ha, as the finance forecast for the same already been provided in the scheme imposed in Condition No. 2.xx for safety zone fencing, protection and regeneration to ensure dense canopy in all along the inner boundary of the mining lease area

Activity	Area in ha	Cost per Ha In Lakh	Total Amount In Lakh	Remarks
Soil & moisture conservation	89.961	2.75	The financial forecast of these items has already been provided in the scheme imposed in Condition No. 2.xxiv.for appropriate mitigative measures to minimize soil erosion and choking of streams & No.2.xx for safety zone fencing, protection and regeneration , So, no extra budgetary provision has been suggested	Retaining wall, Garland drain,Catch drain,Check Dam,LBC, Settling Tank, Contour trench, Percolation pond & Rainwater harvesting, etc
Environmental monitoring (The estimated cost per Year Enclosed as **Annexure-4**)	89.961	3.20	287.88	Ambient Air, Noise, Fugitive emission, Ground water, Surface water & Soil analysis for 10 years
		Sub-Total	**6869.84**	
		Price escalation @ 20%	**1373.968**	
		Estimated total cost	**8243.808** **OR 82.44 CORER**	

S. N. Mohanty, Agent
Dalpahar Fe. & Mn. Mines,
Dalpahar, Joda

Chapter 15

Expected Environmental Outcomes

15.1 Restoration of Land Stability

The reclamation measures proposed in this plan are expected to restore physical stability to the mining landscape. Engineering structures such as terraces, toe walls, and drainage systems will prevent slope failures and reduce soil erosion.

Over time, vegetation established on reclaimed land will further strengthen soil stability through root binding and organic matter accumulation.

15.2 Improvement in Vegetation Cover

Large-scale plantation programs will significantly increase vegetation cover in the mine area. Mixed plantations of native species will recreate forest ecosystems similar to those present before mining.

This restoration of vegetation cover will improve soil fertility, enhance carbon sequestration, and contribute to regional biodiversity conservation.

15.3 Enhancement of Water Resources

Water management measures including check dams, sedimentation ponds, and pit lakes will enhance water availability in the region. These structures will improve groundwater recharge and provide water sources for wildlife and local communities.

15.4 Biodiversity Recovery

Ecological restoration using native plant species will gradually create suitable habitats for wildlife. Over time, reclaimed areas may support a variety of birds, mammals, reptiles, and insects typical of the sal forest ecosystem.

Special attention will be given to habitat features that support wildlife movement across the landscape.

15.5 Long-Term Environmental Sustainability

The ultimate goal of the reclamation plan is to transform the mining landscape into a stable and productive ecosystem. Through progressive reclamation, engineering stabilization, and ecological restoration, the Dalpahar mine area will evolve into a landscape capable of supporting forests, water bodies, and biodiversity.

Successful implementation of this plan will demonstrate that mining operations can be conducted responsibly while ensuring long-term environmental sustainability.

Final Post-Mining Land Use Summary

Sl. No.	Final Land Use Category	Final Area (ha)	Percentage of Total Lease Area
1	Reclaimed Plantation over Backfilled Area	26.5	29.46
2	Reclaimed Plantation over Bench	13.55	15.06
3	Reclaimed Plantation over External Dump	12.89	14.33
4	Plantation Mineral Storage & Processing Area	19.07	21.20
5	Plantation Top soil storage Area	3.817	4.24
6	Plantation Road	2.910	3.23
7	Retained Infrastructure / Utility Area	2.754	3.06
8	Green Belt / Safety Zone Plantation	8.47	9.42
	Total Lease Area	**89.961**	**100**

The post-mining land use plan for Dalpahar Iron & Manganese Mines has been designed to maximize ecological restoration and long-term landscape stability. The final land use pattern envisages conversion of stabilized external dumps and backfilled quarry areas into forest plantation zones using native species typical of the sal-dominated forest ecosystem of Keonjhar district. The unbackfilled portion of the final mine pit is proposed to be developed as a pit lake / water reservoir, which will function as a permanent water body contributing to groundwater recharge, local hydrological stability, and wildlife use. Temporary disturbed areas such as ore stack yards, haul roads, and infrastructure zones shall be progressively reclaimed and integrated into the surrounding plantation matrix, except for limited access routes and utility areas to be retained for post-closure inspection and environmental monitoring. In addition, dedicated grassland and eco-restoration patches are proposed to enhance habitat diversity and support wildlife movement within the reclaimed mining landscape.

Conclusion

The preparation of a scientifically designed reclamation and ecological restoration plan is an essential component of responsible mining in forested landscapes. The Dalpahar Iron and Manganese Mines (Block–A), located within the Baitarani Reserve Forest of Keonjhar district, form part of a mineral-rich region where mining activity must be carefully balanced with environmental protection and long-term ecological sustainability. The Ten-Year Reclamation and Mine Closure Plan presented in this document has been formulated with the objective of ensuring that the environmental impacts of mining are minimized and that the disturbed landscape is restored to a stable and productive ecological condition.

The reclamation strategy outlined in the plan adopts a comprehensive and integrated approach combining engineering stabilization, soil and moisture conservation, vegetation development, and hydrological restoration. Progressive reclamation has been emphasized as the guiding principle, ensuring that land disturbed during mining operations is rehabilitated at the earliest possible stage rather than waiting until the end of the mine life. By implementing reclamation measures concurrently with mining activities, the extent of exposed land susceptible to erosion and degradation is significantly reduced.

A key component of the reclamation plan is the stabilization of waste dumps and mine slopes through scientifically designed engineering measures. Dump terracing, construction of toe walls, drainage channels, and sedimentation ponds will ensure long-term physical stability of the reclaimed landforms. These structures will effectively control soil erosion and prevent the transport of sediments into nearby drainage channels, thereby protecting the hydrological integrity of the surrounding watershed.

The plan also places strong emphasis on soil and moisture conservation measures to enhance water retention and promote vegetation growth. Structures such as contour trenches, check dams, gully plugs, and percolation pits will be constructed across reclaimed areas to slow down surface runoff and encourage groundwater recharge. These interventions will improve soil fertility and create favorable microclimatic conditions for the establishment of vegetation cover.

Ecological restoration through plantation development forms the central pillar of the reclamation strategy. The plan proposes the use of native plant species typical of the sal-dominated forest ecosystems of Keonjhar district, including Shorea robusta (Sal), Terminalia arjuna (Arjun), Terminalia tomentosa (Asan), Bambusa species, Emblica officinalis (Amla), and Azadirachta indica (Neem). Mixed plantations of these species will help recreate natural forest structure and enhance biodiversity within the reclaimed mining landscape. Over time, these plantations are expected to evolve into self-sustaining forest ecosystems that closely resemble the natural vegetation of the region.

Water management measures have also been incorporated into the reclamation plan to ensure hydrological stability of the mining area. Garland drains, sedimentation ponds, and watershed management structures will regulate runoff during the monsoon season and prevent sedimentation of nearby streams. In addition, mined-out pits that cannot be completely backfilled will be converted into pit lakes or water reservoirs, which will serve as long-term water storage structures contributing to groundwater recharge and providing water sources for wildlife and local communities.

Another important aspect of the reclamation plan is the development of a well-defined post-mining land use pattern. Stabilized external dumps and backfilled quarry areas will be converted into forest plantation zones, while selected areas will be developed as grassland or biodiversity patches to enhance habitat diversity. The final mine void will be retained as a water body that contributes to ecological and hydrological balance within the landscape. Such a mosaic of forests, water bodies, and open habitats will create a resilient ecosystem capable of supporting wildlife and maintaining environmental stability.

The plan also recognizes the importance of socio-economic considerations associated with mine closure. Reclamation activities such as plantation development, construction of soil conservation structures, and maintenance of restored areas will generate employment opportunities for local communities during and after the closure phase. The development of pit lakes and bamboo plantations may further create opportunities for fisheries and other livelihood activities, thereby contributing to the socio-economic well-being of the surrounding population.

Environmental monitoring forms an integral part of the reclamation program. Regular monitoring of air quality, water quality, soil health, and vegetation growth will be carried out to evaluate the effectiveness of reclamation measures and ensure compliance with regulatory standards. Monitoring results will be periodically reviewed to identify any corrective actions required to improve the performance of reclamation interventions.

The successful implementation of this reclamation plan will gradually transform the disturbed mining landscape into a stable and productive ecosystem. Over time, reclaimed areas will develop into forested landscapes interspersed with water bodies and grassland habitats, contributing to biodiversity conservation and watershed stability in the region. Such transformation demonstrates that mining activities, when supported by careful planning and responsible environmental management, can coexist with ecological restoration and sustainable land use.

In conclusion, the Ten-Year Reclamation and Mine Closure Plan for Dalpahar Iron and Manganese Mines represents a comprehensive framework for restoring environmental balance within the project area. The plan aligns with the statutory requirements of the Forest (Conservation) Act, 1980 and the environmental safeguards prescribed by the Ministry of Environment, Forest and Climate Change. By integrating engineering stabilization measures with ecological restoration principles, the plan ensures that the mining landscape will be rehabilitated into a stable and environmentally sustainable ecosystem that benefits both nature and local communities in the long term.

PLATES

1. Location Map

2. Topographic Map

3. Dump Stabilization & SMC Map

5. Progressive Mining Closer map

4. Phase wise reclamation map

ANNEXURES

1.Estimate cost for backfilling of mine out area

2.Estimate cost for Spreading of top soil

3. Estimate cost for plantation the reclamation & afforestation land

4. Early environment monitoring cost.

Commitment of the Project Proponent for Implementation of the Reclamation Plan

The project proponent, DC Jain Group, hereby affirms its commitment to implement the Ten-Year Reclamation and Mine Closure Plan for the Dalpahar Iron and Manganese Mines (Block-A) in a responsible and systematic manner in accordance with the environmental safeguards prescribed under applicable laws and regulatory approvals.

Mining operations at the Dalpahar Mine will be carried out with due regard to environmental protection and ecological sustainability. The company recognizes that mining activities in forest areas involve disturbance to natural landforms, vegetation cover, and hydrological systems, and therefore places high priority on implementing scientifically designed reclamation measures to restore ecological balance within the project area.

The reclamation strategy outlined in this plan emphasizes progressive mine closure practices, whereby areas that become inactive during mining operations are reclaimed at the earliest possible stage. The project proponent commits to ensuring that stabilization of overburden dumps, soil and moisture conservation works, and plantation activities are carried out concurrently with mining operations so that the total disturbed land area is minimized at any given time.

The company further commits to the proper conservation and management of topsoil during mining operations. Topsoil will be stripped, stored, and preserved carefully for later use in reclamation activities. This stored topsoil will be utilized during the rehabilitation of dumps, backfilled quarry areas, and other disturbed land surfaces to restore soil fertility and support vegetation development.

Engineering stabilization measures proposed in the reclamation plan, including dump terracing, construction of toe walls, garland drains, sedimentation ponds, and drainage channels, shall be implemented in accordance with approved design specifications. These structures will ensure the physical stability of reclaimed landforms and prevent erosion and sedimentation in nearby water bodies.

The project proponent also commits to implementing the plantation program proposed in the plan using native plant species typical of the sal forest ecosystem of Keonjhar district. Mixed plantations of indigenous species such as Sal, Arjun, Asan, Bamboo, Neem, and Amla will be established across reclaimed areas to restore forest cover and enhance biodiversity. Adequate maintenance and protection measures will be provided to ensure high survival rates of planted saplings.

Water management and watershed protection will be given due importance throughout the mining and reclamation phases. Soil and moisture conservation structures such as contour trenches, check dams, and gully plugs will be constructed to regulate surface runoff, enhance groundwater recharge, and prevent soil erosion within the mine lease area.

The project proponent further commits to developing appropriate post-mining land uses in accordance with the conceptual closure plan. Stabilized dumps and backfilled quarry areas will be converted into forest plantation zones, while the final mine pit may be developed as a pit lake or water reservoir contributing to hydrological stability and wildlife habitat enhancement.

An environmental monitoring program will be implemented to assess the effectiveness of reclamation measures and ensure compliance with environmental standards. Monitoring of air quality, water quality, soil fertility, and vegetation development will be carried out periodically. The monitoring results will be reviewed regularly and corrective measures will be taken wherever necessary to improve environmental performance.

The project proponent also commits to allocating adequate financial resources for the implementation of reclamation activities. Financial assurance will be maintained as required under regulatory provisions to ensure that reclamation and mine closure measures are completed even in the event of premature cessation of mining operations.

The company will maintain close coordination with the State Forest Department, regulatory authorities, and local communities to ensure that reclamation activities are implemented effectively and in compliance with statutory conditions. Periodic progress reports on reclamation activities will be submitted to the concerned authorities as required.

Through the implementation of the measures outlined in this reclamation plan, the project proponent seeks to ensure that the mining landscape is gradually transformed into a stable and productive ecosystem capable of supporting forest vegetation, water resources, and biodiversity. The company reiterates its commitment to responsible mining practices and sustainable environmental management in the Dalpahar mining project area.

S. N. Mohanty, Agent
Dalpahar Fe. & Mn. Mines,
Dalpahar, Joda

(Signature of the designated authority)

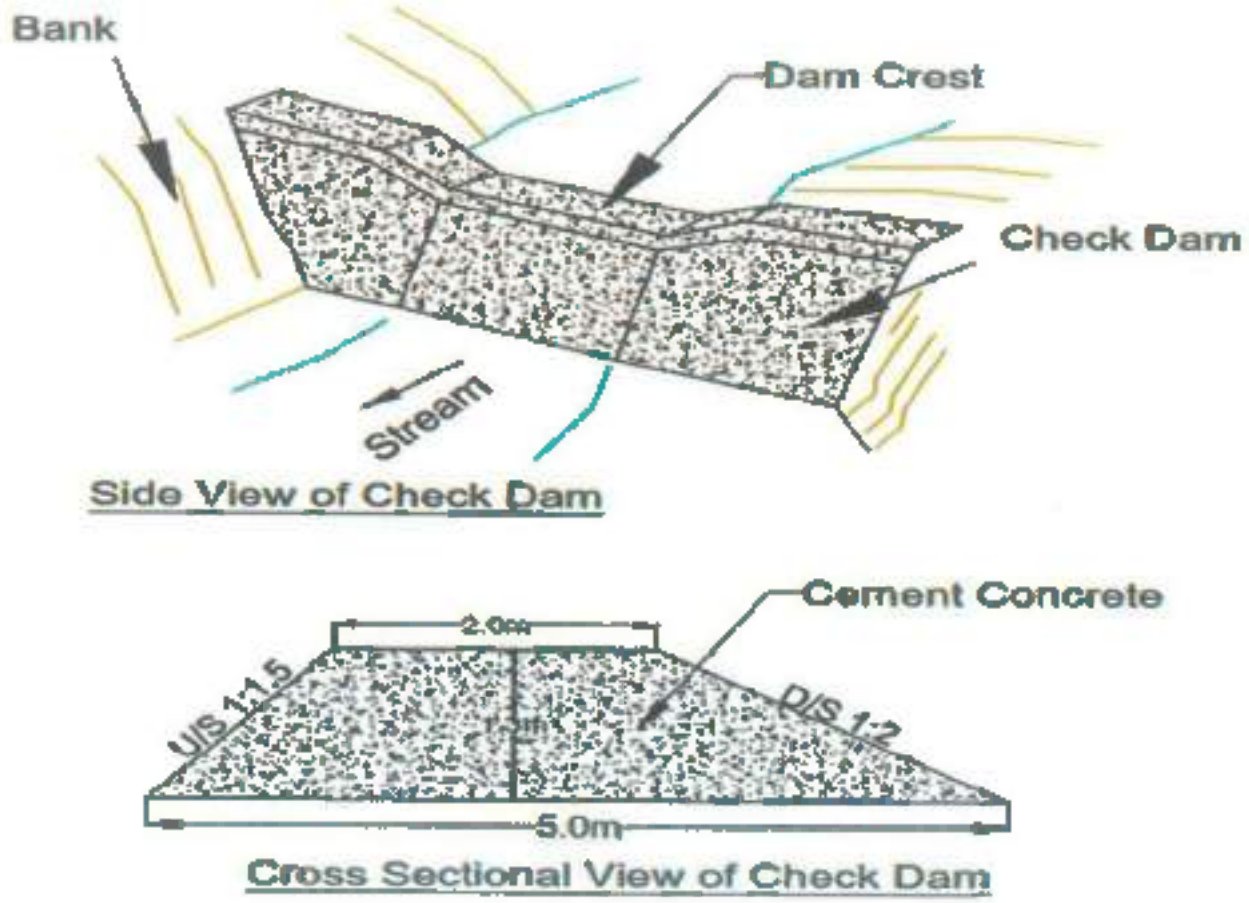


Figure 8:-Check dam engineering Drawing

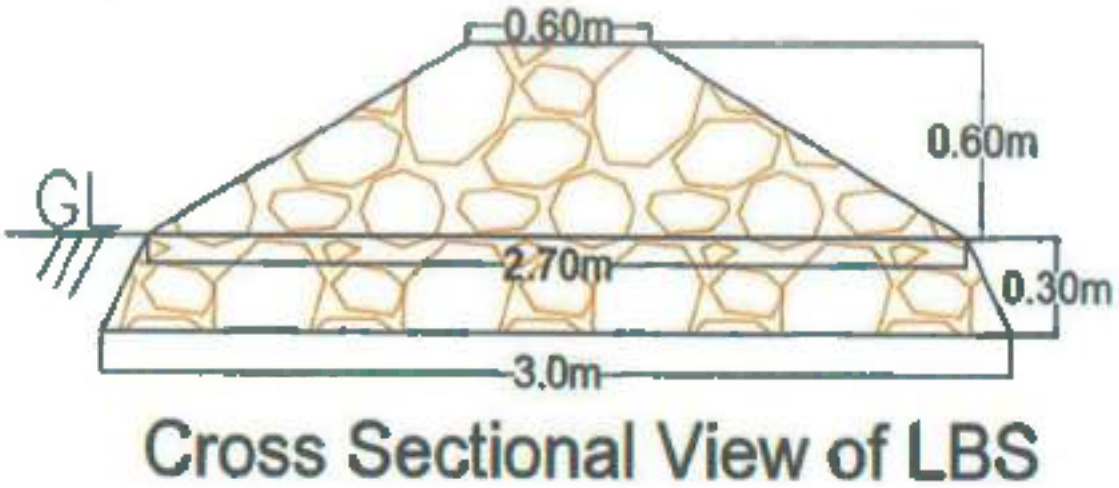


Figure 9:– LBS Engineering drawing

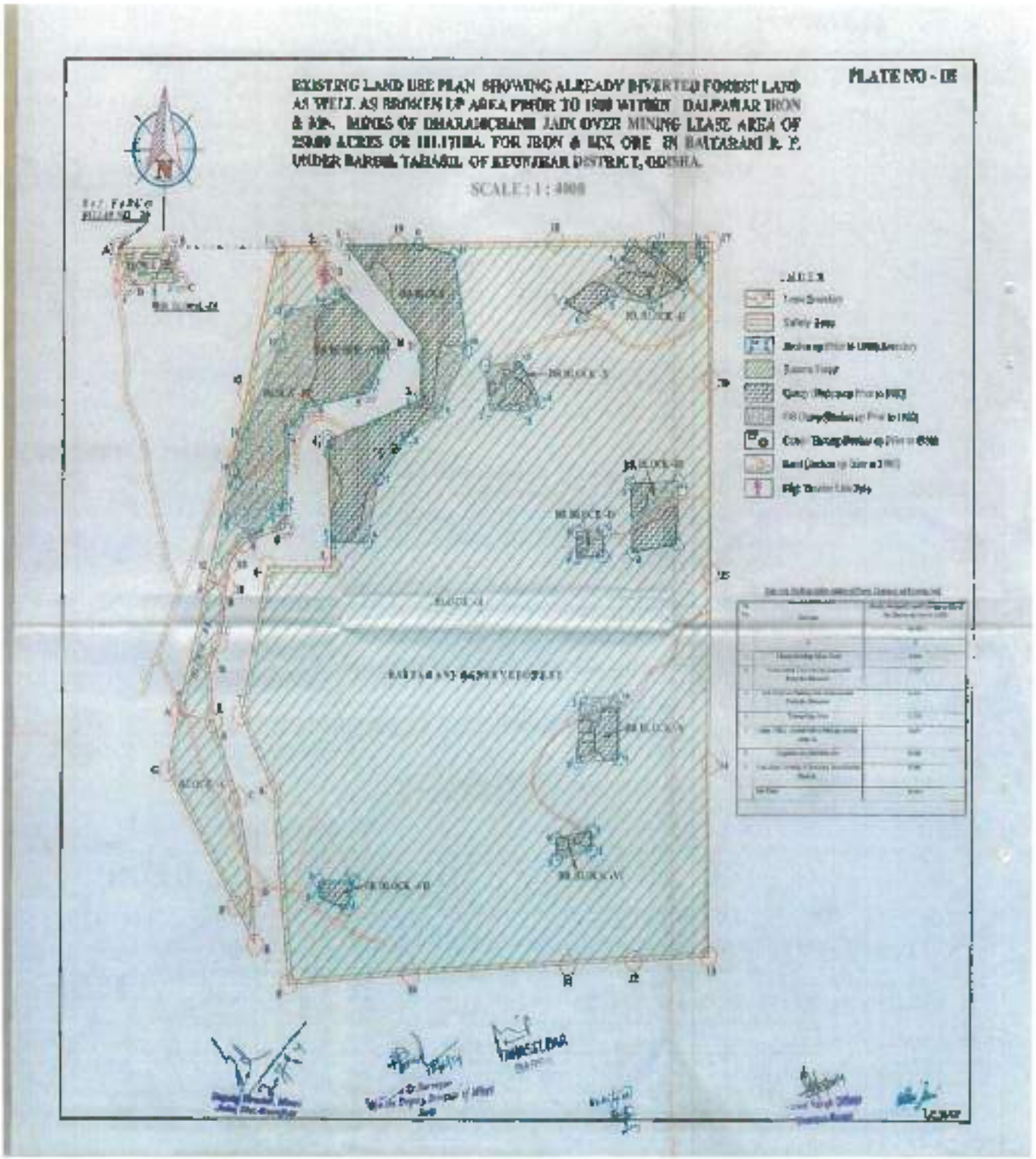


Figure 10: Present Land use map

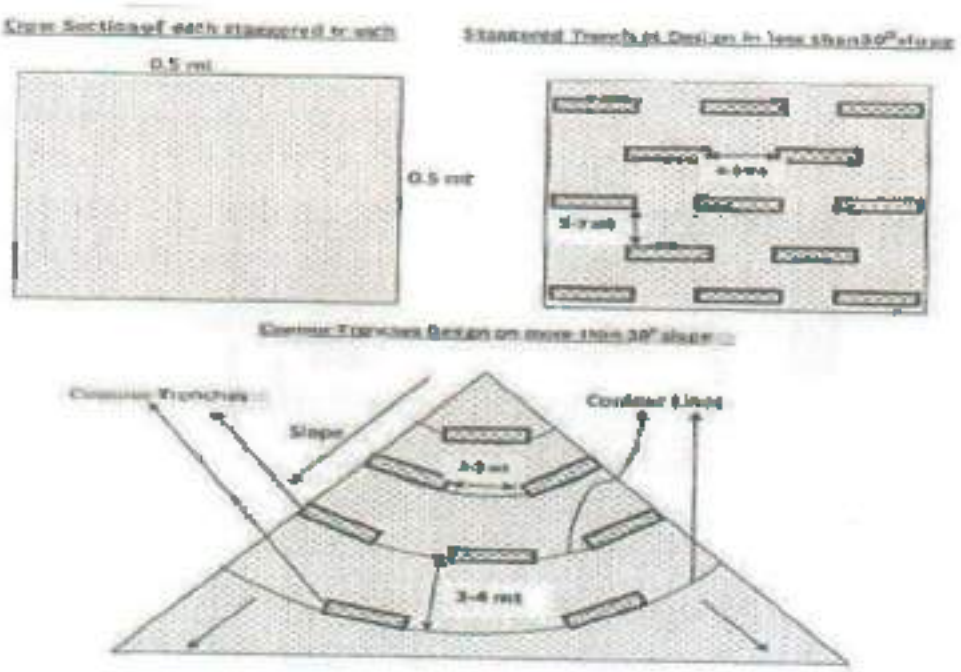


Figure 11 :Contour Trench Design

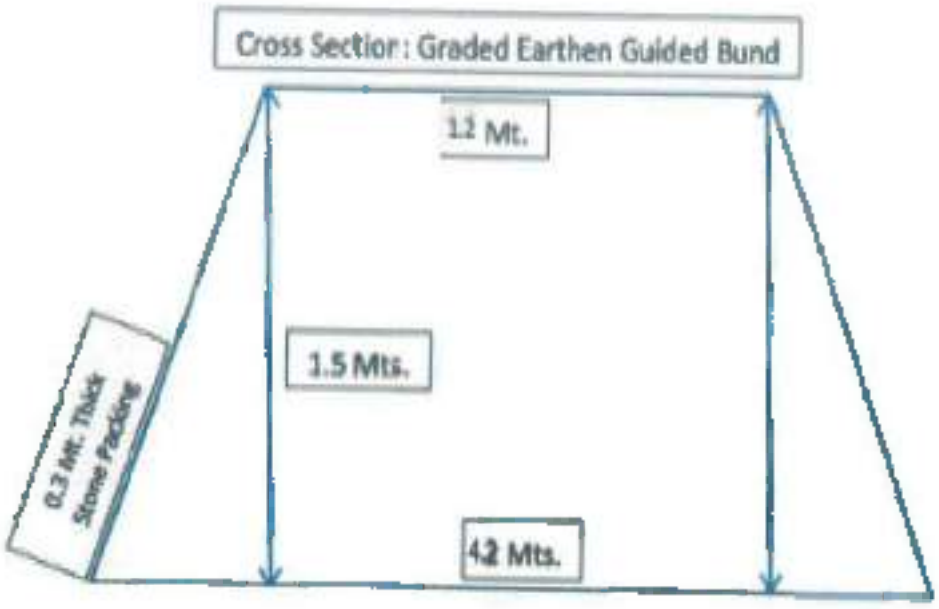


Figure 12: Graded Earthen Bund (GEB) Design

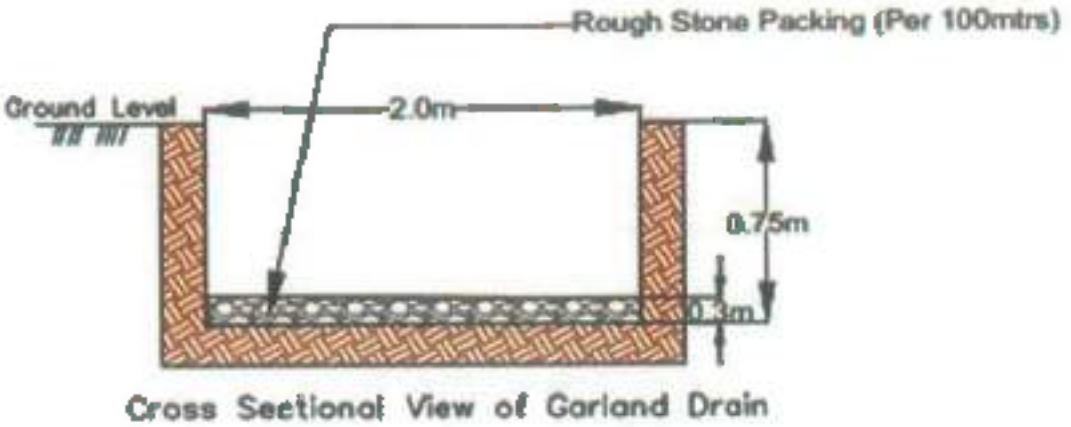


Figure 13-Garland Drain Design

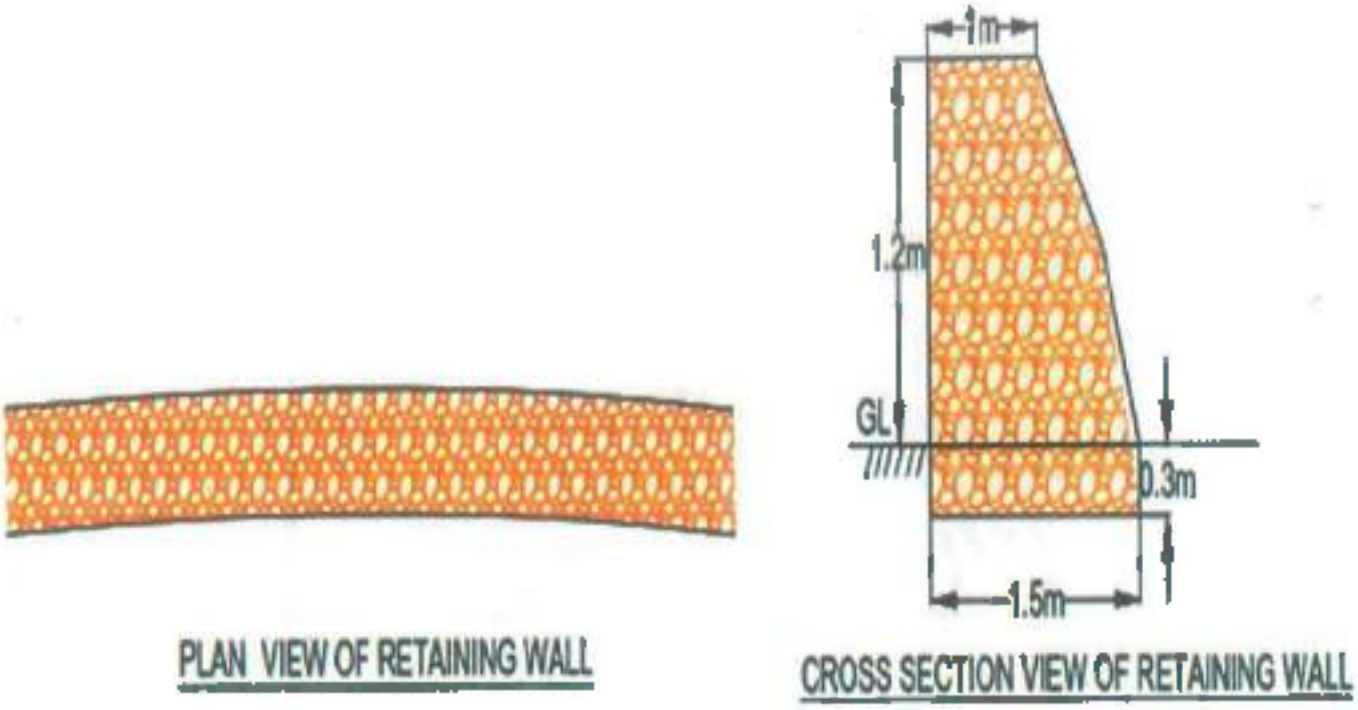


Figure 14 Retaining wall Design

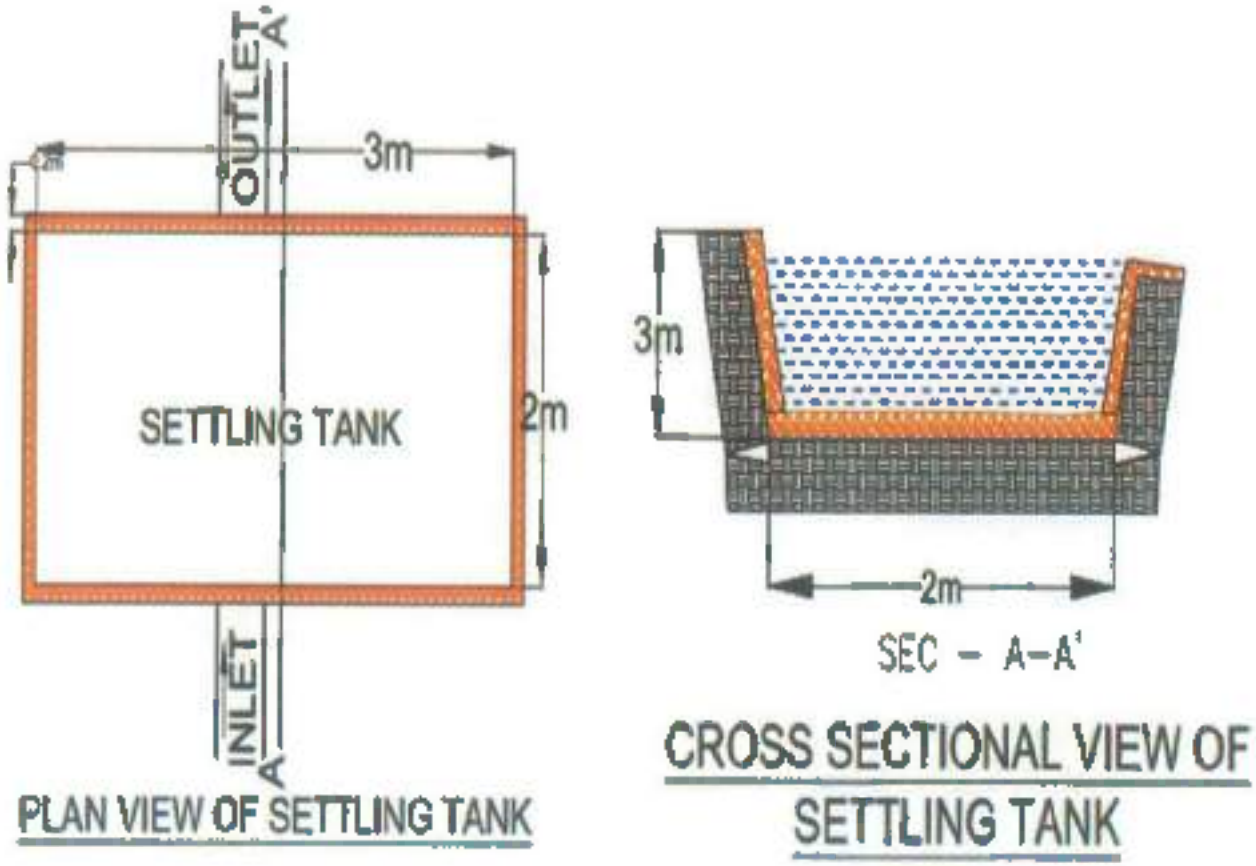


Figure 15-Settling tank design

COST COMPONENTS FOR BACK FILLING PER HECT.

Basic Assumptions

- Material: Overburden (OB)
- Lead distance: 2 km
- Equipment: Excavator + Tippers + Dozer + water tanker
- Working hours/day: 8 hours
- Bulk density considered: 1.6 t/m³
- Operation: Excavation → Hauling → Dumping → Spreading → Compaction

Component	Typical Cost (₹/m³)
Excavation / loading of material	30
Transportation (lead 1–2 km)	80
Spreading & leveling	20
Miscellaneous & overheads	10
Total cost per cum	140

Total 44.75 lakh cum material required for back filling of 26.50 Ha mined out area

Total cost for 44.75 lakh cum or 4475000 cum x Rs 140/cum = Rs 62,65,00,000/-

or for 26.50 ha =Rs. 62,65,00,000

Per 1 Ha = Rs. 62,65,00,000 /26.50 = Rs.2,36,41,510

COST COMPONENTS FOR TOPSOIL SPREADING PER 1 HECT.

Quantity of top soil Estimate per Ha.

Topsoil thickness: Average= 0.20m

Quantity required: 1 ha. = 10000 sqm x 0.20 m = 2000 cum per

Item	Unit	Rate (₹)	Amount (₹/ha)
Excavation & Loading	2000 m^3	30/-	60,000
Transportation (1–2 km)	2000 m^3	80/-	1,60,000
Spreading & Leveling	2000 m^3	20/-	40,000
Total			**₹ 2,60,000 / ha**

COST ESTIMATION FOR AFFORESTATION OF RECLAIMED AREA

The detail estimation of the above item of work per hectare in the year wise statement is furnished below:

1.	Name of the Plantation.	Block Plantation.
2.	No. of seedlings to be planted.	**1600** Nos. per hectare
3.	Spacing to be adopted.	2.5m x 2.5m
4.	Size of pits.	30cm x 30cm x 30cm
5.	Wage rate.	Rs.**462.00** per man days.
6.	Species to be planted.	*Sal, Arjun ,Asan, Bamboo, Neem Amla etc. and* other miscellaneous species

Sl.No	Type of operation	Amount(Rs)
1	Survey, demarcation & pillar posting- 8 Labours	3,696.00
2	Site preparation-6 Labours	2,772.00
3	Alignment and staking-4 Labours	1,848.00
4	Pitting 30cm cube pits-1600 pits @ 40 Labours	18,480.00
	Sub total	26,796.00
5	Contingencies @20%	5,359.20
	Total of 0th year	**32,155.20**
	1st year	
6	Purchage of seedlings 1600 Nos @ Rs60/seedling (including loadin & un loading in site)	96,000.00
7	Planting with application of manure and insecticide - 11 Labours	5082.00
8	Cost of manure 100 gms per plant=160 Kg @Rs.10.00	1,600.00
9	First weeding 10 Labours	4,620.00
10	Application of Manure 10 Labours	4,620.00
11	Second Weeding- 6 Labours	2,772.00
12	Soil working - 6 Labours	2,772.00
13	Fire tracing & Inspection path-10 Labours	4,620.00
14	Soil conservation measures-10 Labours	4,620.00
15	Watch & ward- 8 Labours	3,696.00
	Sub total	130,402.00
16	Contingencies @20%	26,080.40
	Total 1st Year	**156,482.40**

	2nd Year	
17	Casualty replacement including seedlings cost – 20 Labours	9,240.00
18	Application of fertilizer-16 Labours	7,392.00
19	Cost of fertilizer-100gms per plant 160 kg @ Rs.10.00	1,600.00
20	Weeding-10 Labours	4,620.00
21	Soil working-10 Labours (50cms. Radius around plant)	4,620.00
22	Fire tracing-10 Labours	4,620.00
23	Watch & ward- 8 Labours	3,696.00
	Sub total	35,788.00
24	Contingencies @20%	7,157.60
	Total 2nd year	42,945.60
	3rd Year	
25	Pruning - 10 Laborers	4,620.00
26	Watch & ward - 4 Laborers	1,848.00
27	Fire tracing-10 Labours	4,620.00
	Sub total	11,088.00
28	Contingencies @20%	2,217.60
	Total 3rd year	13,305.6

Abstract of Expenditure of Cost of Afforestation (per Ha. @1600 plants) in Phased Reclamation Plan:

Sl. No.	Year of Operation	Cost (in Rupees)
1	0th. Year	32,155.20
2	1st. Year	156,482.40
3	2nd. Year	42,945.60
4	3rd. Year	13,305.6
	Total	244,888.80 or 2,44,890/-

COST OF YEARLY ENVIRONMENT MONITORING						
Sl.No.	Type of Monitoring	Analysis periods	No of Station	Total No of Analysis	Rate per Analysis (in Rs)	Amount (in Rs)
1	Ambient Air Quality (7 parameters)	Weekly Twice	6	624	3000	1872000
2	Fugitive Emission	Fortnightly Once	4	96	1000	96000
3	Ground Water	Quaterly	2	8	6000	48000
4	Surface Water	Quaterly	2	8	6000	48000
5	Noise Monitoring	Monthly	8	96	500	48000
6	Soil Analysis	Quaterly	6	72	4000	288000
					TOTAL	24,00,000

CATCHMENT AREA TREATMENT PLAN

For

DALPAHAR IRON & MANGANESE ORE MINES

Mining Lease Area: 89.961 Ha

Located at: Baitarani R.F, Barbil Tehsil, Keonjhar District, Odisha

Condition No - 2. XI

Prepared By

M/s GREEN FORCE ASSOCIATES PVT. LTD.

Bhubaneswar, Odisha

March 2026

PREFACE

The preparation and implementation of a scientifically designed Catchment Area Treatment Plan (CATP) is an essential component of environmentally responsible mining, particularly in forested and ecologically sensitive landscapes. Mining activities, if not properly managed, have the potential to alter natural drainage systems, accelerate soil erosion, and increase sediment load in downstream water bodies. Therefore, a well-structured CAT Plan is indispensable for ensuring long-term ecological stability and sustainable resource utilization.

The present Catchment Area Treatment Plan has been prepared for the **Dalpahar Iron & Manganese Ore Mine (Block-A)** located in the Baitarani Reserve Forest-A, Keonjhar District, Odisha, in compliance with the conditions stipulated under the **Forest (Conservation) Act, 1980**, and the Stage-I (in-principle) approval granted by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India.

The plan is based on a comprehensive assessment of the catchment characteristics, including topography, slope, drainage pattern, rainfall distribution, soil properties, land use/land cover, and hydrogeological conditions. Modern tools such as Remote Sensing (RS), Geographic Information System (GIS), and Digital Elevation Model (DEM) analysis have been utilized to delineate watersheds, identify erosion-prone zones, and design appropriate mitigation measures.

The CAT Plan integrates both **engineering (structural)** and **ecological (biological)** interventions. Structural measures such as garland drains, check dams, settling tanks, recharge structures, and sedimentation ponds are proposed to regulate runoff and trap sediments. Complementary biological measures including afforestation, vetiver grass plantation, and slope stabilization aim to restore vegetation cover and enhance soil stability

This document aims to provide a practical and implementable framework for controlling soil erosion, improving water conservation, enhancing groundwater recharge, and minimizing environmental impacts associated with mining activities. The plan also incorporates monitoring mechanisms and maintenance strategies to ensure long-term effectiveness.

The successful implementation of this CAT Plan will contribute significantly towards achieving environmental compliance, ecological restoration, and sustainable mining practices in the region.

EXECUTIVE SUMMARY

The Catchment Area Treatment Plan (CATP) for the Dalpahar Iron & Manganese Ore Mine (89.961 ha), located in Baitarani Reserve Forest-A, Keonjhar District, Odisha, has been prepared in compliance with the conditions stipulated under the Forest (Conservation) Act, 1980, and Stage-I approval granted by MoEF&CC.

The mining area lies within a structurally controlled hilly terrain forming part of the Baitarani river basin, characterized by moderate to steep slopes (0.03°–32.65°), lateritic soil, and dendritic drainage network draining into the Kundra River. The region receives an average annual rainfall of approximately 1378 mm, with 70–80% precipitation occurring during the monsoon, leading to high runoff and moderate erosion potential.

Using DEM-based analysis and RUSLE modelling, the average soil loss has been estimated at approximately **16 t/ha/year**, categorizing the area under **moderate erosion risk**.

To address these impacts, a combination of **engineering and biological measures** has been proposed:

Structural Measures

- Garland drains (total ~2160 m + additional network)
- Catch drains for rain water of 3800 m.
- 4 Check dams and 35 Loose Boulder Structures
- Settling tanks and sedimentation ponds
- Exhausted pit (2,00,000 KL) and secondary pond (2,00,000 KL)
- Recharge shafts (2 units @ 110 KLD)
- Silt traps and spillways
- 2 Wire mesh Loose Boulder Check Dam

Biological Measures

- Block plantation over 3.138 ha
- Vetiver plantation over 11.5 ha (dump stabilization)
- Agave plantation (1.85 km along dump toes)
- **Sowing soil binding grass seeds**
- Gap planting over 23 ha in buffer zone
- ANR over 5.55 ha

Expected Outcomes

- Reduction in soil erosion by 40–60%
- Significant reduction in sediment load entering drainage systems

- Improved groundwater recharge in pediment and valley zones
- Stabilization of overburden dumps and slopes
- Enhancement of ecological resilience and vegetation cover

The total estimated cost of the CATP is ₹2.26 Crore, covering both core and buffer zones, including monitoring and escalation provisions.

The plan adopts an integrated watershed-based approach ensuring **long-term environmental sustainability and regulatory compliance**.

PROJECT SNAPSHOT

- **Lease Area:** 89.961 Ha
- **Location:** Baitarani Reserve Forest-A, Odisha
- **Production:** , 0.3 MTPA Iron Ore (Proposed for 2.99 MTPA) + 0.094 MTPA (Mn. Ore)
- **Terrain:** Hilly, forested, erosion-prone
- **Rainfall:** ~1378 mm/year (Monsoon dominated)
- **River Basin:** Baitarani Basin

KEY ENVIRONMENTAL CHALLENGES

▲ High surface runoff during monsoon
▲ Soil erosion on slopes & OB dumps
▲ Sediment load in drainage channels
▲ Disturbed natural drainage due to mining
▲ Reduced groundwater recharge

SCIENTIFIC BASIS OF PLAN

✓ DEM & GIS-based watershed analysis
✓ Slope classification (0°–32°)
✓ Drainage & stream order mapping
✓ LULC analysis (10 km buffer)
✓ Rainfall-runoff modelling (Rational Method)

RUNOFF PROFILE

- **Existing Runoff:** ~97,782 KL/year
- **Plan Period Runoff:** ~4,49,218 KL/year
- **Peak Challenge:** Monsoon-driven runoff surge

STRUCTURAL INTERVENTIONS

(Engineering Controls for Runoff & Sediment)

✓ Garland Drains – 2,000+ m
✓ Catch Drains – 3,800+ m
✓ Check Dams – 4 Nos
✓ Loose Boulder Structures – 35 Nos
✓ Settling Tanks – 4 Nos
✓ Silt Traps & Spillways
✓ Retaining Walls (Dump Stabilization)

Water Storage

- **Exhausted Pit:** 2,00,000 KL
- **Sedimentation Pond:** 2,00,000 KL

Groundwater Recharge

- **Recharge Shafts:** 2 Nos (110 KLD each)

BIOLOGICAL INTERVENTIONS

(Nature-based Stabilization)

Block Plantation – 3.138 Ha
Vetiver Plantation – 11.5 Ha (Dump slopes)
Agave Plantation – 1.85 km (Toe stabilization)
Grass Turfing & ANR

Focus: Soil binding + slope stabilization + ecological restoration

TREATMENT FLOW (CORE CONCEPT)

Slope Runoff → Garland Drain → LBS → Check Dam → Settling Tank → Pond → Recharge

EXPECTED OUTCOMES

✓ **40–60% reduction** in soil erosion
✓ **~50% reduction** in sediment load
✓ **25–35% reduction** in peak runoff
✓ **15–25% increase** in groundwater recharge
✓ Stabilized OB dumps & slopes
✓ Improved water quality in downstream streams

IMPLEMENTATION FRAMEWORK

- **Duration:** 2 Years
- **Execution:** User Agency + Technical Supervision
- **Monitoring:** 15% budget allocation
- **Inspection:** Pre & Post Monsoon

PROJECT COST

- **Core Zone:** ₹140 Lakh
- **Buffer Zone:** ₹ 86 Lakh
- **Total CAT Plan:** ~₹226 Lakh or 2.26 Crore

FINAL IMPACT

Sustainable Mining
Improved Water Security
Reduced Land Degradation
Enhanced Ecological Stability
Full MoEF&CC Compliance

CHAPTER-1

INTRODUCTION

1.1 INTRODUCTION

The Catchment Area Treatment (CAT) is a vital environmental management component designed to minimize adverse impacts of mining activities on the surrounding drainage basin and environmental Conditions.

The Dalpahar Iron & Manganese Ore Mine is located in a region where surface runoff, soil erosion, and sediment transportation may increase due to excavation, overburden removal, and associated infrastructure development. Therefore, preparation and implementation of a scientifically designed catchment treatment plan is essential to maintain ecological balance and ensure sustainable mining operations.

The Catchment Area Treatment Plan for Dalpahar Iron & Manganese Ore Mine has been designed to minimize soil erosion, control surface runoff, and prevent siltation of nearby drainage systems within and around the mining lease area. Mining activities such as excavation, overburden dumping, and haul road development may increase the rate of surface runoff and sediment load in the local drainage network. Therefore, appropriate structural and biological measures will be implemented to stabilize the catchment.

The treatment measures will include construction of garland drains, check dams, gully plugs, sedimentation ponds, and retaining walls around the overburden dumps and along natural drainage channels to intercept and slow down runoff water. These structures will trap suspended sediments before the water enters nearby streams. The design of these structures will follow the guidelines of the Central Pollution Control Board and MoEF&CC to ensure effective sediment control.

In addition, biological measures such as afforestation, grass turfing, and plantation of native species will be undertaken on overburden dumps, reclaimed areas, and along haul roads to stabilize the soil and reduce erosion. Vegetative cover will enhance water infiltration, improve soil stability, and restore the ecological balance of the catchment.

Mining activities often alter natural landforms, vegetation cover, and hydrological regimes, which can accelerate erosion processes and increase silt load in nearby streams, water bodies, and drainage channels. If left unmanaged, these changes can lead to deterioration of water quality, reduction in groundwater recharge potential, and degradation of surrounding ecosystems. The Catchment Treatment Plan aims to identify vulnerable zones within the catchment area and propose suitable structural and biological measures to control erosion, stabilize slopes, improve vegetation cover, and regulate runoff.

The present CATP has been prepared based on detailed analysis of topography, drainage pattern, rainfall characteristics, soil type, land use pattern, and slope stability of the Dalpahar mining lease area and its surrounding catchment. The plan incorporates various soil and water conservation measures such as check dams, garland drains, sedimentation ponds, afforestation, turfing, and slope stabilization techniques to reduce sediment inflow and enhance water retention.

The implementation of the Catchment Treatment Plan will help in controlling land degradation, improving surface water quality, enhancing groundwater recharge, and maintaining long-term environmental sustainability in and around the mining area. The plan is aligned with statutory environmental guidelines and aims to support responsible and environmentally sound mining practices.

1.2OBJECTIVE OF STUDY

The present study aims to prepare a comprehensive Catchment Treatment Plan (CTP) for the Dalpahar Iron Ore Mine to minimize environmental impacts arising from mining activities and to ensure sustainable management of land and water resources. The specific objectives of the study are as follows:

1. **Assessment of Catchment Characteristics**

   To analyze the existing catchment area with respect to topography, drainage pattern, slope, soil characteristics, rainfall pattern, and land use/land cover.

2. **Identification of Erosion-Prone Areas**

   To identify vulnerable zones within the catchment that are susceptible to soil erosion, sediment transportation, and slope instability due to mining and associated activities.

3. **Runoff and Sediment Load Evaluation**

   To estimate surface runoff and sediment yield from the mining lease area and surrounding catchment for planning appropriate control measures.

4. **Formulation of Soil and Water Conservation Measures**

   To design suitable structural and biological measures such as check dams, garland drains, retaining structures, afforestation, turfing, and sedimentation ponds for effective erosion control and runoff management.

5. **Improvement of Hydrological Stability**

   To enhance groundwater recharge, reduce siltation in nearby water bodies, and maintain the natural drainage system.

6. **Environmental Protection and Sustainability**

   To minimize land degradation, protect surrounding ecosystems, and promote environmentally responsible mining practices.

7. **Development of Monitoring and Maintenance Strategy**

   To establish a monitoring framework for evaluating the effectiveness of implemented catchment treatment measures and ensuring long-term sustainability.

This Plan would cover the following aspects:

Identification of free draining catchment

- Assessment of Land Use, Soil, Slope in the Dalpahar Iron & Manganese Ore Mine catchment based on Remote Sensing (RS)/Geographical Information System (GIS) and validation through field survey.

- Erosion levels the watershed and prioritization of watersheds will be done by appropriate methods.

- As per the requirement of Ministry of Environment & Forests and Climate Change, (MoEF& CC) Government of India, the treatment measures will be proposed for the area falling higher priority erosion categories. Both Engineering measures as well as Biological treatment measures will be proposed in the CAT plan.

- The cost of the administrative set up and mitigative measures will include recommendation from State Forest Department for all forest lands and from the Soil Conservation Department for non-forest land.

1.3 STUDY METHEDOLOGY

The methodology adopted for preparation of the Catchment Treatment Plan (CTP) involves systematic evaluation of the catchment characteristics, identification of environmentally sensitive zones, and formulation of appropriate soil and water conservation measures. The study has been carried out using field investigations, analysis of secondary data, and interpretation of satellite and topographical information. The detailed methodology is described below:

1. Collection of Baseline Data

Relevant primary and secondary data related to climate, rainfall pattern, geology, geomorphology, soil characteristics, land use/land cover, and drainage pattern were collected from different Govt. published reports, government records, and field surveys. Rainfall and hydrological data were analyzed to understand runoff characteristics of the catchment area.

Rainfall data were collected from IMD and OSDMA. DEM, satellite imagery, and topographical data were obtained from Bhuvan Geoportal, NRSC, Survey of India, and USGS EarthExplorer. Geological, hydrogeological, and soil data were referred from GSI, CGWB, and NBSS&LUP, followed by field verification.

2. Catchment Delineation

The catchment area was delineated using topographical maps, Digital Elevation Model (DEM), and satellite imagery. Drainage networks and watershed boundaries were identified to understand water flow direction and accumulation zones.

3. Field Survey and Site Inspection

Detailed field visits were conducted to assess slope conditions, soil erosion status, vegetation cover, stability of overburden dumps, and existing drainage channels. Vulnerable areas prone to erosion, sedimentation, and runoff concentration were identified during site inspection.

4. Analysis of Soil Erosion and Runoff

Slope gradient, rainfall intensity, soil type, and land use pattern were analyzed to evaluate erosion potential and sediment yield. The study also assessed runoff generation and its impact on nearby drainage systems and water bodies.

5. Identification of Treatment Measures

Based on erosion susceptibility and drainage characteristics, suitable structural and biological measures were proposed. Structural measures include check dams, garland drains, retaining walls, and sedimentation ponds, while biological measures include afforestation, turfing, and vegetation stabilization.

6. Planning and Design of Conservation Structures

Appropriate design parameters for conservation structures were developed considering rainfall intensity, catchment area, slope stability, and expected runoff load to ensure effectiveness and durability.

CHAPTER-2

STUDY AREA DESCRIPTION

2.1 MINE DETAILS

The mining lease for Dalpahar Iron & Manganese Mines (Block-A) covering an area of 89.961 ha was originally granted in favour of Late Sri Dharmchand Jain on 09 June 1986 for a period of 20 years, i.e., up to 08 June 2006, within Baitarani Reserved Forest-II, under Barbil Tahasil of Keonjhar Forest District, Odisha.

Prior to expiry of the lease, an application for Renewal of Mining Lease (RML) was submitted on 01 June 2005 within the stipulated time. Accordingly, the lease was deemed to have been extended under the provisions of Rule 24A(1) of the Mineral Concession Rules, 1950.

Subsequently, due to delay in submission of the succession certificate and in obtaining statutory clearances, the lease was declared lapsed by the Government of Odisha, Steel & Mines Department, on 01 May 2015. Against this order, a petition was filed before the Hon'ble High Court of Odisha. Pursuant to the directions of the Hon'ble Court and subsequent hearings, the Government of Odisha, vide order dated 06 September 2019, declared that the lease had not lapsed and extended its validity up to 08 June 2036 in favour of Sri Avin Jain, Power of Attorney holder of Smt. Sobha Jain, wife of Late Sri Dharmchand Jain, under the MMDR (Amendment) Act, 2015

Based on the approval of the Steel & Mines Department, Government of Odisha, vide letter dated 28 April 2022, a Supplementary Lease Deed for Block-A over 89.961 ha was executed on 27 April 2023 in favour of Sri Avin Jain, Power of Attorney holder of Smt. Sobha Jain.

The entire mining lease area lies within the Baitarani Reserve Forest and forms part of Survey of India Toposheet No. F45N5 (73G/5). The lease area is bounded by latitudes 21°58'04.701" N to 21°58'42.918" N and longitudes 85°23'26.729" E to 85°23'59.175" E.

At present, a proposal for diversion of 79.367 ha of forest land, including 2.822 ha earmarked as a safety zone, in addition to 10.594 ha of forest land already diverted, has been submitted under Section 2(ii) of the Forest (Conservation) Act, 1980. The MoEF&CC, Government of India, has accorded Stage-I (in-principle) approval, vide File No. 8-31/2015FC(E-91135) dated 13.02.2026, subject to compliance with stipulated conditions.

As per Condition No. 2.xi of the Stage-I approval, the User Agency is required to prepare and implement a comprehensive Catchment Plan at the project cost. In compliance with the said condition, the present comprehensive scheme has been prepared for implementation over the entire mining lease area of 89.961 ha.

This project pertains to expansion of iron ore production from 0.31 MTPA to 2.99 MTPA iron ore and 0.094MTPA of Manganese Ore along with crushing and screening plant within the lease area. Method of mining will be by Open cast mechanized mining. The material produced will be used in the domestic steel & other alloy industries.

2.2 MINE LOCATION

The lease area is located in Baitarani R.F-A, Barbil Tehsil, Keonjhar District, Odisha, about 5km SW of Joda Town. It is approachable Joda via Bichhakundi The nearest railway station is Jaroli Railway Station about 2.7Km (SE) of the lease area.

A brief description of the mining area, along with the location, coordinates, accessibility, etc. has been details below in Table No.2.1

Table 2.1: Mine site description

Location	Baitarani R.F-A, Barbil Tehsil, Keonjhar District, Odisha
Coordinates	Latitude: 21o 58' 43.04" N – 21o 58'04.70" N Longitude: 85o 23' 59.17" E – 85o 23' 26.72"E
Nearest Village	Dalpahar – 500m
Nearest Town	Joda – 5.0Km
Nearest Railway Station	Jaroli Railway Station – 2.7Km (SE)
Topography	• The lease area located within Baitarani R.F. • The highest contour within the lease hold area is 723m MSL, which is along the SE portion of the lease area while the lowest contour being 553m a MSL in the SW corner of the lease area. • The general trend of the hill is NNE-SSW.
Drainage	• There is no perennial nala within the ML area. • Suna Nadi is flowing due North in the west side of the lease area at a distance of at a distance of 0.8 km from the lease area.

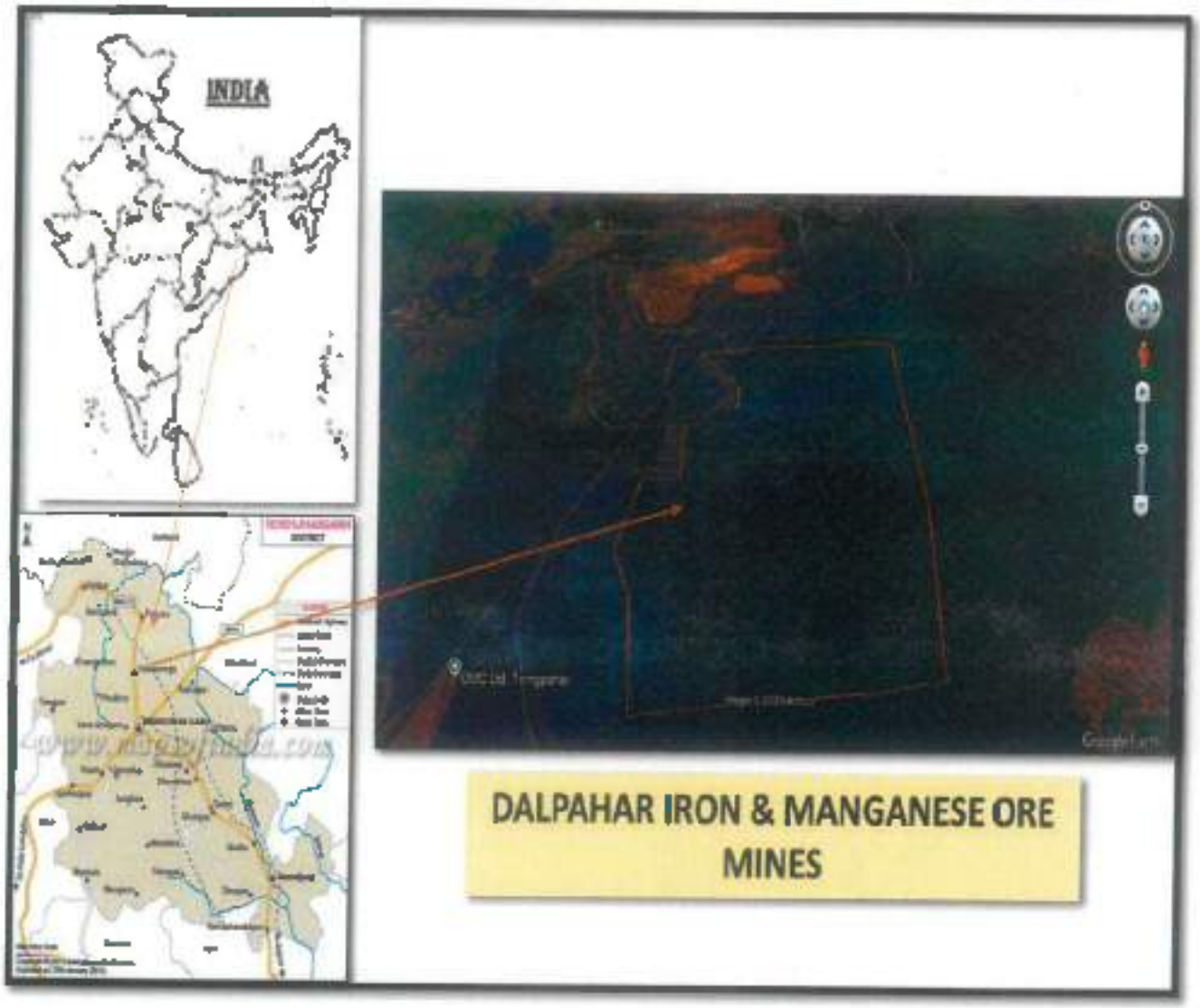


Figure 2.1: Location MAP

Figure 2.1: 10KM Radius Topographic MAP

2.4Land Utilization / Land Use

DESCRIPTION	Existing (Ha)	Attheend of phaperiod (Ha)	Endof conceptual period(Ha)
AreaUnderMining	3.06	18.53	40.05
Overburden/WasteDumping	1.93	4.80	12.89
MineralStorage	Nil	9.62	Nil
Infrastrucure/Utility	Nil	2.18	28.55
Township/housingcolony	Nil	Nil	Nil
Roads	2.17	10.34	Nil
Railwaylineetc.,Magazine	Nil	Nil	Nil
TopsoilStacking	Nil	0.44	Nil
Safetyzone/Green belt	3.11	3.11	3.11
Sub-Total	10.27	49.020	81.49
Unutilized	79.691	48.101	5.36
Grand-Total	89.961	40.941	89.961

Table 2.2: Land Utilization

2.5Water Requirement

The water requirement for the mines is mainly for green belt, dust suppression, ETP, workshop, wheel washing and drinking water purpose. The total water requirement will be 188 KLD. The water required will be sourced from proposed three no's of bore well within the lease area.

Table 2.3: Water Requirement

Activities	Requirement(KLD)
DomesticUse	18
DustSuppression	154
Plantation	11
Workshop	5
Totalrequirement	**188**

CHAPTER-3

DESCRIPTION OF CATCHMENT AREA

3.0Physiography

The Dalpahar Iron and Manganese Ore Mine is situated within the Baitarani Reserve Forest, Barbil Tehsil, Keonjhar District of Odisha, between Latitude 21°58'43.04" N ,21°58'04.70" N and Longitude 85°23'59.17" E ,85°23'26.72" E.

The region forms part of the mineral-rich Bonai-KeonjharIron Ore belt, characterized by undulating to hilly terrain with moderate to steep slopes and a mix of rugged ridges and shallow valleys typical of the eastern limb of this belt

The physiography is largely controlled by resistant Iron and Manganese bearing formations associated with the Archean Iron Ore Supergroup and older metamorphic rocks that form pronounced hillocks and ridges, interspersed with gentle lowlands.

The area lies within the upper catchment of Baitarani River system, and the natural surface drainage reflects the general topographic slope from higher elevations in the west towards lower lying plains to the east, ultimately contributing to the Baitarani river basin.

Dense forest cover under the Reserve Forest classification dominates the landscape, contributing to relatively stable surface conditions, though localized runoff and erosion occur along steeper slopes and drainage lines due to seasonal high rainfall typical of this part of Odisha.

This physiographic setting influences surface water flow, sediment transport, and runoff characteristics within the mine catchment, and thereby forms the basis for identifying erosion-prone zones and planning suitable catchment treatment measures.

3.1 Topography & Landforms

The study area is characterized by undulating to hilly terrain with rugged hill ranges, narrow ridges, and intervening valleys. The terrain shows moderate to steep slopes formed by resistant iron and manganese bearing formations. The mining lease area and surrounding catchment mainly consist of elevated hillocks and structural ridges with localized flat to gently sloping valley portions.

The elevation in the area generally varies from approximately 500 m to 800 m above mean sea level, producing moderate local relief. Higher elevations are marked by iron ore bearing ridges, whereas lower elevations are occupied by seasonal drainage channels and valley zones.

3.2 Climate and Meteorological Conditions

Temperature

The area experiences a tropical monsoon climate. The maximum temperature during summer months (April to June) generally ranges between 38°C to 42°C, while minimum temperature during winter months (December to January) varies between 10°C to 15°C. The average annual temperature generally remains around 25°C to 28°C.

Rainfall

The region receives significant rainfall mainly during southwest monsoon season from June to September. The average annual rainfall of the Barbil–Keonjhar region ranges between 1100 mm and 1600 mm. High intensity rainfall during monsoon contributes to high runoff, erosion, and sediment transportation.

Humidity

Relative humidity in the area varies seasonally. During monsoon season, humidity generally ranges between 75% to 90%, whereas during summer months it reduces to approximately 40% to 60%. Higher humidity levels during rainy seasons enhance vegetation growth but also increase runoff potential.

Wind Pattern

The predominant wind direction in the area is generally from southwest to northeast during monsoon and from northeast to southwest during winter season. Average wind velocity ranges from 3 km/hr to 10 km/hr. Wind flow influences evapotranspiration rate and dispersion of dust particles generated from mining activities.

3.3 Vegetation and Surface Conditions

The mining area is located within reserve forest land having mixed deciduous vegetation. Natural vegetation cover plays an important role in stabilizing slopes, reducing erosion, and enhancing infiltration. However, localized disturbance due to mining operations may increase soil erosion risk.

3.4 Land Use Land Cover Study

Land use and land cover (LULC) is important in the assessment of environmental impact studies of a region. LULC is the surficial expression of terrain parameters and vastly influenced by them. It helps in understanding the changes in various physic-chemical parameters such as geology, landforms, soil, contour, water bodies, groundwater, climate and rainfall.

Industrial or developmental activities of an area causing changes in any of these parameters would reflect changes in the spatial pattern of LULC. The study of landuse and land cover is essential to understand environmental issues of a region and also about the human interface in that region while undertaking developmental activities, especially mining activities.

Knowledge on the nature of terrain is necessary to understand the spatial pattern and distribution of various LULC categories because of the existence of intrinsic relation between them. With this background, to understand LULC from regional (10 Km buffer area) to local – within the ML - RS data is used.

The extracted LULC information is geo-refcrenced and transformed to generate spatial database using Geographic Information System (GIS) technique. Various aspects of data used, details of method, spatial pattern and distribution of LULC with their spatial estimation are discussed in the following sections.

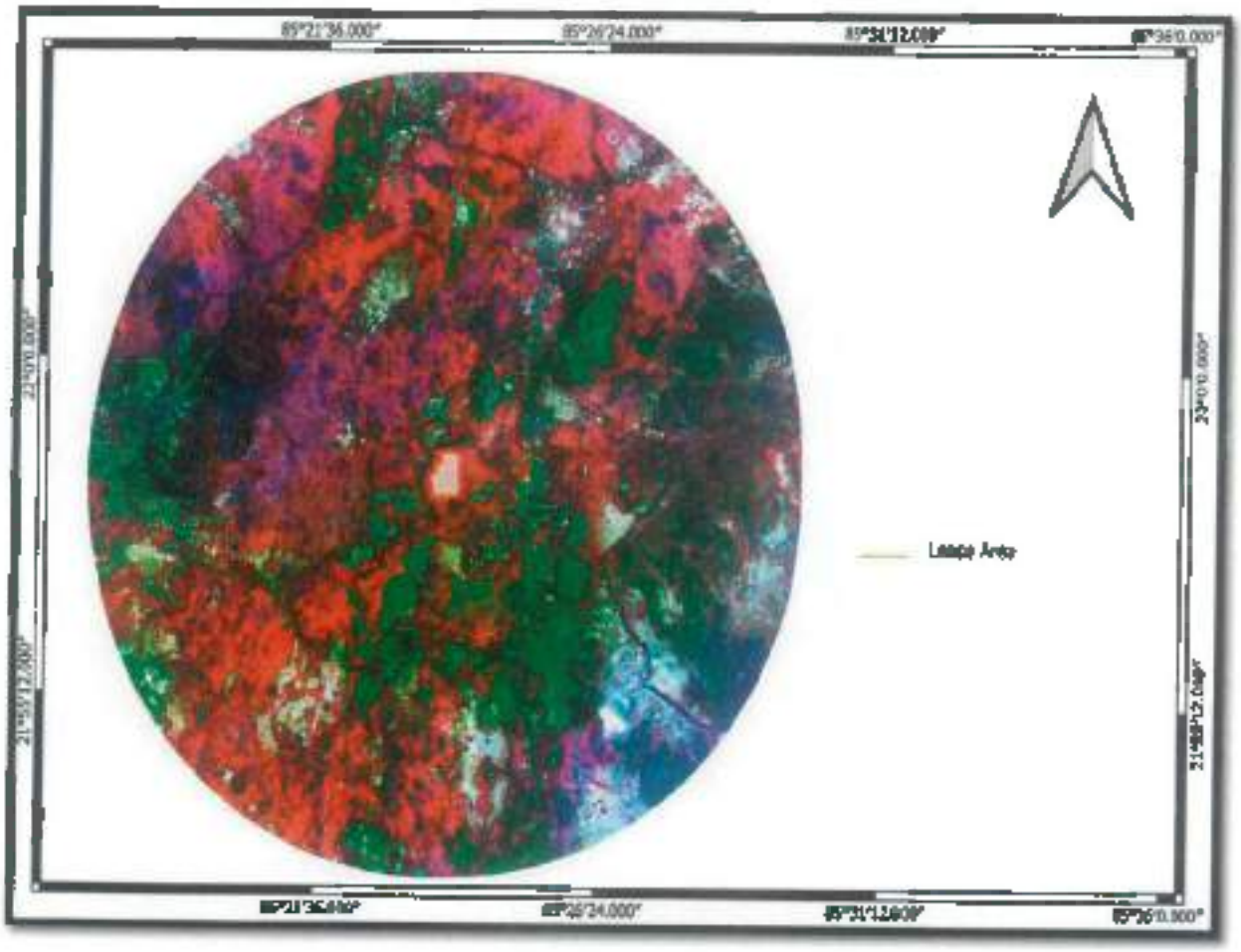
Remote sensing satellite data of Sentinel-2 satellite data acquired on May 2024 has been used to generate LULC around the mining lease area. Satellite data is selected for the present study data is based on the availability of appropriate cloud free data. The detail of remote sensing satellite data used for generation of landuse information of the study area is given below:

Table3.1:RemoteSensingsatelliteimageusedforthepresentstudy

S.No	TypeofData	GeneratedMaps
1.	Sentinel-2-May2025	1.LULCMapof10KmbufferaroundtheCZ

From this data, LULC maps showing 10 Km buffer area covering a total radial buffer area of 324.38 sq.km. The satellite data used for the present study to prepare LULC map of 10 Km buffer area is shown in Figure No.3.1.

Figure3.1:SateliteDataShowing10KmbufferareaaroundtheML



LULCPATTERNWITHIN10KMRADIALBUFFERAROUNDTHEML

Map showing various LULC categories is prepared using visual interpretation technique based on image elements such as color, tone, texture, size, shape and association of elements. Categorization of LULC and their nomenclature is based on the national level landuse classification system, which is adopted for the entire country as recommended by National Remote Sensing Centre (NRSC), Department of Space, Government of India

Table3.2:MajorLanduseandLandcoverunitsofthestudyarea

S.No	MajorLULC Category	Landuseunit
1.	Built-upLand	Village Town Industries/InfrastructureBuildings
2.	AgriculturalLand	Cropland Fallowland Plantation
3.	Forest	Dense Mixed Forest SparseMixedForest Open Mixed Forest Degraded Forest ForestBlank
4.	WasteLand	LandwithScrub Barren/Rocky/Stonywaste Mining / Dump Area
5.	Waterbodies	Tanks / Ponds Rivers/Streams

LULC map showing 10 Km radial buffer around the mining lease (ML) area is shown in Figure No.3.19 and some of the major LULC categories such as built-up, agriculture, forest, wasteland and water bodies along with their spatial estimation are discussed below.

Table3.3:LULCunitswithin10KmBufferzoneandtheirSpatialExtent

S.No	LULCCategories	Area (Sq.km)	Percentage of Area
1	ForestArea	156.16	48.14
2	MiningArea	45.58	14.05
3	Settlement/Industries/Infrastructure	17.84	5.50
4	Landwithoutscrub	25.56	7.88
5	Landwithscrub	2.60	0.80
6	CropLand	25.56	7.88
7	Water bodies	1.78	0.55
8	Fallowland	49.31	15.20
	Total	324.39	100

It could be observed that "forest cover" is the predominant LULC in the 10Km buffer area representing 48.14 % followed Fallow Land 15.20 % & 14.05 % of mining area. The spatial pattern and the extent of LULC categories also suggest that mining and allied activities are the major economic resource in the buffer area - rather than agriculture.

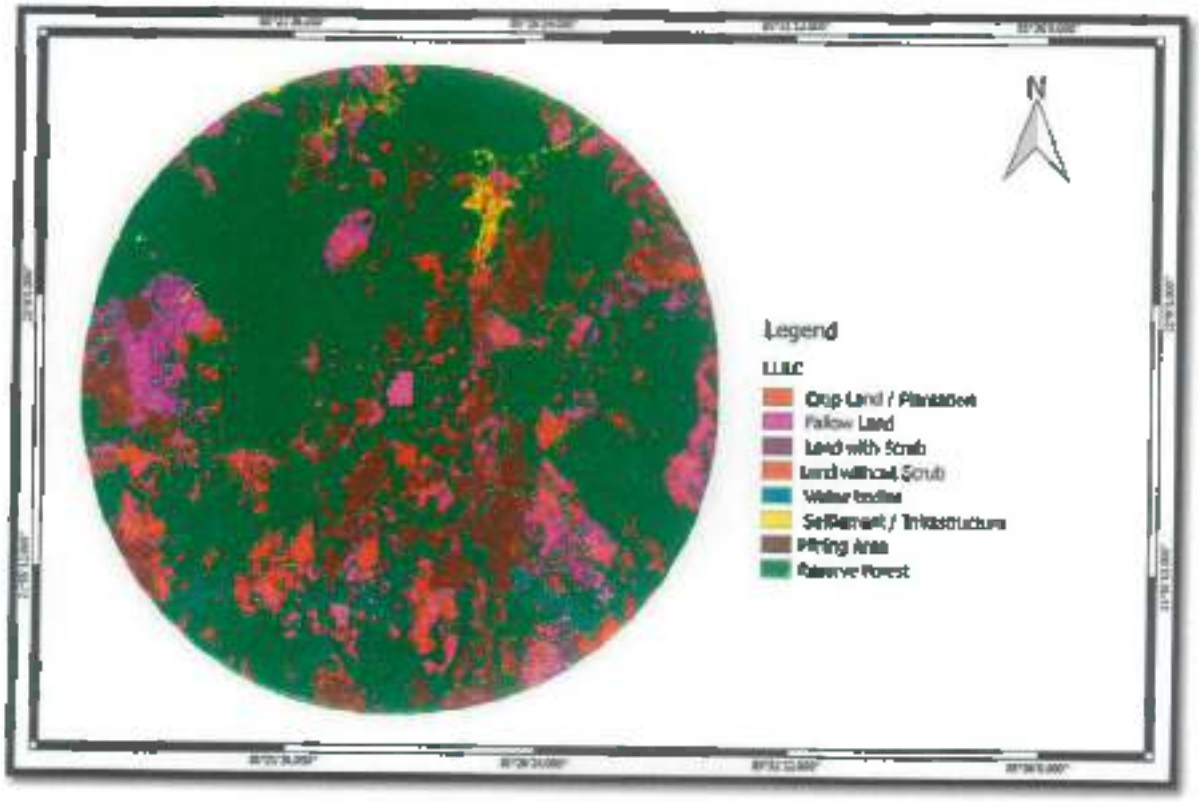


Figure 3.2 : LULC MAP of the 10KM buffer Zone

Built Up Area

Built-up / settlements category represents dwelling units and human habitation apart from other supportive permanent or impermanent structures catering to the economic and social activities of an area. This include structures such as dwelling units, villages, temporary camp sites, business infrastructure buildings, industrial units so on. Built-up area shows an area of 17.84 Sq.Km representing 5.5% of the buffer area.

Agricultural Land

Agricultural activity - crop land, fallow and trees and plantation – is very limited in the buffer area owing to limitations imposed by terrain setting. Being predominantly a rugged mountainous hard rock terrain with major parts occupied by forest cover,agriculture is very limited and confined to narrow valleys and intermittent plains. Besides such natural constraints, presence of large number of mining activities in the buffer area provides means of earning for the local people. Earning through working in mining and its allied activities is more lucrative than agriculture.

Crop land covers an area of 25.56 Sq.km representing a meager 7.88 % of the study area implying the existence of natural restraints preference of occupation by the local people. Crop cultivation is mostly monsoon dependent and people cultivate paddy, few dry crops such as millets along with vegetables. People also grow horticulture crops such as lettuce and vegetables and some fruit bearing trees in the backyard of their houses. This helps in their day- to-day sustainability and earns them some meager revenues when sold in local market.

Fallow land represents barren crop land which is recently harvested or tilled for next sowing and may be left barren for few seasons. Large tracts of fallow land are delineated from the satellite image by their characteristic image elements. Since fallow land category is nothing but barren crop land without vegetation. Spatial extent of fallow land is estimated to be 49.31 Sq.km representing 15.20 % of the buffer area.

Forest Land

Forest cover is the major LULC category that dominates the buffer area covered with tall trees, climbers and creepers, fruits bearing trees, shrubs and grass. Various density of these natural vegetation occupies vast area with vegetation such as and covers deciduous trees, shrubs and scrubs. They are distributed in various densities in different parts of the buffer area. It covers an area of 156.16 Sq.km representing 48.14% of the buffer area.

Waste Land

Wasteland is the LULC that indicates land parcels that lie unproductive in terms of agricultural activity even after sustained conservation practices but could be used for other land utilization or land use activities such as infrastructure, industries and mining activities."Land with scrub", abandoned quarries, dumps andmining areaaresome ofthe wastelandLULCcategories inthe buffer area.

Land with scrub forest is identified by isolated patches and closely associated with agricultural area, waterbodies and settlements covering an area of 2.60 Sq.Km representing 0.80 % of the buffer area.

Mining area is the major economic resource and many such activities seen in the study area forming the significant land use type in the buffer area. This category covers a relatively vast area – 39.41 Sq.km representing 11.13 % and land without scrub representing 7.88 % (25.56 Sq.km) of the buffer area.

Water Bodies

Waterbodies in this area include many small ponds, minor first order streams, minor streams and nalasjoing to form major rivers. Presence of nalas and minor streams are due to the overland flow of precipitation running down from hill ranges implying the role of altitude and lithology in the drainage pattern of the area. Few ponds and tanks also exist near agricultural fields and settlements. The major river Baitarani River was flowing in the study area. Thus, total area of waterbodies occupies an area of 1.78 Sq.Km representing 0.55 % of the buffer area.

CHAPTER-4

GEOLOGY, HYDROGEOLOGY &SLOPE ANALYIS OF CATCHMENT AREA

4.1 Geology of the Area

The study area is located within the Singhbhum–Keonjhar–Bonai iron ore belt of the Eastern Indian Shield and is characterized by Precambrian rock formations. The geology of the area is dominantly represented by the Iron Ore Group (IOG), which comprises Banded Hematite Jasper (BHJ), Banded Hematite Quartzite (BHQ), ferruginous shale, chert, and massive hematite iron ore. These formations are the principal host rocks for high-grade iron ore mineralization formed due to prolonged weathering and supergene enrichment processes.

The Iron Ore Group overlies the Older Metamorphic Group consisting mainly of quartzite, schist, phyllite, and amphibolite. These formations represent metamorphosed sedimentary and volcanic sequences forming the basement complex of the region. In certain locations, granitoid intrusions belonging to the Singhbhum Granite are also observed.

Structurally, the area exhibits folding, faulting, and jointing, which play a significant role in controlling mineralization as well as groundwater occurrence. The terrain is characterized by rugged hills, structural ridges, and narrow valleys formed due to differential weathering of iron-bearing formations.

From a hydrogeological perspective, BHJ and BHQ formations possess secondary porosity developed through fractures and joints, whereas compact iron ore zones generally exhibit low permeability. Weathered zones and valley fill materials act as potential groundwater reservoirs.

Overall, the geological setup indicates a mineral-rich terrain with moderate groundwater potential controlled mainly by structural discontinuities and weathered zones.

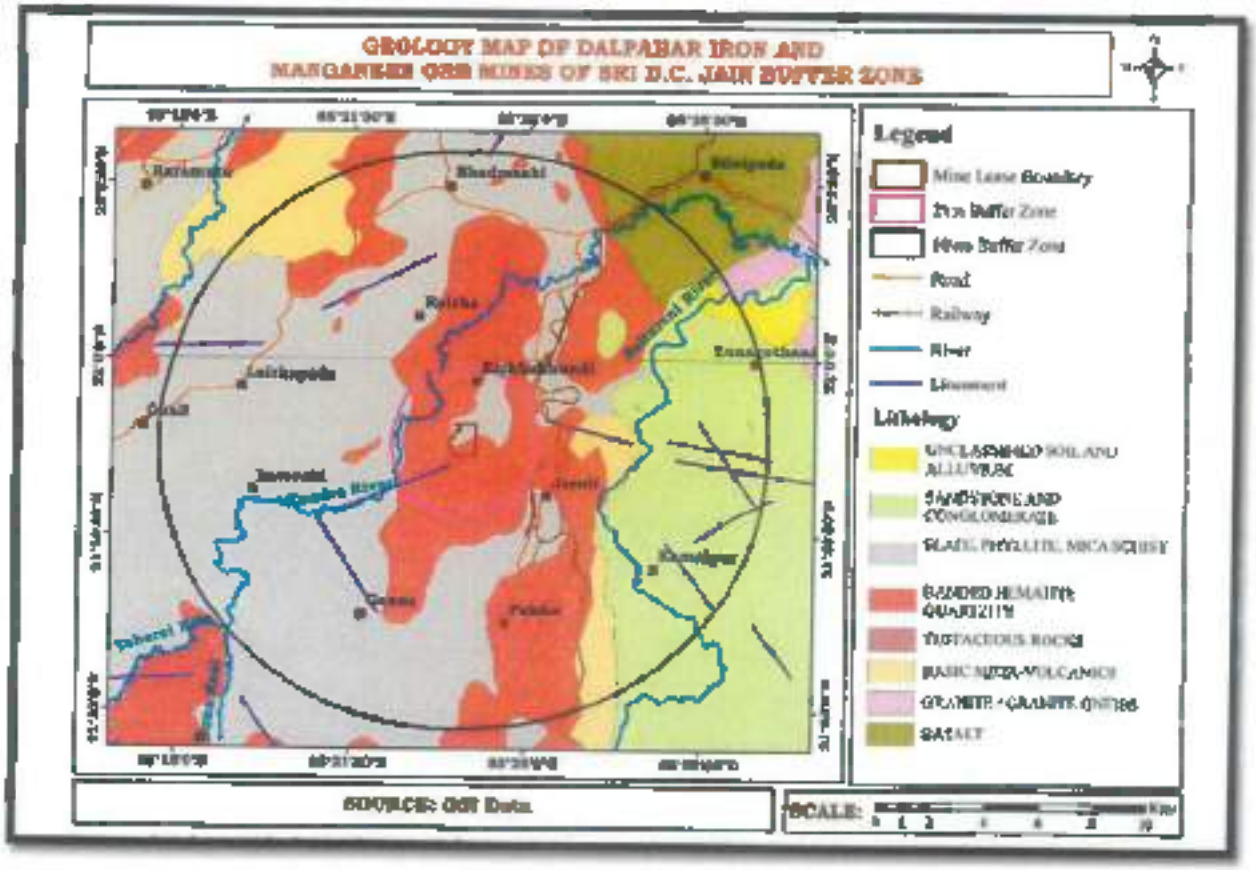


Figure 4.1: Geology of Core and Buffer Zone of Dalpahar Iron and Manganese Ore Mine

4.2 Geomorphology

The geomorphology of the study area is predominantly controlled by structural and denudational landform processes associated with iron ore bearing hill ranges. The terrain exhibits rugged topography with dissected hills, valleys, pediments, and anthropogenically modified landforms due to mining and allied activities.

The major geomorphological unit observed in the area is **moderately dissected hills and valleys**, which dominate the core mining zone and surrounding regions. These landforms are characterized by moderate slope gradients, structurally controlled ridges, and narrow to moderately wide valleys. The dissected nature of the terrain results from prolonged weathering, erosion, and structural weaknesses within the iron ore formations. These zones generally show higher surface runoff and limited soil development.

Another important geomorphic unit present within the buffer area is the **pediment–pediplain complex**. These are gently sloping erosional surfaces developed at the foothills of dissected highlands. The pediment zones consist of weathered rock surfaces with thin soil cover and

colluvial deposits. These areas generally favour groundwater infiltration and act as transitional zones between hill slopes and valley plains.

Localized patches of **highly dissected hills and valleys** are observed mainly in southern parts of the buffer zone. These terrains exhibit steep slopes, rugged relief, and higher erosion intensity. Such areas show poor soil development and rapid surface drainage, which restrict groundwater storage potential.

The area also contains **anthropogenic terrain**, which includes mine pits, overburden dumps, haul roads, and other mining infrastructure. These landforms significantly modify natural drainage patterns, slope stability, and surface characteristics. Mining activities often create artificial depressions that may temporarily store rainwater and influence local hydrological conditions.

Small water bodies such as ponds are present within the buffer zone and generally occupy low-lying topographic depressions. These ponds play an important role in local groundwater recharge and act as seasonal water storage zones.

Overall, the geomorphology of the area reflects a combination of structural control, erosional landform development, and human-induced modifications, resulting in varied terrain features influencing drainage, groundwater occurrence, and slope stability within the region.

Figure 4 2 shows the Geomorphological features presents in the area.

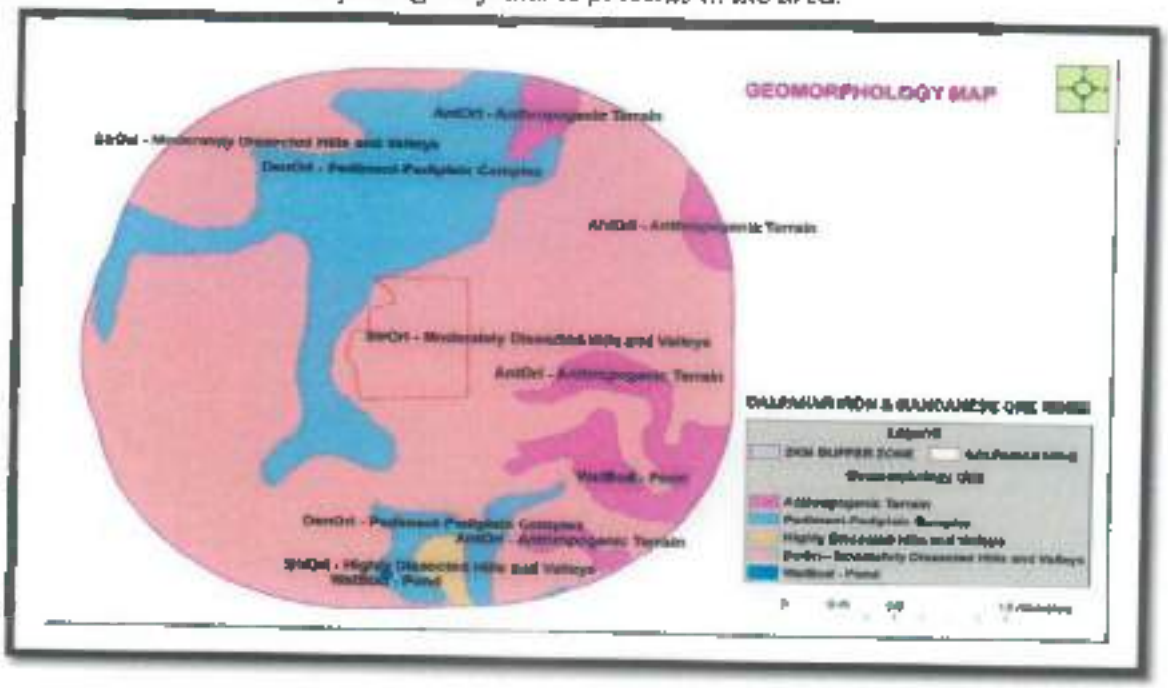


Figure 4.2: Geomorphological Map

4.3 Landforms of the Area

The landforms of the study area are primarily controlled by structural hills, erosional processes, and anthropogenic modifications associated with mining operations. The terrain exhibits significant variation in elevation and slope, resulting in diverse geomorphic features within the core zone and 2 km buffer area.

1. Moderately Dissected Hills and Valleys

This is the dominant landform within the study area. These hills are formed due to long-term weathering and erosion of iron and manganese-bearing formations. The terrain consists of undulating hill slopes separated by narrow to moderately wide valleys. The slopes are generally moderate, promoting surface runoff and soil erosion during heavy rainfall. These areas form the major catchment zones influencing drainage and sediment transport.

2. Pediment

Pediment surfaces occur mainly at the foothills of dissected hill ranges. These are gently sloping erosional rock surfaces covered with thin layers of weathered material and colluvial deposits. Pediments act as transitional zones between uplands and valley plains and are relatively stable terrain features. These zones generally facilitate infiltration of rainwater and contribute to groundwater recharge.

3. Intermontane Valley

Intermontane valleys are present as low-lying depressions between hill ranges. These valleys are comparatively flatter and tend to accumulate alluvial and colluvial sediments transported from surrounding hill slopes. Such areas may support seasonal drainage channels and vegetation growth due to higher soil moisture availability. These valleys also act as natural drainage pathways during monsoon periods.

4. Active Quarry

Active quarry zones represent anthropogenically modified landforms developed due to ongoing mining activities. These include excavation pits, benches, haul roads, and overburden dump areas. Quarrying significantly alters the natural topography and drainage characteristics. The excavated pits may accumulate rainwater, forming temporary water reservoirs and influencing local hydrological behavior.

5. Water Bodies (Ponds)

Small ponds and water-filled depressions are observed in low-lying areas, especially near quarry zones and valley regions. These water bodies function as seasonal storage structures and play an important role in groundwater recharge and sediment deposition.

Overall Landform Characteristics

The landforms of the area reflect a combination of natural denudational processes and human-induced terrain modification. The dissected hills act as major runoff generating zones, while pediments and valley regions serve as sediment deposition and groundwater recharge areas. Quarry activities have locally modified slope stability and drainage patterns, thereby influencing the overall watershed behavior of the region.

Figure 4.3- Shows the landform present in the core zone and 2km buffer zone of the area.

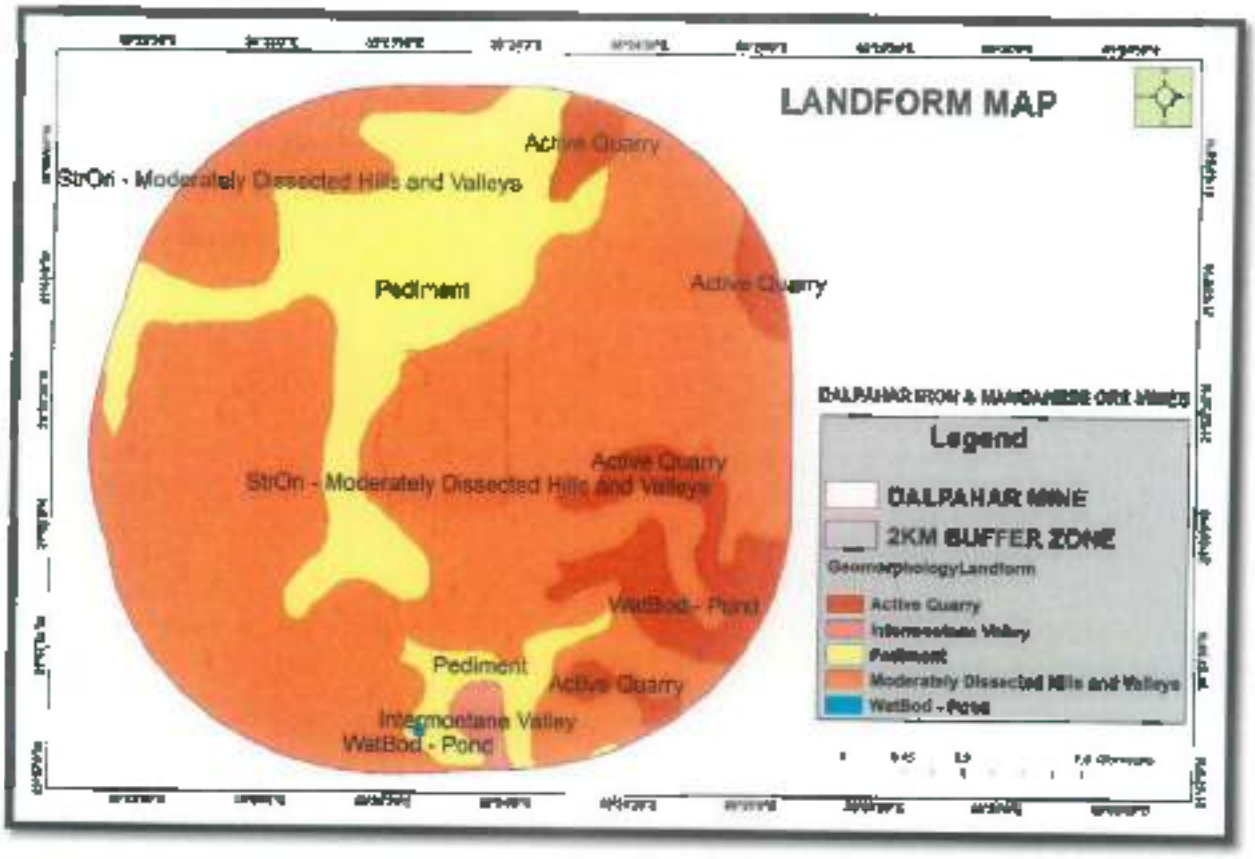


Figure 4.3: Landform of core and buffer zone.

4.4 Digital Elevation Model (DEM)

The DEM represents the elevation variation of the study area and surrounding 2 km buffer zone. The elevation within the study area ranges approximately from **455 m to 639 m above mean sea level (MSL)**. The DEM analysis indicates that the area is characterized by undulating to hilly terrain with significant elevation variation.

Higher elevation zones (above 613 m) are mainly concentrated in ridge and hilltop areas which represent resistant iron ore bearing formations. These elevated areas form watershed divides and control drainage direction. Moderate elevation zones (531 m to 613 m) occupy hill slopes and transitional zones between ridge tops and valley floors. Lower elevation areas (below 531 m) are mostly associated with valleys, pediment surfaces, and drainage channels.

The DEM also indicates that the mining lease area is located in moderately elevated terrain surrounded by higher hill slopes, suggesting the natural tendency of surface runoff to flow towards valley and low-lying areas. The elevation pattern plays a crucial role in controlling surface drainage, erosion intensity, groundwater recharge zones, and slope stability within the catchment.

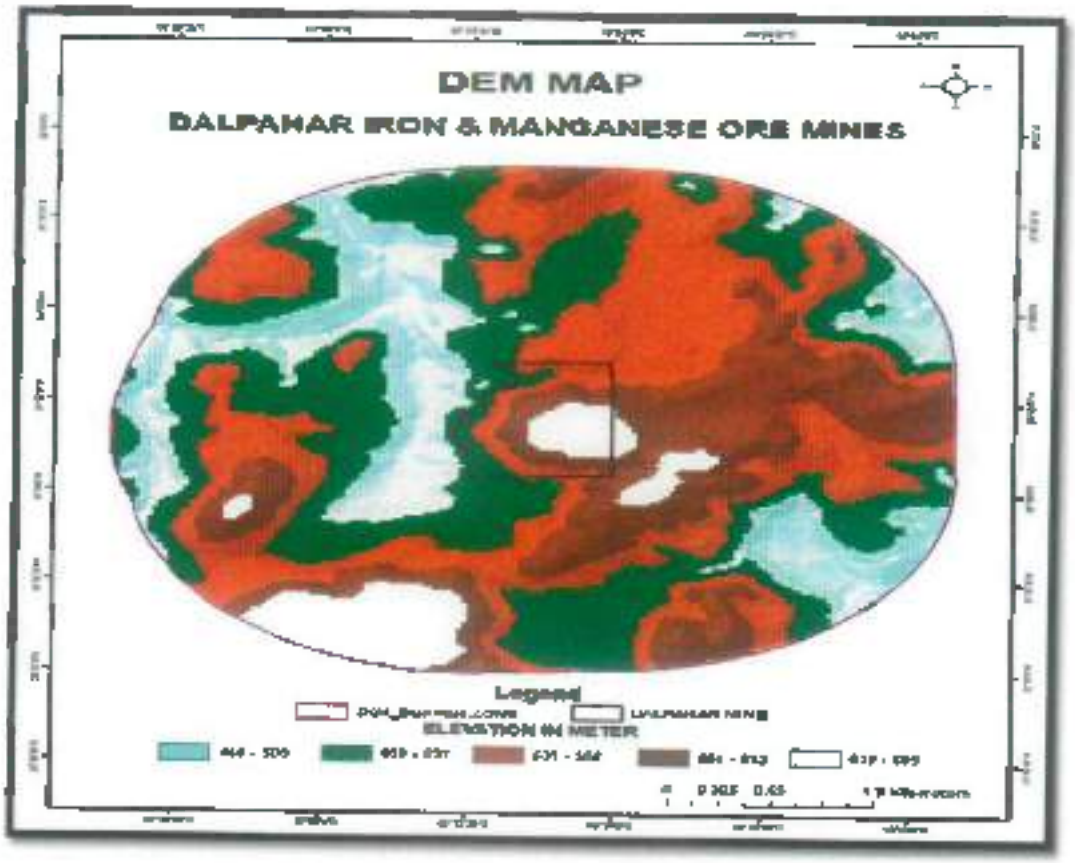


Figure 4.4:DEM Map of Core and Buffer Zone

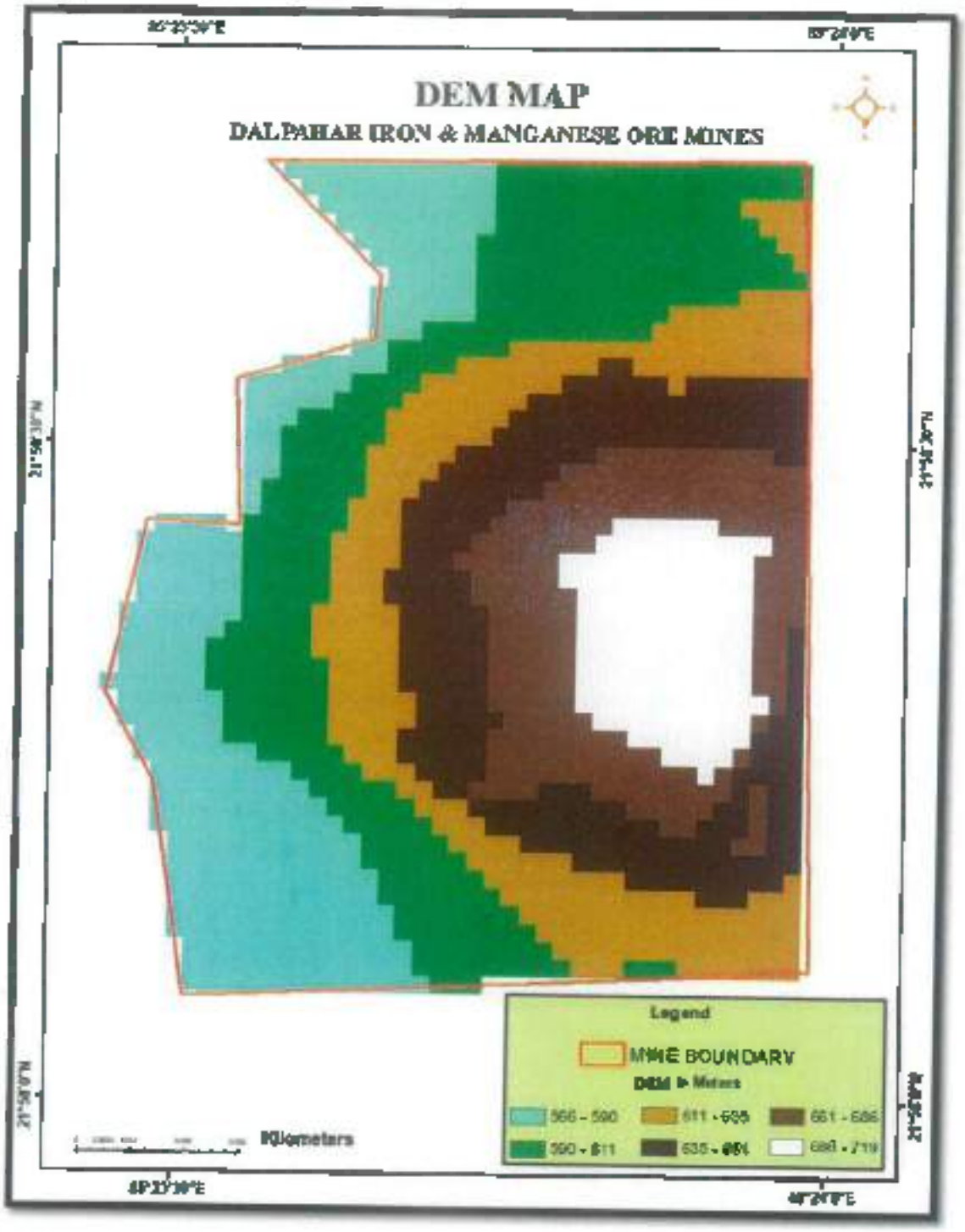


Figure 4.5 DEM Map of Core Zone.

4.5 Contour Analysis

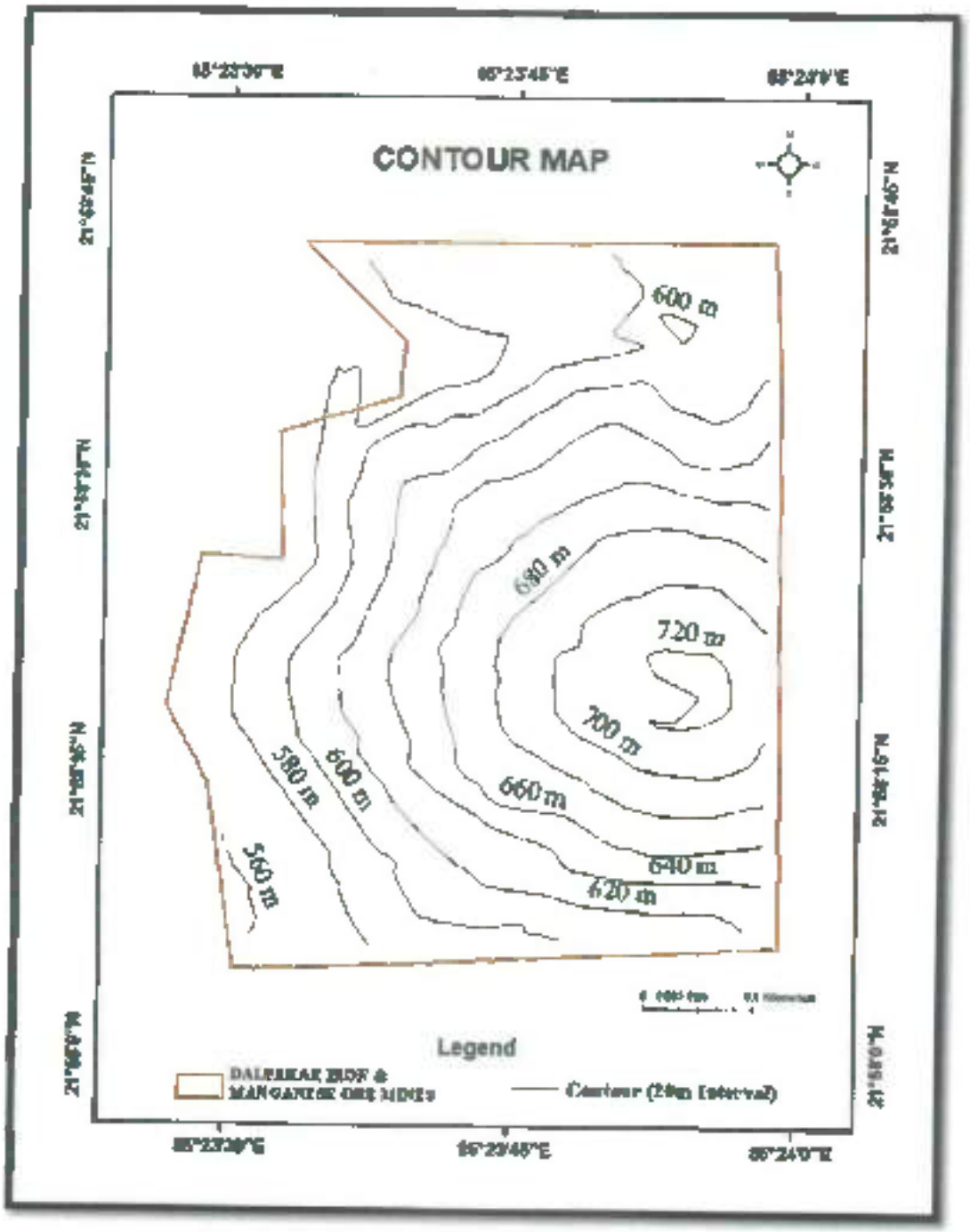


Figure 4.6: Contour Map of Core Zone

The contour map was generated with a 20 m contour interval to represent the topographic configuration of the study area. The contour pattern clearly reflects the hilly terrain and slope characteristics.

Closely spaced contour lines observed in certain portions of the map indicate steep slopes and rugged terrain, particularly along ridge flanks and dissected hill zones. Widely spaced contours represent gentle slopes and pediment areas, which are generally favorable for infiltration and soil accumulation.

The highest contour within the study area reaches approximately 720 m, representing localized hilltop zones, while the lowest contour is around 560 m, indicating valley and lower slope regions. The contour orientation suggests that slope gradients generally descend from elevated ridge portions towards valley floors, facilitating natural drainage and surface runoff movement.

4.6 Slope Analysis of Catchment Area

The slope map of the study area and 2 km buffer zone was generated using Digital Elevation Model (DEM) data through GIS-based terrain analysis. The slope values represent the rate of elevation change and are expressed in degrees. The slope in the study area ranges from 0.03° to 32.65°, indicating significant variation in terrain steepness.

The slope map of the study area has been prepared using available DEM data and considering the local lithological characteristics, in order to identify erosion-prone zones and plan appropriate soil and water conservation measures under the Catchment Area Treatment Plan (CATP).

The slope map categorizes the terrain into six slope classes:

1. **0.03° – 3.87° (Nearly Flat to Gentle Slope)**

   These areas are mainly located in valley portions, pediment zones, and low-lying terrain. Such regions favour infiltration, soil deposition, and groundwater recharge with comparatively low erosion potential.

2. **3.87° – 7.20° (Gentle Slope)**

   These areas represent transitional zones between valleys and hill slopes. Surface runoff is moderate, and soil conservation measures can be effectively implemented.

3. **7.20° – 10.78° (Moderate Slope)**

These slopes are commonly observed along hill flanks and mid-slope regions. These areas experience increased runoff velocity and moderate erosion risk.

4. **10.78° – 14.74° (Moderately Steep Slope)**

These terrains indicate active hill slopes where soil erosion and runoff are more pronounced. Vegetation cover plays a crucial role in slope stabilization in such zones.

5. **14.74° – 19.47° (Steep Slope)**

These slopes are mostly present along ridge sides and dissected hill zones. They are prone to higher erosion intensity and rapid surface runoff.

6. **19.47° – 32.65° (Very Steep Slope)**

These represent rugged hill terrain and structurally controlled ridges. Such areas have high runoff potential, minimal soil development, and significant susceptibility to slope instability.

Within the mining lease area, the terrain is dominated by moderate to steep slopes, indicating active erosional processes and controlled surface drainage patterns.

Importance of Slope Map in Catchment Area Treatment Plan (CATP)

The slope map plays a vital role in planning and designing Catchment Area Treatment measures. It helps in identifying erosion-prone zones and selecting suitable soil and water conservation techniques.

- **Identification of Erosion-Prone Areas:**

Steeper slopes are highly vulnerable to soil erosion and sediment transport. The slope map helps in locating critical areas requiring immediate treatment.

- **Selection of Appropriate Conservation Measures:**

Different slope categories require different treatment methods such as contour trenching, check dams, vegetative barriers, slope stabilization, and afforestation.

- **Runoff Management:**

Slope gradient directly influences runoff velocity and drainage behavior. Understanding slope distribution helps in designing drainage channels and water harvesting structures.

- **Slope Stability and Land Management:**

The slope map assists in identifying areas susceptible to landslides, slope failure, and gully formation, especially in mining-affected zones.

- **Groundwater Recharge Planning:**

Gentle slope areas are suitable for infiltration structures such as recharge pits, percolation tanks, and water storage ponds.

- **Prioritization of CAT Measures:**

The slope classification allows prioritization of treatment activities by focusing first on steep and highly vulnerable zones. Slope map of the core and buffer zone given in Map no 4.7.

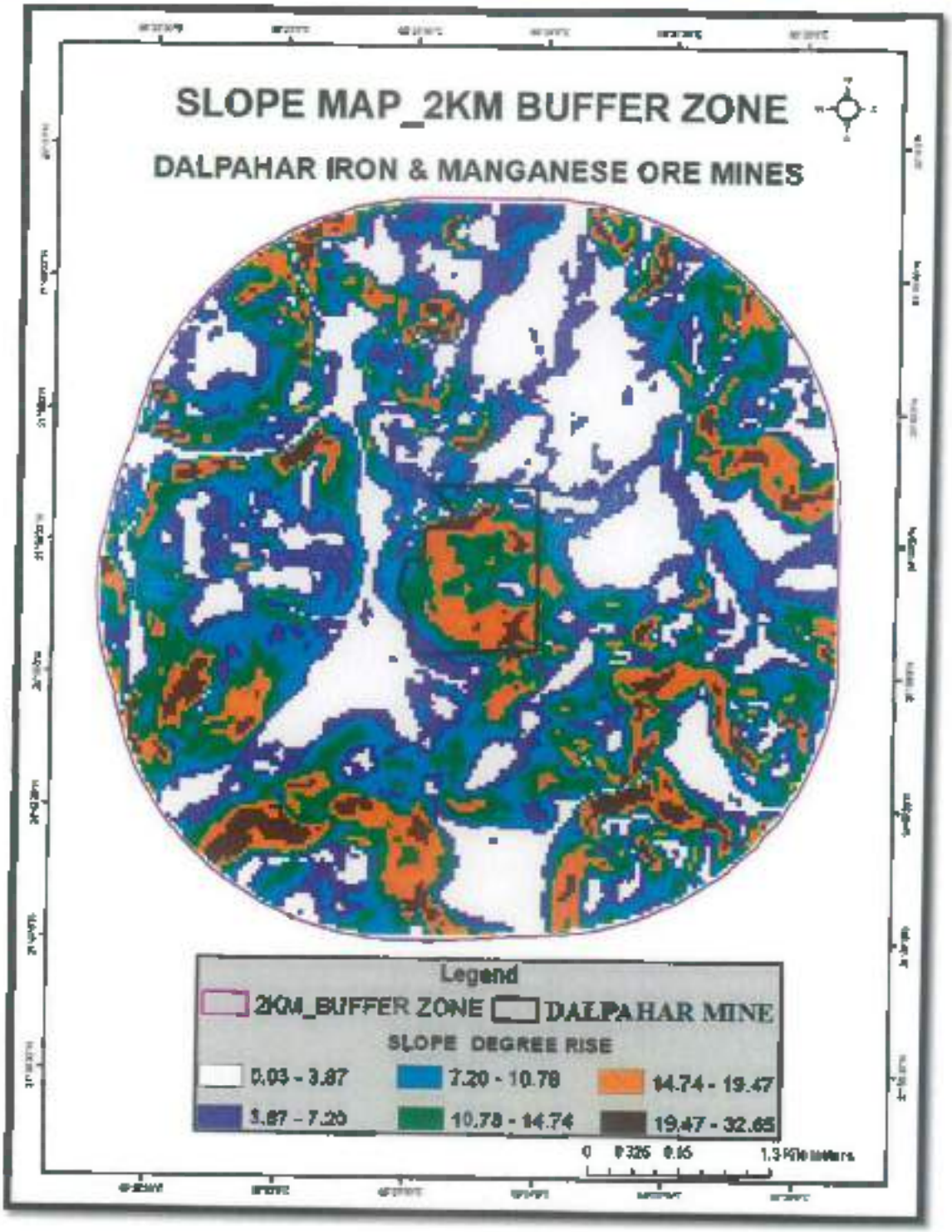


Figure 4.7: Slope Map of Core & 2Km Buffer Zone.

4.7 Hydrogeology

The hydrogeological characteristics of the study area are mainly controlled by geological formations, structural features, geomorphology, and rainfall pattern. The mine area falls within the iron ore bearing terrain of the **Keonjhar District, Odisha,** which is dominated by hard rock formations.

Groundwater in the area occurs under both weathered zone aquifer and fractured rock aquifer conditions. The weathered mantle developed over iron ore and associated formations acts as a shallow aquifer with moderate groundwater storage capacity. The thickness of the weathered zone varies depending upon lithology and topographic position, generally being thicker in valley and pediment regions and thinner over hilltops.

The fractured and jointed zones within the banded iron formations and associated rocks form secondary aquifers. Groundwater movement and storage are mainly controlled by the presence of fractures, joints, and lineaments. These fractures provide pathways for groundwater movement and recharge, especially during monsoon rainfall.

Groundwater recharge in the area primarily occurs through rainfall infiltration. Pediment and valley areas act as favorable recharge zones due to gentle slopes and relatively thicker soil cover. In contrast, hill slopes and ridge areas exhibit rapid runoff and comparatively low groundwater recharge potential.

Mining activities may locally influence groundwater conditions by creating excavation pits, overburden dumps, and altered surface drainage patterns. Mine pits may temporarily act as groundwater storage zones depending on depth and local hydrogeological conditions. Hydrogeological condition and floo direction shown in Figure *4.8.*

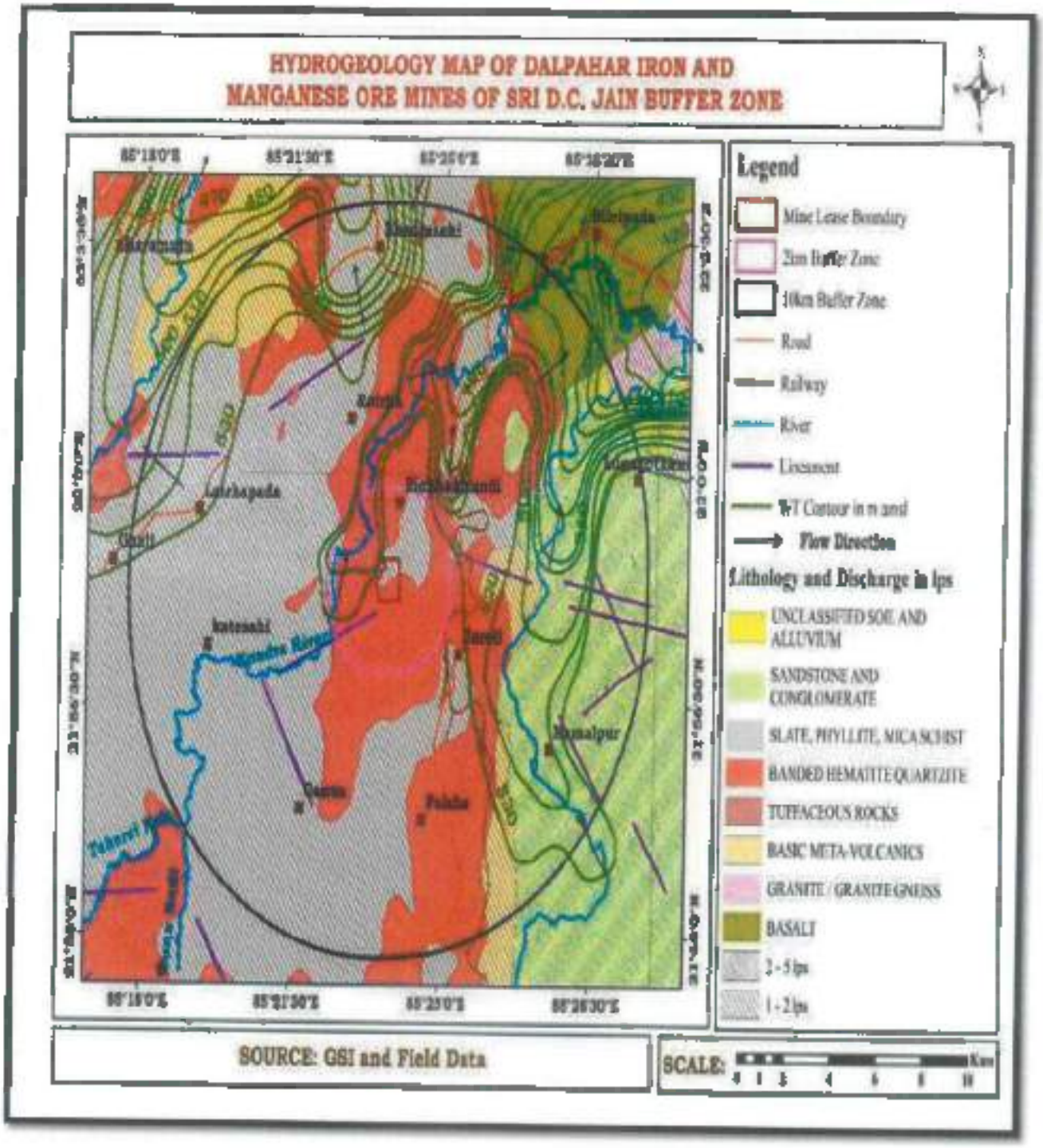


Figure 4.8: Hydrogeological Map

4.8 Drainage Study of the Area

The drainage pattern within the 2 km buffer zone is mainly dendritic, indicating uniform lithological and structural conditions. Numerous seasonal first-order and second-order streams originate from elevated hill slopes and flow towards lower valley portions.

The major surface drainage feature of the area is the **Kundra River**, which flows along the western side of the buffer zone. The river acts as the principal drainage channel receiving runoff from smaller tributary streams originating within the catchment area.

The drainage network shows the presence of:

- **First Order Streams:**

These are small seasonal channels originating from hill slopes and upland areas. They carry runoff mainly during the monsoon season and play a crucial role in initiating surface erosion.

- **Second Order Streams:**

These streams are formed by the confluence of first-order channels and carry relatively higher discharge. They act as intermediate drainage conduits transporting runoff and sediments.

- **Third Order Streams:**

These are larger drainage channels formed by the merging of second-order streams and ultimately drain into the Kundra River. These streams contribute significantly to catchment drainage and sediment transport.

The mine lease area is surrounded by seasonal streams, indicating that the surface runoff generated within the mining area ultimately joins the regional drainage system. The drainage direction is generally controlled by terrain slope and elevation gradient, with runoff flowing from elevated hill zones towards valley areas and main drainage channels Drainage map of core & Buffer zone is shown in figure no 4.9 along with Stream map and stream order shown in map no 4.10.

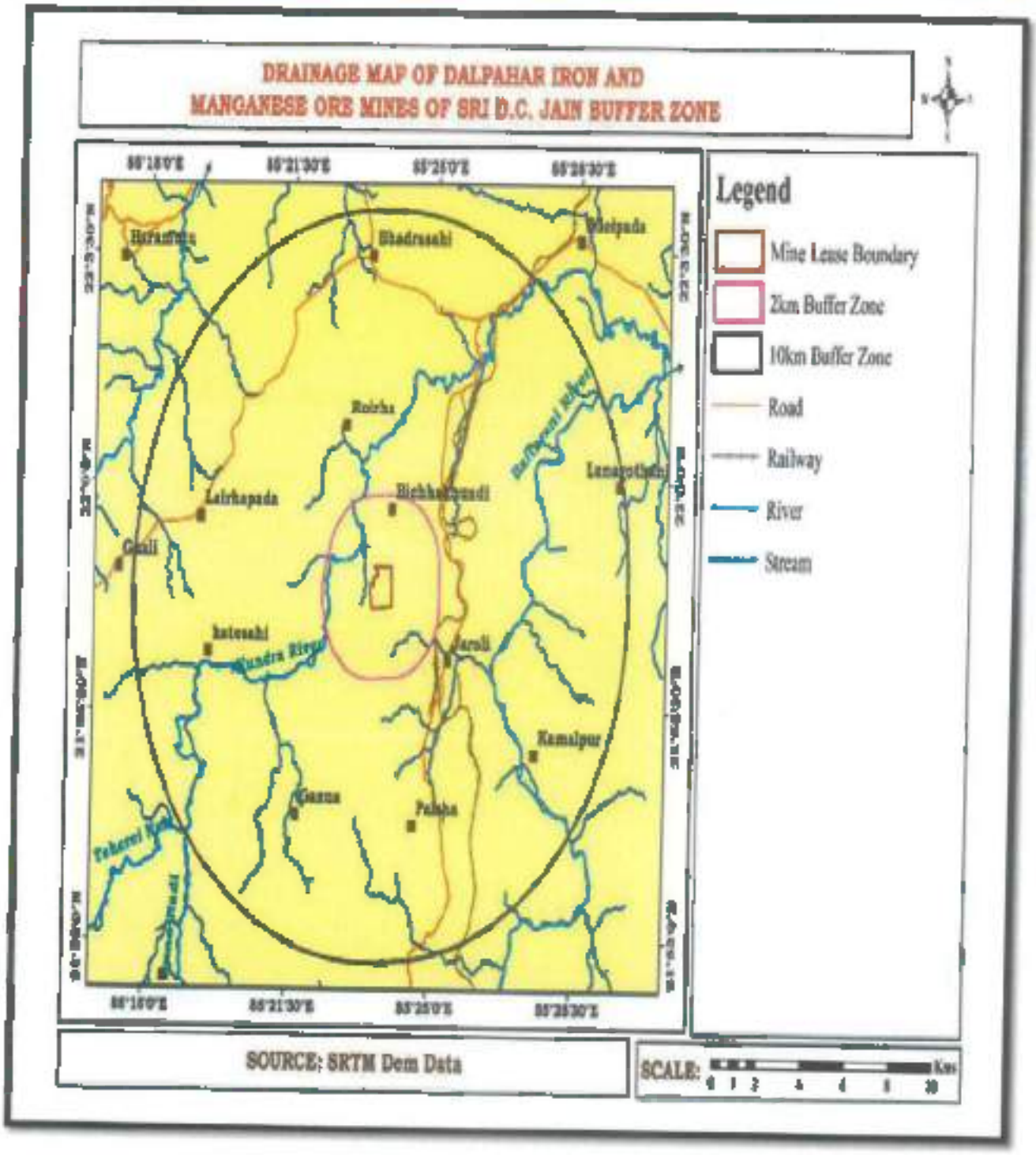


Figure no 4.9: Drainage Map of the area

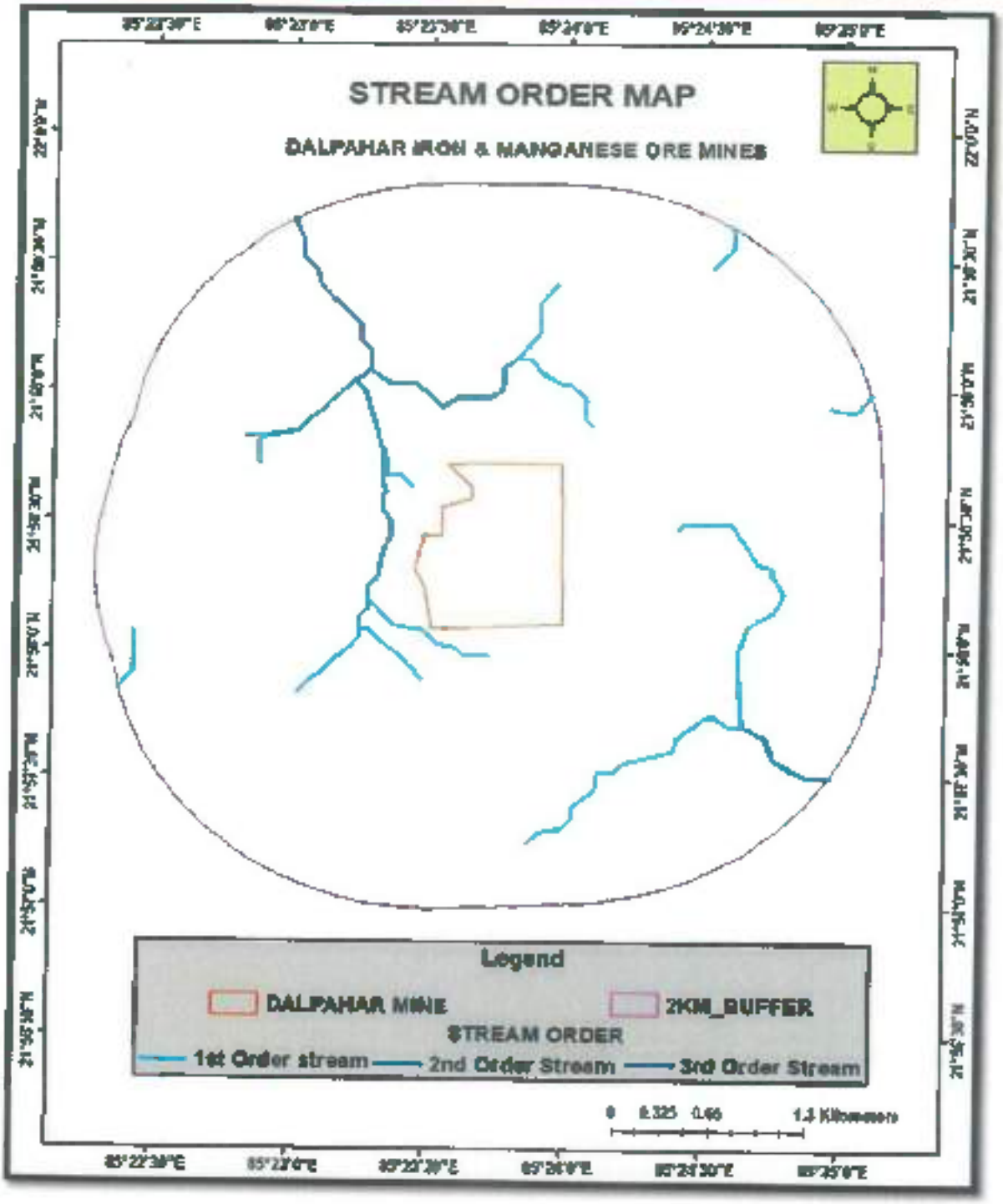


Figure no 4.10: Stream Order Map

The analysis of the Stream Map and Stream Order Map shows that the Dalpahar mining area is drained by a network of 1st, 2nd, and 3rd order streams flowing towards the Kundra River. Implementation of the Catchment Area Treatment Plan through structural and biological measures will effectively control runoff, prevent sediment transport, and protect downstream water bodies, ensuring environmentally sustainable mining operations.

The **Stream Map** provides the overall drainage network, while the Stream Order Map helps identify the priority streams for erosion control and sediment management. Together, these maps help design effective Catchment Area Treatment measures such as check dams, garland drains, gully plugs, and afforestation, ensuring protection of the drainage system and downstream water bodies around the Dalpahar mining area.

Difference in Representations:

- In the Stream Map, all streams are shown uniformly without classification, so the drainage network appears dense.
- In the Stream Order Map, streams are grouped according to their order, and many minor channels may appear merged or simplified to maintain the hierarchy.
- A **Stream Map** shows all drainage lines extracted from DEM/topographic data, including very small and temporary channels.
- A **Stream Order Map** classifies only those streams that meet the hierarchical criteria of the Strahler Stream Order system, where streams are assigned orders (1st, 2nd, 3rd, etc.) based on their tributary connections.
- Two stream maps of different scales (1:10 km and 1:1.3 km) have been used to obtain both regional and detailed perspectives of the drainage network. The smaller scale map (1:10 km) provides a generalized overview of the major drainage pattern and regional stream distribution, which helps in understanding the overall catchment characteristics. In contrast, the larger scale map (1:1.3 km) captures finer details such as minor tributaries, first- and second-order streams, and micro-drainage features that are not visible in the smaller scale map. Therefore, the use of two different scales ensures a more accurate and comprehensive analysis of the drainage system for proper interpretation and planning.

4.9 WATERSHED ANALYSIS

The watershed analysis carried out using **DEM-based hydrological modelling in ArcGIS** indicates that the mine lease area falls within two distinct watersheds, namely **Watershed-1 (WATERSH_1)** and **Watershed-2 (WATERSH_2)**. These watersheds form part of the local drainage basin surrounding the mining lease.

Watershed Characteristics

The drainage network in the study area exhibits a **dendritic drainage pattern**, which is typical of relatively homogeneous lithological conditions. Stream ordering has been carried out following the **Strahler Stream Order** method.

- **Watershed-1** covers the north-western part of the study area and partly overlaps with the **mining lease.**
- **Watershed-2** occupies the south-eastern part and drains runoff from a larger portion of the surrounding terrain.

The drainage network consists of **1st, 2nd, 3rd, and locally 4th order streams**, indicating a moderately developed drainage system. First-order streams dominate the upper catchment areas, while higher-order streams form the main drainage channels carrying runoff toward downstream areas.

Relation with Mine Lease Area

The mine boundary is located mainly within **Watershed-1**, while the surrounding areas fall under **Watershed-2**. Surface runoff generated from the mine lease area and adjoining hill slopes flows through a network of lower-order streams before joining higher-order drainage channels outside the lease area.

A 2 km and 5 km buffer zone around the mining lease has been considered to assess the hydrological influence zone and to identify catchment areas requiring treatment.

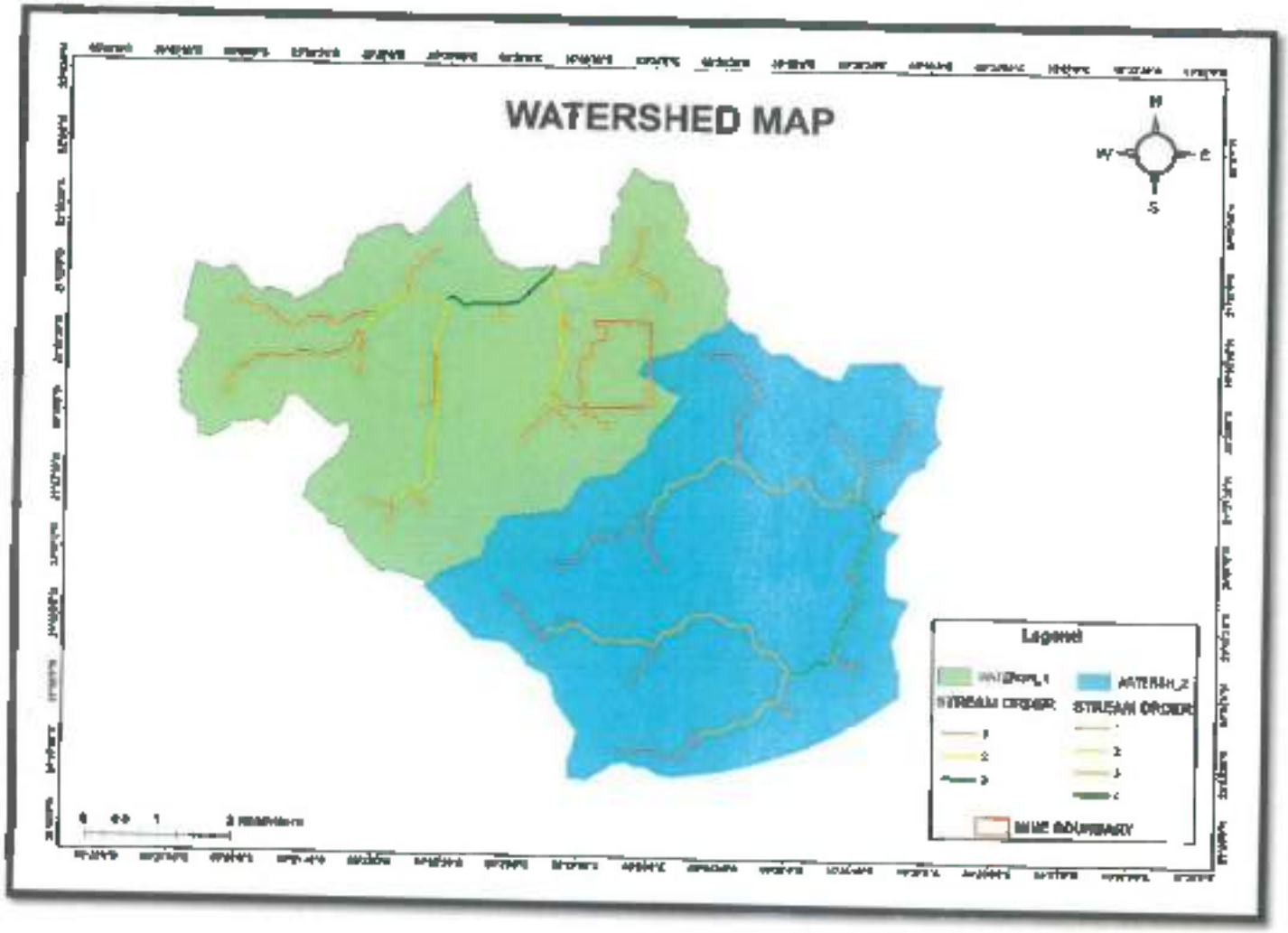


Figure no 4.11: Watershed of the are

4.10 BASIN ANALYSIS

The basin map indicates that the mining lease area falls within a locally developed sub-basin system consisting of multiple micro-basins that control surface runoff and drainage flow in the region. A total of several basin units has been delineated in the 5 km buffer zone around the mine lease area.

Basin Distribution

The basin analysis shows that:

- The mine lease area is located near the central portion of a micro-basin within the watershed system.
- The surrounding terrain forms several small drainage basins, which collect runoff from hill slopes and channel it through seasonal streams.
- These micro-basins ultimately merge into larger downstream drainage channels outside the immediate mining area.

The basin values represented in the map range from low-order basins (value 1) to higher-order basins (value 56), indicating a hierarchical drainage basin structure within the study area.

Basin Drainage Pattern

The drainage pattern within the basin is predominantly dendritic, which generally develops over homogeneous lithological formations and moderate slopes. The drainage network is composed of:

- Numerous first-order streams originating from hill slopes.
- Second- and third-order streams that collect runoff from smaller tributaries.
- A few higher-order channels acting as the main drainage pathways in the basin.

Hydrological Significance for Mining Area

The basin analysis indicates that runoff generated within the mine lease area and adjacent catchments is distributed through these micro-basins before entering the main drainage system.

Since mining activities can modify surface topography and increase sediment load, proper drainage management and catchment treatment measures are necessary to prevent sediment transport into downstream basin channels.

Role in Catchment Area Treatment

Understanding the basin configuration helps in:

- **Identifying critical runoff contributing areas.**
- **Planning check dams and sedimentation structures** along basin drainage lines.
- **Locating erosion-prone slopes requiring** vegetative stabilization.
- **Designing effective storm water drainage systems** within the mining lease.

Thus, basin analysis forms an important component of the Catchment Area Treatment plan (CATP) for sustainable environmental management of the mining area.

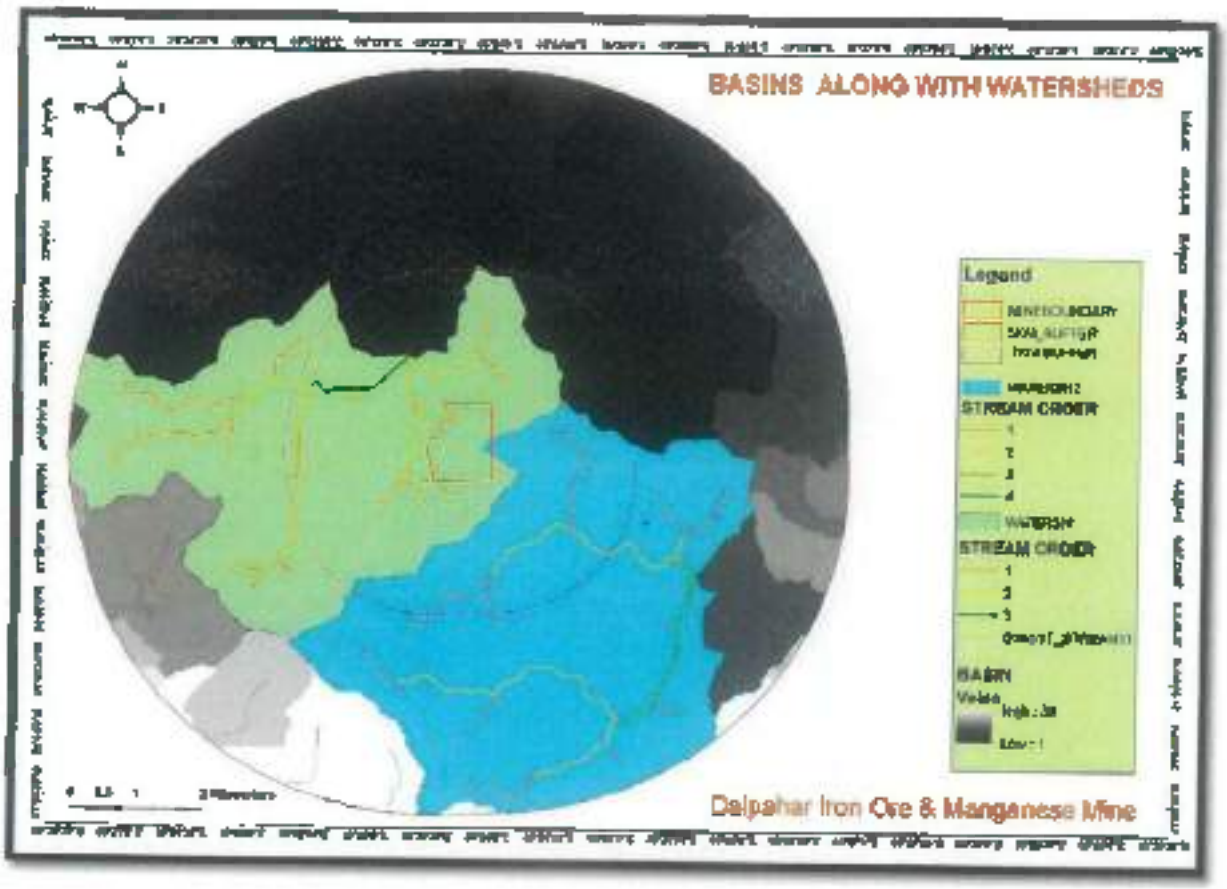


Figure no 4.12: Watershed along Basin Map of the area

4.11 SOIL EROSION ASSESSMENT

The soil erosion assessment has been carried out for the catchment area surrounding the Dalpahar Iron Ore & Manganese Mine in Keonjhar district, Odisha, India, considering the mining lease area and its 2 km buffer zone. The terrain characteristics were analysed using Digital Elevation Model (DEM) based terrain analysis in ArcGIS. The slope map indicates that slope within the study area varies between 0.03° and 32.65°, ranging from nearly flat valley areas to steep hill slopes. The region is characterized by lateritic soil with moderate erodibility. The average annual rainfall is approximately 1.3 m (1300 mm). Surface runoff ultimately drains toward the Kundra River located about 1.2 km from the mining lease boundary.

METHEDOLOGY

Soil erosion has been estimated using the Revised Universal Soil Loss Equation (RUSLE):

$A = R \times K \times LS \times C \times P$

Where:

A = Average annual soil loss (ton/ha/year)

R = Rainfall erosivity factor

K = Soil erodibility factor

LS = Slope length and slope steepness factor

C = Cover management factor

P = Conservation practice factor

Rainfall Erosivity Factor (R)

Formula used: $R = 79 + 0.363P$

P = Average annual rainfall in mm

For the study area:

$P = 1300$ mm, $R = 79 + (0.363 \times 1300)$,

$R = 79 - 471.9$ i.e., $R \approx 551$

Soil Erodibility Factor (K)

The soil type in the study area is predominantly lateritic soil. Based on standard watershed management studies and soil erosion literature, the erodibility factor for lateritic soil is taken as:

$$K = 0.20$$

Slope Length and Steepness Factor (LS)

The slope map derived from DEM indicates slopes ranging from 0.03° to 32.65°. Considering the mixture of gentle valley slopes and moderate hill slopes across the catchment area, an average LS factor of 1.2 has been adopted.

$$LS = 1.2$$

Cover Management Factor (C)

The catchment area includes forest patches, scrub vegetation, and partially vegetated hill slopes. Since a significant portion of the buffer zone is vegetated, an average cover management factor is taken as:

$$C = 0.20$$

Conservation Practice Factor (P)

Under the proposed Catchment Area Treatment Plan, measures such as contour trenching, afforestation, vegetative barriers, and check dams will be implemented. Therefore, the conservation factor is considered as:

$$P = 0.60$$

Soil Loss Calculation

Using the RUSLE equation:

$A = R \times K \times LS \times C \times P$

$A = 551 \times 0.20 \times 1.2 \times 0.20 \times 0.60$

$A = 15.86$ ton/ha/year

$A \approx 16$ ton/ha/year

Soil Erosion Classification

Soil Loss (ton/ha/year)	Erosion Category
0–5	Very Low
5–10	Low
10–25	Moderate
25–50	High
>50	Very High

The estimated soil erosion value of approximately 16 ton/ha/year places the study area in the Moderate Soil Erosion Category.

The soil erosion assessment indicates moderate erosion potential within the catchment area surrounding the Dalpahar Iron Ore & Manganese Mine. Implementation of Catchment Area Treatment measures such as contour trenches, afforestation, check dams, vegetative stabilization, and runoff management structures will help reduce soil loss and prevent sediment transport into nearby drainage systems connected to the Kundra River. These measures will support environmentally sustainable mining operations and compliance with environmental clearance requirements

CHAPTER-5

RAINFALL TREND ANALYSIS & SURFACE RUNOFF ESTIMATION

Rainfall is one of the most significant hydro meteorological parameters influencing catchment hydrology, runoff generation, soil erosion, and sediment transport. Detailed rainfall analysis is essential for understanding seasonal precipitation patterns and for designing effective catchment treatment measures. The rainfall characteristics of the study area directly influence drainage behavior, slope stability, and erosion potential within the mining catchment.

5.1 Source of Rainfall Data

The rainfall data used for the present study has been collected from the records of the Indin Meteorological Department (IMD), which provides long-term and reliable meteorological observations for hydrological and environmental assessment. Additional rainfall records and regional precipitation statistics were referred from the Odisha State Disaster Management Authority (OSDMA) to ensure accuracy and completeness of rainfall analysis for the study area.

5.2 Annual Rainfall Characteristics

The analysis of rainfall data indicates that the study area receives considerable precipitation during the monsoon season. The annual rainfall recorded over the observation period varies from approximately 1009.5 mm to 1718.5 mm, with an average annual rainfall of about 1377.9 mm.

The variation in annual rainfall indicates moderate inter-annual variability, which is typical for tropical monsoon climatic regions. The relatively high annual rainfall contributes to significant surface runoff and plays a major role in soil erosion and sediment transport processes.

5.3 Monthly Rainfall Distribution

The monthly rainfall analysis reveals distinct seasonal variations in precipitation patterns:

- **Pre-Monsoon Season (March to May):**
  Rainfall during this period is moderate and mostly occurs due to localized convective storms. The rainfall gradually increases from March and reaches noticeable levels during May, which marks the transition towards monsoon conditions.
- **Monsoon Season (June to September):**

  The majority of rainfall occurs during this period. Rainfall sharply increases in June with the onset of southwest monsoon and reaches peak levels during July and August. September also receives substantial rainfall before the monsoon gradually withdraws.

Monthly rainfall values during monsoon months often exceed 200 mm and occasionally cross 300 mm, indicating high rainfall intensity. This period contributes approximately 70–80% of total annual rainfall, resulting in high runoff generation and increased erosion risk.

- **Post-Monsoon Season (October to November):**

  Rainfall significantly reduces during this period, although occasional rainfall events are observed due to retreating monsoon systems and cyclonic disturbances.

- **Winter Season (December to February):**

  The study area experiences very low rainfall during winter months. The rainfall during this period is generally negligible and does not significantly influence catchment hydrology.

5.4 Rainfall Intensity & Hydrogeological Impact

The rainfall pattern indicates concentration of precipitation within a short monsoon duration. High intensity rainfall events during peak monsoon months lead to rapid surface runoff, slope instability, and increased soil erosion, particularly in exposed mining areas and overburden dumps. The concentrated rainfall pattern reduces infiltration time and increases sediment load in drainage channels.

5.5 Seasonal Contribution

Seasonal analysis of rainfall distribution indicates that:

- Monsoon season contributes the highest proportion of total rainfall.
- Pre-monsoon rainfall plays a supportive role in initiating surface moisture conditions.
- Post-monsoon and winter rainfall contribute minimally to total precipitation.

The dominance of monsoonal rainfall highlights the importance of designing catchment treatment structures capable of managing high runoff loads during peak rainfall periods.

Last 10year rainfall data has been listed below in table no-5.1.

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Annual Average Rainfall
2016	20.7	14.6	8.5	64.4	52.9	197.6	319.2	167.3	114.3	27.1	0.2	22.7	1009.5
2017	1.7	54.0	23.7	2.3	137.1	145.0	270.4	348.5	166.2	58.3	4.0	0.0	1211.2
2018	0 9	0.0	35.4	15.1	117.5	162.0	320.5	230.5	161.2	160.1	25.0	0.1	1228.4
2019	0.0	0.0	0.8	133.3	95.7	185.8	360.6	375.1	351.5	113.4	0 2	49.6	1666.0
2020	0.0	55.2	40.2	59.6	116.6	143.3	232.2	327.3	353.6	161.6	0.8	4.2	1494.7
2021	39.9	55.0	49.0	152.9	153.2	272.9	170.7	605.7	137.8	76.4	5.0	0.0	1718.5
2022	0.6	3.7	6.2	37.3	342.7	154.2	232.8	178.7	361.2	88.2	27.8	60.2	1493.6
2023	32.7	17.6	0.4	17.9	90.9	137.7	326.9	404.8	175.5	87.4	0.0	0.0	1291.7
2024	0.2	0 0	51.9	68.4	60.8	212.5	274.4	392.4	266.1	128.0	10.3	25.5	1490.5
2025	29.3	6.1	49.1	7.5	96.9	109.7	208.2	301.7	250.8	89.5	7.0	19.0	1174.8

Table 5.1: Last 10-year Rainfall

As per the last 10 years rainfall data estimated average rainfall is 1377.9 mm i.e 1.3779m.

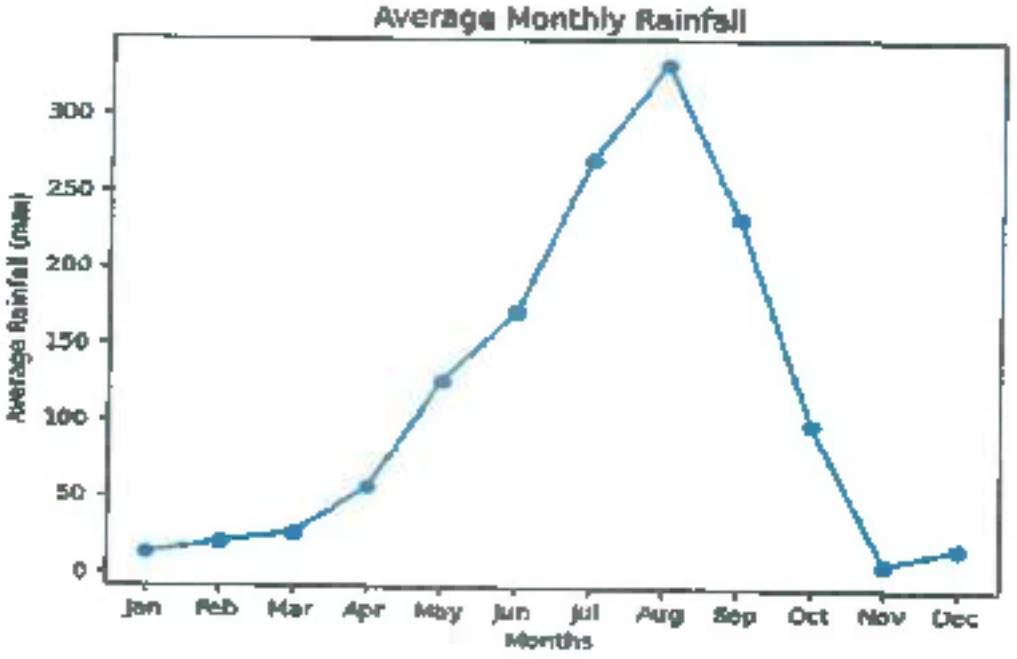


Figure 5.1- Monthly Rainfall Trend Analysis.

5.6 Runoff Estimation

The rational method estimates runoff using the following equations:

$Q = C * I * A$

Where:

- Q = Runoff (m^3)
- C = Runoff Coefficient (dimensionless) – varies based on surface type
- I = Rainfall Intensity (m) – taken as 0.9 m for monsoon season
- A = Area (m^2) of the land use segment

Key Features of the Method Applied:

- Each land use component was assigned an appropriate runoff coefficient based on its surface characteristics (e.g., 0.2 for greenbelt, 0.85 for roads, 0.9 for built-up structures).

- Each land use component was assigned an appropriate runoff coefficient based on its surface characteristics (e.g., 0.2 for greenbelt, 0.85 for roads, 0.9 for built-up structures).

- The runoff volume was calculated for each segment using the formula: Runoff Volume = C × Rainfall × Area
- Water bodies (ponds) were excluded from runoff generation as they act as recharge/storage features.

Runoff Co-efficient

The runoff coefficient is a dimensionless number that represents the portion of rainfall that becomes surface runoff rather than infiltrating into the ground, evaporating, or being absorbed by vegetation.

In simple terms:

- It shows how much of the rainwater flows off the land surface.
- It depends on land use, soil type, slope, and surface conditions.

Runoff Coefficient Table used in surface runoff estimation (especially with the Rational Method). These values are commonly referenced from BIS standards (IS 12056), CPCB guidelines, and hydrology manuals.

Table 5.2: Runoff Co-efficient

LandUse/SurfaceType	RunoffCoefficient(C)
PavedSurfaces(concrete, asphalt)	0.85 – 0.95
Gravelroads/compactedsurfaces	0.70 – 0.80
Miningpits / activemining areas	0.65 – 0.80
Mineralstorageyards (bare,compacted)	0.75 – 0.85
Buildings/roof areas	0.85 – 0.95
Roads (tarred)	0.80 – 0.90
Roads(gravelorearth)	0.60 – 0.75
Industrialareas(mixed surfaces)	0.70 – 0.85
OB/WasteDumps (compacted,un-vegetated)	0.50 – 0.75
GreenBelt/Lawns(goodcondition)	0.10 – 0.30
Forestedareas(dense vegetation)	0.10 – 0.25
Undisturbednaturalterrain	0.05 – 0.20
Agriculturalland(cultivated)	0.20 – 0.40
Reclaimedareaswithvegetation	0.15 – 0.35
Sandysoil(bare)	0.10 · 0.30
Clay soil (bare)	0.40 – 0.60

Considering 10% loss of downpour in air and 30% loss due to absorption and evaporation, the total loss will be 40%.
The pan evaporation data has been taken from Odisha University of Agriculture & Technology, Bhubaneswar for calculation of actual evaporation loss in the Sump.

Table 5.3: Estimated Runoff During Existing Period

RUNOFF EXISTING PERIOD					
Description	**Existing (HA)**	**Area (SQ. M)**	**Runoff Co-efficient**	**Avg Annual Rain Fall (M)**	**Generated Runoff During Existing Period (In Cum/Yr)**
Area Under Mining	3.06	30600	0.65	1.3	25857
Overburden / waste Dump	1.93	19300	0.5	1.3	12545
Mineral Storage	0	0	0.65	1.3	0
Infrastructure / Utility	0	0	0.8	1.3	0
Township / Housing Colony	0	0	0.6	1.3	0
Roads	2.17	21700	0.6	1.3	16926
Railway Lines, etc.	0	0	0.8	1.3	0
Topsoil Stacking	0	0	0.5	1.3	0
Safety Zone / Green Belt	3.11	31100	0.1	1.3	4043
Sub Total	**10.27**	102700			59371
Unutilized	79.691	796910	0.1	1.3	103598.3
Grand Total	**89.961**	899610			
TOTAL GENERATED RUNOFF(CUM)					**1,62,969.3**
Runoff After 40% evaporation loss					**65187.72**

Table 5.4: Estimated Runoff During Plan Period

RUNOFF EXISTING PERIOD				
Description	**Area (Sq. M)**	**Runoff Co-Efficient**	**Avg Annual Rain Fall (M)**	**Generated Runoff During Plan Period (In Cum/Yr)**
Area Under Mining	400500	0.65	1.3	338422.5
Overburden / waste Dump	128900	0.5	1.3	83785
Mineral Storage	0	0.65	1.3	0
Infrastructure / Utility	285500	0.85	1.3	315477.5
Township / Housing Colony	0	0.85	1.3	0
Roads	0	0.6	1.3	0
Railway Lines, etc.	0	0.8	1.3	0
Topsoil Stacking	0	0.5	1.3	0
Safety Zone / Green Belt	31100	0.1	1.3	4043
Sub Total	**814900**			741728
Unutilized	53600	0.1	1.3	6968
Grand Total	**899610**	**TOTAL RUNOFF (CUM/YR)**		**7,48,696**
Runoff After 40% evaporation loss				**4,49,218**

- Estimated runoff generation during the existing period is assessed to be **97,782 KLY** (kilolitres per year). After considering evaporation losses, approximately **268 KLD** (kilolitres per day) of runoff water is expected to be available for utilization in mining operations such as dust suppression, plantation, and other ancillary activities.
- During the plan period, the estimated runoff generation is projected to be **4,49,218 KLY** (kilolitres per year). After considering losses, approximately **1,230 KLD** (kilolitres per day) of water is anticipated to be available for utilization during the plan period for various mining and allied activities.

CHAPTER-6

CATCHMENT AREA TREATMENT PLAN FOR CORE & BUFFER ZONE.

A. CORE ZONE TREATMENT PLAN

As described in Chapter 5, the estimated runoff generation is 97,782 KLY during the existing period and 4,49,218 KLY during the plan period. Based on this assessment, the design, size, and location of the proposed runoff accumulation ponds/structures are detailed in this chapter. The chapter also includes layout specifications of each proposed runoff storage structure.

6.1 Surface Runoff Management

Based on hydrological assessment, the total estimated runoff generation during the plan period is 4,49,218 KLY. Proper storage and management of this runoff water is essential for mine water conservation, sediment control, and sustainable utilization.

The following parameters have been considered for pond sizing and location selection:

Drainage pattern and natural flow accumulation derived from DEM analysis

Slope gradient to ensure gravity flow and structural stability

Availability of natural depressions

Distance from active mining zone

Safety from pit slope failure and waste dump instability

Accessibility for maintenance and water utilization

Sediment load handling capacity

Considering site topography and runoff volume, one exhausted pit and one pond is proposed instead of a single large structure to improve water management efficiency and reduce structural risk.

The location of the proposed exhausted pit /pond locations are selected based on:

- Natural drainage convergence
- Low slope zones (<10° preferred)
- Minimum excavation requirement
- Safe distance from mining activities
- Efficient gravity flow of runoff
- Ease of desilting and maintenance

6.2.STRUCTURAL MEASURES

1.Exhausted Pit (Primary Collection Pond)

•**Purpose:** Collection of runoffs from main working pit and adjacent benches

• ProposedCapacity:

• ApproximateDimensions:2,00,000KL

- Length: 120 m
- Width: 75 m
- Depth: 5 m

• SuggestedLocation:The exhausted mine pit lies in a lower elevation area near the convergence point of the main drainage system

• Approximate Coordinates:

- Latitude: 21°58' 40.75"N
- Longitude: 85°23'37.84"E

2. POND (Secondary Sedimentation Pond)

• Purpose: Sediment settling and runoff storage from waste dump and overburden area

• Proposed Capacity: 2,00,000 KL

• Approximate Dimensions:

- Length: 80 m
- Width: 60 m
- Depth: 3 m

• Suggested Location: Downstream of OB dump drainage channel

• Approximate Coordinates:

- Latitude: 21°58' 12.96"N
- Longitude: 85°23'32.17"E

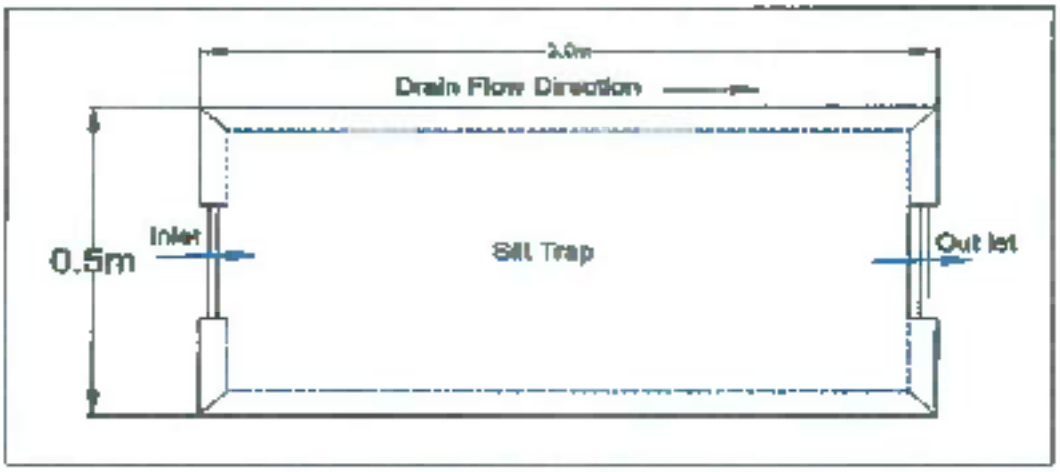
Additional Engineering Recommendations

Construction of silt traps

Silt traps should be constructed upstream of the pit/pond inlet to intercept and retain sediments carried by surface runoff before the water enters the pond. These structures help in reducing silt deposition within the pond, thereby maintaining its storage capacity and improving water quality.The construction of silt trap is summarized as follows:

Item	Location	Length x breath & height in mtr	unity	Volume
silt trap	Upstream of pit	3m x 1.5m x 1.5m	1	6.75 cum
Silt trap	Upstream pond	3m x 1.5m x 1.5m	1	6.75 cum

Design of Silt Trap



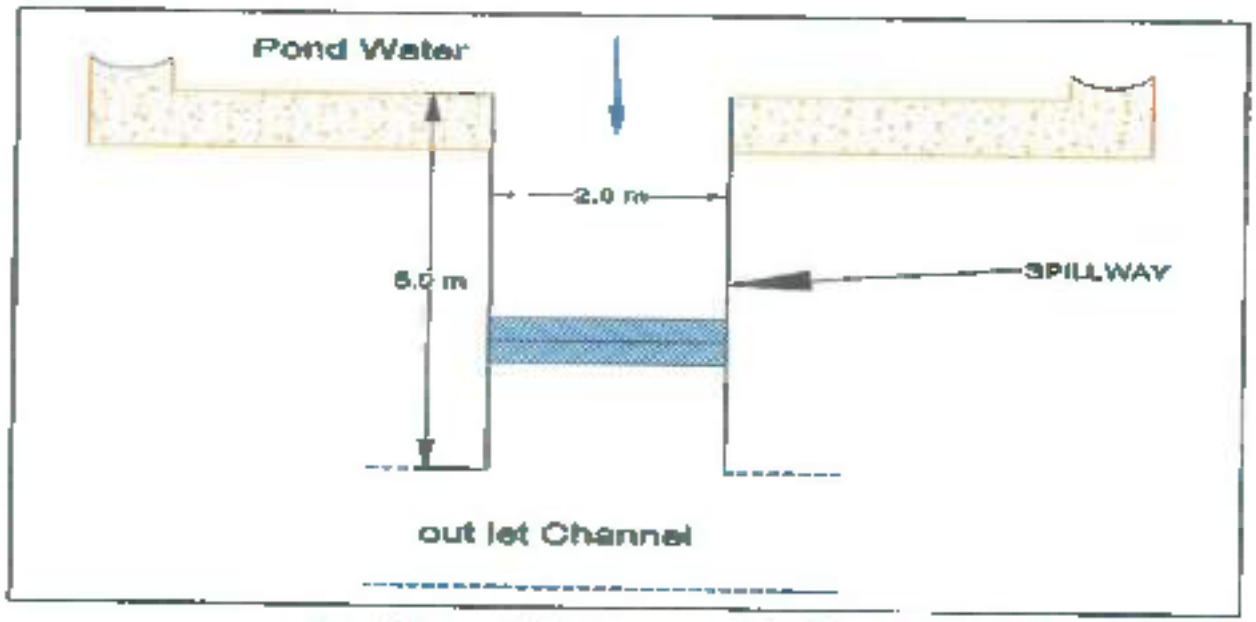
PLAN VIEW OF SILT TRAP

Provision of overflow spillway

An overflow spillway shall be provided at the pond/pit to safely discharge excess water during heavy rainfall or peak runoff conditions. The spillway prevents overtopping and possible damage to the embankment by allowing controlled release of surplus water.The construction of Spillway is summarized as follows:

Item	Location	Length x breath & height in mtr	unity
spillway	Upstream of pit	5 m x 2 m x 1 m	1
spillway	pond	5 m x 2 m x 1 m	1

Design of Small Spill Way



PLAN VIEW OF SPILLWAY

Periodic desilting schedule

A periodic desilting schedule of a pond/pitand theSettling Tanks is important to maintain its storage capacity, reduce silt accumulation, and ensure proper water management. In mine reclamation or water management plans, desilting is usually done at fixed intervals based on sediment load.

Activity	*Frequency*	*Time of Year*
Inspection of pond & inlets	Twice a year	Pre-monsoon & Post-monsoon
Minor desilting	Every year	April–May
Major desilting	Every 3–5 years	Summer / dry season
Cleaning of silt traps & drains	Before and after monsoon	May & October

Provision of garland drains to channel runoff

Drainage channels are engineered channels designed to safely convey storm water runoff from mining areas, infrastructure zones, and disturbed slopes to natural drainage systems without causing erosion.

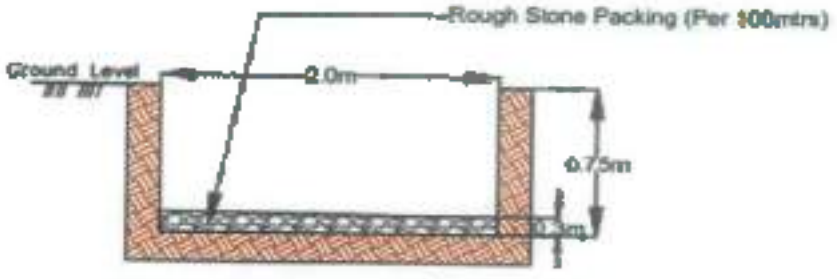
Suggested Location

- Around mine pits and working benches.
- Around stockyards and Mineral processing area.
- At slope toe areas of dumps.

The construction of Garland/catch drainisasummarized as follows:

Item	Location	Length x breath & height in mtr	GPS reading
Garland drain	Bottom of proposed OB dump -I	340 x 2 x 1	2431251 N,334752 E To 2431316 N,334632 E
	Bottom of proposed OB dump -II	510 x 2 x 1	2430981 N,334633 E To 2431014 N, 334759 E
	Bottom of proposed OB dump -III	440 x 2 x 1	2430793 N,334114 E To 2431003 N,334234 E
	Bottom of proposed OB dump -IV	670 x 2 x 1	2430228 N, 334762 E To 2430315 N,334274 E
Garland drain	Top Soil storage area	850 x 2 x 1	2430271 N,334760 E To 2430368 N, 334288 E & 2430794 N 334115 E To 2430800 N, 333902 E
Catch drain	From 4 no's of settling ponds to main channel	200 x 2 x 1	
Catch drain	Around mine pits	2500 x2 x1	Covering 5 no of pits
Catch drain	Around stockyards and Mineral processing area	1300 x2 x1	

Design of Garland /Catch Drain



Cross Sectional View of Garland Drain

Construction of Guard Wall / Retaining Wall

Guard walls or retaining walls are structural support systems constructed at the toe of waste dump slopes to provide stability and prevent material slippage and erosion

Suggested Location

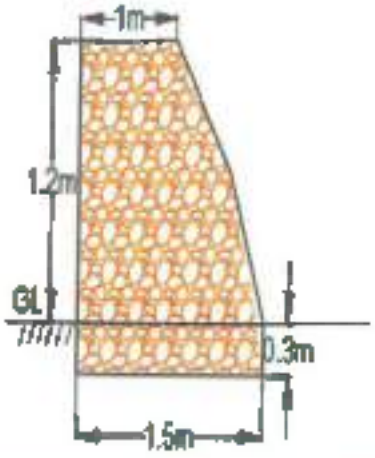
- At the toe of overburden dump slopes.
- At the top soil storage area

The construction of Retaining wall is summarized as follows:

Item	Location	Length, breath & height in mtr	GPS reading
Retaining wall	Bottom of proposed OB dump -I	340 x 1.5 x 1	2431251 N,334752 E To 2431316 N,334632 E
	Bottom of proposed OB dump -II	510 x 1.5 x 1	2430981 N,334633 E To 2431014 N, 334759 E
	Bottom of proposed OB dump -III	440 x 1.5x 1	2430793 N,334114 E To 2431003 N,334234 E
	Bottom of proposed OB dump -IV	670 x 1.5 x 1	2430228 N, 334762 E To 2430315 N,334274 E
	Storage of Top soil	810 x 1.5 x 1	2430271 N,334760 E To 2430368 N, 334288 E & 2430794 N,334115 E To 2430800 N,333902 E

Design Of Retaining Wall

PLAN VIEW OF RETAINING WALL

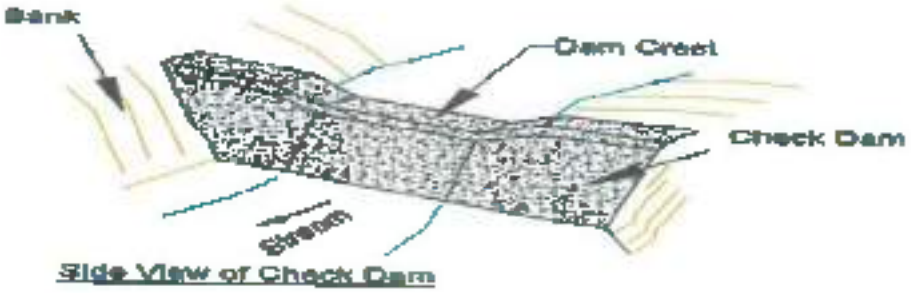


CROSS SECTION VIEW OF RETAINING WALL

Check Dams

There are four (4) Check dams are proposed to constructed across seasonal drainage channels to slow down surface runoff, reduce erosion, and promote groundwater recharge. These structures help in trapping sediments carried by runoff and reduce downstream siltation.Check dams are suggested in the valley portions where runoff accumulation is high. These are suggested in valley portions where runoff accumulation is high.

Design of Check Dam



Side View of Check Dam

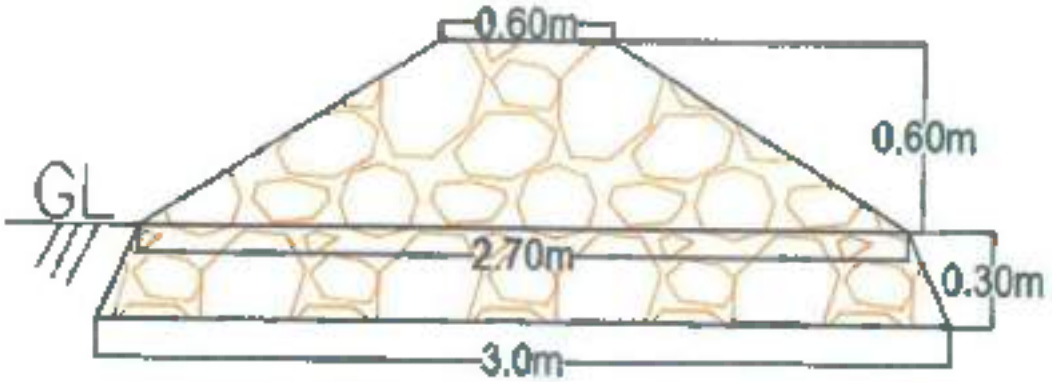
Cross Sectional View of Check Dam

Loose Boulder Structure (LBS)

A total of thirty-five (35) Loose Boulder Structures (LBS) are proposed to be constructed across the garland drains and natural drainage channels to reduce runoff velocity, control soil erosion by trapping sediments, and promote groundwater recharge by allowing water to percolate into the ground.

Out of the total proposed LBS, twenty-five (25) structures will be constructed in the garland drains around the toe of the dumps and Along the down contour, while the remaining ten (10) structures will be constructed across the drainage channels.

Design of Loose Boulder Structures (LBS)



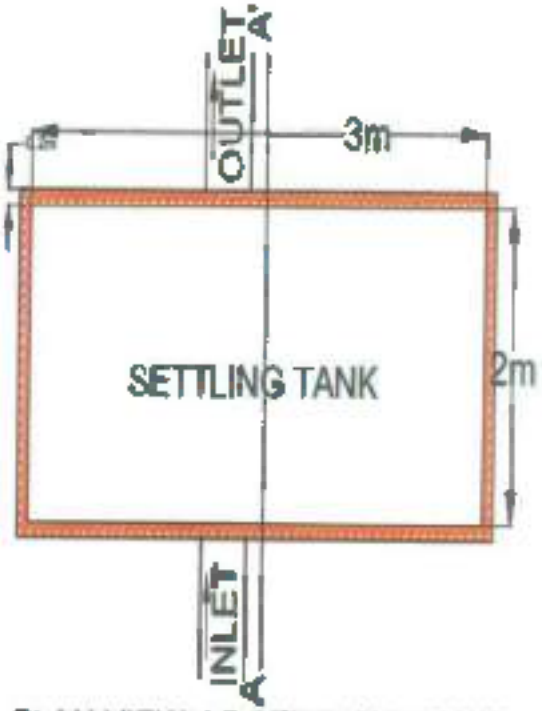
Cross Sectional View of LBS

Construction of the Settling tank

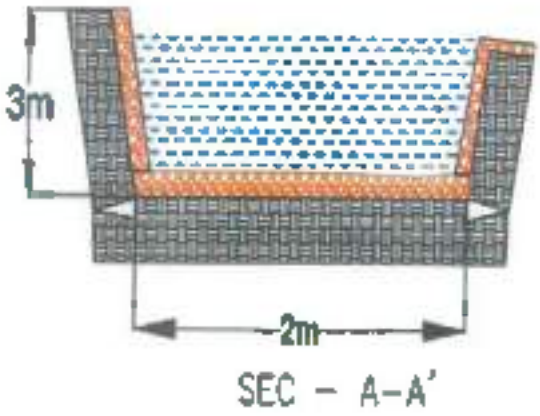
Four (04) settling tanks are proposed to be constructed at the lower level of each dump slope, each having a capacity of about 20 m^3, to ensure proper stabilization and management of rainwater runoff. The primary objective of these settling tanks is to retain suspended particles and sediments carried by surface runoff, allowing the sediments to settle before the water is discharged into the natural drainage system. This helps in reducing siltation, controlling soil erosion, and improving the quality of water entering downstream drainage channels

The runoff water from the dump will be first guided through garland drains, which will channel the water into the settling tank. Inside the tank, the velocity of water is reduced, allowing suspended solids, silt, and fine particles to settle at the bottom. The relatively clear water will then overflow through a properly designed outlet or spillway and discharge into the nearby drainage channel.

Design OfSettling Tank



PLAN VIEW OF SETTLING TANK



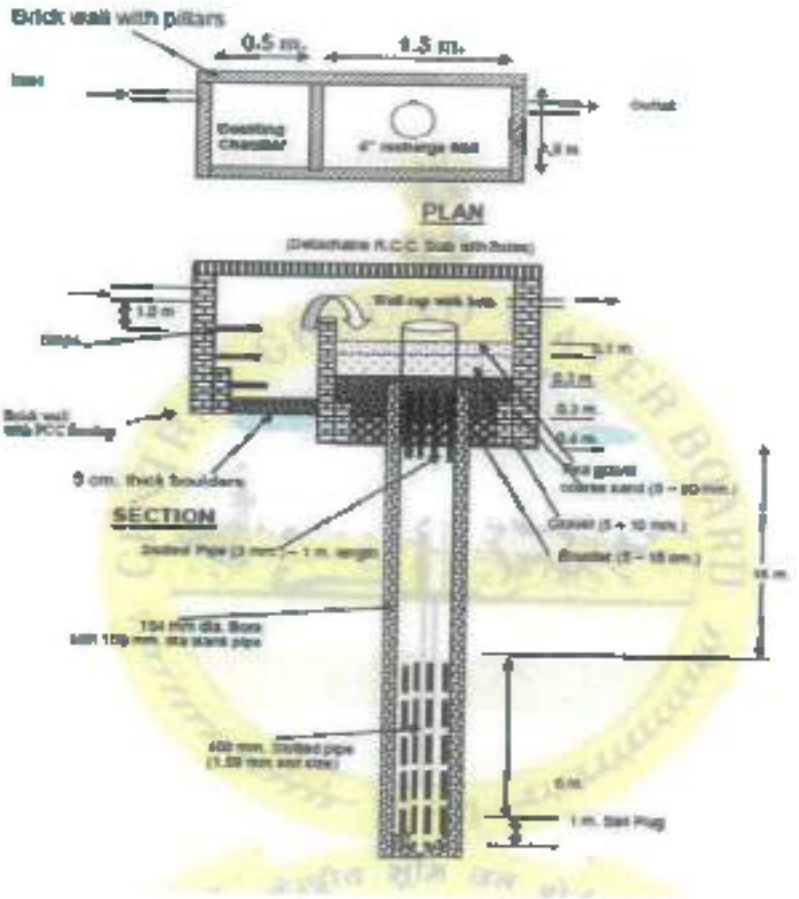
CROSS SECTIONAL VIEW OF SETTLING TANK

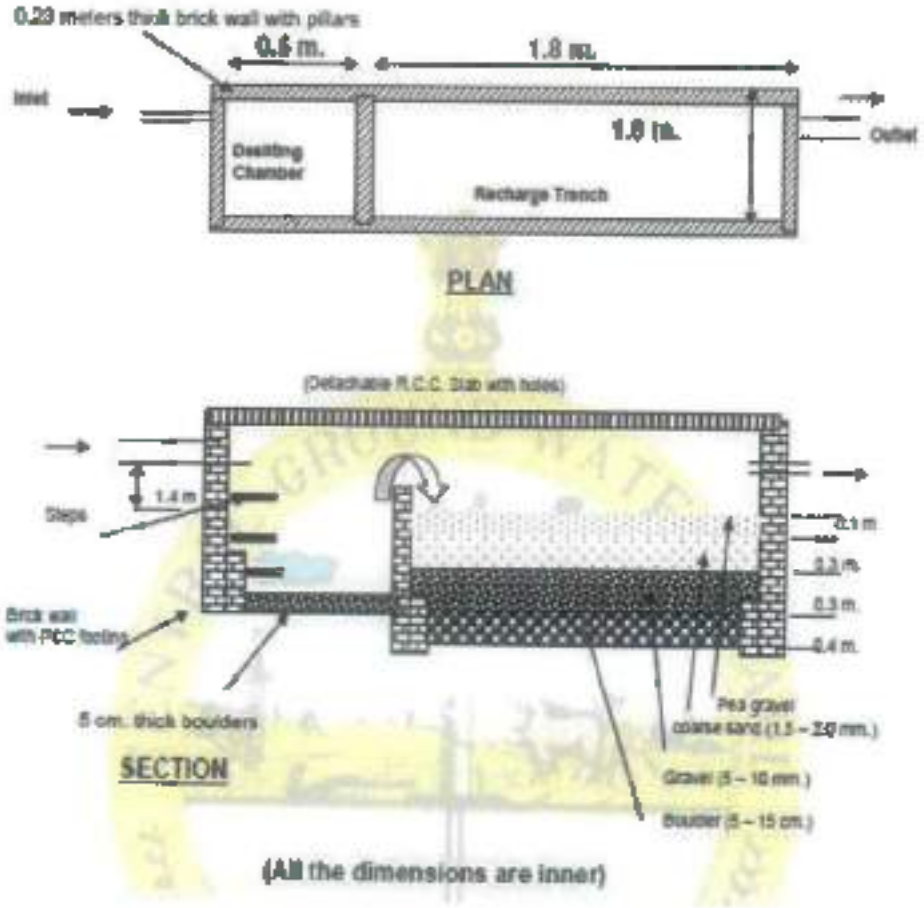
Rain Water Harvesting Management

As per the data provided by the India Meteorological Department (IMD), the maximum daily rainfall recorded for the area is 0.204 m. Therefore, the design of the groundwater recharge system has been carried out considering this maximum rainfall value to ensure adequate recharge capacity.

RUNOFF CONSIDERED FOR DESIGN OF RECHARGE PIT					
Description	**Area available (HA)**	**Area (SQ. M)**	**Runoff Co-efficient**	**Avg Annual Rain Fall (M)**	**Generated Runoff During Existing Period (In Cum/day)**
Infrastructure / Utility	2.18	21800	0.8	0.204	3557.76

Indicative design for Rooftop Rainwater Harvesting Structure and Recharge (For Groundwater Abstraction up to 10 m 3 /d)





Since the project pertains to an iron ore mining operation, there is a possibility of **groundwater contamination** due to **dust deposition and runoff during rainfall events.** Therefore, the above recharge structure has been designed to mitigate such impacts and facilitate controlled groundwater recharge.

Based on the rainfall analysis, it is estimated that **approximately 3560 KLD of runoff may be generated during a single day (considering 16 hours of rainfall).** Accordingly, the recharge system has been designed to accommodate **222.50 KLD of runoff,** ensuring effective management and recharge of stormwater.

It is proposed to install two (02) nos. of recharge shafts, each having a capacity of **110 KLD,** within the mining lease area to facilitate groundwater recharge and effective rainwater management.

6.3. BIOLOGICAL MEASURES

Plantation

Soil erosion and sediment control in areas covered with forests are very minimal. However, it is proposed to undertake block plantation @1000 seedlings per Ha inside the safety zone area over 3.138 ha along the lease boundary. The Vetiver Plantation & in the 4 nos of OB dump and Agave Plantation is proposed around the toe of the OB dumps, which are located in north-eastern (Dump-I &II), south side (Dump-III) & South (Dump-IV) side of the ML area of Dalpahar Iron & Manganese mines.

The Location of the dumps is given below: -

Co-Ordinate of the Dumps location		
Dump No.	**Latitude**	**Longitude**
Dump-I	21°58' 39.402" N to 21°58' 42.562" N	85°23' 50.825" E to 85°23' 58.111" E
Dump-II	21°58' 30.980" N to 21°58' 39.508" N	85°23' 54.057" E to 85°23' 58.354" E
Dump-III	21°58' 22.484" N to 21° 58'32.247" N	85°23' 33.167" E to 85°23' 40.622" E
Dump-IV	21°58' 5.975" N to 21°58' 10.898" N	85°23' 40.708" E to 85°23' 58.745" E

Location wise proposed plantation will be as follows:

7.5 mtrs SZ area along the Mining Lease boundary	Block Plantation	3.138 Ha	3138 trees

The list of species to be adopted for the plantation is as follows:

Sl. No.	Local Name	Scientific Name
1	Amla	Emblicaofficinalis
2	Karania	Pongamiapinnata
3	Asan	Terminalia elliptica
4	Kurum	Adina cordifolia
5	Simarouba	Simaroubaglauca

6	Neem	Azadirachtaindica
7	Bamboo	Dendrocalamusstrictus
8	Chakunda	Senna siamea
9	Sisoo	Dalbergiasissoo

Planting shall be done during July in pre-dug pits of size 45 cm X 45 cm X 45 cm. A basal dose of N.P.K fertiliser shall be applied at the time of planting, besides mixing with insecticides to prevent termites & insects. Planning for plantation shall be such that they should not be planted in proximity. A minimum distance of 2.5 mt X 2.5 mt shall be maintained on every fourth plant in planting either of the species. Care should be taken to complete the planting during July while rains are still on during the first or second week of July.

Vetiver& Agave Plantation

The Vetiver plantation on the dump no. 1, 2, 3 & 4 over an area of 11.5 ha will be carried out. Similarly, extensive plantation of Agave will also be carried out around the bottom of the dump slopes for stabilization and moisture conservation. The cost norm of block plantation @ 1000 trees per ha has been provided in Annexure- 1&2 of Vetiver plantation & Agave plantation respectively. The details are as follows: -

Category	Location	Area (in Ha.)
Vetiver Plantation	OB dump I, II, III, IV	11.50

Category	Location	Length (Metre)
Agave Plantation	Toe of the OB dump I, II, III, IV	1850 m.

Choice of species:

The choice of species will be based on the following parameters: (i) Drought hardy and (ii) it should resist the xerophytic nature of the locality, i.e., with less rainfall, less soil fertility, and to resist biotic interference. Selection of the plant species shall be based on the inventory of the local forest species like Chakunda (Cassia siamea) Kusum (Schleicheraoleosa), Bel (Aegle marmelos), Karanja (Pongamiapinnata), Kurum (Adina cordifolia), Amla (Emblicaofficinalis) etc. Some soil binding grasses will also be introduced. The species of grass seeds to be broadcast are given in the following table. Plant species suitable for plantation should not only be able to flourish in the area but must also have a rapid growth rate, an evergreen habit, a large crown volume, and small leaves with smooth surfaces. All these traits are difficult to get in a single species. Therefore, a combination of species has been taken into consideration as stated above.

Name of Grass Species	Usage	Habitat / Soil
Chrysopogonfulvus	Fodder	Red Soil/black cotton soil
Eremopogonfoveolatus	Fodder	Skeletal soil
Sporobolusmarginatus	Fodder	Sandy soil
Heteropogoncontortus	Non-Fodder	Eroded soil
Cymbopogon martini	Non-Fodder	Eroded soil
Cynodondactylon	Fodder	Wide range soil

Weeding:

Two weeding have been proposed along with soil working and manuring in the first year and due weeding, soil working and manuring of 2 doses of 15g each in a gap of 15 days in the second year and weeding ploughing in the third year. The first weeding, along with manuring, should be taken up soon after completion of the plantation and the second weeding and soil working should be taken up after one month of the first weeding. Weeding should be done at a radius of one meter and soil working should be done to a depth of 15 cm. All the weeding along with soil work should be completed during November to December. The first weeding should be done along with the replacement of causality that may occur during planting in the first year and after replacement of causality in the 2nd year.

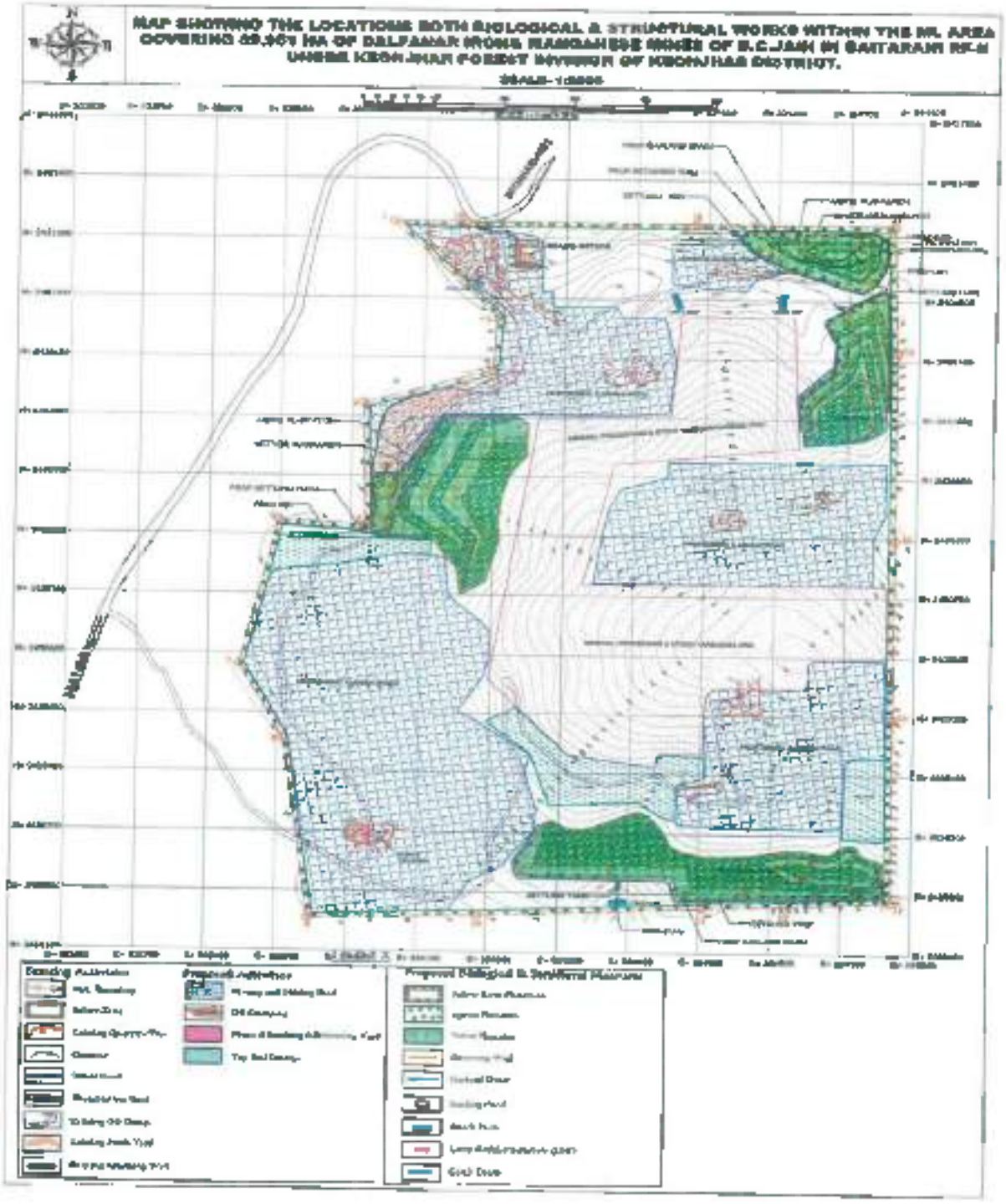
a] Application of Insecticides.

The plantation site, after cleaning and burning, good quality seedlings may cause an influx of insects that usually eat and damage the tender leaves and shoots of the plants. To get rid of such insect attacks, the application of insecticides should be taken up in required doses at desired intervals. Spraying of insecticides shall be done preferably on a sunny day and before forenoon.

6.4 Overall Benefits of Recommended Structures

- Reduces soil erosion and sediment generation.
- Maintains natural drainage and hydrological balance
- Enhances groundwater recharge potential.
- Improves slope and dump stability.
- Prevents siltation of downstream water bodies.
- Supports sustainable mining and environmental protection.

Map showing the location of both biological and structural works within the ML area of Dalpahar Iron &Mn Mines over 89.961 ha.



7. INSPECTION, MONITORING AND EVALUATION

For the successful implementation of the above treatment plan of catchment area in core zone, thorough inspection and technical guidance from the relevant technical wing are necessary. The user agency shall provide sufficient fuel and conveyance charges for technical experts to ensure the proper execution of these programs. A budgetary allocation of 15% of the total project cost has been set aside for this purpose.

8. EXECUTION.

The works in the core zone of the present Scheme shall be executed by the User Agency having specialized departments headed by qualified persons with outsourced manpower and machinery. To facilitate this, the user agency shall establish its own executing and supervision cells along with the required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in coordination with the Forest Department and will be completed within 2 years after getting the final forest clearance. Maintenance work will be continued regularly.

9. REQUIREMENT OF FUNDS

The total estimated cost for the implementation of the Catchment Area Treatment Plan in the core zone is **Rs. 1,40,08,852/-** (Rupees one crore Forty Lakh Eight Thousand Eight Hundred Fifty-Two) only.

Considering the likely increase in the cost of materials and labour during the implementation period, an additional 20% escalation charge has been incorporated into the total estimated cost to account for future price variations.

Sl. No.	Description of the Work (Core Zone)	Fund Required (in Rs.)
1	**STRUCTURAL MEASURES**	
A	POND (Secondary Sedimentation Pond) size- 80m(L) x 60m (B) x 3m(D) for 14400 cum @ Rs.387/cum (The cost norm Enclosed as **Annexure-1**)	55,72,800.00
B	Construction of 2 no's of silt traps up stream of the Exhausted Pit and pond= Rs.31948 x 2nos (The cost norm Enclosed as **Annexure-2**)	63,896.00
C	Construction of 2 no's of over flow spillway of the Exhausted Pit and pond= Rs.41575 x 2nos (The cost norm Enclosed as **Annexure-3**)	83,150.00
D	Catch drain Around mine pits, stockyards and Mineral processing area over a length of 3800m @ Rs. 341/per running meter.(The cost norm Enclosed as **Annexure-4**)	12,95,800.00
E	10 no. of Loose Boulder Structure(2mt) in the drainage channel @ Rs. 25911/-per no. (The cost norm Enclosed as **Annexure-5**)	2,59,110.00
F	Distillation work for the drain channel and water recharge pond/pit twice a year (On LS)	5,00,000.00
G	Construction of Garland drain toe of OB dump & catch drain over a length of 2160 m. @ Rs. 341/- per running meter.(The cost norm already Enclosed as **Annexure-4**)	The financial forecast of these items has already been provided in the scheme for appropriate mitigative measures to minimize soil erosion and choking of streams imposed in Condition No. 2.xxi (a). So, no extra budgetary provision has been suggested.
H	Construction of retaining wall around the dumps over a length of 1960 m.@ Rs.2313/- (The cost norm Enclosed as **Annexure-6**)	
I	25 no. of Loose Boulder Structure 2mt in the garland drain and contour slope @ Rs. 25911/-per no.(The cost norm already Enclosed as **Annexure-5**)	
J	Construction of 4 nos. of check dam in main drainage slope @ Rs.2,35,180/-, (The cost norm Enclosed as **Annexure-7**)	
K	Construction of 4 nos. of Settling Tank of 20 CuM Capacity each @645per CuM.(The cost norm Enclosed as **Annexure-8**)	The financial forecast of these items has already been provided in the scheme for appropriate

L	Terracing of OB dump over area of 11.50 Ha. Or 1,15,000 SqM @ Rs. 134/-perSq.M. (The cost norm Enclosed as **Annexure-9)**	mitigative measures to minimize soil erosion and choking of streams imposed in Condition No. 2.xxi (a). So, no extra budgetary provision has been suggested.
M	Distillation work for the Garland drain settling pond & check dam twice a year (On LS)	
N	Maintenance of retaining wall and check dam & Check wire (On LS)	
O	Construction of Garland drain around the top soil storage area over a length of 850m @ Rs. 341/per running meter and retaining wall over a length of 810 m.@ Rs.2313/-.	The financial forecast of these items has already been provided in the scheme for top soil management imposed in ConditionNo.2.xxi (e). So, no extra budgetary provision has been suggested
P	Installation of 2 no's of Recharge shaft for Rainwater Harvesting = 2 x Rs 11,88,293/- (The cost norm Enclosed as **Annexure-10)**	23,76,586.00
	Sub-Total	**Rs. 1,01,51,342.00**
2	**BIOLOGICAL MEASURES**	
A	Block Plantation (1000 no/ha.) over 3.138 ha of Safety Zone @ Rs. 2,99,567/- and SMC cost over 3.138 ha @ Rs.45,475/-.(as per base norm of Matrix for the year 2026-27) .	The financial forecast has already been provided in the scheme Safety Zone Fencing, Protection and Regeneration imposed in Condition No.2.xx (a,b& c). So no extra budgetary provision has been suggested
B	Cost for Vetiver Plantation with 10 years maintenance over 11.50 ha @ Rs. 1,12,404/- per Ha. (The cost norm Enclosed as **Annexure-11)**	The financial forecast of these items has already been provided in the scheme imposed in Condition No. 2.xxi (a). So, no extra budgetary provision has been suggested
C	Cost of agave plantation on the toe of Dump with 10 years maintenance for a distance of 1.85 km (1850 m) @ Rs. 12,20,300/- per Km.(The cost norm Enclosed as **Annexure-12)**	
	Cost for sowing of grass seeds of the slope of the haul roads over 0.96ha @ Rs. Rs.59, 532/- per ha. (The cost norm Enclosed as **Annexure-13)**	The financial forecast has already been provided in the scheme planting of adequate drought hardy plant species and sowing of seeds in the appropriate area

		Imposed in Condition No.2.xxi.(b) So no extra budgetary provision has been suggested
	Sub-Total	0.00
	Total	**Rs. 1,01,51,342.00**
	Inspection and monitoring charges @ 15%	15,22,701.30
	Sub-Total	1,16,74,043.30
	Price escalation @ 20%	23,34,808.66
	Grant Total	**Rs. 1,40,08,851.96/- or say Rs.1,40,08,852/-**

(Rupees one crore Forty Lakh Eight Thousand Eight Hundred Fifty-two) only

Asst. Conservator of F...
I/C, Champua Forest ...

B. BUFFER ZONE TREATMENT PLAN

10.1 Structural Measures

Runoff generated from hill slopes during rainfall should be properly collected and managed to prevent soil erosion, sediment transport, and downstream flooding. The collection of runoff from hill areas can be achieved through a combination of drainage and water conservation structures.

The proposed structure should be located at a lower elevation area near the convergence point of hill slopes within the Baitarani Reserve Forest. This location is suitable because runoff from the surrounding hill slopes naturally drains toward this point, allowing effective collection and management of rainwater. Placing the structure at this convergence zone will help in intercepting surface runoff, reducing soil erosion, trapping sediments, and facilitating groundwater recharge before the water enters the natural drainage system.

a.) Percolation / Collection Pond

- Purpose: Collection of runoffs from slope of Hill area
- Length: 80 m
- Width: 50 m
- Depth: 3 m
- Volume: 12000 cum
- Suggested Location: In a lower elevation area near the convergence point of the hill slope within the Baitarani Reserve Forest
- Coordinates:
- Latitude: 21°58' 33.74"N, Longitude: 85°24'0.82"E

to

Latitude: 21°58' 33.93"N , Longitude: 85°24'3.47"E

Additional Engineering Recommendations

b). Construction of silt traps

Silt traps should be constructed upstream of the pond inlet to intercept and retain sediments carried by surface runoff before the water enters the pond. These structures help in reducing silt deposition within the pond, thereby maintaining its storage capacity and improving water quality. The construction of silt trap is summarized as follows:

Item	Location	Length x breath & height in mtr	unity	Volume
silt trap	Upstream of pit	3m x 1.5m x 1.5m	1	6.75 cum

Design of Silt Trap

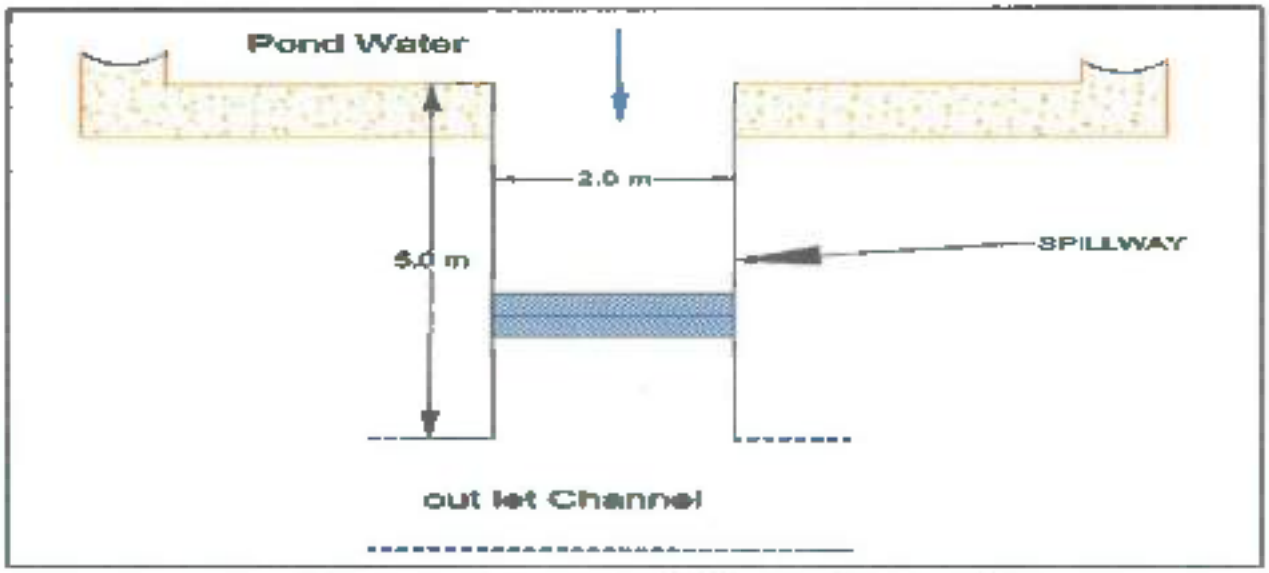
PLAN VIEW OF SILT TRAP

c). Provision of overflow spillway

An overflow spillway shall be provided at the pond to safely discharge excess water during heavy rainfall or peak runoff conditions. The spillway prevents overtopping and possible damage to the embankment by allowing controlled release of surplus water. The construction of Spillway is summarized as follows:

Item	Location	Length x breath & height in mtr	unity
spillway	pond	5 m x 2 m x 1 m	1

Design of Small Soill Way



PLAN VIEW OF SPILLWAY

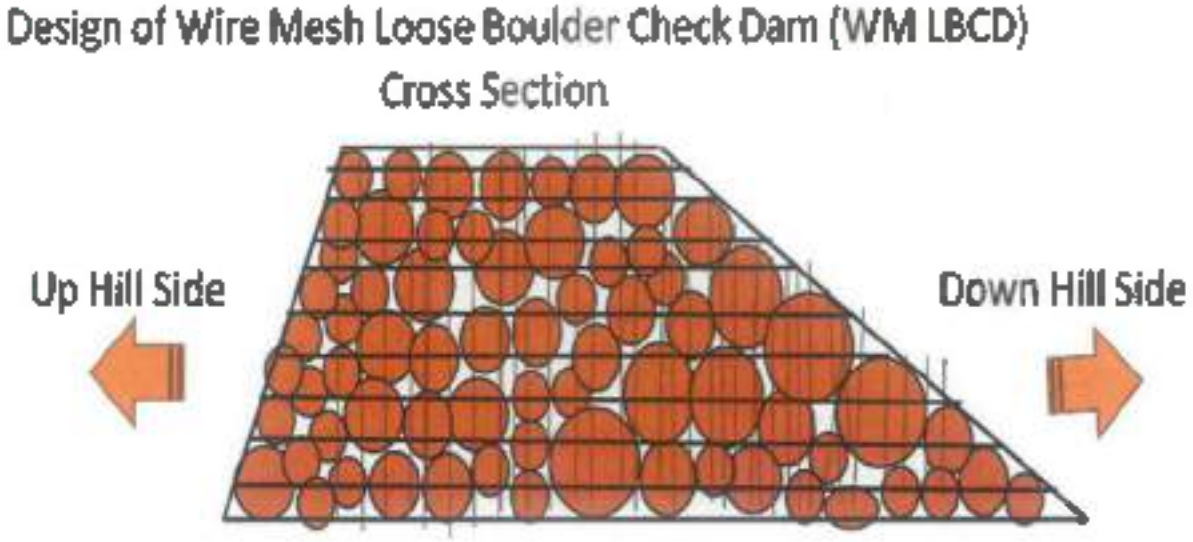
d). Wire Mesh Loose Boulder Check Dams (WMLBCD)

Two (2) WMLBCD (Wall Masonry Loose Boulder Check Dams) are proposed to be constructed across seasonal drainage channels connected to Suna Nadi to slow down surface runoff, reduce soil erosion, and promote groundwater recharge. These structures will also help trap sediments carried by runoff and thereby reduce downstream siltation.

The construction details of the proposed check dams are summarized as follows

Sl.No	Location	Coordinate	Dimension	Volume
1	Dalpahar Basti (Baitarani R.F.-A)	21°58'29.36"N 85°23'21.69" E	Length-8 m Bottom width-5m Top width- 1.5m Height-1 m	26 cum
2	Baitarani R.F-A	21°58'45.17"N 85°23'52 79" E	Length-15 m Bottom width-5m Top width- 1.5m Height-1.2 m	58.5 cum
Total				84.5 cum

Design of Check Dam



e). De-silting of Village Pond/ Water Bodies within 5 km of the Mine Lease Boundary

Periodic **de-silting of village pons located within a 5 km radius of the mine lease boundary** shall be undertaken to mitigate the impact of siltation caused by surface runoff and sediment transport from mining activities. Over time, suspended particles and eroded soil from the surrounding catchment areas may accumulate in nearby tanks and ponds, reducing their water holding capacity and affecting their ecological and irrigation functions.

Under this measure, accumulated silt and sediments deposited in the bed of village tanks, ponds, and other natural water bodies will be **removed periodically to restore their original storage capacity and maintain proper water flow**. The removed silt may be utilized for **agricultural field levelling, soil improvement, or strengthening of embankments**, wherever feasible and with the consent of local authorities and community members.

This activity will help to:

- Restore the **water storage capacity** of village tanks and ponds.
- Prevent **overflow and flooding during heavy rainfall**.
- Improve **groundwater recharge and water availability** in surrounding areas.

Location & dimension with scope of work of the ponds selected for desilting as follow:

Pond No.	Name of the Location of the Water Body	One point GPS Reading		Dimension in (Length x Breadth x Height)	Remarks
		Easting	Northing		
1	Roida village pond-1	85° 22' 33.01"	22° 00' 46.01"	55 x 50 x 3	Scope for De-siltation & construction of Embankment
2	Roida village pond-2	85° 22' 38.13"	22° 00' 41.74"	50 x 37 x 2.5	Scope for De-siltation & construction of Embankment
3	Bholbeda village pond	85° 26' 36.86"	21° 57' 56.23"	36 x 31 x 2.5	Scope for De-siltation & construction of Embankment
4	Kundurpani Village Pond	85° 22' 07.11'	21° 58' 56.31"	32 x 31 x 2.5	Scope for De-siltation & construction of Embankment
5	ChilikaPat Village Pond	85° 24' 37.89"	21° 57' 41.78"	40 x 33 x 2.5	Scope for De-siltation & construction of Embankment
6	Khandbandha Village Pond	85° 23' 46.24"	21° 57' 11.05"	67 x 32 x 2	Scope for De-siltation
7	Kamarjoda Pond	85° 25' 23.96"	22° 00' 36.49"	57 x 53 x 2.5	Scope for De-siltation & construction of Embankment
8	Khuntapani Village Pond	85° 25' 39.94'	21° 59' 29.22"	64 x 54 x 2.5	Scope for De-siltation & construction of Embankment

10.2. BIOLOGICAL MEASURE

a). Gap Planting Located In The Area Within 100 Mtrs. From Outer Perimeter Of The Mining Lease.

Gap planting and soil moisture conservation measures are proposed to restock and rejuvenate the degraded open forest located in the area within 100 mtrs. from outer perimeter of the mining lease area and strengthen the degraded open forest area located within **100 m from the outer perimeter of the mining lease.** Due to sparse vegetation cover and soil disturbance in this zone, ecological restoration interventions are necessary to improve forest density, enhance biodiversity, and stabilize soil.

Gap planting will be carried out over 23.0 Ha in open patches where natural vegetation is sparse or absent. Suitable native and site-specific species will be planted to improve canopy cover and ecological balance. The spacing and density of planting will depend on the size of gaps and site conditions. Priority will be given to indigenous species that are drought-tolerant and well adapted to the local forest ecosystem. The objective is to gradually convert degraded open forest into moderately dense vegetation cover.

These measures will help in reducing surface runoff, minimizing soil erosion, and increasing groundwater recharge. The combined approach of gap planting and soil moisture conservation will improve vegetation regeneration, enhance ecological stability, and contribute to the long-term restoration of the degraded forest area surrounding the mining lease.

PATCH WISE GAP PLANTATION AREA OVER 23.00 HA LOCATED WITHIN 100 MTRS FROM THE OUTER PERIMETER OF ML BOUNDARY	
Location	**Area in Ha**
Patch-1	15.90
Patch-2	7.10
Total , 23.00	

The details of the Gap planting and soil moisture conservation measures are discussed in the Scheme prepared for Gap planting and soil moisture conservation measures are proposed to restock and rejuvenate the degraded open forest located in the area within 100 mtrs. from outer perimeter of the mining lease area and strengthen the degraded open forest area located within 100 m from

the outer perimeter of the mining lease with compliance to condition no. No.2.xxiii of the
Stage-I approval. The total financial outlay Rs. 50,83,542/-was provided for the implementation of these activities.

Location of the area 23.00 ha proposed for Gap Plantation within 100mtrsouter perimater of ML boundary.

GOGGLE IMAGE SHOWING THE AREA SUITABLE FOR GAP PLANTATION OVER 23.00 HA LOCATED WITHIN 100 MTRS FROM OUTER PERIMETER OF THE ML AREA OF DALPAHAR IRON & MN MINES OF SRI D.C.JAIN IN BAITARANI RESERVE FOREST UNDER KEONJHAR FOREST DIVISION IN KEONJHAR DISTRICT,ODISHA

b). Assisted Natural Regeneration (ANR) Plantation

Due to mining activities, the natural vegetation within the catchment area is likely to be degraded. Therefore, Assisted Natural Regeneration (ANR) plantation over 5.55 ha has been proposed as a biological measure under the Catchment Area Treatment Plan to restore the degraded vegetation cover. ANR is a forest restoration approach that encourages the natural regeneration of existing vegetation by protecting and supporting naturally occurring seedlings and rootstock present in the area. Instead of establishing an entirely new plantation, this method focuses on improving the growth and survival of naturally regenerated species through protective measures, cleaning, soil working, and regular maintenance, thereby helping to stabilize the catchment area, reduce soil erosion, and improve ecological balance.

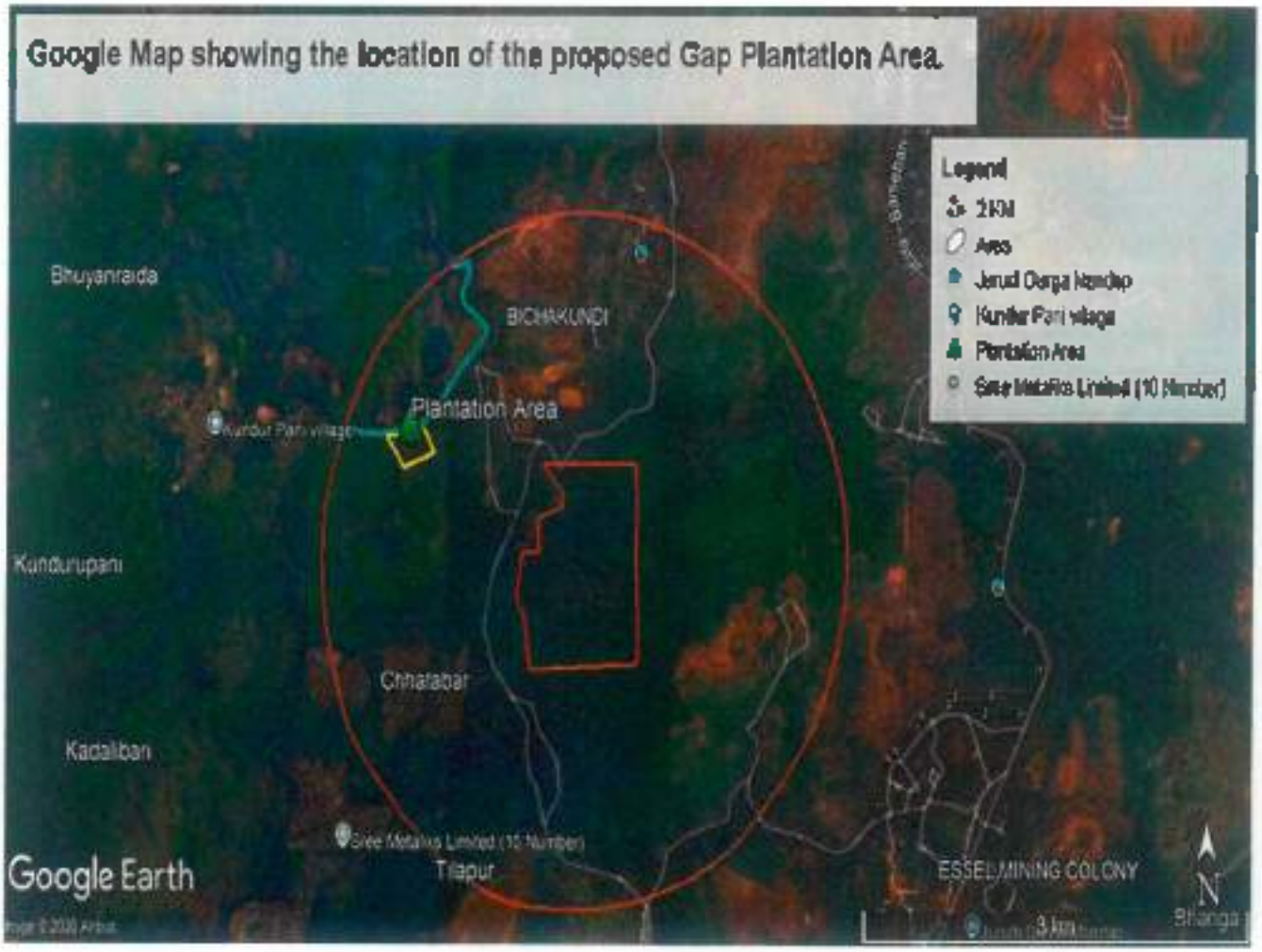
Key Objectives

- To restore degraded vegetation, cover within the catchment area by encouraging the growth of native plant species.
- To improve vegetation density and biodiversity, thereby strengthening the soil binding capacity of the catchment slopes.
- To reduce soil erosion, sediment yield, and surface runoff within the catchment area.
- To enhance soil moisture retention and groundwater recharge in the treated catchment.
- To improve the overall ecological stability and hydrological condition of the catchment area.

Activities Involved in ANR

- Identification and Protection of Natural Regeneration
- Cleaning and Weeding
- Soil Working and Moisture Conservation
- Gap Planting (Where Required)
- Protection Measures
- Maintenance and Monitoring

Boundary GPS Coordinates of the area of 5.55 ha proposed for ANR plantation		
Location	Latitude	Longitude
Baitarani R.F.-A	21°58'42.17"N	85°22'56.38"E
	21°58'45.15"N	85°23'4.75"E
	21°58'50.35"N	85°23'0.79"E
	21°58'50.20"N	85°22'57.64"E
	21°58'48.48"N	85°22'53.83"E
	21°58'48.25"N	85°22'51.32"E



SITE PREPARATION AND SILVICULTURAL OPERATION INCLUDING CLEARANCE OF WEED, CLIMBER CUTTING, HIGH STUMP CUTTING, SINGLING OF SHOOTS-

The clearing of the site involving removal of invasive weeds, bushes, climbers, high stumps and singling of shoots will be taken up preferably by the end of February and latest by the end of March. Pits of the dimension 45 x 45 x 45 cm. will be dug @ 200 per ha in the available gaps, preferably 2 months before or at least a month before planting of seedlings.

PLANTING OPERATION

Planting of seedlings will be taken up in the month of July. The polythene covering of the balls of earth will be carefully removed before planting. Care will be taken to see that the ball of the earth is not broken while doing so. The seedling with the ball of earth will then be placed firmly in the pit and buried at such a depth that the root collar is well below the surface of the soil. The soil around the plant will be well compacted with the heel as a final step so that there is a proper bond between the ball and the surrounding soil. The earth close to the collar will be slightly elevated so that rainwater does not accumulate very close to the plant.

Species Proposed for Plantation

Sl. No.	Local Name	Scientific Name
1	Jamun	*Syzygium cumini*
2	Kurum	*Adina cordifolia*
3	Dhaura	*Anogeissus acuminata*
4	Khair	*Acacia catechu*
5	Sisoo	*Dalbergia sissoo*
6	Neem	*Azadirachta indica*
7	Bahada	*Terminalia bellirica*
8	Harida	*Terminalia chebula*
9	Karanja	*Pongamia pinnata*
10	Amla	*Emblica officinalis*

POST PLANTING OPERATION

CASUALTY REPLACEMENT

The entire area will be gone over in the same order as the plantation was carried out and casualties, if any, will be replaced as soon as the main plantation operation is over.

WEEDING AND SOIL WORKING

Regular and efficient weeding will start immediately after sprouting of the stumps is complete or after the seedlings have started throwing up new buds.

MANURING AND INSECTICIDE APPLICATION

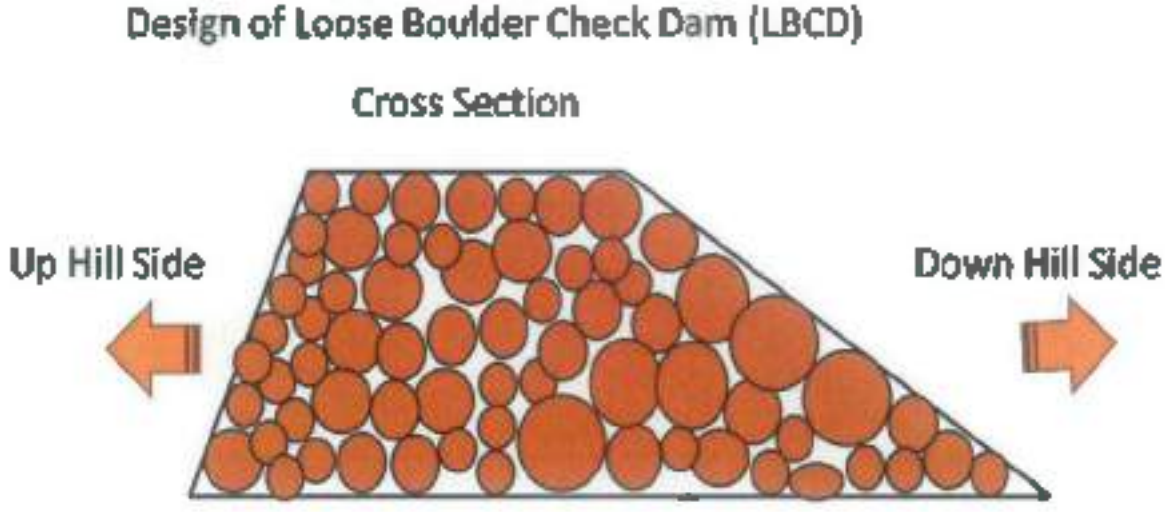
On degraded sites, urban compost or farmyard manure, wherever available, will be added to the soil while refilling the pits. As regards artificial fertilizers, the minerals required and dosage @ 50 grams of patent mixtures like 'Gromor' or N.P.K. (2:2:1) will be applied in two split doses, one in August and the other in September.

SOIL MOISTURB CONSERVATION MEASURES

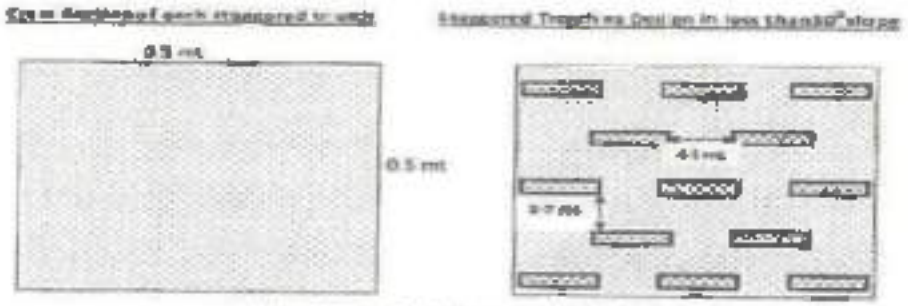
Soil Moisture Conservation Measures, structures like Staggered Trench, Contour Trench, Graded earthen bund, LBCD, Wire mesh LBCD, sub-surface dyke & WHS as per the slope & site requirement will be constructed in the plantation area.

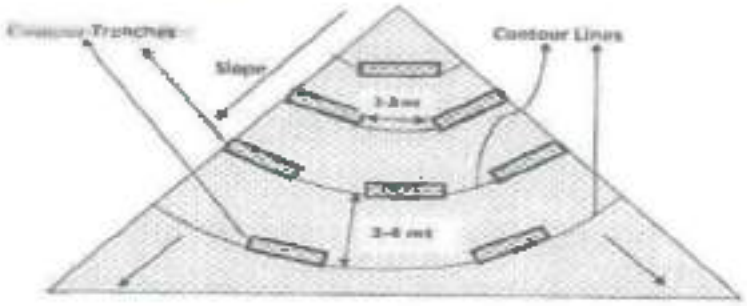
Design/Cross Section of Soil Moisture Conservation Measures structures

Loose Boulder Check Dam (LBCD)

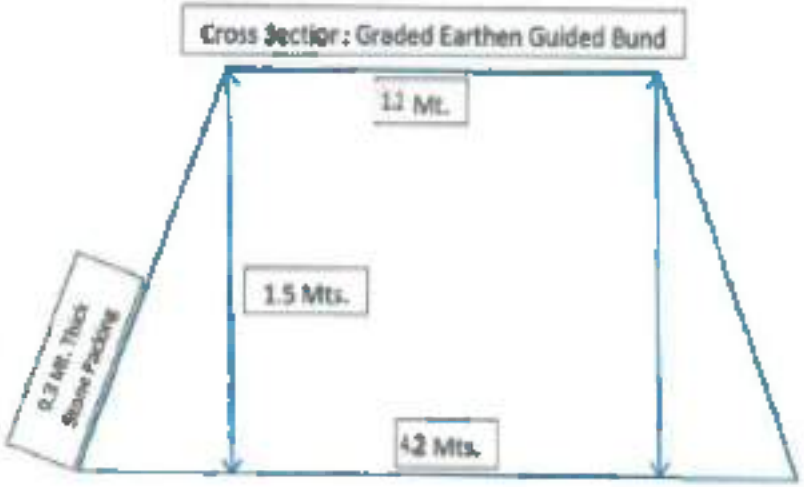


Staggered Trench (ST) and Contour Trench (CT)

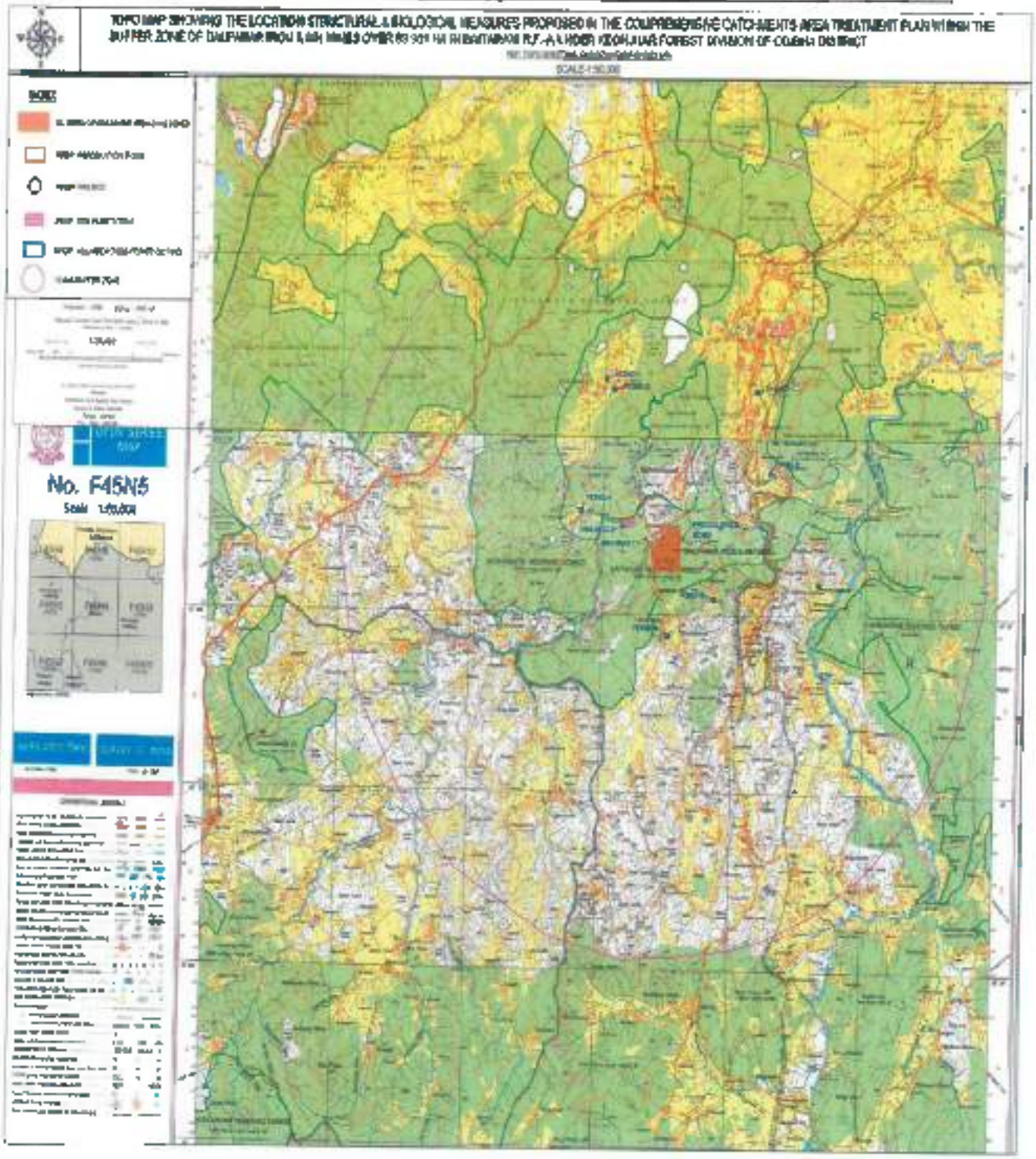




Graded Earthen Bund (GEB)



Map showing the structural & Biological measures in the buffer Zone



11. PROTECTION AGAINST FIRE AND GRAZING

Fire line tracing will be undertaken to protect the plantation from forest fire hazards, and watch & ward arrangements will be provided as per approved norms to safeguard the plantation from grazing and other biotic interferences. The cost of fire line tracing and watch & ward has been duly included in the budgetary provision under inspection and monitoring.

12. INSPECTION, MONITORING AND EVALUATION

For the successful implementation of the above treatment plan of catchment area in Buffer zone, thorough inspection and technical guidance from the relevant technical wing are necessary. The user agency shall provide sufficient fuel and conveyance charges for technical experts to ensure the proper execution of these programs. A budgetary allocation of 15% of the total project cost has been set aside for this purpose.

13. EXECUTION.

The works in the buffer zone of the present Scheme shall be executed by the User Agency having specialized departments headed by qualified persons with outsourced manpower and machinery under supervision of Divisional Forest Officer, Keonkjhar division. The entire work shall be carried out in coordination with the Forest Department and will be completed within 3 years after getting the final forest clearance. Maintenance work will be continued regularly.

14.REQUIREMENT OF FUNDS

The total estimated cost for the implementation of the Catchment Area Treatment Plan in the core zone is **Rs. 85,93,954/-** (Rupees Eighty-Five Lakh Ninety-Three Thousand Nine Hundred Fifty-Four) only.
Considering the likely increase in the cost of materials and labour during the implementation period, an additional 20% escalation charge has been incorporated into the total estimated cost to account for future price variations.

Sl. No.	Description of the Work (Buffer Zone)	Fund Required (in Rs.)
1	**STRUCTURAL MEASURES**	
A	Percolation Pond (size- 80m(L) x 50m (B) x 3m(D) for 12000 cum @ Rs.387/cum (The cost norm Enclosed as **Annexure-14**)	46,44,000.00
B	Construction of of silt traps up stream of the pond= Rs.31948 x 1no (The cost norm already Enclosed as **Annexure-2**)	31,948.00
C	Construction of over flow spillway of the pond= Rs.41575 x 1no (The cost norm already Enclosed as **Annexure-3**)	41,575.00
D	Construction of two nos Wire Mesh Loose Boulder Check Dams (WMLBCD) for 84.5 cum@ Rs.5700/- per cum. (The cost norm Enclosed as **Annexure-15**)	4,81,650.00
E	De-silting of 8 nos Village Pond of 12118 cum with ancillary activities within 5 km of the Mine Lease Boundary	The financial forecast of these items has already been provided in the scheme imposed in Condition No. 2.xxiv . So, no extra budgetary provision has been suggested.
	1. Total	**Rs. 51,99,173.00**
	BIOLOGICAL MEASURE	
A	RDF Plantation (200 no./ha.) of the over 23 ha. @ Rs. 1,22,694/- per ha and Soil Moisture Conservation (SMC) over 23 ha @ Rs. 45,475/- per ha (as per base norm of Matrix for the year 2026-27)	The financial forecast of these items has already been provided in the scheme for gap planting and soil moisture conservation activities to restock and rejuvenate the degraded open forest located in the area within 100 mtrs. From outer perimeter of the mining lease imposed in Condition No. 2.xxiii . So, no extra budgetary provision has been suggested.

B	Rising of Nursery 2000(18 months) seedlings @ Rs.51.70 per seedling. (The cost norm Enclosed as **Annexure-16**).	1,03,400.00
C	ANR Plantation (200 no/Ha) over 5.5 ha @ Rs. 1,22,694/- (as per base norm of Matrix for the year 2026-27 attached as **Annexure-17**).	6,74,817.00
D	Soil Moisture Conservation (SMC) over 5.5 ha @ Rs. 45,475/- per ha /- (as per base norm of Matrix for the year 2026-27 attached as **Annexure-18**).	2,50,112.50
	2. Total	10,28,329.50
	Sub Total (1+2)	62,27,502.50
	Inspection and monitoring charges @ 15%	9,34,125.38
	Sub-Total	71,61,627.88
	Price escalation @ 20%	14,32,325.58
	Grant Total	85,93,953.46 or say **Rs. 85,93,954/-**

(Rupees Eighty-Five Lakh Ninety-Three Thousand Nine Hundred Fifty-Four) only

ABSTRACT OF THE TOTAL COSTS FOR IMPLIMENTATION OF COMPREHENSIV E CATCHMENT AREA TREATMENT WITHIN THE CORE ZONE AND BUFFER ZONE OF DALPAHAR IRON & MANGANESE MINES.

SL.No.	IMPLEMENTATION AREA	ESTIMATED FUND IN RS.
1	CORE ZONR (within the ML Area)	**Rs. 1,40,08,852.00**
2	BUFFER ZONE	**Rs. 85,93,954.00**
	TOTAL	**Rs. 2,26,02,806.00**

Asst. Conservator of Forest
I/C, Champua Forest Range

Divisional Forest Officer,
Keonjhar Division

Technically Approved
Regional Chief Conservator of Forests
Rourkela Circle

CONCLUSION

The Catchment Area Treatment Plan (CATP) for the Dalpahar Iron & Manganese Ore Mine has been formulated as a comprehensive and integrated strategy to mitigate the environmental impacts associated with mining activities and to ensure sustainable management of land and water resources.

The study of the catchment area indicates that the region is characterized by undulating to hilly terrain, moderate to steep slopes, dendritic drainage pattern, and significant monsoonal rainfall. These factors contribute to increased surface runoff, soil erosion, and sediment transport, particularly in disturbed areas such as mine pits, overburden dumps, and haul roads.

Based on detailed analysis using field investigations, Remote Sensing and GIS techniques, and hydrological assessment, erosion-prone and runoff-contributing zones have been identified. Appropriate structural and biological measures have been designed to address these issues effectively.

The proposed structural measures, including garland drains, check dams, settling tanks, recharge shafts, and sedimentation ponds, will significantly reduce runoff velocity, control sediment transport, and prevent siltation of downstream water bodies. Simultaneously, biological measures such as afforestation, vetiver plantation, agave plantation, and grass turfing will enhance slope stability, improve soil binding, and restore ecological balance.

The plan also emphasizes efficient rainwater harvesting and groundwater recharge through scientifically designed recharge structures, thereby contributing to water resource sustainability within the mining lease area.

The implementation of the CAT Plan is expected to:

- Reduce soil erosion and sediment load
- Improve surface water quality
- Enhance groundwater recharge potential
- Stabilize overburden dumps and disturbed slopes
- Maintain natural drainage systems
- Support ecological restoration of the area

Further, a structured monitoring and maintenance framework has been incorporated to evaluate the performance of the implemented measures and ensure their long-term effectiveness.

In conclusion, the Catchment Area Treatment Plan provides a technically sound, environmentally sustainable, and regulatory-compliant approach for managing the impacts of mining activities in the Dalpahar region. With proper implementation and periodic monitoring, the plan will significantly contribute to environmental protection, resource conservation, and sustainable mining practices.

EXPECTED OUTCOMES OF CAT PLAN IMPLEMENTATION

The implementation of the proposed Catchment Area Treatment Plan is expected to result in significant environmental, hydrological, and ecological improvements within the mining lease area and its surrounding catchment.

1. Reduction in Soil Erosion

- Soil erosion rates are expected to reduce by 40–60% due to slope stabilization, vegetation cover, and structural interventions.
- Loose soil from overburden dumps and exposed surfaces will be effectively controlled.

2. Control of Sediment Load

- Check dams, settling tanks, and silt traps will significantly reduce sediment transport.
- Expected reduction in sediment load entering drainage channels: ~50%.

3. Improved Surface Water Quality

- Reduction in turbidity and suspended solids in runoff water.
- Prevention of siltation in nearby streams and water bodies such as Kundra River.

4. Enhanced Groundwater Recharge

- Recharge shafts, ponds, and percolation structures will increase groundwater recharge.
- Estimated improvement in recharge potential: 15–25% in valley and pediment zones.

5. Effective Runoff Management

- Reduction in peak runoff discharge by 25–35% through staggered structural interventions.
- Improved water storage and reuse for dust suppression and plantation.

6. Stabilization of Overburden Dumps

- Vetiver and agave plantation will strengthen dump slopes and prevent erosion.
- Reduction in slope failure risk and surface runoff velocity.

---

7. Increase in Vegetation Cover

- Block plantation and natural regeneration will enhance green cover.
- Improvement in biodiversity and ecological resilience of the area.

---

8. Restoration of Hydrological Balance

- Improved infiltration and reduced surface runoff will help restore natural water balance.
- Maintenance of natural drainage pathways.

---

9. Compliance with Regulatory Requirements

- Ensures compliance with MoEF&CC Forest Clearance conditions.
- Supports environmental clearance and sustainable mining certification.

---

10. Long-Term Environmental Sustainability

- Integrated approach ensures long-term stability of landforms.
- Supports sustainable mining with minimal ecological disturbance.

Asst. Conservator of Forest
I/C, Champua Forest Range

Divisional Forest Officer,
Keonjhar Division

REFERENCES

- **India Meteorological Department (IMD).** (Year of data). *Rainfall data for Keonjhar District.* Retrieved from India Meteorological Department website: https://mausam.imd.gov.in
- **Odisha State Disaster Management Authority (OSDMA).** *Rainwater & disaster related climate data.* Retrieved from https://sdma.odisha.gov.in
- **National Geospatial Data Repository (NGDR) Portal.** (Year). *Geology and Geomorphology Maps.* Retrieved from https://ngdr.in
- **U.S. Geological Survey (USGS).** (Year). *Digital Elevation Model (DEM) Data.* Retrieved from https://earthexplorer.usgs.gov
- **Shuttle Radar Topography Mission (SRTM).** (Year) *SRTM DEM Data for Keonjhar region.* U.S. Geological Survey Retrieved from https://earthexplorer.usgs.gov
- **Remote Sensing and GIS Websites.** (Year). *Various datasets for satellite imagery and GIS analysis.* Retrieved from public remote sensing portals (e.g., https://earthexplorer.usgs.gov, https://glovis.usgs.gov)
- **Google Earth Pro.** *Imagery and spatial interpretation.* Google LLC.
- **ArcGIS Desktop / ArcGIS Pro.** (10.8 Version). *GIS software used for spatial analysis.* ESRI.
- **Global Mapper.** *GIS processing and terrain analysis software.* Blue Marble Geographics.
- **Central Ground Water Board (CGWB).** (*District Groundwater Brochure – Keonjhar District.* Ministry of Jal Shakti, Government of India. Retrieved from CGWB official website.
- **Central Pollution Control Board (CPCB).***Environmental quality reports / monitoring data.* Ministry of Environment, Forest and Climate Change, Government of India. Retrieved from https://cpcb.nic.in
- **State Pollution Control Board (SPCB), Odisha.** (Year). *State environmental monitoring data.* Retrieved from Odisha SPCB official website.
- **Cost Estimation References:**

- **Central Public Works Department (CPWD).** (Year). *Delhi Schedule of Rates (DSR).* CPWD, Government of India.
- **National Highway Authority of India (NHAI).** (Year). *Manual of Specifications and Standards / Cost Data.* Government of India.
- **Rural Development Department, Government of Odisha.** (Year). *Schedule of Rates / Cost Guidelines* (if used).

ANNEXURE-1

Measure to be taken for construction of pond:
Wage Rate Rs.462/- per mandy

TYPE OF STRUCTURE	POND
LOCATION	Within ML Area (near ML pillar no.5)
Latitude	21°58' 12.96"N
Longitude	85°23'32.17"E
LENGTH	80
WIDTH	60
HEIGHT	3
VOLUME IN CUM	14400
UNITS	1
TOATAL QTY IN CUM	14400
COST /CUM	Rs.387/-
TOTAL COST	Rs. 55,72,800/-

WATER BODY (80m X 60m X 3m)					
SL No	Item of Work	Qty	Unit	Rate (in Rs.)	Amount (in Rs.)
1	Earth Work in excavation in stony earth and gravels mixed with stone and boulders not exceeding .014cum in volume within 50met. initial lead and 1.5met initial lift inducing rough dressing and breaking clods etc complete.				
	40m x 30m x 3.0m	14400	Cum	373/-	53,71,200.00
2	Extra lift of 1.5meter or part there of over the initial lift of 1.5 meter for earth work in all kinds of embankment and roads works and ordinary earthwork in general.				
		7200	Cum	28/-	2,01,600.00
	Total:-				55,72,800.00
		Rate for 1cum			Rs.387.00

Analysis of Rate for Water Body					
1	Earth Work in excavation in stony earth and gravels mixed with stone and boulders not exceeding .014cum in volume within 50met. Initial lead and 1.5met. Initial lift including rough dressing and breaking clods etc. complete.	M.Mulla	0.34	462	157.08
		W.Mulla	0.34	462	157.08
		Total:-			314.16
		Over head charges 7.5%			23.56
		Contractor Profit 10%			31.42
		Total:-			369.14
		Labour Cess 1%			3.69
		Rate per Cum			372.83 or say Rs.373.00
2	Extra lift of 1.5meter or part there of over the initial lift of 1.5meter for earth work in all kinds of embankment and roads works and ordinary earthwork in general.	M.Mulla	5	462	2310
		Rate for 100 cum			2310
		Over head charges 7.5%			173.25
		Contractor Profit 10%			231.00
		Total:-			2714.25
		Labour Cess 1%			27.14
		Total:-			2741.39
		Rate per Cum			27.41 or Rs. 28.00

ANNEXURE-2

ESTIMATE OF SILT TRAP

1. Typical Silt Trap Design

Recommended Size :

- Length: 3.0 m
- Width: 1.5 m
- Depth: 1.5 m
- Freeboard: 0.30 m

Construction Materials

- Brick masonry / stone masonry in cement mortar
- PCC base (1:3:6)
- Inlet and outlet stone pitching or concrete protection

2. Approximate Quantity Estimate (One Silt Trap)

a. Excavation

Excavation volume

= 3.0 × 1.5 × 1.5

= 6.75 m³

b. PCC Bed (100 mm thick)

= 3.0 × 1.5 × 0.10

= 0.45 m³

c. Brick/Stone Masonry (230 mm thick walls)

Perimeter

= 2(3 + 1.5) = 9 m

Wall volume

= 9 × 1.5 × 0.23

= 3.10 m³

d. Plaster (12 mm both sides)

Surface area

= 9 × 1.5 × 2

= 27 m²

3.Cost Estimate

Item	Quantity	Rate (₹)	Amount (₹)
Excavation	6.75 m³	200	1,350.00
PCC	0.45 m³	7,500	3,375.00
Brick/Stone Masonry	3.10 m³	5,500	17,050.00
Plaster	27 m²	250	6,750.00
		Total	**28,525.00**
		Contingency charges @12%	3423
		G.total	**Rs.31,948.00**

ANNEXURE-3

ESTIMATE OF SPILLWAY

1. **Typical Design Spillway**
   - Spillway type: **Open rectangular masonry / concrete spillway**
   - Spillway width: **2.0 m**
   - Spillway depth: **1.0 m**
   - Spillway length: **5.0 m**
   - Side wall thickness: **0.30 m**
   - Bed concrete thickness: **0.20 m**

---

2. Quantity Estimate

a. Earthwork Excavation

Excavation for spillway channel

Volume=Length×Width×DepthVolume = Length \times Width \times DepthVolume=Length×Width×Depth

= 5 × 2.6 × 1.2

= 15.6 m³

---

b. PCC Bed Concrete

Thickness = 0.20 m

Volume=5×2×0.20Volume = 5 \times 2 \times 0.20Volume=5×2×0.20

= 2.0 m³

---

c. Masonry in Side Walls

Wall height = 1.0 m

Thickness = 0.30 m

Volume=2×(5×1×0.30)Volume = 2 \times (5 \times 1 \times 0.30)Volume=2×(5×1×0.30)

= 3.0 m³

---

d. Plastering

Both side walls

Area=2×(5×1)Area = 2 \times (5 \times 1)Area=2×(5×1)

= 10 m²

---

2. Cost Estimate

Item	Quantity	Rate (₹)	Amount (₹)
Excavation	15.6 m³	200	3,120.00
PCC	2.0 m³	7,500	15,000.00
Brick/Stone Masonry	3.0 m³	5,500	16,500.00
Plaster	10 m²	250	2,500.00
		Total	**37,120.00**
		Contingency charges @12%	4454.40
		G.total	**Rs. 41,574.40 or say Rs.41,575/-**

ANNEXURE: 4

Detail Estimate of construction of Catch/Garland Drain

Sl No	Description of Items	No	Length	Width	Height	Qty	Unit	Rate	Amount
1	Cleaning of Jungles & bushes	1.0	200.00	7.00		1400.00	Sqm	4.00	5600.00
2	Earth work in hard soil in embankment roads within 50 mtrinitial lead &1.50 mtrinitial lift including rough dressing &breaking clods to Maximum 5.00c.m. to 7.00 c.m.Staying layers not exceeding 0.30 mtr depth as per specification approved by department along with proper compaction with H.R.R Excavation	1	200.00	2.00	0.75	300.00	Cum	197.1	59130.00
3	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be Supplied by the Company through contractual manner)	2	3.00	2.00	0.30	3.60	Cum	919.47	3310.09
									68040.09
		Rate pet two Hundred meter Length				Total			Say Rs. 68040/-

Rate/Running metre length – Rs. 340.20 or Rs.341/-

ANNEXURE: 5

Detail Estimate of Loose Boulder Structure (L.B.S.)

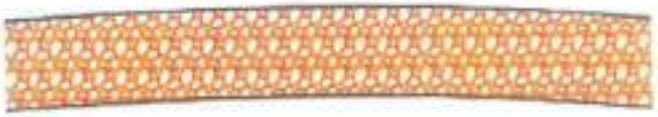
Wage rate Rs.462/per manday

Span of 2 Mtr. Size

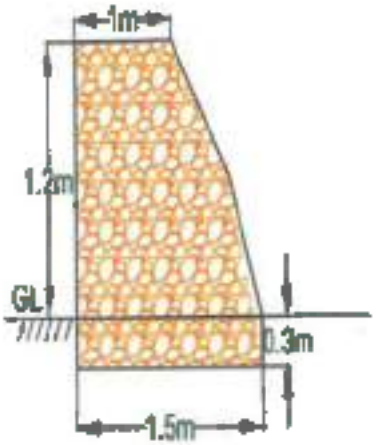
Sl No.	Item of activity	Cost per unit (Rs.)	Total unit(No/ Cum)	Total cost (in Rs.)
1.	Levelling the unshaped surface of the selected site & layout the structure foundation L.S. 1 MD.	462	1	462.00
2.	Excavation of foundation in hard soil within initial lead of 50 mtr. including rough dressing and breaking of clods to maximum size 5 cm. to 7 cm. laying in layer not exceeding 0.3 in depth to strengthening both side U/S approx. bund of loose boulder structure.	197.10	3.63	715.47
	Base with apron:- 1 x 3.70 x 3.00 x 0.30 = 3.33			
	Wing wall- 4 x 0.50 x 0.50 x 0.30 = 0.30			
	@ Rs.19710.00 per 100 cum.			
3.	**Rough stone dry packing**	2859.35	8.65	24733.38
	up to GL			
	Base with apron- 1 x 3.70 x 3.00 x 0.30 =3.33			
	Wing wall- 4 x 0.50 x 0.50 x 0.30 = 0.30			
	Above GL			
	Super structure 1 x 2.00 x [2.70 + 0.60)/2 x 0.60 =1.980			
	Wing wall- 4 x 0.50 x 0.50 x 0.50 =0.50			
	Side wall:-			
i.	2 x (0.50 + 1.10)/2 x 0.9 x 0.5 =0.72			
ii.	2 x (0.5 + 1.10)/2x 1.2 x 0.5 = 0.96			
iii.	2 x 0.6 x 0.6 x 0.5 =0.36			
iv.	2 x 1.0 x 0.5 x 0.5 =0.50			
	@ Rs.2859.35 per cum			
	G. Total per Loose Boulder Structure of span of 2 Mtrs			25910.85 or Rs.25911/-

ANNEXURE – 6

Design Of Retaining Wall



PLAN VIEW OF RETAINING WALL



CROSS SECTION VIEW OF RETAINING WALL

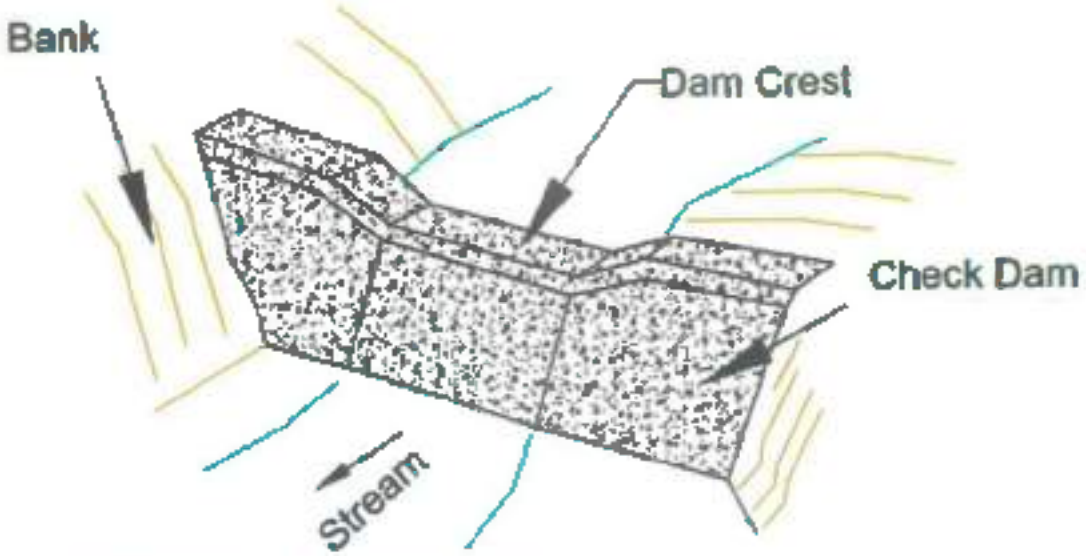
Detail Estimate of Retaining wall of loose local Boulder with cement-Sand Patching over the surface of Boulder wall

Sl. No.	Description of Items	No	Length	Width	Height	Qty	Unit	Rate	Amount in Rs
1	2	3	4	5	6	7	8	9	10
For one K.M.Length									
1	Clearing of Jungles & bushes	1	1000	1.5		1500	Sqm	4.00	6000 00
2	Earth work in hard soil in embankment roads with in 50 mtr initial lead &1.50 mtr initial lift including rough dressing &breaking clods to Maximum 5.00c.m. to 7.00 c.m.& laying layers not exceeding 0.30 mtr depth as per specification approved by department along with proper compaction with H.R.R Excavation	1	1000	1.5	0.3	450	Cum	197 1	88,695.00
3	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be Supplied by our Company)	1	1000	(1.00+ 1.50)/2	1.20	1500	Cum		
		1	1000	1.50	0.30	450	Cum		
		Total				1950	Cum	919.47	1792966.50
4	Irregular cement sand patches on the both side of the wall with 2" thick cement sand mortar (1:6) on top	1	1000	1.00		1000	Sqm		
		2	1000	1.20		2400	Sqm		
						3400	Sqm	125.00	425000.00
		Rate per one K.M. Length				Total			23,12,661.5 Say Rs. 23,12,668/-

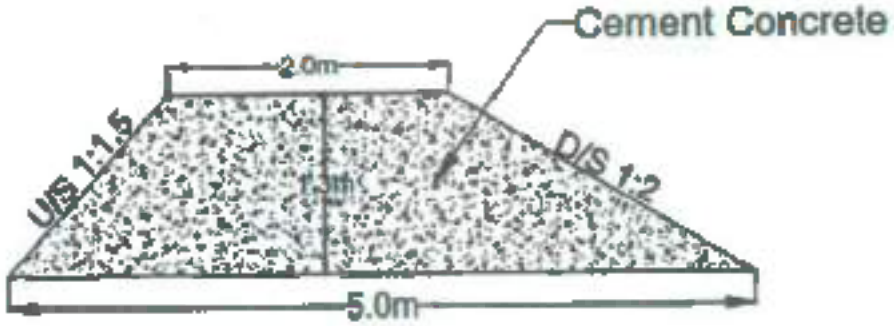
Cost of Running Meter Length Rs. 2313/-

ANNEXURE –7

Design of Check Dam



Side View of Check Dam



Cross Sectional View of Check Dam

Detail Estimate of Concrete Structure of Check Dam

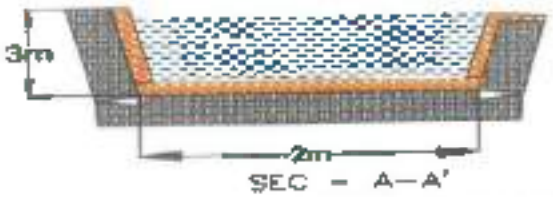
Sl No	Description of Items	No	Length	Width	Height	Qty	Rate	Amount in Rs
1	2	3	4	5	6	7	8	9
1	Earth working in hard soil embankment roads with in 50 mtr initial lead &1.50 mtr initial lift including rough dressing &breaking clods to Maximum 5.00c.m. to 7.00 c.m.&laying layers not exceeding 0.30 mtr depth as per specification approved by department along with proper compaction with H.R.R Excavation							
	Base	1	5.00	5.50	0.50	13.75		
	Wing Wall	4	2.00	0.50	0.50	2.00		
	Appron	2	3.00	5.00	0.20	6.00		
	Cut of wall	2	5.00	0.45	0.50	2.25		
						24.00	197.10	4730.40
2	Plain cement concrete (1:4:8)							
	Base	1	4.00	5.50	0.075	1.65		
	Wing Wall	4	2.00	0.50	0.08	0.30		
	Appron	2	3.00	5.00	0.08	2.25		
	Cut of wall	2	4.00	0.45	0.08	0.27		
						4.47	4600.00	20562.00
3	Cement concrete (1:2:4)							
	Below Ground Level							
	Base	1	4.00	5.50	0.40	8.80		
	Wing Wall	4	2.00	0.50	0.40	1.60		
	Appron	2	3.00	5.00	0.10	3.00		
	Cut of wall	2	4.00	0.45	0.50	1.80		
						15.20		
	Above Ground Level							
	Base	1	4.00	(2.00+ 5.00)/ 2	1.00	14.00		
	Wing Wall	4	2.00	0.40	1.00	3.20		
					Total	17.20		
				Grand Total		32.40	6478.00	209887.2
	Rate per one No Check Dam. Length=4.00 mtrHt=1.30 mtr Slope U/S=1:1.5 D/S=1:2					Total		2,35,179.60 Say Rs. 235180/-

(Rupees two lakh thirty five thousand one hundred and eight) only.

ANNEXURE – 8

Design Of Settling Tank

PLAN VIEW OF SETTLING TANK



CROSS SECTIONAL VIEW OF SETTLING TANK

ESTIMATE FOR PER RMT CONSTRUCTION OF SETTLING TANK
(Length: 3m., width: 2.0m. height: 1m.)

Sl No	Description of Items	No	Length	Width	Height	Qty	Unit	Rate	Amount
1	Earth work in hard soil in embankment roads within 50 mtr initial lead &1.50 mtr initial lift including rough dressing &breaking clods to a Maximum 5.00c.m. to 7.00 c.m., & laying layers not exceeding 0.30 mtr depth as per specification approved by the department, along with proper compaction with H.R.R Excavation	1	3.00	2.00	1.0	6.00	Cum	197.1	1182.60
2	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be supplied by our Company)	1	3.00	4.00	0.20	2.40	Cum	919.47	2206.73
3	Transportation charges for 5.00 K.M. lead by truck load from quarry to work site with all costs of , labour, T. & P. etc. all complete in all respects as per specification and direction of	As same as Item No-2				2.40	Cum	200.00	480.00
								Rate per one No Settling tank of 6 Cum	3869.33
Cost for								**Per 1 Cum Rs.645/-**	**Rs.3870.0**

ANNEXURE -9

ENGAGEMENT OF HEMM (HEAVY EARTH MOVING MACHINERIES) ON THE OB DUMP SLOPE FOR TERRACING

Location – Over Burden Dump –work efficiency per hour – 18SqM on the dump.
Width & height of the terrace – 5 m. & 5 m.
Rate for engagement of HEM machine per SqM – Rs. 2400/hr.
i.e. Rs. 2400/18
=Rs. 133.33/-, say Rs. 134/-

ANNEXURE-10

Cost Estimate for Recharge Shaft

Sl. No	Item Description	Quantity	Unit	Rate (₹)	Amount (₹)
1	Earthwork excavation in ordinary soil (1.5m dia × 10m depth ≈ 222.5 m³)	223	m³	350	78,050
2	Disposal of excavated material	223	m³	150	33,450
3	Brick / RCC lining (if provided)	592	m²	900	5,32,800
4	Providing & laying gravel and pebble filter media	151	m³	1200	1,81,200
5	Coarse sand filling	63	m³	1000	63,000
6	Perforated PVC pipe (160–200 mm dia)	126	m	800	1,00,800
7	RCC slab cover with manhole cover	1	LS	12,000	12,000
				Total	10,01,300.00
				Overhead charges 7.5%	75,097.50
				Contractor Profit 10%	1,00,130.00
				Total	11'76,527.50
				Labour Cess 1%	11,765.28
	TOTAL COST PER STRUCTURE				₹ 11,88,292.78 or say ₹11,88,293/-

ANNEXURE – 11

Estimate for Vetiver Plantation (Bens) on the OB dump slopes per ha.

Cost norm, Wages - Rs.462/-

Sl. No	Name of the Work	Man Days	Manpower Cost	Material in Rs	Total Cost in Rs
	1st YEAR OPERATION				
1	Site clearance, alignment and stacking	2	924	0	924
2	Cost of lining materials including transportation.	0	0	1,500	1,500
3	Staking and digging of pits.	20	9,240	0	9,240
4	Cost of Clumps 500 per IIa including transportation.	0	0	16,000	16,000
5	Carriage and planting	30	13,860	0	13,860
6	Soil working and application of fertilisers(twice)	10	4,620	0	4,620
7	Cost of fertiliser	0	0	1,500	1,500
8	Watch and ward	2	924	0	924
	Total	**64**	**29,568**	**19,000**	**48,568**
	2nd YEAR OPERATION				
9	Causality replacement (20%) including cost of clumps.	10	4,620	3,200	7,820
10	Weeding and application of fertilisers	20	9,240	0	9,240
11	Cost of fertilisers and insecticides	0	0	1,500	1,500
12	Watch and ward	2	924	0	924
	Total	**32**	**14,784**	**4,700**	**19,484**
	3rd YEAR OPERATION				
13	Weeding, soil working and application of fertilisers.	10	4,620	0	4,620
14	Plant protection measures including watch and ward	2	924	0	924
	Total	**12**	**5,544**	**0**	**5,544**
4TH YEAR TO 10TH YEAR		**84**	**38,808**	**0**	**38,808**
	Grand Total	**192**	**88,704**	**23,700**	**1,12,404**

ABSTRACT

Year of operation	Cost norm per Ha
1st year	48,568
2nd year	19,484
3rd year	5,544
4th to 10th year	38,808
Total	**1,12,404**

ANNEXURE – 12

COST NORM FOR AGAVE PLANTATION (FOR 5 ROWS & 40 MTRS.

Wage Rate: 462.00

Sl.No	Name of the Work	Man-Day	Man Power Cost	Material	Total
	FIRST YEAR OPERATION				
1	Site clearance alignment and stacking	2	924	0	924
2	Cost of lime materials including transportation	0	0	660	660
3	Digging pits and application of lime	6	2,772	0	2,772
4	Cost of 200 Ac. (sucker) including transportation	0	0	3320	3,320
5	Carriage and planting	2	924	0	924
6	Soil working and application of fertilizers (twice) and lime	8	3,696	0	3,696
7	Cost of fertilizer	0		740	740
8	Contingency	0		740	740
	Total:-	**18**	**8,316**	**5460**	**13,776**
	SECOND YEAR OPERATION				
1	Causality replacement (20%) including cost of suckers and pitting	2	924	664	1,588
2	Weeding and application of fertilizer and lime	6	2,772	0	2,772
3	Cost of fertilizer insecticides & lime			500	500
	Total:-	**8**	**3,696**	**1,164**	**4,360**
	THIRD YEAR OPERATION				
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**

FOUR YEAR OPERATION					
1	Weeding, cleaning, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
FIVE YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
SIX YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
SEVEN YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
EIGHT YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**

	NINE YEAR OPERATION				
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
	TEN YEAR OPERATION				
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
				Grand Total : -	**48,812**

Cost norm for agave fencing with five rows per km for 10 Year 48812/40 X 1000 = **Rs.12,20,300/-**

Annexure- 13

COST OF GRASS SEED SOWING PER HA.

Wage Rate Rs.462.00

Sl No	Purpose	No of Labour / Quantity of materials	Rate (Rs.)	Amount (Rs.)
1	Spreading of good top soil	03 Nos	462 / labour	1386
2	Adding FYM and good earth	2 TL FYM	1506.48 /TL FYM	6025.92
		2TL good earth	1506.48 /TL Good earth	
3	Cost of gross seed 500Kg/ per ha		95/kg	47,500.00
4	Broadcasting	10 nos.	462.00/ labour	4620.00
			Total	59531.92 Or, 59,532.00

ANNEXURE-14

Measure to be taken for construction of pond:
Wage Rate Rs.462/- per manday

TYPE OF STRUCTURE	POND
LOCATION	lower elevation area near the convergence point of the hill slope within the Baitarani Reserve Forest
Latitude	21°58' 33.74"N to 21°58' 33.93"N
Longitude	85°24'0.82"E to 85°24'3.47"E
LENGTH	80
WIDTH	50
HEIGHT	3
VOLUME IN CUM	12000
UNITS	1
TOATAL QTY IN CUM	12000
COST /CUM	Rs.387/-
TOTAL COST	Rs. 46,44,000/-

WATER BODY (80m X 60m X 3m)					
SL No	Item of Work	Qty	Unit	Rate (in Rs.)	Amount (In Rs.)
1	Earth Work in excavation in stony earth and gravels mixed with stone and boulders not exceeding .014cum in volume within 50met. Initial lead and 1.5met. Initial lift including rough dressing and breaking clods etc. complete.				
	40m x 30m x 3.0m	12000	Cum	373/-	44,76,000.00
2	Extra lift of 1.5meter or part there of over the initial lift of 1.5meter for earth work in all kinds of embankment and roads works and ordinary earthwork in general.				
		6000	Cum	28/-	1,68,000.00
	Total:-				46,44,000
		Rate for 1cum			Rs.387.00

Analysis of Rate for Water Body				
1	Earth Work in excavation in stony earth and gravels mixed with stone and boulders not exceeding .0'4cum in volume within 50met. Initial lead and 1.5met. Initial lift including rough dressing and breaking clods etc. complete.	M.Mulia	0.34	462	157.08
		W.Mulia	0.34	462	157.08
		Total:-			314.16
		Over head charges 7.5%			23.56
		Contractor Profit 10%			31.42
		Total:-			369.14
		Labour Cess 1%			3.69
		Rate per Cum			372.83 or say Rs.373.00
2	Extra lift of 1.5meter or part there of over the initial lift of 1.5meter for earth work in all kinds of embankment and roads works and ordinary earthwork in general.	M.Mulia	5	462	2310
		Rate for 100 cum			2310
		Over head charges 7.5%			173.25
		Contractor Profit 10%			231.00
		Total:-			2714.25
		Labour Cess 1%			27.14
		Total:-			2741.39
		Rate per Cum			27.41 or Rs. 28.00

ANNEXURE-15

Model Estimate of Wire Mesh LBCD
Wage rate @ Rs.462/- per Manday

Providing & making Gabion structure with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh Gabion Boxes as per IS 16014:2012,MORTH Clause 2500, of required size, Mesh Type 10x12 (D=100 mm with tolerance of ± 2%) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedges with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter

2.2mm,supplied @3% by weight of Gabion boxes filled with boulders with least dimension of 200 mm.

Details of Cost for: 2.00 Cum

SL No	Description	Unit	Quantity	Rate (In Rs.)	Amount (In Rs.)
MATERIALS:					
1	Crates made of GI Mesh Type 10x12 (D=100 mm with tolerance of ± 2%) Zinc coated, Mesh wire diameter 3.0 mm) For size 2 m X 1m X 1 m. Surface area is 11.00 Sqm	Sqm	11	600	6600
Stone boulder with least dimension 200 mm		Cum	2	1000	2000
	Total (A)				8600
LABOUR:					
Male		Day	0.1	562	56.2
Mason Second class		Day	0.5	512	256
Man Mulia		Day	1.5	462	693
	Total (B)				1005.2
	Total (A+B)				9605.2
Add OH Charges @ 7.5% on (A+B)					720.39
Contractor Profit @ 10 % on (A+B)					960.52
	Total:-				11286.11
	Add LC @ 1%				112.86
	Total:-				11,398.97or say 11,400.00
	Cost for 2.00 Cum				11,400.00
	Cost for 1.00 Cum				5,700.00

Annexure- 16

Nursery Cost Norm for raising of 1000 (12 months) seedlings

Wage Rate @ 462 Rs per Man Day

Sl. No	Items of work	Preferable Period of Execution	Unit	Unity Cost in Rs	No./Qty.	Labour Cost (Rs.)	Material cost (Rs.)	Total cost (Rs.)
1st Financial Year (Seedlings Cost for 3 Months)								
1	Cost of Polythine Bag (12" x 8"x 400 gauge) 80 nos /kg=12.5 kg@Rs 208per kg (including GST)	Nov- Dec	Kg	208	12.5	0	2600	2600
	Procurement of raw & crude Polypot Mixture							
2	(i) Soil	Nov- Dec	Cft	15	70	0	1050	1050
	(ii) Sand	Nov- Dec	Cft	20	35	0	700	700
	(iii) COW/ Vermi compost/ Bio-Fertilizers,etc.	Nov- Dec	Cft	40	35	0	1400	1400
	(iv) Insecticide/ Bio-Pesticide	Nov- Dec	Kg	150	6	0	900	900
3	Preparationof Soil Mixture includes Pulverisation, Straining & mixing the ingredients Properly	Nov- Dec	MD	462	8	3696	0	3696
4	Filling of polythene bags & Setting in the bed	Nov- Dec	MD	462	12	5544	0	5544
5	Collection of Seed GradingG & Treatment	Dec	MD	462	2	924	100	1024
6	Preparation of germination bed,Sowing of seed and Mulching including cost of materials	Jan	MD	462	1	462	100	562
7	Dibbling of seeds/Picking out the Seedlings from germination beds , transplanting in the poly bags and providing sheds including cost of materials	Feb	MD	462	2	924	500	1424
8	Watering for 3 months	Jan - Mar	MD	462	10	4620	0	4620
9	Contingencies (Water can, Buckets, Nursery shed, Electricty charges/ Diseal charges Maintenance of pump set and accessories & any other)					0	500	500
	Total				95	18170	7850	24020
2nd Finance year								
1	Watering for 3 months	April-June	MD	462	10	4620	0	4620
2	Weeding,Sorting,Grading & other operations	April-Mar	MD	462	12	5544	0	5544
3	Cost of Insecticide/Bio-pesticide/Ivermuta/Herbal based plant growing products					0	550	550
4	Watering	Oct - Mar	MD	462	20	9240	0	9240
5	Contingencies (Electricty charges/ Diesel charges Maintenance of pump set and accessories & any other)					0	670	670
	Total				42	19404	1220	20624
3rd Finance year April-June								
1	Watering for 3 months	April-June	MD	462	10	4620	0	4620
2	Weeding,Sorting,Grading , Root cutting & other operations	April-June	MD	462	3	1386	0	1386
3	Cost of Insecticide/Bio-pesticide/Ivermuta/Herbal based plant growing products	April-June				0	800	800
4	Contingencies (Electricty charges/ Diesel charges Maintenance of pump set and accessories & any other)					0	250	250
	Total				13	6006	1050	7056

ABSTRACT

Sl.No	Year	No of Man Day	Labour Cost (	Material cost (Rs.)	Total cost
1	1 st Finance Year (3 Months)	95	18170	7850	24020
2	2 nd Finance Year (12 Months)	42	19404	1220	20624
3	3 rd Finance Year (3 Months)	13	6006	1050	7056
Total		90	41580	10120	51700

Cost per 12 months old Seedling = Rs. 51700/1000= Rs. 51.70

Annexure-17

COST STRUCTURE OF PLANTATION, PROVISION OF FUNDS AND UTILIZATION

ANNEXURE-6

Base Cost Norms for Compensatory Afforestation through Aided Natural Regeneration (ANR) @ 200 Seedlings/Ha. (18 months old seedling)

WAGE RATE Rs. 311/- PER MANDAY

Sl. No	Items of work	Preferable Period of Operation	No of Mandays	Labour Cost (in Rs.)	Material Cost (in Rs.)	Total cost (in Rs.)
	0th Year (Advance work) Pre-Plantation Operation					
1	Survey, Demarcation and Pillar pitting	Nov/Dec	2	622	0	622
2	Preparation of Treatment Map (Digital Map)	Nov/Dec	1	311	100	411
3	Site preparation	Nov/Dec	2	622	0	622
4	Silvicultural operations including clearing of weed, cutting of climber, high stump cutting, stacking of slashes & removal of cut out alien species from live fence to blank space.	Jan/Feb	15	4665	0	4665
5	Alignment and marking for digging of pits	Feb/Mar	0.5	156	0	156
6	Digging of pits (45 cm x 45 cm X 45 cm) in hard and gravelly soil	Feb/Mar	8	2488	0	2488
	Total		28.5	8863.5	100.0	8963.5
	1st Year/Planting Year					
1	Refilling of pit by altering the dugout soil of the pit, application of organic compounds/ coal/ mud & mixing the same perfectly.	June/Jul	1.5	466.5	1000	1467
2	Transportation of 10 months old polythene bag seedlings in hired truck /tractor from the permanent/Mega nursery to planting site including Loading & unloading (Average lead of 10 Kms) & stacking the seedling @ Rs.6/-/ Seedling (220 nos.)	Jul/Aug	0	0	1320	1320
3	Watering polythene bag seedlings at stacking site of plantation	Jul/Aug	0.5	155.5	0	156
4	Conveyance of polythene bag seedlings on head load from the stacking site to individual dugout pits within the planting site, applying insecticide, fertilizer & planting after scooping the soil with other applied materials and pressing the soil perfectly around the planted seedling	Jul/Aug	4.5	1399.5	0	1400
5	Cost of fertilizer & insecticide (a) NPK/ Bio-fertilizer @ 50 gms/plant as basal dose = 100kg @ Rs.70/- per kg = Rs. 7000 (b) Cow/Vermicompost/Mix Khata/any other fertilizer @ Rs. 150.00 (c) Insecticide/ Bio-pesticide @ 5 gms/plant= 1 kg @ Rs.180/- per kg = Rs. 180/-	Jul/Aug	0	0	600	600
6	Casualty Replacement @ 10% (20 nos.)	Jul/Aug	0.5	156	0	156
7	1st weeding & Mulching	Aug/Sept	2	622	0	622
8	2nd Weeding, Soil working (Light chiseling around the plants) & Mulching	Oct/Nov	3	933	0	933
9	Tree fencing & Trenching path	Feb/Mar	3	933	0	933
10	Watch & Ward including watering as per requirement	Aug-Mar	8	2488	0	2488
	Total		23	7151	2920	10071
	2nd Year Maintenance					

Sl. No	Name of work	Preferable Period of Execution	No of Mandays	Labour Cost (in Rs.)	Natrial Cost (in Rs.)	Total cost (in Rs.)
1	Transportation of 28 seedlings from Nursery to plantation site including loading, unloading & conveyance by Tractor @ Rs.6/- per seedling	Jul	0	0	120	120
2	Pruning for casualty replacement	Jul	0.5	155.5	0.0	155.5
3	Cost of Fertilizer & Insecticide- A) Cost of Insecticide/ Bio- pesticide(Thimet/ Furate) @ 5 gms/plant = 0.1 Kg @ Rs.150/- per kg = Rs.15/- B) Urea/NPK/Bio-fertilizer/Vermicompost/Mo Khata/any other fertilizers Rs. 560/-	Jul	0	0	575	575
4	Weeding (Complete weeding), Mounting & Soil working, (1mt. diameter around the plants)	Sep/Oct	4	1244	0.0	1244
5	Fire line tracing (2 m. wide fire line over 400 m long) & inspection path	Feb/Mar	3	933	0.0	933
6	Watch & Ward including watering as per requirement	Apr/Mar	12	3732	0.0	3732
	Total		19.5	6064.5	695.0	6759.5
	3rd Year Maintenance					
3	Cost of fertilizer : Urea/NPK/Bio-fertilizer/Vermicompost/Mo Khata/any other fertilizers Rs. 560/-	Sep/Oct	0	0	560	560
4	Weeding (Complete weeding), Mounting & Soil working, (1mt. Diameter around the plants)	Aug/Sep	4	1244	0	1244
5	Fire line tracing (2 m. wide fire line over 400 m long) & inspection path	Feb/Mar	3	933	0	933
6	Watch & Ward including watering as per requirement	Apr/Mar	12	3732		3732
	Total		19.0	5909.0	560.0	6469.0
	4th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m long) & inspection path	Feb/Mar	3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732	0	3732
	Total		15	4665	0	4,665
	5th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length) & inspection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732.00	0	3732
	Total		15.0	4665.0	0	4665
	6th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length) & inspection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732.00	0	3732
	Total		15.0	4665.0	0.0	4665.0
	7th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length) & inspection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732.00	0	3732
	Total		15.0	4665.0	0.0	4665.0
	8th Year Maintenance					

Sl. No	Items of work	Preferable Period of Execution	No of Mandays	Labour Cost (in Rs.)	Material Cost (In Rs.)	Total cost (In Rs.)
1	Fire line tracing (2 m. wide fire line over 480 m length) Intersection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732.00	0	3732
	Total		15.0	4665.0	0.0	4665.0
	Pth Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 480 m length) Intersection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732.00	0	3732
	Total		15.0	4665.0	0.0	4665.0
	Sth Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 480 m length) Intersection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732.00	0	3732
	Total		15.0	4665.0	0.0	4665.0

Year wise Abstract of Cost Norm (showing seedling cost separately)

Sl. No	Year	No. person days	Labour cost @ Rs. 311/-per day (Rs)	Material Cost (In Rs.)	Monitoring Evaluation, Learning, Documentation and Other Contingency (5%) of (4+5+6)	Cost of Seedlings @Rs.50.31 per seedlings	TOTAL COST
1	2	3	4	5	7	8	9
1	0th year	28.5	8863.5	100	436.50	0.00	9300.0
2	1st year	42.0	7758.0	2920	437.00	11068.00	21560.0
3	2nd year	19.5	6064.5	868	246.58	10066.80	8046.8
4	3rd year	19.0	5908.0	940	231.45	0.00	6780.0
5	4th year	15.0	4665.0	0	135.00	0.00	4800.0
6	5th year	15.0	4665.0	0	135.00	0.00	4800.0
7	6th year	15.0	4665.0	0	135.00	0.00	4800.0
8	7th year	15.0	4665.0	0	135.00	0.00	4800.0
9	8th year	15.0	4665.0	0	135.00	0.00	4800.0
10	9th year	15.0	4665.0	0	135.00	0.00	4800.0
11	10th year	15.0	4665.0	0	135.00	0.00	4800.0
	Totals	195.0	60643.0	4275.0	2388.0	13974	79274.0

Note:

1. Yearly activities given in the budgetary estimates are tentative only at the time of preparation.
2. It is suggested that training programme be conducted in Plantation.
3. Site specific Soil conservation work like VCB, Gully Plugging, Staggered Trench, Contour Trench, Crescent Bund, etc. may be taken up.
4. Cost of fencing will be apportioned in the CA plantation taken up outside the forest area and if unless wire fencing may be provided to CA plantation which are to be upgraded forest area.
5. Watering facilities for plantation of water & watering may be adjusted as per the availability of water.
6. The Cost Norms are tentative and may change with the approval of the concerned PCCF keeping the overall cost as indicated for each Respective Year.

APCCF (Working Circle) & NO. PC Act)

Activities for AWP-200 Plants/ Ha

Sl. No.	Commence ment Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total Cost
	Base Items	Unit	Qty	Rate	Amt	Rate	Amt	Rate	Amt	Rate	Amt	Rate	Amt	Rate	Amt	Rate	Amt	Rate	Amt	Rate	Amt	
1	2004-05	Nos	22500	2005	450	1754	394	4000	900	4000	900	4000	900	4000	900	4000	900	4000	900	4000	900	9000
2	2005-06	Nos	19845	2205	437	1754	348	4000	793	4000	793	4000	793	4000	793	4000	793	4000	793	4000	793	7938
3	2006-07	Nos	17500	2426	424	1754	307	4000	700	4000	700	4000	700	4000	700	4000	700	4000	700	4000	700	7000
4	2007-08			2668		1754		4000		4000		4000		4000		4000		4000		4000		
5	2008-09			2935		1754		4000		4000		4000		4000		4000		4000		4000		
6	2009-10			3228		1754		4000		4000		4000		4000		4000		4000		4000		
7	2010-11			3551		1754		4000		4000		4000		4000		4000		4000		4000		
8	2011-12			3906		1754		4000		4000		4000		4000		4000		4000		4000		
9	2012-13			4297		1754		4000		4000		4000		4000		4000		4000		4000		
10	2013-14			4726		1754		4000		4000		4000		4000		4000		4000		4000		
11	2014-15			5199		1754		4000		4000		4000		4000		4000		4000		4000		
12	2015-16			5719		1754		4000		4000		4000		4000		4000		4000		4000		
13	2016-17			6291		1754		4000		4000		4000		4000		4000		4000		4000		
14	2017-18			6920		1754		4000		4000		4000		4000		4000		4000		4000		
15	2018-19			7612		1754		4000		4000		4000		4000		4000		4000		4000		
16	2019-20			8373		1754		4000		4000		4000		4000		4000		4000		4000		
17	2020-21			9210		1754		4000		4000		4000		4000		4000		4000		4000		
18	2021-22			10131		1754		4000		4000		4000		4000		4000		4000		4000		
19	2022-23			11144		1754		4000		4000		4000		4000		4000		4000		4000		
20	2023-24			12259		1754		4000		4000		4000		4000		4000		4000		4000		
	Total Cost																					

As Approved

APCCF (Forest Diversion & WCI, FC Act)

Annexure- 13

Cost Norms for Creation of Compensatory Afforestation with Stabilization of Soil Moisture Conservation (SMC)

Annexure-13

Cost Norms for creation of Compensatory Afforestation with Stabilization of Soil & Conservation of Moisture (1,000 Plants/Ha. for 3.1/- PER PIT

Sl.No	Name of Activities	Permissible Period of Execution	Total Cost
	Site Year (Digging Operation)		
1	Nil		0
	1st Year		
2	Soil Conservation measure structures like Staggered Trench, Percolation pit, Contour bunds, Wooden check dams, LBCH, Water spots, MCH, Sub surface dykes & WHS as per the slope & site requirement as Nil	Apr/Sept.	20,215
	2nd Year		
3	Maintenance of SMC structures @ 15 % of initial year cost	Apr/Jul	3,032
	3rd Year		
4	Maintenance of SMC structures @ 10 % of initial year cost	Apr/Jul	2,022
	4th Year		
5	Maintenance of SMC structures @ 10 % of initial year cost	Apr/Jul	2,022
	5th Year		
6	Maintenance of SMC structures @ 10 % of initial year cost	Apr/Jul	2,022
	Total		29,313.0

Abstract

Sl. No	Year	No. persons days	Labour Cost @ Rs. 310/-per day	Material Cost	Total cost (Rs.)
1	Site year	0.0	0.0	0.0	0.0
2	1st year	0.0	0.0	20,215.0	20,215.00
3	2nd year	9.8	0.0	3,032.00	3,032.00
4	3rd year	9.8	0.0	3,032.00	3,032.00
5	4th year	0.0	0.0	3,032.00	3,032.00
6	5th year	0.0	0.0	3,032.00	3,032.00
	Total	0.00	0.00	29,343.0	29,343.0

Different types of SMC structures may be taken up as per the slope & requirement of the present lay out of the design & specification of different structures mentioned above, will be taken.

APCCF (Forest Diversion & NR, FC Act)

SCHEME FOR

FENCING, PROTECTION AND REGENERATION OF THE SAFETY ZONE OVER 3.138 HA. ALL ALONG THE INNER BOUNDARY OF THE ML AREA OF 89.961 HA.

FOR

DALPAHAR IRON & MANGANESE MINES (BLOCK-A)

OF

SRI AVIN JAIN

UNDER KEONJHAR FOREST DIVISION

in compliance

with

Condition No.2.xx (a,b & c) of

Stage-I approval granted vide Online Proposal No.FP/OR/MIN/9360/2015 Dated.13.02.2026

of Govt. of India, Ministry of Environment, Forests & Climate Change, New Delhi.

SAFETY ZONE FENCING, PROTECTION AND REGENERATION TO ENSURE DENSE CANOPY IN ALL ALONG THE INNER BOUNDARY OF THE MINING LEASE AREA

1. INTRODUCTION

The mining lease of **Dalpahar Iron & Manganese Mines (Block-A)** over an area of **89.961 ha** was originally granted in favour of **Late Shri Dharmchand Jain** on **09 June 1986** for a period of **20 years**, valid up to **08.06.2006**, within the **Baitarani Reserved Forest-A** under **Barbil Tahasil, Keonjhar Forest District**, Odisha.

Prior to expiry of the lease period, an application for **Renewal of Mining Lease (RML)** was submitted on **01.06.2005**, within the stipulated timeframe. Accordingly, the mining lease was deemed to have been extended under the provisions of **Rule 24A(1) of the Mineral Concession Rules, 1950.**

Subsequently, due to delay in submission of the succession certificate and delay in obtaining statutory clearances, the mining lease was declared lapsed by the **Government of Odisha, Steel & Mines Department**, vide order dated **01.05.2015**. Aggrieved by the said order, a writ petition was filed before the **Hon'ble High Court of Odisha.**

Pursuant to the directions of the Hon'ble High Court and subsequent hearings before the Steel & Mines Department, the **Government of Odisha**, vide order dated **06.09.2019**, declared that the mining lease had not lapsed and extended the validity of the lease area measuring **89.961 ha** up to **08.06.2036**, in favour of **Shri Avin Jain**, Power of Attorney holder of **Smt. Sobha Jain** (wife of Late Shri Dharmchand Jain), under the provisions of the **MMDR (Amendment) Act, 2015.** This was further confirmed vide letter dated **28.04.2022** issued by the Steel & Mines Department, Government of Odisha.

Accordingly, the **State Government of Odisha** executed a **Supplementary Lease Deed** for **Dalpahar Iron & Manganese Mines (Block-A)** over **89.961 ha** in favour of **Shri Avin Jain**, Power of Attorney holder of **Smt. Sobha Jain**, on **27.04.2023.**

The entire mining lease area of **89.961 ha** falls within the **Baitarani Reserved Forest** and is covered under **Survey of India Topographical Sheet No. F45N5 (73G/5).** The lease area lies between latitudes **21°58'04.701" N to 21°58'42.918" N** and longitudes **85°23'26.729" E to 85°23'59.175" E.**

At present, a proposal for diversion of **79.367 ha** of forest land, including **2.822 ha earmarked as safety zone along the mining lease boundary**, in addition to **10.594 ha** of forest land already diverted, has been submitted under **Section 2(ii) of the Forest (Conservation) Act, 1980.** The **Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India**, vide Letter No. **F.No. 8-31/215/FC (E-91138)** dated **13.02.2026** has accorded **in-principle (Stage-I) approval**, subject to fulfillment of stipulated conditions.

As per Condition No. 2.xx.(a),(b),(c) of the Stage-I approval, the User Agency, at its own cost, is required to prepare and implement a plan for the fencing, protection and regeneration of the Safety Zone over area of 3.138 ha with a width of 7.5 mtrs along ML boundary.

2. LOCATION OF THE MINING LEASE AREA

The mining lease area of **Daipahar Iron & Manganese Mines**, measuring **89.961 ha**, is situated within the **Baitarani Reserved Forest-A**, under **Keonjhar Forest Division**, near **Bichakundi Village**.of Joda Block under **Barbil Tahasil**, **Keonjhar District**, Odisha.

The lease area forms part of **Survey of India Topographical Sheet No. F45N5 (73G/5)** and is bounded by latitudes **21°58'04.701" N to 21°58'42.918" N** and longitudes **85°23'26.729" E to 85°23'59.175" E.**

3. TOPOGRAPHY

The area forms part of the **Baitarani Reserved Forest** and is characterized by a **predominantly hilly terrain** with **undulating topography and steep slopes**. The general trend of the hill ranges is NNE–SSW.

The elevation of the lease area varies from approximately **553 m RL to 723 m RL**. No perennial nalas exist within the lease boundary. **Soua Nadi**, located about **1 km** west of the lease area, constitutes the major surface drainage feature of the region.

4. SOIL TYPE

The area is dominated by **lateritic formations**, overlain by a **thin soil cover** ranging in thickness from **0.5 m to 4.0 m**. The soil colour varies from **yellowish brown to reddish brown and grey**.

Due to past mining activities and deforestation, the soil has undergone **considerable erosion**, particularly along slopes, and is mostly **retained** in areas having vegetation cover. The **soil/alluvium** is predominantly **silty to clayey**, with the presence of **pebbles and cobbles of chert, jasper, banded hematite jasper (BHJ), and hematite iron ore.**

5. CLIMATE

The area experiences a **tropical climatic regime**. Summer extends from **March to May**, with **maximum temperatures reaching up to 45°C**. The **south-west monsoon** commences in **June** and continues till **September**, with an average annual **rainfall** of about **1500 mm**.

Winter is confined to **November, December, and January**, during which the temperature may drop to a **minimum** of approximately **4°C**.

6. DRAINAGE

No perennial stream or nala exists within the mining lease area. Soma Nadi, flowing northward at a distance of about 1.0 km west of the lease boundary, serves as the primary drainage channel for the surrounding area.

7. EXISTING VEGETATION

The area supports dry deciduous forest vegetation, consisting of species such as Sal, Kurum, Kangara, Asan, Dhaura, Kendu, Jamun, Mango, etc. The existing canopy density is generally below 0.6, indicating a moderately degraded forest condition.

The present vegetation pattern has been influenced by local edaphic and climatic factors, along with anthropogenic pressure and historical mining activities.

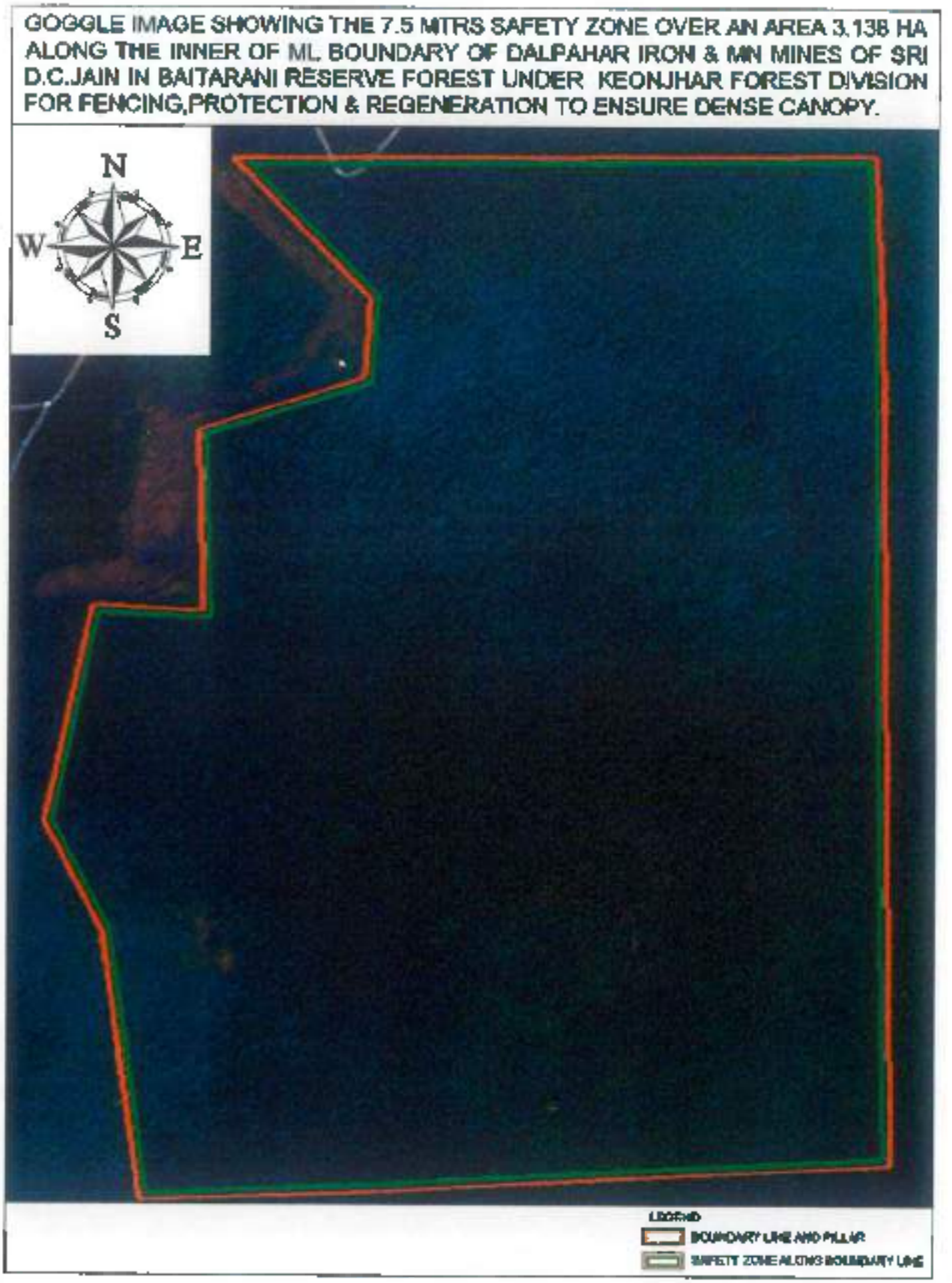
8. OBJECTIVES OF THE SCHEME

The objectives of the proposed scheme are as follows:

1. To comply withCondition No.2.xx. (a),(b),(c) of the Stage-I Forest Clearance approvalissued byMoEF&CC, Government of India.
2. To restock and rejuvenate degraded open forest areas within and around the mining lease.
3. To develop and maintain a green belt around the mining lease for ecological stability.
4. To tend existing vegetation for enhanced growth and improvement in canopy density, condition, and species composition.
5. To protect the area against encroachment, illicit felling, fire occurrence, grazing etc., so as to check further degradation of the area.

Map Showing Location of Safety Zone Area

A map depicting the Safety Zone area over 3.138 ha along the inner side of the mining lease boundary, proposed for chain-link fencing and protection, is enclosed.



MEASURES PROPOSED

To achieve the above aims and objectives, the following steps will be adopted based on field condition

A. **Biological Measures**

i) **Plantation**

Safety zone fencing, protection and regeneration to ensure a dense canopy along the inner boundary of the mining lease area.It is proposed to undertake block plantation @1000 seedlings per Ha (considering the existing vegetation with average density is 0.5)inside the safety zone area over 3.138 ha along the lease boundary. The total area comes under the Baitarani Reserve Forest.

Location wise proposed plantation will be as follows:

7.5 mtrs SZ area along the Mining Lease boundary	Block Plantation	3.138 Ha	3138 trees

The choice of species will be based on the following parameters.
(i) drought-hardy and (ii) it should resist the xerophytic nature of the locality, i.e , with less rainfall, less soil fertility, and to resist biotic interference.
The list of species to be adopted for the plantation is as follows:

Sl. No.	Local Name	Scientific Name
1	Amla	*Emblicaofficinalis*
2	Karanja	*Pongamia pinnata*
3	Asan	*Terminalia elliptica*
4	Kurum	*Adina cordifolia*
5	Simarouba	*Simaroubaglauca*
6	Neem	*Azadirachta indica*
7	Bamboo	*Dendrocalamus strictus*
8	Chakunda	*Senna siamea*
9	Sisoo	*Dalbergia sissoo*

Planting shall be done during July in pre-dug pits of size 30 cm X 30 cm X 30 cm. A basal dose of N.P.K fertiliser shall be applied at the time of planting, besides mixing with insecticides to prevent termites & insects. Planning for the plantation shall be such that fruitbearing trees and bamboo rhizomes should not be planted nearby. A minimum distance of 2.5 mt X 2.5 mt shall be maintained on every fourth plant in planting either of the species. Care should be taken to complete the planting during July while rains are still on during the first or second week of July.

Some soil binding grasses will also be introduced. The species of grass seeds to be broadcast are given in the following table. Plant species suitable for plantation should not only be able to flourish in the area but must also have a rapid growth rate, evergreen habit, large crown volume and small leaves with smooth surfaces. All these traits are difficult to get in a single species. Therefore, a combination of species has been taken into consideration as stated above

Name of Grass Species	Usage	Habitat / Soil
Chrysopogon fulvus	Fodder	Red Soil/black cotton soil
Crenopogonfoveolatus	Fodder	Skeletal soil
Sporobolus marginatus	Fodder	Sandy soil
Heteropogoncontortus	Non-Fodder	Eroded soil
Cymbapogon martini	Non-Fodder	Eroded soil
Cynodondactylon	Fodder	Wide range soil

ii) Weeding

Two weeding have been proposed along with soil working and manuring in the first year and due weeding, soil working and manuring of 2 doses of 15g each in a gap of 15 days in the second year and weeding ploughing in the third year. The first weeding along with manuring, should be taken up soon after completion of the plantation and the second weeding and soil working should be taken up after one month of the first weeding. Weeding should be done at a radius of one meter and soil working should be done to a depth of 15 cm. all the weeding along with soil working, should be completed during November to December. The first weeding should be done along with the replacement of causality that may occur during planting in the first year and after replacement of causality in the 2nd year.

iii) Application of Insecticides.

The plantation site, after cleaning and burning, good quality seedlings may cause an influx of insects that usually eat and damage the tender leaves and shoots of the plants. To get rid of such insect attacks, the application of insecticides should be taken up in required doses at desired intervals. Spraying of insecticides shall be done preferably on a sunny day and before forenoon.

iv) Fire line Tracing & Maintenance

Fire causes heavy loss to the forest during the fire season. To prevent incidents of fire, the area should be divided into suitable blocks by tracing fire lines. Bounciaries of plantation patches and these blocks should be scraped of forest growth to a width of three meters during February-March and cut back materials and dry leaves stacked along these lines should be burnt under strict supervision. This operation should be carried out for three years. 1 man-day will be utilized for three months in a year & the same manpower will be engaged for the next five years.

B. Structural Measures

i) Adequate Number of RCC Boundary pillars&6 feet high Safety Zone Pillars.

There are 19oumbers of comer boundary pillars and 20 no's intemediate pillars, in total 39numbersof RCC pillars parallel to that,i.e., 7.5 mts inside the ML boundary, the same number of pillars of 6 feet high RCC pillars has been posted all along the Mining Lease boundary.

ii) Fencing with6-foot-highpillars in the ML boundary & SZ boundary

The total periphery of the Mining Lease boundary is 4.184 Km, similarly periphery of the safety zone boundary inside the ML boundary is 4.114 Km.The entire length of 8.298 Km will be fenced within 2 years after getting the final forest clearance.

(C) Soil Conservation Measures.

The site selected for Safety Zone Afforestation is undulating, and gullies have been formed due to erosion. So, Soil Conservation Measures like Staggered Trench, Percolation Pit, Contour Trench, graded earthen bund, LBCD, Wire mesh LBCD, Sub surface Dyke and WHS as per site requirement have been proposed in the area Safety Zone area of 3.138 ha.

D. INSPECTION, MONITORING AND EVALUATION

For the successful implementation of the above Mitigative measures, intensive Inspection and technical guidance from the concerned technical wing is required. Sufficient fuel/ conveyance charges for technical experts shall be provided by the user agency for the proper execution of these programmes. A budgetary provision of 15% of the total project cost has been earmarked for this score.

E. EXECUTING AGENCY

The works in the present Scheme shall be executed by the User Agency having specialized departments headed by qualified persons with outsourced manpower and machinery. To facilitate this, the user agency shall establish its own executing and supervision cells along with the required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in coordination with the Forest Department.

F. REQUIREMENT OF FUNDS

The total cost of the implementation of safety zone fencing, protection and regeneration to ensure dense canopy in all along the inner boundary of the mining lease area will be Rs. 1,68,04,500.00 (Rupees One Crore Sixty-Eight Lakhs Four Thousand Five Hundred) only for implementation of the above work. the above expenditure will be made over the next ten years' period. Therefore, the budget provision of will be kept by the user agency for implementation of the above mitigation measures over a period of the next three years. This budget will be subject to increase in amount considering the increase in materials and labour charges. The tentative cost for the above work is in the following table:-

FINANCIAL FORECAST

Sl.No.	Description of the Work Wage Rate Rs.462 /Mandey	Fund Required (In Rs.)
1.	**Biological Measures**	
A	Rising of Nursery for 4000 (18 months) Seedlings @ Rs 51.70 per ha. (The cost norm Enclosed as **Annexure-I**)	The financial forecast has already been provided in the scheme planting of adequate drought hardy plant species and sowing of seeds in the appropriate area imposed in Condition No.2.xxi (b) So no extra budgetary provision has been suggested
B	Block Plantation (1000 no./ha.) over 3.138 ha. @ Rs. 2,99,567/- (as per base norm of Matrix for the year 2026-27) (**Annexure-II**).	9,40,041.25
C	Cost of Soil conservation measures structures like staggered trench, percolation pit, contour trench, graded earthen bund, LBCD, wire mesh, LBCD, Sub surface Dyke and Water Harvesting structures = 3.138 ha X Rs.45,475/-.(as per base norm of Matrix for the year 2026-27) (**Annexure-III**).	1,42,700.55
	Total:	**10,82,741.80**
2.	**Structural Measures**	
A	Barbed wire Fencing of 6 feet high in ML boundary & SZ boundary of 8.298 Km or 8298m @ Rs. 1337/- running Mtrs with 10 years maintenance (**Annexure-IV**)	1,10,94,426.00
	Sub-Total:	**1,21,77,167.80**
	inspection, monitoring and evaluation @15%	**18,26,575.17**
	Sub-Total:	**1,40,03,742.97**
	Price Escalation @20%	**28,00,748.59**
TOTAL	**GRAND**	**1,68,04,491.56 SAY RS.1,68,04,500/-**
(Rupees One crore Sixty Eight lakhs Four thousand Five Hundred) only		

16/04/26

Divisional Forest Officer,
Keonjhar Division

Asst. Conservator of Forest
I/C, Champua Forest Range

Technically Approved

Regional Chief Conservator of Forests
Rourkela Circle

ANNEXURE-I

Nursery Cost Norm for raising of 1000 (18 months) seedlings

Wage Rate @ 462 Rs per Man Day

Sl. No	Items of work	Preferable Period of Execution	Unit	Unity cost in Rs	No./Qty.	Labour Cost (Rs.)	Material cost (Rs.)	Total cost (Rs.)
1st Financial Year (Seedlings Cost for 3 Months)								
1	Cost of Polythine Bag (12" x 8"x 400 gauge) 80 nos./kg=12.5 kg@Rs 208per kg (including GST)	Nov- Dec	kg	208	12.5	0	2600	2600
	Procurement of raw & crude Polypot Mixture							
2	(i) Soil	Nov- Dec	Cft	15	70	0	1050	1050
	(ii) Sand	Nov- Dec	Cft	20	35	0	700	700
	(iii) COW/ Vermi compost/ Bio-Fertilizers, etc.	Nov- Dec	Cft	40	35	0	1400	1400
	(iv) Insecticide/ Bio-Pesticide	Nov- Dec	Rs	150	6	0	900	900
3	Preparation of Soil Mixture includes Pulverisation, Straining & mixing the ingredients Properly	Nov- Dec	MD	462	8	3696	0	3696
4	Filling of polythene bags & Setting in the bed	Nov- Dec	MD	462	12	5544	0	5544
5	Collection of Seed Grading & Treatment	Dec	MD	462	2	924	100	1024
6	Preparation of germination bed,Sowing of seed and Mulching including cost of materials	Jan	MD	462	1	462	100	562
7	Dibbling of seeds/Pricking out the Seedlings from germination beds , transplanting in the poly bags and providing sheds including cost of materials	Feb	MD	462	2	924	500	1424
8	Watering for 3 months	Jan - Mar	MD	462	10	4620	0	4620
9	Contingencies (Water can, Buckets, Nursery shed, Electricty charges/ Diesel charges Maintenance of pump set and accessories & any other)					0	500	500
	Total				35	16170	7850	24020
2nd finance year								
1	Watering for 9 months	April-June	MD	462	10	4620	0	4620
2	Weeding,Sorting,Grading & other operations	April-Mar	MD	462	12	5544	0	5544
3	Cost of Insecticide/Bio-pesticide/Ikvanuta/Herbal based plant growing products					0	550	550
4	Watering	Oct - Mar	MD	462	20	9240	0	9240
5	Contingencies (Electricty charges/ Diesel charges Maintenance of pump set and accessories & any other)					0	670	670
	Total				42	19404	1220	20624
3rd finance year April-June								
1	Watering for 3 months	April-June	MD	462	10	4620	0	4620
2	Weeding,Sorting,Grading , Root cutting & other operations	April-June	MD	462	3	1386	0	1386
3	Cost of Insecticide/Bio-pesticide/Ikvanuta/Herbal based plant growing products	April-June				0	800	800
4	Contingencies (Electricty charges/ Diesel charges Maintenance of pump set and accessories & any other)					0	250	250
	Total				13	6006	1050	7056

ABSTRACT

Sl.No	Year	No of Man Day	Labour Cost (	Material cost (Rs.)	Total cost
1	1 st Finance Year (3 Months)	35	16170	7850	24020
2	2 nd Finance Year (12 Months)	42	19404	1220	20624
3	3 rd Finance Year (3 Months)	13	6006	1050	7056
Total		90	41580	10120	51700
Cost per 18 months old Seedling = Rs. 51700/1000= Rs. 51.70					

Annexure-II

COST ESTIMATE FOR BLOCK PLANTATION OF 1000 SEEDLINGS / Ha.

ANNEXURE-4

BASE COST NORM FOR CONSERVATORY APPORTIONATION (BLOCK PLANTATION)
@ 1000 PLANTS PER HECTARE (18 months old seedling)

WAGE RATE Rs-311/- PER MANDAY

Sl. No	Name of work	Preferable Period of Operation	No of Mandays	Labour Cost (in Rs.)	Material Cost (in Rs.)	Total cost (in Rs.)
1	2	3	4	5	6	7
	0th Year (Advance work) Pre-Planting Operation					
1	Survey, Demarcation and Pillar pegging	Nov/Dec	2	622	0	622
2	Preparation of Treatment Map (Digital Map)	Nov/Dec	1	311	150	461
3	Site preparation (Clearing & removal of shrubs)	Nov/Dec	12	3732	0	3732
4	Creation of 4.00 mtr wide inspection Path	Feb/Mar	1	311	0	311
5	Alignment and marking of pits	Feb/Mar	1	311	0	311
6	Digging of pits (45 cm x 45 cm x 45 cm) in hard and rocky soil	Feb/Mar	40	12440	0	12440
7	Construction of Temporary Labour Shed, Drinking water facility and First Aid etc.	Jan/Mar	0	0	3500	3500
	Total		57	17732	3650	21382
	1st Year/Planting Year					
1	Refilling of pits by skimming the topmost soil of the pit, application of organic compounds/ CMF/ STM & mixing the same properly.	Jun/Jul	75	2332.50	5000	7332.50
2	Transportation of 18 months old polythene bag seedlings in hired truck /tractor from the Permanent/stage nursery to planting site including loading & unloading. (Average load of 60 Rs/q) & stacking the seedling @ Rs.6/- per Seedling (1500 nos.)	Jul/Aug	0	0	6480	6480
3	Distribution of the seedlings at planting site	Jul/Aug	2	622	0	622
4	Conveyance of polypot seedlings on head load from the stacking site to individual dugout pits within the planting site, applying insecticide, fertilizers & planting after scooping the soil with other applied materials & pressing the soil properly around the planted seedlings.	Jul/Aug	22.5	6997.50	0	6997.50
5	Cost of fertilizer & insecticide (a)NPK/Bio-fertilizer @ 50 gms/plant as basal dose = 50kg @ Rs.30/- per kg = Rs. 1500.00 (b) Urea/Vermicompost/Bio Khata/any other fertilizer in two subsequent doses @ Rs. 738.00 (c) Insecticide/ Bio-pesticide @ 5 gms/plant=5 kg @ Rs.150/- per kg = Rs. 750.00	Jul/Aug	0	0	3000	3000
6	Casualty Replacement @ 10% (100 nos.)	Jul/Aug	2.5	777.5	0	777.5
7	1st weeding & Hoeing	Aug/Sept	12	3732	0	3732
8	2nd Weeding, Soil working (Loosening around the plant) & Mulching	Oct/Nov	15	4665	0	4665
9	Fire line tracing (2 m. wide fire line over 400 m long) including maintenance of inspection path	Feb/Mar	3	933	0	933
10	Watch & Ward including watering as per requirement	Apr/Mar	12	3732	0	3732
	Total		76.5	23791.50	14480.00	38271.50
	2nd Year Maintenance					
1	Transportation of 100 seedlings from Nursery to plantation site including loading, unloading & conveyance by Tractor @ Rs.6/- per seedling	Jul	0	0	600	600
2	Casualty replacement- 10%	Jul	2.5	777.5	0	777.5
3	Cost of fertilizer & insecticide (a) Cost of Insecticide/ Bio-pesticide @ 5 gms/plant = 4.5 kg @ Rs.150/- per kg = Rs.75/- (b)Urea/SSP/MOP/Bio-fertilizer/Vermicompost/Bio Khata/any other fertilizer upto 200/-	July/Aug	0	0	2872	2872
4	Weeding (Complete weeding & Hoeing & soil working (1st, 2nd etc. as per requirement)	Sept/Nov	15	4665	0	4665
5	Fire line tracing (2 m. wide fire line over 400 m long) including maintenance of inspection path	Feb/Mar	3	933	0	933
6	Watch & Ward including watering as per requirement	Apr-Mar	18	5598	0	5598
7	Replacement of Temporary Labour Shed, Drinking water facility and First Aid etc.	Apr-Mar		0	1000	1000
	Total		38.5	11973.5	4472	16445.5

Sl. No	Name of work	Preferable period of operation	No of days/ps	Labour Cost (in Rs.)	Material Cost (in Rs.)	Total cost (in Rs.)
1	2	3	4	5	6	7
	3rd Year Maintenance					
1	Cost of Pest Aces(Urea/SMP/Zinc Sulphate/Vermicompost/Jeevamrut/any other fertilizer	July/Aug	0	0	2800	2800
2	Weeding (Complete weeding), Mowing (Hoe/ Manually around the plant)	Sep/Oct	15	4665	0	4665
3	Pipe line tracing (2 m. wide line over 400 m long) including maintenance of pipe line	Feb/Mar	3	933	0	933
4	Watch & Ward including watering as per requirement	Apr/May	18	5598	0	5598
5	Maintenance of Temporary Labour Shed, Drinking water facility and First Aid etc.	Apr/May	0	0	1400	1400
	Total		36.0	11196	4200	15396
	4th Year Maintenance					
1	Pipe line tracing (2 m. wide line over 400 m long) including maintenance of pipe line	Feb/Mar	3	933	0	933
2	Watch & Ward including maintenance of vegetative fencing	Apr-Mar	18	5598	0	5598
	Total		21	6531	0	6531
	5th Year Maintenance					
1	Pipe line tracing (2 m. wide line over 400 m length)	Feb/Mar	3	933.00	0	933
2	Watch & Ward	Apr/Mar	18	5598.00	0	5598
	Total		21	6531	0	6531
	6th Year Maintenance					
1	Pipe line tracing (2 m. wide line over 400 m length)	Feb/Mar	3	933.00	0	933.0
2	Provision of boundary, Shifting and repairing of mulching sheets	Jun/Mar	3	933.00	0	933.0
3	Watch & Ward	Apr/Mar	18	5598.00	0	5598.0
	Total		24	7464	0	7464.0
	7th Year Maintenance					
1	Pipe line tracing (2 m. wide line over 400 m length)	Feb/Mar	3	933.00	0	933
2	Watch & Ward	Apr/Mar	18	5598.00	0	5598
	Total		21	6531	0	6531
	8th Year Maintenance					
1	Pipe line tracing (2 m. wide line over 400 m length)	Feb/Mar	3	933.00	0	933
2	Watch & Ward	Apr/Mar	18	5598.00	0	5598
	Total		21	6531	0	6531
	9th Year Maintenance					
1	Pipe line tracing (2 m. wide line over 400 m length)	Feb/Mar	3	933.00	0	933
2	Watch & Ward	Apr/Mar	18	5598.00	0	5598
	Total		21	6531	0	6531
	10th Year Maintenance					
1	Pipe line tracing (2 m. wide line over 400 m length)	Feb/Mar	3	933	0	933
2	Watch & Ward	Apr/Mar	18	5598.00	0	5598
	Total		21	6531	0	6531
	Year wise abstract of Cost Norm (drawing, enabling cost separately)					

Sl. No.	Details of work	Productive Period of Equipment	No. of Mandays	Labour Cost (in Rs.)	Material Cost (in Rs.)	Total cost (in Rs.)	
1	2	3	4	5	6	7	8
Sl. No.	Year	No. of Mandays	Labour cost (in Rs)	Material Cost(in Rs.)	Supervision, Evaluation, Surveying, Documentation, Insurance, Other Contingency (5%) of (4+5)	cost of Seed bags @Rs.18.50 per seed bags	TOTAL COST in Rs
1	2	3	4	5	6	7	8
1	0th year	62.5	17737.5	36000	973.88	0.00	54711.38
2	1st year	74.8	21230.5	144000	3588.08	3034.00	171852.58
3	2nd year	52.5	14902.5	44750	1131.88	888.50	61672.88
4	3rd year	24.8	7038.5	36000	1145.88	0.00	44184.38
5	4th year	21.0	5961.0	0.0	296.88	0.00	6257.88
6	5th year	20.8	5904.5	0.0	295.88	0.00	6200.38
7	6th year	24.8	7038.5	0.0	372.88	0.00	7411.38
8	7th year	21.0	5961.0	0.0	326.88	0.00	6287.88
9	8th year	21.4	6074.5	0.0	326.88	0.00	6401.38
10	9th year	21.1	5989.5	0.0	326.88	0.00	6316.38
11	10th year	21.4	6074.5	0.0	326.88	0.00	6401.38
	Total	346.0	111723.0	264750.0	9271.0	6809.50	392553.50

Note:

1. Prior approval to be taken for the irrigation project / venture and Public meeting to be taken at the time of plantation.
2. JFMC Indigenous fruit bearing trees must be provided by Municipality.
3. After getting the DAR approved from the DFO, Eco Tourism, Bird Watch, Canopy Walk, Cottage Stay, etc. may be taken up
4. Chain link fencing can be alternated by the Participation where ever possible like live trees and Bamboo (might fencing may be preferred
5. Watering facilities for preservation of water & watering may be adopted as per the rainfall (Nov) of area.
6. The Cost Norms / systems table can be changed with the approval of the owner and DFO's keeping the overall cost norm fixed for per ha Plantation Year

JFMC (Forest Division & FD, FC Act)

Matrix for Model-I A Conventional CA Plantation (AR) 1000 plants per Ha

In Rupees

Sl. NO.	Commencement Year	I	II	IIA	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	XXI	XXII	Total Cost (10 Years)
Area Norm		22000	99651	22304	15748	6457	6457	7807	6857	6859	6857	6857												
1	2021-22	22000	100454	24585	18226	8826	8761	30502	9648	18031	10637	11169												284728
2	2022-23		13436	105456	25814	30137	8752	9769	13027	10429	22606	11169	11929											346454
3	2023-24			26586	110729	37105	20094	9183	8648	11578	10537	11170	11723	12513										258777
4	2024-25				25835	116265	18460	11699	9680	10190	11147	11169	11936	11915	12809									271726
5	2025-26					27109	122078	25983	27154	10229	10637	11965	11927	11915	13589	13575								285801
6	2026-27						28461	128183	11977	24767	10640	11169	11803	12913	17919	13575	14254							299567
7	2027-28							29984	134591	12944	24475	11171	11777	14079	12959	13570	14254	14987						314548
8	2028-29								31378	141371	24541	15646	11731	12913	14772	13570	14257	14987	15715					330278
9	2029-30									32947	148537	16128	24808	12913	17929	15516	14254	14978	16715	16851				346788
10	2030-31										24504	25808	24139	20975	12904	13575	16292	14987	15729	16851	17826			364127

APCCF (Forest Diversion & NO, FC Act)

Annexure-II

Sl.No	Item of Works	Preferable Period of Execution	Total Cost
	0th Year (Pre Planting Operation)		
1	[illegible]		0
	1st Year		
2	[illegible]	Apr/Jul	20,215
	2nd Year		
3	[illegible]	Apr/Jul	3,032
	3rd Year		
4	[illegible]	Apr/Jul	3,032
	4th Year		
5	[illegible]	Apr/Jul	3,032
	5th Year		
6	[illegible]	Apr/Jul	3,032
	Total		32,343.0

Abstract

Sl. No	Year	No. person days	Unkown cost @ Rs. 313/-per day	Planting cost (Rs.)	Total cost (Rs.)
1	0th year	00	0/-	0.0	0
2	1st year	65	313/-	20,215.0	20,215.00
3	2nd year	10	313/-	3,032.00	3,032.00
4	3rd year	10	313/-	3,032.00	3,032.00
5	4th year	10	313/-	3,032.00	3,032.00
6	5th year	10	313/-	3,032.00	3,032.00
	Total	0.00	0.00	32,343.0	32,343.0

Different types of SMC structures may be taken up as per the scope & requirements of the plantation site out of the design & specification of different structures annexed along this document.

ACCF (Forest Devision & HQ, PC Ayo)

Matrix for (SMC)

in Rupees

Sl. no.	Conservancy asset Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
Base Norm		0	32805	3945	3951	4098	4417											
1	2021-22	0	31209	3942	4610	3985	3879											89630
2	2022-23		0	31207	3509	3886	3969	4064										97615
3	2023-24			0	33401	3880	3870	4063	4267									89391
4	2024-25				0	34571	3866	4064	4268	4498								91368
5	2025-26					0	35803	4061	4267	4478	4704							93180
6	2026-27						0	37090	4264	4480	4702	4988						95429
7	2027-28							0	38445	4477	4704	4977	5238					97748
8	2028-29								0	39867	4702	4838	5284	5445				100136
9	2029-30									0	31960	4836	5288	5449	6717			93662
10	2030-31										0	33930	5291	5615	5715	6000		98774

A/CCF (Forest Diversion & NO, FC Act)

ANNEXURE-IV

ESTIMATE FOR GARBED WIRE FENCING OF 5 MTRS (Specing 2.5mtrs)

Sl. No.	Items	Unity	Rate per Unity in Rs	Amount in Rs
1	Pillar	3 nos	500	1500
2	Supporting pillar (2 nos per 20m) for 5 m	0.5 nos	500	250
3	Barbed Wire 7 lines for 5 m (7x5)	35 m	40	1400
4	Excavation for pillar size 0.45 mx 0.45mx 0.45m =0.091 cum for 3 nos	0.273 cum	250	68.25
5	PCC for pillar size 0.45 mx 0.45mx 0.45m =0.091 cum for 3 nos	0.273 cum	8000	2184
6	Pillar & ware shifting	0.5 man day	478	239
			Total for 5 mtrs	5641.25 or say Rs. 5650/-
	Instalation cost For 1 running metere Rs. 5650/5			Rs.1130/-
1	Mainteinance cost 2% of the instalation charge =1130@2% - 22.6 say Rs 23 per mtr for 9 years			Rs.207
	Total cost per mtrs			Rs.1337

SCHEME
FOR
APPROPRIATE MITIGATIVE MEASURES TO MINIMIZE SOIL EROSION AND CHOKING OF STREAMS

In compliance

with

Condition No.2.xxi (a) of

Stage-I approval granted vide Online Proposal No.FP/OR/MIN/9360/2015 Dated.13.02.2026

of Govt. of India, Ministry of Environment, Forests

& Climate Change,

New Delhi.

FOR

DALPAHAR IORN & MANGANESE MINES

(BLOCK-A)

ML AREA OVER 89.961 HA.

OF

SRI AVIN JAIN

APPROPRIATE MITIGATIVE MEASURES TO MINIMIZE SOIL EROSION AND CHOKING OF STREAMS

EXECUTIVE SUMMARY:

The present scheme has been prepared in compliance with Condition No.1.xxi (a) of the Stage-I (In-Principle) Forest Clearance granted by the Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India, for Dalpahar Iron & Manganese Mines (Block-A) over an area of 89.961 hectares, located within the Raitarani Reserve Forest-A, Keonjhar District, Odisha.

The mining lease area is characterized by hilly terrain with steep slopes, lateritic soil cover, and absence of perennial nalas within the lease boundary. The nearest natural drainage, Sona Nadi, flows approximately 1.0 km west of the lease area and serves as the primary regional drainage channel. During monsoon periods, surface runoff from overburden dumps, sub-grade dumps, mine pits, haul roads, and exposed slopes has the potential to transport sediment, which, if not properly managed, may lead to soil erosion and downstream siltation.

In view of the above, a comprehensive soil and water conservation scheme has been formulated to minimize erosion, arrest sediment movement, and prevent choking of natural drainage systems. The scheme covers the entire mining lease area and is based on site-specific topography, drainage characteristics, soil properties, and approved mining practices.

The proposed measures include a combination of structural and biological interventions. Structural measures comprise construction of masonry check dams, retaining/toe walls, loose boulder structures, garland drains, and settling tanks at strategic locations to intercept runoff, reduce flow velocity, and facilitate sediment deposition. Biological measures include plantation on stabilized dump slopes and along drainage structures, maintenance of existing vegetation, and utilization of desilted material for soil conditioning and afforestation support.

Implementation of the scheme shall be undertaken at the project cost by the User Agency through qualified technical personnel, in close coordination with the Forest Department. Regular inspection, monitoring, and maintenance shall be carried out to ensure long-term effectiveness of the measures. A budgetary provision of 15% of the total project cost has been earmarked for monitoring, evaluation, and upkeep.

All proposed measures shall be completed within three (3) years from the commencement of mining operations, with maintenance activities continuing throughout the lease period. The scheme is expected to significantly reduce soil erosion, prevent sediment inflow into downstream drainage systems, and support ecological stability within and around the mining lease area.

SALIENT FEATURES OF THE MITIGATIVE PLAN

A. Site Characteristics Considered

- No perennial nala exists within the mining lease area.
- Sona Nadi, the nearest natural drainage, flows approximately 1.0 km west of the lease boundary.
- The area is hilly with steep slopes, prone to runoff-induced erosion during monsoon.
- Mining-related activities such as OB dumps, sub-grade dumps, haul roads, and exposed slopes are potential sources of sediment generation

B. Proposed Mitigative MeasuresThe scheme integrates both structural and biological measures, summarized as follows:

I. Structural Measures:

- Construction of masonry check dams at suitable downstream locations to reduce runoff velocity and trap sediments.
- Provision of garland drains around overburden dumps to intercept surface runoff.
- Installation of retaining walls / toe walls at the base of OB dumps to prevent lateral movement of dump material.
- Construction of loose boulder structures across drains to dissipate flow energy and stabilize sediments.
- Provision of settling tanks at dump toes to facilitate sedimentation before discharge
- Periodic desilting of check dams, settling tanks, and drains, preferably before and after the monsoon.

II. Biological Measures:

- Plantation on stabilized dump slopes and along drainage structures.
- Utilization of desilted material for soil conditioning and plantation support.
- Maintenance of existing vegetation and casualty replacement to ensure long-term slope stability.

C. Implementation and Monitoring

- The scheme shall be implemented at the project cost.
- Works shall be executed by the User Agency through qualified technical personnel, in coordination with the Forest Department.
- Regular inspection, monitoring, and maintenance shall be undertaken to ensure sustained performance of the erosion control measures.
- A budgetary provision of 15% of the total project cost has been earmarked for inspection, monitoring, and evaluation.

D. Time Frame for Implementation

- All proposed mitigative measures shall be completed within three (3) years from commencement of mining operations.
- Maintenance activities shall continue throughout the lease period. The scheme shall be implemented in a phased and monitored manner, ensuring protection of downstream drainage systems and surrounding forest ecology.

1. INTRODUCTION

The mining lease for **Dalpahar Iron & Manganese Mines (Block-A)** covering an area of **89.961 ha** was originally granted in favour of **Late Sri Dharmchand Jain on 09 June 1986** for a period of **20 years**, i.e., up to **08 June 2006**, within **Baitarani Reserved Forest-A**, under **Barbil Tahasil of Keonjhar Forest District**, Odisha.

Prior to expiry of the lease, an application for **Renewal of Mining Lease (RML)** was submitted on **01 June 2005** within the stipulated time. Accordingly, the lease was deemed to have been extended under the provisions of **Rule 24A(1) of the Mineral Concession Rules, 1950**.

Subsequently, due to delay in submission of the succession certificate and in obtaining statutory clearances, the lease was declared **lapsed** by the **Government of Odisha, Steel & Mines Department, on 01 May 2015**. Against this order, a petition was filed before the **Hon'ble High Court of Odisha**. Pursuant to the directions of the Hon'ble Court and subsequent hearings, the **Government of Odisha**, vide order dated **06 September 2019**, declared that the lease had not lapsed and extended its validity up to **08 June 2036** in favour of **Sri Avin Jain**, Power of Attorney holder of **Smt. Sobha Jain**, wife of Late Sri Dharmchand Jain, under the **MMDR (Amendment) Act, 2015**.

Based on the approval of the **Steel & Mines Department, Government of Odisha**, vide letter dated **28 April 2022**, a **Supplementary Lease Deed** for Block-A over **89.961 ha** was executed on **27 April 2023** in favour of **Sri Avin Jain**, Power of Attorney holder of **Smt. Sobha Jain**.

The entire mining lease area lies within the **Baitarani Reserve Forest** and forms part of **Survey of India Toposheet No. F45N5 (73G/5)**. The lease area is bounded by latitudes **21°58'04.701" N to 21°58'42.918" N** and longitudes **85°23'26.729" E to 85°23'59.175" E**.

At present, a proposal for **diversion of 79.367 ha of forest land**, including **2.822 ha earmarked as a safety zone**, in addition to **10.594 ha of forest land already diverted**, has been submitted under **Section 2(ii) of the Forest (Conservation) Act, 1980**. The **MoEF&CC, Government of India**, has accorded **Stage-I (in-principle) approval**, vide File No. 8-31/2015FC(E-91135) dated 13.02.2026, subject to compliance with stipulated conditions.

As per **Condition No. 2.xxi (a)** of the Stage-I approval, the User Agency is required to **prepare and implement a plan containing appropriate mitigative measures to minimize soil erosion and choking of streams** at the project cost. In compliance with the said condition, the present comprehensive scheme has been prepared for implementation over the entire mining lease area of **89.961 ha**.

There is **no perennial nala within the lease area**. However, **Sona Nadi**, a natural drainage channel, flows in the **northward direction** on the **western side of the lease area** at a distance of approximately **1.0 km**. During mining operations, there exists a potential risk of sediment-laden runoff reaching downstream drainage if not properly managed, necessitating appropriate mitigative measures.

2. LOCATION OF THE MINING LEASE AREA

The mining lease area of **Dalpahar Iron & Manganese Mines**, covering **89.961 ha**, is situated within the **Baitarani Reserve Forest** under **Keonjhar Forest Division**, near **Bichakundi Village, Barbil Tahasil, Keonjhar District**, Odisha. The lease area falls under **Survey of India Toposheet No. F45N5 (73G/5)** and is bounded by latitudes **21°58'04.701" N to 21°58'42.918" N** and longitudes **85°23'26.729" E to 85°23'59.175" E.**

3. TOPOGRAPHY

The lease area forms part of a **hilly terrain within the Baitarani Reserve Forest**, characterized by **undulating topography and steep slopes**. The general hill trend is NNE–SSW. Elevation within the lease area varies from approximately **723 m RL to 553 m RL**. No perennial nala exists within the lease boundary, while **Sona Nadi** flows at a distance of about **1 km west of the lease area.**

4. SOIL TYPE

The area is characterized by a **lateritic surface** overlain by a **thin** soil cover with **thickness ranging from 0.5 m to 4.0 m**. The soil colour **varies from yellowish-brown to reddish-brown and grey**. Due to historical mining activities and deforestation, soil erosion has occurred along slopes, and soil cover is predominantly preserved only in areas with natural vegetation.

The soil/alluvium is mainly **silty and clayey**, interspersed with **pebbles and cobbles** of chert, jasper, banded hematite jasper (BHJ), and hematite ore.

5. CLIMATE

The area experiences a **tropical climate**, with summer extending from **March to May**, during which temperatures may reach up to **45°C**. The **south-west monsoon** commences in **June** and continues until **September**, with an average annual rainfall of about **1500 mm**. Winters are confined to **November, December, and January**, with minimum temperatures dropping to around 4°C.

6. DRAINAGE

There is **no perennial drainage channel within the mining lease area. Sona Nadi**, flowing northward on the western side of the lease area at a distance of approximately **1.0 km**, serves as **the main drainage system** of the region.

7. EXISTING VEGETATION

The area supports **natural dry deciduous forest vegetation**, comprising species such as **Sal, Kurum, Kangura, Asan, Dhaura, Kendu, Jamun, Mango**, etc., with an average canopy density of **less than 0.6**. The existing vegetation pattern has evolved under the influence of **edaphic and climatic conditions typical** of the reserve forest ecosystem.

8. FACTORS RESPONSIBLE FOR SOIL EROSION AND CHOKING OF STREAMS

Mining activities, including excavation, sub-grade dumps, and overburden dumps, are the primary factors contributing to soil erosion in the area. The dominant erosion forms observed include rill and gully erosion.

During monsoon periods, stormwater runoff from hill slopes, mine faces, OB dumps, and sub-grade dump areas carries significant sediment loads through lower-order streamlets and gullies. Due to steep gradients, these channels possess high erosive capacity and transport coarse fragments at high velocity. When such flows enter higher-order streams, a reduction in velocity results in sediment deposition, leading to choking of drainage channels.

Additional erosion occurs due to bank undercutting, triggering mass wasting processes such as slumps or slides. The fallen material is subsequently transported and deposited in streambeds, aggravating sedimentation issues.

9. OBJECTIVES OF THE SCHEME

The objectives of the proposed scheme are:

1. To comply with Condition No. 2.xxi (a) of the Stage-I Forest Clearance granted by MoEF&CC, Government of India.
2. To prevent erosion of overburden dumps and topsoil in non-working areas, thereby minimizing the risk of siltation of natural streams.
3. To avoid obstruction of natural drainage systems.
4. To ensure scientific management of overburden materials and prevent sediment inflow into downstream drainage.
5. To prevent movement of eroded soil from mining areas to cultivable lands, natural streams, and nearby habitations.

10. PROPOSED METHODOLOGY

To achieve the above objectives, both biological and structural soil and water conservation measures are proposed for the four overburden dumping sites, as per the approved Mining Plan.

Vegetative measures shall be primarily adopted in the upper reaches and around OB dumps, while structural measures shall be implemented in the lower reaches, drainage lines, and other critical locations.

The following interventions are proposed:

1. Although no seasonal streams exist within the mining lease boundary, monsoon runoff carrying silt and sediments originates from OB dumps, mine pits, haul roads, stockpiles, and exposed surfaces. Masonry check dams have therefore been proposed at suitable downstream locations to reduce flow velocity and arrest sediment load.
2. Periodic desilting and sediment removal shall be undertaken from check dams and garland drains, preferably before and after the monsoon season. The desilted material shall be utilized for plantation and slope stabilization.
3. Erosion from OB dump slopes shall be controlled through loose boulder structures, retaining/toe walls, garland drains, settling tanks, and allied measures. These interventions aim to minimize soil loss from dumps and mineral stockpiles and prevent choking of downstream natural drainage channels.

11. MEASURES PROPOSED

i) Biological Measures

a] Plantation

Soil erosion and sediment control in areas covered with forests are very minimal.However, it is proposed to undertake block plantation @1000 seedlings per Ha inside the safety zone area over 3.138 ha along the lease boundary. The Vetiver Plantation & in the 4 nos of OB dump and Agave Plantation is proposed around the toe of the OB dumps, which are located in north-eastern (Dump-I &II), southside (Dump-III) & South (Dump-IV) side of the Ml. area of Dalpahar Iron & Manganese mines.

The Location of the dumps is given below: -

Co-Ordinate of the Dumps location		
Dump No.	**Latitude**	**Longitude**
Dump-I	21°58'39.402" N to 21°58'42.562" N	85°23'50.825" E to 85°23'58.111" E
Dump-II	21°58'30.980" N to 21°58'39.508" N	85°23'54.057" E to 85°23'58.354" E
Dump-III	2.°58'22.484" N to 21°58'32.247" N	85°23'33.167" E to 85°23'40.622" E
Dump-IV	21°58'5.975" N to 21°58'10.898" N	85°23'40.708" E to 85°23'58.745" E

Location wise proposed plantation will be as follows:

7.5 mtrs SZ area along the Mining Lease boundary	Block Plantation	3.138 Ha	3138 trees

The list of species to be adopted for the plantation is as follows.

Sl. No.	Local Name	Scientific Name
1	Amla	*Emblica officinalis*
2	Karanja	*Pongamia pinnata*
3	Asan	*Terminalia elliptica*
4	Kurum	*Adina cordifolia*
5	Simarouba	*Simaroubaglauca*
6	Neem	*Azadirachta Indica*
7	Bamboo	*Dendrocalamus strictus*
8	Chakunda	*Senna siamea*
9	Sisoo	*Dalbergia sissoo*

Planting shall be done during July in pre-dug pits of size 45 cm X 45 cm X 45 cm. A basal dose of N.P.K fertiliser shall be applied at the time of planting, besides mixing with insecticides to prevent termites & insects. Planning for plantation shall be such that they should not be planted in proximity. A minimum distance of 2.5 mt X 2.5 mt shall be maintained on every fourth plant in planting either of the species. Care should be taken to complete the planting during July while rains are still on during the first or second week of July.

b) Vetiver & Agave Plantation

The Vetiver plantation on the dump no. 1, 2, 3& 4 over an area of 11.5 ha will be carried out.Similarly, extensive plantation of Agave will also be carried out around the bottom of the dump slopesfor stabilization and moisture conservation. The cost norm of block plantation @ 1000 trees per ha has been provided in Annexure- 1&2 of Vetiver plantation & Agave plantation respectively.The details are as follows: -

Category	Location	Area (in Ha.)
Vetiver Plantation	OB dump I, II, III, IV	11.50

Category	Location	Length (Metre)
Agave Plantation	Toe of the OB dump I, II, III, IV	1850 m.

CHOICE OFSPECIES:

The choice of species will be based on the following parameters: (i) Drought hardy and (ii) it should resist the xerophytic nature of the locality, i.e., with less rainfall, less soil fertility, and to resist biotic interference. Selection of the plant species shall be based on the inventory of the local forest species likeChakunda (*Cassiastamea*) Kusum *(Schleicheraoleosa)*, Bel *(Aeglemarmelos)*, Karanja *(Pongamiapinnata)*, Kurum*(Adinacordifolia)*, Amla *(Emblicaofficinalis)* etc. Some soil binding grasses will also be introduced. The species of grass seeds to be broadcast are given in the following table. Plant species suitable for plantation should not only be able to flourish in the area but must also have a rapid growth rate, an evergreen habit, a large crown volume, and small leaves with smooth surfaces. All these traits are difficult to get in a single species. Therefore, a combination of species has been taken into consideration as stated above.

Name of Grass Species	Usage	Habitat / Soil
Chrysopogon fulvus	Fodder	Red Soil/black cotton soil
Erevnopogon foveolatus	Fodder	Skeletal soil
Sporobolus marginatus	Fodder	Sandy soil
Heteropogon contortus	Non-Fodder	Eroded soil
Cymbopogon martini	Non-Fodder	Eroded soil
Cynodon dactylon	Fodder	Wide range soil

c) Weeding

Two weeding have been proposed along with soil working and manuring in the first year and due weeding, soil working and manuring of 2 doses of 15g each in a gap of 15 days in the second year and weeding ploughing in the third year. The first weeding, along with manuring, should be taken up soon after completion of the plantation and the second weeding and soil working should be taken up after one month of the first weeding. Weeding should be done at a radius of one meter and soil working should be done to a depth of 15 cm. All the weeding along with soil work should be completed during November to December. The first weeding should be done along with the replacement of causality that may occur during planting in the first year and after replacement of causality in the 2nd year.

d) Application of Insecticides.

The plantation site, after cleaning and burning, good quality seedlings may cause an influx of insects that usually eat and damage the tender leaves and shoots of the plants. To get rid of such insect attacks, the application of insecticides should be taken up in required doses at desired intervals. Spraying of insecticides shall be done preferably on a sunny day and before forenoon.

e) Fire line Tracing & Maintenance

Fire causes significant damage to forests during the fire season. To prevent fire incidents, the area should be divided into suitable blocks by establishing fire lines. The boundaries of plantation patches and these blocks should be cleared of forest growth to a width of three meters during February–March. The cut vegetation and accumulated dry leaves along these lines should be burnt under strict supervision. This operation should be carried out for a period of three years. Approximately two man-days will be utilized

per day for three months each year, and the same manpower will continue to be engaged for the next five years for maintenance and monitoring. The budgetary allocation for this activity has been considered under inspection, monitoring, and evaluation.

(1) Structural Measures

Vegetative means of erosion control are the most feasible and economic measures. However, as the pressure on land is increasing, need is felt to bring even highly eroded land underutilization. In these lands, vegetative measures are not adequate to keep down the erosion. Some structural measures are required to be taken before vegetative measures are adopted. Structural measures, therefore, serve as a supplement to vegetative measures. The objective behind building mechanical structures is to reduce the degree and length of the slope, reducing run-off and consequently reducing soil erosion.

a) Construction of Loose Boulder Structure:

The User Agency has planned to construct 25 no. of loose boulder structures across the proposed Garland Drain. These loose boulder structures across the proposed garland drain at various locations will help in stabilization of silt & sediment as well as prevention of soil erosion & enrichment of vegetation & greenery development & the location is as follows: -

Loose boulder structures across the proposed garland drain of 2 mtrspan

Category	Location	Quantity in (Nos.)	Span (Mtr)
Loose boulder structures	Down gradient side of proposed dump No. I, II, III, IV	20	Each 2mtrs
	Along the down contour	05	Each 2mtrs
		25	

The cost norm and Design of the Loose boulder Structure have been provided
Annexure

b) Construction of the Garland drain & Catch drain:

A shallow trench (2.0 m wide x 1 m deep) over 2160 rmt for draining surface water before it releases to the vacant land or natural water course. Details of the proposed Garland drain to be constructed around Dump No.I, II, III, IV summarized as follows: -

Item	Location	Length x breath & height in mtr	GPS reading
Garland drain	Bottom of proposed OB dump -I	340 x 2 x 1	2431251 N,334752 E To 2431316 N,334632 E
	Bottom of proposed OB dump -II	510 x 2 x 1	2430981 N,334633 E To 2431014 N, 334759 E
	Bottom of proposed OB dump -III	440 x 2 x 1	2430793 N,334114 E To 2431003 N.334234 E

	Bottom of proposed OB dump -IV	670 x 2 x 1	2430228 N, 334762 E To 2430315 N,334274 E
Catch drain	From 4 nos of settling ponds to vacant land	200 x 2 x 1	

The cost norm & Design of the garland drain have been provided in Annexure-4.

C) Terracing of OB Dump Slope

It is proposed to construct berms& terraces at all four OB dumps during the lease period. Considering the volume of OB materials & the area earmarked for dumping. The slope of individual terraces should be within the permissible range, considering the angle of repose of the soil and space available, thereby maintaining the angle of repose to be around 28°. The terracing will be done through the internal resources by deploying the operating mining equipment. The cost norm of Terrace development has been provided in Annexure-5.

d) Masonry Check Dams

During mining,4 Nos of Check dams will be constructed along an outer line of the mining area, which will be inside the lease area to reduce the flow velocity of runoff & settle the silts/sediments flow from up slope/higher elevation. Obtaining the catchment area from the topo sheet, the peak discharge is calculated & then assuming the depth of flow, the span of the check dam is determined. The proper designs of length, top width, bottom width, aprons, etc., are done with the help of the technical expert. The structure is to be checked against overturning & sliding, etc. Proper abutment at both sides is ensured in design with earth filling so that excess runoff would pass through only check dams without any breach elsewhere.
The cost norm and design structure of the Check Dam have been provided in Annexure-6.
Further, the existing Check dam and Check wire will be regularly maintained for theannual maintenance expenditure charge will be a lump sum of one lakh per Check dam and Check wire.

e) Retaining Walls/Toe Walls around OB Dumps

A retaining wall over 1960 mm is a structure designed and constructed to resist the lateral pressure of soil when there is a designed change in ground elevation that exceeds the angle of repose of the soil.
The proposed retaining walls will be constructed around all 4 dumps of 1960 mtrs. The details of the retaining wall of the proposed dump to be constructed are summarized in the following table-

Item	Location	Length, breath & height in mtr	GPS reading
Retaining wall	Bottom of proposed OB dump -I	340 x 1.5 x 1	2431251 N,334752 E To 2431316 N,334632 E
	Bottom of proposed OB dump -II	510 x 1.5 x 1	2430981 N,334633 E To 2431014 N, 334759 E
	Bottom of proposed OB dump -III	440 x 1.5 x 1	2430793 N,334114 E To 2431003 N,334234 E
	Bottom of proposed OB dump -IV	670 x 1.5 x 1	2430228 N, 334762 E To 2430315 N,334274 E

The cost norm and design structure of the retaining wall have been provided in Annexure-7.

f) Construction of the Settling tank: -

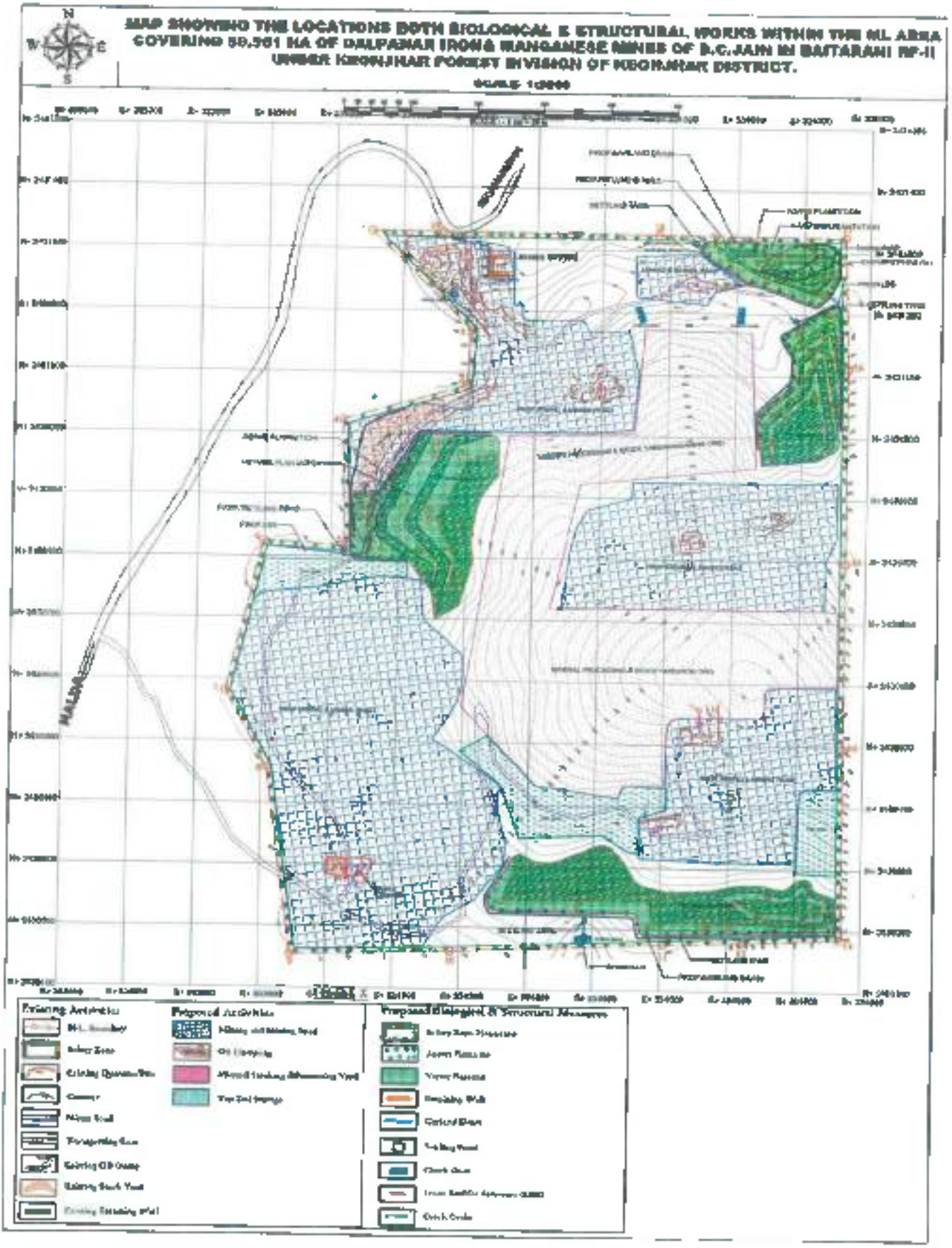
Four nos of settling tankswill be constructed at the lower level of each dump slope of 20 cum (Each) to stabilisetainwater properly. The cost norm and design and design structure of the settling tank have been provided in Annexure-8.

g) De-siltation

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

Map showing the location of all biological and structural works within the ML area of Dalpatar Iron & Mn Mines over 89.961 ha enclosed as Plate no.2

Map showing the location of both biological and structural works within the ML area of Dalpahar Iron & Mn Mines over 89.961 ha.



12.INSPECTION, MONITORING AND EVALUATION

For the successful implementation of the above mitigative measures, thorough inspection and technica. guidance from the relevant technical wing are necessary. The user agency shall provide sufficient fuel and conveyance charges for technical experts to ensure the proper execution of these programs. A budgetary allocation of 15% of the total project cost has been set aside for this purpose.

13.EXECUTING AGENCY

The works in the present Scheme shall be executed by the User Agency having specialized departments headed by qualified persons with outsourced manpower and machinery. To facilitate this, the user agency shall establish its own executing and supervision cells along with the required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in coordination with the Forest Department The entire work will be completed within 3 years after the execution of the mines. Maintenance work will be continued regularly.

14.REQUIREMENT OF FUNDS

The total cost of the implementation of mitigative measures to minimize soil erosion and choking of streams will be Rs. 3,72,19,064.00 (Rupees Three Crore Seventy Two Lakhs Ninety Thousand Sixty Four) Only for the implementation of the above mitigation measures, the above expenditure will be made over the next ten-year period Therefore, the budget provision will be kept by the user agency for implementation of the above mitigation measures over a period of the next ten years after execution of the mines. This budget will be subject to increase in amount considering the increase in materials and labour charges

The tentative annual expenditure planned for the next ten years for the implementation of mitigative measures is given in the following table: -

TOTAL COST OF THE PROJECT

Sl. No.	Description of the Work (wages rate@ Rs.462/-)	Fund Required (In Rs.)
1.	Biological Measures	
A	Rising of Nursery for 4000 (18 months) Seedlings @ Rs 51.70 per ha. (The cost norm Enclosed as **Annexure-1)**	The financial forecast has already been provided in the scheme planting of adequate drought hardy plant species and sowing of seeds in the appropriate area imposed in Condition No.2.xxi (b) So no extra budgetary provision has been suggested
B	Cost for sowing of grass seeds of the slope of the haul roads over 0 96ha @ Rs.59, 532/ha. /-.(The cost norm Enclosed as **Annexure-2]**	
C	Block Plantation (1000 no/ha.) over 3.138 ha of Safety Zone @ Rs. 2,99,567/- and SMC cost over 3.138 ha @ Rs.45,175/- .(The cost norm Enclosed as **Annexure-3 & 4**)	The financial forecast has already been provided in the scheme Safety Zone Fencing, Protection and Regeneration imposed in Condition No.2.xx (a, b& c). So no extra budgetary provision has been suggested

D	Cost for Vetiver Plantation with 10 years maintenance over 11.50 ha @ Rs.1,12,404per Ha. (The cost norm Enclosed as **Annexure-5**)	12,92,646.00
E	Cost of agave plantation on the toe of Dump with 10 years maintenance for a distance of 1.85 km (1850 m) @ Rs.12,20,300/- per Km.(The cost norm Enclosed as **Annexure-6**)	22,57,555.00
	Sub-Total:	**Rs. 35,50,201.00**
2.	**Structural Measures**	
A	25 no. of Loose Boulder Structure 2mt @ Rs. 25911\-per no.(The cost norm **Enclosed as Annexure-7**)	6,47,775.00
B	Construction of Garland drain toe of OB dump & catch drain over a length of **2160 m. @ Rs. 341/- per running meter.**(The cost norm **Enclosed as Annexure-8**)	7,36,560.00
C	Terracing of OB dump over area of 11.50 Ha. Or 1,15,000 SqM @ **Rs. 134/-perSq.M.** (The cost norm **Enclosed as Annexure-9**)	1,54,10,000.00
D	Construction of **4 nos.** of check dam@ **Rs.2,35,180/-**, (**The** cost norm **Enclosed as Annexure-10**)	9,40,720.00
E	Construction of **retaining wall over a length of 1960 m.@ Rs.2313/-.** (The cost norm **Enclosed as Annexure-11**)	45,33,480.00
F	Construction of **4 nos.** of Settling Tank of 20 CuM Capacity each @645per CuM.(The cost norm **Enclosed as Annexure-12**)	51,600.00
G	Distillation work for the Garland drain settling pond & check dam twice a year (On LS)	1,00,000.00
H	Maintenance of retaining wall and check dam & Check wire (On LS)	10,00,000.00
	Sub-Total:	**2,34,20,136.00**
	Total (1+2):	**2,69,70,336.00**
3	Inspection, monitoring and evaluation @ 15% of the total Project cost	40,45,550.40
	Sub- Total:	**3,10,15,886.40**
4	Price escalation @ 20%	6203177.28
	Grant Total	**Rs.3,72,19,063.68 or say Rs.3,72,19,064/-**
(RUPEES THREE CRORE SEVENTY TWO LAKHS NINENTY THOUSAND SIXTY FOUR) ONLY		

Divisional Forest Officer,
Keonjhar Division

Asst. Conservator of Forest
I/C, Champua Forest Range

Technically Approved

Regional Chief Conservator of Forests
Rourkela Circle

Nursery Cost Norm for raising of 1000 (18 months) seedlings								
Wage Rate @ 462 Rs per Man Day								
Sl. No	Items of work	Preferable Period of Execution	Unit	Unity Cost in Rs	No./Qty.	Labour Cost (Rs.)	Material cost (Rs.)	Total cost (Rs.)
1st Financial Year (Seedlings Cost for 3 Months)								
1	Cost of Polythine Bag (12" x 8"x 400 gauge) 80 nos./kg=12.5 kg@Rs 208per kg (Including GST)	Nov- Dec	Kg	208	12.5	0	2600	2600
	Procurement of raw & crude Polypot Mixture							
2	(i) Soil	Nov- Dec	Cft	15	70	0	1050	1050
	(ii) Sand	Nov- Dec	Cft	20	35	0	700	700
	(iii) COM/ Vermi compost/ Bio Fertilizers,etc.	Nov- Dec	Cft	40	35	0	1400	1400
	(iv) Insecticide/ Bio-Pesticide	Nov- Dec	Kg	150	6	0	900	900
3	Preparationof Soil Mixture includes Pulverisation, Straining & mixing the ingredients Properly	Nov- Dec	MD	462	8	3696	0	3696
4	Filling of polythene bags & Setting in the bed	Nov- Dec	MD	462	12	5544	0	5544
5	Collection of Seed GradING & Treatment	Dec	MD	462	2	924	100	1024
6	Preparation of germination bed,Sowing of seed and Mulching including cost of materials	Jan	MD	462	1	462	100	562
7	Dibbling of seeds/Pricking out the Seedlings from germination beds , transplanting in the poly bags and providing sheds including cost of materials	Feb	MD	462	2	924	500	1424
8	Watering for 3 months	Jan - Mar	MD	462	10	4620	0	4620
9	Contingencies (Water can, Bucket, Nursery shed, Electricity charges/ Diseal charges Maintenance of pump set and assoseries & any other)					0	500	500
	Total				89	16170	7850	24020
2nd finance year								
1	Watering for 3 months	April-June	MD	462	10	4620	0	4620
2	Weeding,Sorting,Grading & other operations	April-Mar	MD	462	12	5544	0	5544
3	Cost of insecticide/Bio-pesticide/Jivamruta/Herbal based plant growing products					0	550	550
4	Watering	Oct - Mar	MD	462	20	9240	0	9240
5	Contingencies (Electricity charges/ Diseal charges Maintenance of pump set and assoseries & any other)					0	670	670
	Total				42	19404	1220	20624
3rd finance year April-June								
1	Watering for 3 months	April-June	MD	462	10	4620	0	4620
2	Weeding,Sorting,Grading , Root cutting & other operations	April-June	MD	462	3	1386	0	1386
3	Cost of Insecticide/Bio-pesticide/Jivamruta/Herbal based plant growing products	April-June				0	800	800
4	Contingencies (Electricity charges/ Diseal charges Maintenance of pump set and assoseries & any other)					0	250	250
	Total				13	6006	1050	7056

ABSTRACT

Sl.No	Year	No of ManDay	Labour Cost (	Material cost (Rs)	Total cost
1	1 st Finance Year (9 Months)	35	16170	7850	24020
2	2 nd Finance Year (12 Months)	42	19404	1220	20624
3	3 rd Finance Year (8 Months)	13	6006	1050	7056
Total		90	41580	10120	51700
Cost per 18 months old Seedling = Rs. 51700/1000= Rs. 51.70					

ANNEXURE-2

COST OF GRASS SEED SOWING PER HA.

Wage Rate Rs.462.00

Sl No	Purpose	No of Labour / Quantity of materials	Rate (Rs.)	Amount (Rs.)
1	Spreading of good top soil	03 Nos	462 / labour	1386
2	Adding FYM and good earth	2 TL FYM	1506.48 /TL FYM	6025.92
		2TL good earth	1506.48 /TL Good earth	
3	Cost of grass seed 500Kg/ Per ha.		95/kg	47,500.00
4	Broadcasting	10 nos.	462.00/ labour	4620.00
			Total	59531.92 Or, 59,532.00

COST ESTIMATE FOR BLOCK PLANTATION OF 1000 SEEDLINGS / Ha.

ANNEXURE-4

BASE COST NORM FOR COMPENSATORY AFFORESTATION (BLOCK PLANTATION)
@ 1000 PLANTS PER HECTARE (10 months old seedling)

WAGE RATE Rs. XXX/- PER MANDAY

Sl. No	Name of work	Preferable Period of Execution	No of Mandays	Labour Cost (In Rs.)	Material Cost (In Rs.)	Total cost (In Rs.)
1	2	3	4	5	6	7
	0th Year (Advance work) Pre-Planting Operation					
1	Survey, Demarcation and Pillar marking	Nov/Dec	2	422	0	422
2	Preparation of Treatment Map (Digital Map)	Nov/Dec	1	311	100	411
3	Site preparation (Cleaning & removal of debris)	Nov/Dec	12	3732	0	3732
4	Creation of 4 Mtrs wide Inspection Path	Feb/Mar	1	311	0	411
5	Alignment and marking of pits	Feb/Mar	1	311	0	311
6	Digging of pits (45 cm x 45 cm X 45 cm) in hard and scarcely soil	Feb/Mar	40	12440	0	12440
7	Construction of Temporary Labour Hut, Drinking water facility and First Aid etc.	Jan/Mar	0	0	3500	3500
	Total		57	17727	3600	21327
	1st Year/Planting Year					
1	Refilling of pits by altering the deepest soil of the pit, application of organic compounds/ CSNF/ FYM & refilling the upper strength.	Jun/Jul	7.5	2332.50	5000	7332.50
2	Transportation of 10 months old polybagged seedlings in loaded truck /tractor from the Nursery/Mega nursery to planting site including loading & unloading. (Average load of 10 Kms) & stacking the seedling @ Rs.6/- per Seedling. (1000 nos.)	Jul/Aug	0	0	6000	6000
3	Watering to plant seedlings at planting site	Jul/Aug	2	622	0	622
4	Conveyance of polypot seedlings on head load from the stacking site to individual dugout pits while the planting the, applying insecticide, fertilizers & planting after pressing the soil with other applied materials & pressing the soil perfectly around the planted seedlings	Jul/Aug	22.5	6997.50	0	6997.50
5	Cost of Fertilizer & Insecticide (a) NPK/Bio-fertilizer @ 50 gms/plant as optimal dose = 5kg @ Rs.30/- per kg = Rs. 150/-00 (b) Urea/Vermicompost/Mo Khala/any other fertilizer in two subsequent doses @ Rs. 750.00 (c) Insecticide/ Bio-pesticide @ 5 gms/plant=5 kg @ Rs.150/- per kg = Rs. 750.00	Jul/Aug	0	0	1500	1500
6	Casualty Replacement @ 10% (100 nos.)	Jul/Aug	3.5	777.5	0	777.5
7	1st weeding & Watering	Aug/Sept	12	3732	0	3732
8	2nd Weeding, Soil working (Loss Aftercare around the plants) & Mulching	Oct/Nov	15	4665	0	4665
9	Fire line tracing, (2 m. wide fire line over 400 m long) including maintenance of inspection path	Feb/Mar	3	933	0	933
10	Watch & Ward including watering as per requirement	Aug-Mar	12	3732	0	3732
	Total		76.50	23791.50	14600.00	38391.50
	2nd Year Maintenance					
1	Transportation of 100 seedlings from Nursery to plantation site including loading, unloading & conveyance by Tractor @ Rs.6/- per seedling.	Jul	0	0	600	600
2	Casualty replacement- 10%	Jul	2.5	777.5	0	777.5
3	Cost of fertilizer & insecticide: A) Cost of Insecticide/ Bio-pesticide= 5gms/plant = 0.5 kg @ Rs.150/- per kg = Rs.75/- B) Urea/NPK/Bio fertilizer/Vermicompost/Mo Khala/any other fertilizer: upto 2000/-	July/Aug	0	0	2075	2075
4	Weeding (Complete weeding), Mulching & Soil working (Loss Aftercare around the plants)	Sep/Oct	15	4665	0	4665
5	Fire line tracing, (2 m. wide fire line over 400 m long) including maintenance of inspection path	Feb/Mar	3	933	0	933
6	Watch & Ward including watering as per requirements	Apr-Mar	10	3110	0	3110
7	Maintenance of Temporary Labour Hut, drinking water facility and First Aid etc.	Apr-Mar		0	1890	1890
	Total		30.5	19972.5	4475	14448.5

Sl. No	Items of work	Preferable Period of Execution	No of Mandays	Labour Cost (in Rs.)	Material Cost (in Rs.)	Total cost (in Rs.)
1	2	3	4	5	6	7
	2nd Year Maintenance					
1	Cost of Fertilizer(Urea/NPK/Bio-fertilizer/Vermicompost/Mix Sheets/any other fertilizer	July/Aug	0	0	2000	2000
2	Weeding (Complete weeding), Mulching & Soil working (1 no. digging around the plant)	Sep/Oct	15	4465	0	4465
3	Fire Line tracing (3 m. wide fire line over 400 m long) including maintenance of fencing mesh	Feb/Mar	3	931	0	931
4	Watch & Ward (including engaging an ex-serviceman)	Apr/May	18	5590	0	5590
5	Maintenance of Temporary Labour Shed, Drinking water facility and First Aid etc.	Apr/May	0	0	1000	1000
	Total		36.0	11179	3000	14179
	3rd Year Maintenance					
1	Fire line tracing (3 m. wide fire line over 400 m long) including maintenance of intersection mesh	Feb/Mar	3	931	0	931
2	Watch & Ward including maintenance of vegetative fencing	Apr/Mar	18	5590	0	5590
	Total		21	6521	0	6521
	4th Year Maintenance					
1	Fire line tracing (3 m. wide fire line over 400 m length)	Feb/Mar	3	931.00	0	931
2	Watch & Ward	Apr/Mar	18	5590.00	0	5590
	Total		21	6521	0	6521
	4th Year Maintenance					
1	Fire line tracing (3 m. wide fire line over 400 m length)	Feb/Mar	3	931.00	0	931.0
2	Pruning of branches, Shifting out of multiple stems	Jan/Mar	3	933.00	0	933.0
3	Watch & Ward	Apr/May	18	5590.00	0	5590.0
	Total		24	7464	0	7464.0
	5th Year Maintenance					
1	Fire line tracing (3 m. wide fire line over 400 m length)	Feb/Mar	3	933.00	0	933
2	Watch & Ward	Apr/Mar	18	5590.00	0	5590
	Total		21	6523	0	6523
	6th Year Maintenance					
1	Fire line tracing (3 m. wide fire line over 400 m length)	Feb/Mar	3	931.00	0	931
2	Watch & Ward	Apr/Mar	18	5590.00	0	5590
	Total		21	6521	0	6521
	6th Year Maintenance					
1	Fire line tracing (3 m. wide fire line over 400 m length)	Feb/Mar	3	931.00	0	931
2	Watch & Ward	Apr/Mar	18	5590.00	0	5590
	Total		21	6521	0	6521
	10th Year Maintenance					
1	Fire line tracing (3 m. wide fire line over 400 m length)	Feb/Mar	3	931	0	931
2	Watch & Ward	Apr/Mar	18	5590.00	0	5590
	Total		21	6521	0	6521
	Year wise Abstract of Cost Items (showing seedling cost separately)					

Sl. No	Nature of Work	Applicable Period of Execution	No. of Mandays	Labour Cost (in Rs.)	Material Cost (in Rs.)	Total Cost (in Rs.)	
1	2	3	4	5	6	7	8
Sl. No	Year	No. of Mandays	Labour cost (in Rs)	Material Cost(in Rs.)	Monitoring, Protection, Lawning, Improvement Maintenance and Other Contingency (5%) of (4+5)	Cost of Seedlings @Rs.30.31 per seedlings	TOTAL COST(in Rs)
1	2	3	4	5	6	7	8
1	0th year	32.0	12737.6	2400.0	972.00	0.00	16109.60
2	1st year	76.5	30717.3	14400.0	1958.58	5514.00	52589.88
3	2nd year	58.5	19972.5	4474.0	1222.48	3031.80	28700.78
4	3rd year	34.0	13106.8	1800.0	745.00	0.00	15746.80
5	4th year	21.0	6631.8	0.0	329.00	0.00	6957.80
6	5th year	21.0	6631.8	0.0	329.00	0.00	6957.80
7	6th year	24.0	7664.8	0.0	373.00	0.00	8037.80
8	7th year	21.0	6631.8	0.0	329.00	0.00	6957.80
9	8th year	21.0	6631.8	0.0	329.00	0.00	6957.80
10	9th year	21.0	6631.8	0.0	329.00	0.00	6957.80
11	10th year	21.0	6631.8	0.0	329.00	0.00	6957.80
	Total	350.0	121356.8	23497.0	6773.06	8545.80	127972.66

Notes

1. Details of work to be given in the budget estimate for species available nearby to the site of plantation.
2. 10 % miscellaneous item including trees apart the patterned as Plantation.
3. Site specific Soil conservation work like CCD, Gully Plugging, Staggered Trench, Contour Trench, Crushed Stone etc may be taken up
4. Chain link fencing can be proposed in the Eco-Sensitive zone up outside the forest area and Bamboo fencing may be provided
5. Watering for three year plantation as under R watering may be proposed as per the availability of water.
6. The Cost norms of various items may be changed with the approval of the competent PCCF keeping the overall cost norms fixed for each Financial Year

APCCF (Forest) Diversion & MC, FC Act)

Matrix for Model-I A Conventional CA Plantation (AR) 1000 plants per Ha

In Rupees

Sl. NO.	Component wise/ Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	XXI	Total Cost (20 Years)
Base Norm		22400	93651	22301	16745	8857	8857	7877	8857	8857	8857	8857											
1	2021-22	22800	169484	24589	14226	8935	8751	10502	9648	10133	20857	11169											364738
2	2022-23		23411	105456	25834	19257	8752	9189	11037	10138	12683	11198	11727										348836
3	2023-24			24586	110729	17755	20084	9150	9846	11378	12687	11170	11727	11348									250792
4	2024-25				25815	116246	28460	29099	9650	10135	12167	11169	11729	12313	12929								271716
5	2025-26					27108	132978	29889	29452	10135	10687	11765	11727	12815	12929	13575							185302
6	2026-27						28461	128182	31377	23767	10649	11169	11727	12811	13931	13579	14254						299507
7	2027-28							29884	134581	13944	24475	11172	11727	14025	12929	13579	14254	14963					316546
8	2028-29								31378	14[illegible]321	26593	25848	13791	13813	14777	13575	14257	14987	15715				380738
9	2029-30									31547	248357	14335	26826	12515	12929	13516	14254	14973	15715	25621			346786
10	2030-31										47594	355806	38139	28275	13934	13575	18282	14967	29719	16621	17376		364127

APCCF (Forest Diversion & NO, FC Act)

Cost Norms for Creation of Compensatory Afforestation with Stabilization of Soil Moisture Conservation (SMC)

Annexure-II

Cost norms for creation of Compensatory Afforestation with Stabilization of Soil & Conservation of Moisture (SMC)

WAGE RATE Rs. 311/- PER DAY

Sl.No.	Mode of Works	Permissible Period of Execution	Total Cost
	0th Year (Pre-Monsoon Operation)		
1	Nil		0
	1st Year		
2	Soil Conservation measure structures (by Staggered Trench, Percolation pit, Contour mark, Gradient earthen Bund, LWD, Wire mesh LWD, Soil protect Gabion & WHS as per the slope & site requirement as I.S	Apr/Sept.	20,2 M
	2nd Year		
3	Maintenance of SMC structures @ 15 % of initial year cost	Apr/Jul	3,031
	3rd Year		
4	Maintenance of SMC structures @ 15 % of initial year cost	Apr/Jul	3,032
	4th Year		
5	Maintenance of SMC structures @ 15 % of initial year cost	Apr/Jul	3,032
	5th Year		
6	Maintenance of SMC structures @ 15 % of initial year cost	Apr/Jul	3,032
	Total		32,343.0

Abstract

Sl. No	Year	No. of man days	Labour cost @ Rs 311/- per day	Material Cost	Total cost (Rs.)
1	0th year	0.0	0.0	0.0	0.0
2	1st year	65	0.0	20,215.0	20,215.00
3	2nd year	0.0	0.0	3,032.00	3,032.00
4	3rd year	0.0	0.0	3,032.00	3,032.00
5	4th year	0.0	0.0	3,032.00	3,032.00
6	5th year	0.0	0.0	3,032.00	3,032.00
	Total	0.00	0.00	32,343.0	32,343.0

Different types of SMC structures may be taken up as per the slope & requirements of the plantation the cost of the design & specification of different structures annexed along this annexure.

APCCF (Forest Distribution & NCAC Act)

Matrix for (SMC)

In Rupees

Sl. NO.	Commence ment Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
Base Norm		0	20235	3032	3032	3032	3032											
1	2021-22	0	22236	3842	3610	3665	3670											33633
2	2022-23		0	22287	3629	3686	3669	4064										37435
3	2023-24			0	7360	3594	3670	4067	4267									39284
4	2024-25				0	3457	3868	4064	4265	4480								43248
5	2025-26					0	25803	4351	4267	4478	4702							43910
6	2026-27						0	27093	4264	4480	4702	4939						45475
7	2027-28							0	28443	4477	4702	4937	5186					47749
8	2028-29								0	29867	4702	4939	5186	5445				50136
9	2029-30									0	31380	4936	5186	5443	5717			52662
10	2030-31										0	37938	5183	5445	5735	6023		55274

APCCF (Forest Diversion & NO, FC Act)

ANNEXURE – 5					
Estimate for Vetiver Plantation (Bena) on the OB dump slopes per ha.					
Cost norm, Wages - Rs.462/-					
Sl. No	Name of the Work	Man Days	Manpower Cost	Material Rs.	Total Cost in Rs
1st YEAR OPERATION					
1	Site clearance, alignment and stacking	2	924	0	924
2	Cost of lining materials including transportation.	0	0	1,500	1,500
3	Staking and digging of pits	20	9,240	0	9,240
4	Cost of Clumps 500 per Ha including transportation.	0	0	16,000	16,000
5	Carriage and planting	30	13,860	0	13,860
6	Soil working and application of fertilisers(twice)	10	4,620	0	4,620
7	Cost of fertiliser	0	0	1,500	1,500
8	Watch and ward	2	924	0	924
	Total	**64**	**29,568**	**19,000**	**48,568**
2nd YEAR OPERATION					
9	Causality replacement (20%) including cost of clumps.	10	4,620	3,200	7,820
10	Weeding and application of fertilisers	20	9,240	0	9,240
11	Cost of fertilisers and insecticides	0	0	1,500	1,500
12	Watch and ward	2	924	0	924
	Total	**32**	**14,784**	**4,700**	**19,484**
3rd YEAR OPERATION					
13	Weeding, soil working and application of fertilisers.	10	4,620	0	4,620
14	Plant protection measures including watch and ward	2	924	0	924
	Total	**12**	**5,544**	**0**	**5,544**
4TH YEAR TO 10TH YEAR		**84**	**38,808**	**0**	**38,808**
	Grand Total	**192**	**88,704**	**23,700**	**1,12,404**

ABSTRACT

Year of operation	Cost norm per Ha
1st year	48,568
2nd year	19,484
3rd year	5,544
4th to 10th year	38,808
Total	**1,12,404**

ANNEXURE – 6

COST NORM FOR AGAVE PLANTATION (FOR 5 ROWS & 40 MTRS.)

Wage Rate: 462.00

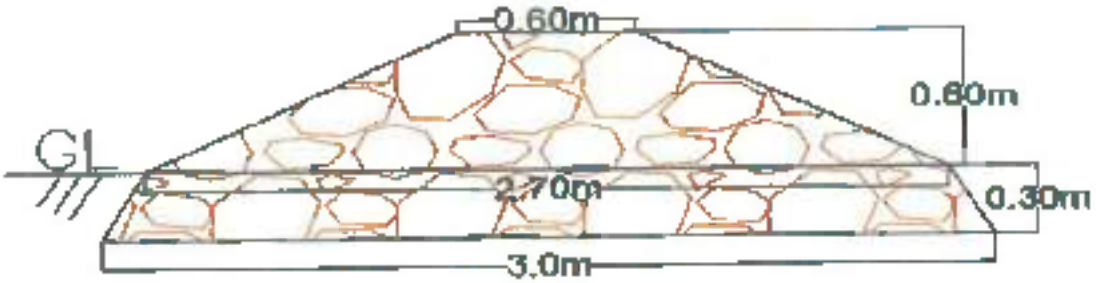
Sl.No	Name of the Work	Man-Day	Man Power Cost	Material	Total
	FIRST YEAR OPERATION				
1	Site clearance alignment and stacking	2	924	0	924
2	Cost of lime materials including transportation	0	0	660	660
3	Digging pits and application of lime	6	2,772	0	2,772
4	Cost of 200 Ac (sucker) including transportation	0	0	3320	3,320
5	Carriage and planting	2	924	0	924
6	Soil working and application of fertilizers (twice) and lime	8	3,696	0	3,696
7	Cost of fertilizer	0		740	740
8	Contingency	0		740	740
	Total:-	**18**	**8,316**	**5460**	**13,776**
	SECOND YEAR OPERATION				
1	Causality replacement (20%) including cost of suckers and pitting	2	924	664	1,588
2	Weeding and application of fertilizer and lime	6	2,772	0	2,772
3	Cost of fertilizer insecticides & lime			500	500
	Total:-	**8**	**3,696**	**1,164**	**4,860**
	THIRD YEAR OPERATION				
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
	FOUR YEAR OPERATION				
1	Weeding, cleaning, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**

FIVE YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
SIX YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
SEVEN YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
EIGHT YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
NINE YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
TEN YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
				Grand Total : -	**48,812**

Cost norm for agave fencing with five rows per km for 10 Year 48812/40 X 1000 = **Rs.12,20,300/-**

ANNEXURE -7

Design of Losse Boulder Structures (LBS)



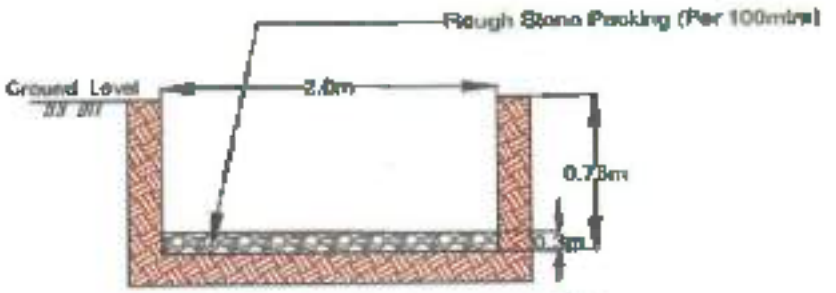
Cross Sectional View of LBS

Detail Estimate of Loose Boulder Structure (L.B.S.)

Span of 2 Mtr. Size

Sl. No.	Item of activity	Cost per unit (Rs.)	Total unit(No/ Cum)	Total cost (in Rs.)
1.	Levelling the unshaped surface of the selected site & layout the structure foundation L.S. 1 MD.	462	1	462.00
2.	Excavation of foundation in hard soil within initial lead of 50 mtr. including rough dressing and breaking of clods to maximum size 5 cm. to 7 cm. laying in layer not exceeding 0.3 in depth to strengthening both side U/S approx. bund of loose boulder structure.	197.10	3.63	715.47
	Base with apron- 1 x 3.70 x 3.00 x 0.30 = **3.33**			
	Wing wall- 4 x 0.50 x 0.50 x 0.30 = **0.30**			
	@ **Rs.19710.00 per 100 cum.**			
3	**Rough stone dry packing**	2859.35	8.65	24733.38
	up to GL			
	Base with apron- 1 x 3.70 x 3.00 x 0.30 **=3.33**			
	Wing wall- 4 x 0.50 x 0.50 x 0.30 = **0.30**			
	Above GL			
	Super structure 1 x 2.00 x (2.70 + 0.60)/2 x 0.60 **=1.980**			
	Wing wall- 4 x 0.50 x 0.50 x 0.50 **=0.50**			
	Side wall-			
i.	2 x (0.50 + 1.10)/2 x 0.9 x 0.5 **=0.72**			
ii.	2 x (0.5 + 1.10)/2x 1.2 x 0.5 **= 0.96**			
iii.	2 x 0.6 x 0.6 x 0.5 **=0.36**			
iv.	2 x 1.0 x 0.5 x 0.5 **=0.50**			
	@ **Rs.2859.35 per cum**			
	G. Total per Loose Boulder Structure of span of 2 Mtrs			**25910.85 or Rs.25911/-**

Design of Garland Drain



Cross Sectional View of Garland Drain

Detail Estimate of construction of Garland Drain

Sl No	Description of Items	No	Length	Width	Height	Qty	Unit	Rate	Amount
1	Cleaning of Jungles & bushes	1.0	200.00	7.00		1400.00	Sqm	4.00	5600.00
2	Earth work in hard soil in embankment roads within 50 mtrinitial lead &1.50 mtrinitial lift including rough dressing &breaking clods to Maximum 5.00c.m. to 7.00 c.m.&laying layers not exceeding 0.30 mtr depth as per specification approved by department along with proper compaction with H.R.R Excavation	1	200.00	2.00	0.75	300.00	Cum	197.1	59130.00
3	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be Supplied by the Company through contractual manner)	2	3.00	2.00	0.30	3.60	Cum	919.47	3310.09
									68040.09
		Rate per two Hundred meter Length				Total			Say Rs. 68040/-

Rate/Running metre length – Rs. 340.20 or Rs.341/-

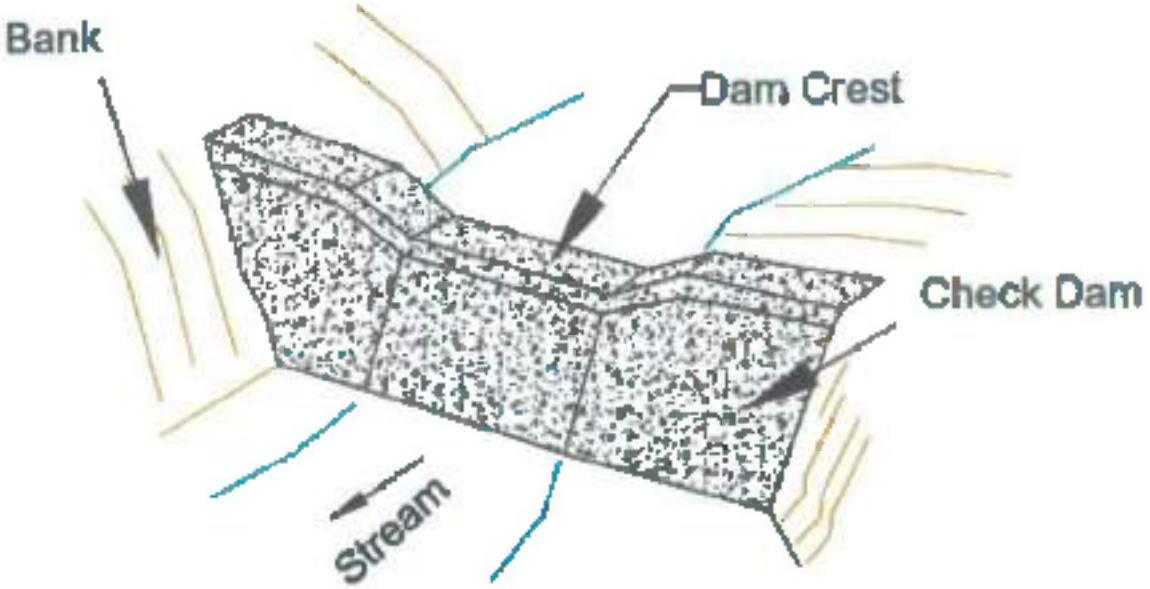
ANNEXURE -9

ENGAGEMENT OF HEMM (HEAVY EARTH MOVING MACHINERIES) ON THE OB DUMP SLOPE FOR TERRACING

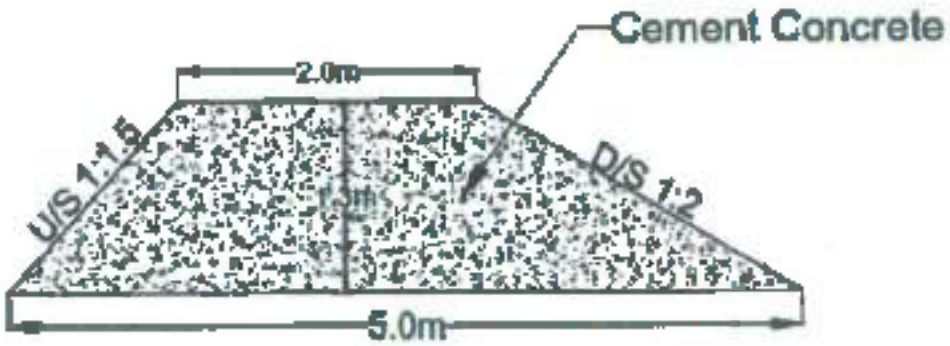
Location – Over Burden Dump –work efficiency per hour – 18SqM on the dump.
Width & height of the terrace – 5 m. & 5 m.
Rate for engagement of HEM machine per SqM – Rs. 2400/hr.
i.e. Rs. 2400/18
=Rs. 133.33/-, say Rs. 134/-

ANNEXURE –10

Design of Check Dam



Side View of Check Dam



Cross Sectional View of Check Dam

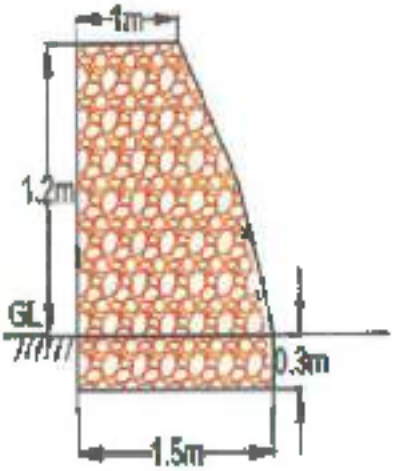
Detail Estimate of Concrete Structure of Check Dam

Item No	Description of Items	No	Length	Width	Height	Qty	Rate	Amount in Rs
1	2	3	4	5	6	7	8	9
1	Earth working in hard soil embankment roads with in 50 mtr initial lead &1.50 mtr initial lift including rough dressing &breaking clods to Maximum 5.00c.m. to 7.00 c m.&laying layers not exceeding 0.30 mtr depth as per specification approved by department along with proper compaction with H.R.R Excavation							
	Base	1	5.00	5.50	0.50	13.75		
	Wing Wall	4	2.00	0.50	0.50	2.00		
	Appron	2	3.00	5.00	0.20	6.00		
	Cut of wall	2	5.00	0.45	0.50	2.25		
						24.00	197.10	4730.40
2	Plain cement concrete (1:4:8)							
	Base	1	4.00	5.50	0.075	1.65		
	Wing Wall	4	2.00	0.50	0.08	0.30		
	Appron	2	3.00	5.00	0.08	2.25		
	Cut of wall	2	4.00	0.45	0.08	0.27		
						4.47	4600.00	20562.00
3	Cement concrete (1:2:4)							
	Below Ground Level							
	Base	1	4.00	5.50	0.40	8.80		
	Wing Wall	4	2.00	0.50	0.40	1.60		
	Appron	2	3.00	5.00	0.10	3.00		
	Cut of wall	2	4.00	0.45	0.50	1.80		
						15.20		
	Above Ground Level							
	Base	1	4.00	(2.00+ 5.00)/ 2	1.00	14.00		
	Wing Wall	4	2.00	0.40	1.00	3.20		
					Total	17.20		
				Grand Total		32.40	6478.00	209887.2
	Rate per one No Check Dam. Length=4.00 mtrHt=1.30 mtr Slope U/S=1:1.5 D/S=1:2					Total		2,35,179.60 Say Rs. 235180/-

(Rupees two lakh thirty five thousand one hundred and eighty) only.

Design Of Retainning Wall

PLAN VIEW OF RETAINING WALL



CROSS SECTION VIEW OF RETAINING WALL

Detail Estimate of Retaining wall of loose local Boulder with cement-Sand Patching over the surface of Boulder wall

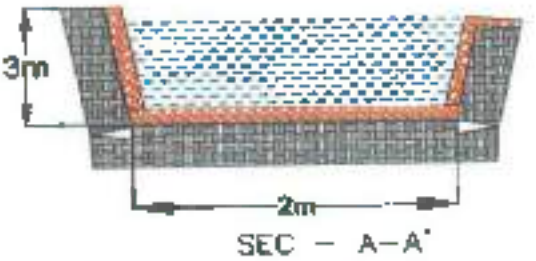
Sl. No.	Description of Items	No	Length	Width	Height	Qty	Unit	Rate	Amount in Rs
1	2	3	4	5	6	7	8	9	10
For one K.M.Length									
1	Cleaning of Jungles & bushes	1	1000	1.5		1500	Sqm	4.00	6000.00
2	Earth work in hard soil in embankment roads with in 50 mtr initial lead &1.50 mtr initial lift including rough dressing &breaking clods to Maximum 5.00c.m. to 7.00 c.m.& laying layers not exceeding 0.30 mtr depth as per specification approved by department along with proper compaction with H.R.R Excavation	1	1000	1.5	0.3	450	Cum	197.1	88,695.00
3	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be Supplied by our Company)	1	1000	{1.00+ 1.50 }/2	1.20	1500	Cum		
		1	1000	1.50	0.30	450	Cum		
		Total				1950	Cum	919.47	1792966.50

4	Irregular cement sand patches on the both side of the wall with 2" thick cement sand mortar (1:6) on top	1	1000	1.00		1000	Sqm		
		2	1000	1.20		2400	Sqm		
						3400	Sqm	125.00	425000.00
		Rate per one K.M Length				Total			23,12,661.5 Say Rs. 23,12,665/-

Cost of Running Meter Length Rs. 2313/-

Design Of Settling Tank

PLAN VIEW OF SETTLING TANK



CROSS SECTIONAL VIEW OF SETTLING TANK

ESTIMATE FOR PER RMT CONSTRUCTION OF SETTLING TANK
(Length: 3m., width: 2.0m. height: 1m.)

Sl No	Description of Items	No	Length	Width	Height	Qty	Unit	Rate	Amount
1	Earth work in hard soil in embankment roads within 50 mtr initial lead &1.50 mtr initial lift including rough dressing &breaking clods to a Maximum 5.00c.m. to 7.00 c.m., & laying layers not exceeding 0.30 mtr depth as per specification approved by the department, along with proper compaction with H.R.R Excavation	1	3.00	2.00	1.0	6.00	Cum	197.1	1182.60
2	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be supplied by our Company)	1	3.00	4.00	0.20	2.40	Cum	919.47	2206.73
3	Transportation charges for 5.00 K.M. lead by truck load from quarry to work site with all costs of , labour, T. & P. etc. all complete in all respects as per specification and direction of	As same as Item No-2				2.40	Cum	200.00	480.00
								Rate per one No Settling tank of 6 Cum	3869.33
Cost for								**Per 1 Cum Rs.645/-**	**Rs.3870.0**

Scheme
For

PLANTING OF ADEQUATE DROUGHT HARDY PLANT SPECIES AND SOWING OF SEEDS IN THE APPROPRIATE AREA WITHIN MINING LEASE TO ARREST SOIL EROSION.

in compliance
with
Condition No.2.xxi (b) of
Stage-I approval granted vide Online Proposal No.FP/OR/MIN/9360/2015 Dated.13.02.2026
of Govt. of India, Ministry of Environment, Forests & Climate Change,
New Delhi.

FOR

DALPAHAR IRON & MANGANESE MINES
(BLOCK-A)
OF
SRI AVIN JAIN

PREFACE

Soil erosion is one of the major environmental challenges associated with mining activities, particularly in areas where natural vegetation has been disturbed. The removal of topsoil, exposure of loose overburden, and alteration of natural drainage patterns accelerate the process of erosion, leading to loss of fertile soil, siltation of nearby water bodies, and degradation of the surrounding ecosystem.

The Dalpahar Iron & Manganese Mines (Block-A), covering an area of 89.961 hectares, is situated within the Baitarani Reserve Forest-A under Barbil Tahasil of Keonjhar District, Odisha. The lease area falls in undulating hilly terrain with significant elevation differences and receives substantial monsoonal rainfall, making the area vulnerable to slope instability and soil erosion if suitable preventive measures are not adopted. Mining operations in the lease are expected to generate a substantial quantity of overburden and waste materials in the form of alluvial soil, BHJ, and BHQ, which require systematic handling and scientifically designed dumping practices.

The Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India, while granting Stage-I (in-ptinciple) approval vide File No. 8-31/2015-FC (E-91135) dated 13.02.2026, stipulated under Condition No. 2.xxi (b) that the User Agency shall prepare a detailed scheme for planting of adequate drought hardy plant species and sowing of seeds in the appropriate area within mining lease to arrest soil erosion

This scheme presents a comprehensive to mitigate these adverse impacts, it is essential to adopt effective biological measures alongside engineering interventions. Plantation of adequate drought-hardy plant species and systematic sowing of suitable seeds in appropriate areas within the mining lease plays a vital role in stabilizing the soil, improving moisture retention, and restoring ecological balance. These plant species, being resilient to harsh climatic conditions and poor soil quality, ensure higher survival rates and long-term sustainability of the reclamation efforts'. The biological measures include plantation of Vetiver grass, Agave, and other soil-binding grasses to enhance slope stability, bind loose material, reduce erosion, and promote ecological recovery.

The present document outlines the strategy, selection of suitable species, and implementation framework for effective plantation and seeding activities, aligned with sustainable mining practices and environmental compliance requirements.

ECUTIVE SUMMARY

This scheme has been prepared for the Dalpahar Iron & Manganese Mines (Block-A), located in the Baitarani Reserve Forest-A, Keonjhar District, Odisha, over a total lease area of 89.961 ha, in compliance with Condition No. 2.xxi (d) of the Stage-I Forest Clearance approval granted by the MoEF&CC vide File No. 8-31/2015-FC (F-91135) dated 13.02.2026. The condition requires the User Agency to prepare a scheme for stabilization of overburden dumps through appropriate grading and benching, ensuring that the angle of repose at any point remains below 28°.

The lease area is characterized by hilly and undulating topography, with elevations ranging from 723 m RL to 553 m RL, and experiences a tropical monsoonal climate with average annual rainfall of about 1500 mm. These conditions make the area prone to runoff-induced erosion and instability of overburden dump slopes and haul roads, if adequate preventive and corrective measures are not adopted.

During the conceptual period of mining, it is proposed to dump overburden/waste material in four designated overburden (OB) dumps covering a total area of 12.890 hectares, along with the development of approximately 3,200 meters of haul roads.

To ensure long-term stability and environmental sustainability, the scheme incorporates a combination of biological and structural measures for effective dump stabilization:

Biological Measures:

Plantation of Vetiver grass over an area of 11.50 hectares on dump slopes to enhance slope stabilization through its deep root system.

Plantation of Agave species along approximately 1,850 meters around the toe of the dumps to act as a bio-barrier and reduce soil erosion.

Sowing of soil-binding grasses over 0.96 hectares along haul road slopes to minimize surface runoff and improve soil cohesion.

1. INTRODUCTION

The mining lease for **Dalpahar Iron & Manganese Mines (Block-A)**, covering an area of **89.961 ha**, was originally granted in favour of **Late Sri Dharmchand Jain** on **09 June 1986** for a period of **20 years**, i.e., up to **08 June 2006**, in **Baitarani Reserved Forest-II** under **Barbil Tahasil, Keonjhar Forest District**. Prior to the expiry of the lease, an application for **Renewal of Mining Lease (RML)** was submitted on **01 June 2005** within the stipulated time. Accordingly, the lease was deemed to have been extended in terms of **Rule 24A(1) of the Mineral Concession Rules, 1950**.

Subsequently, based on the approval of the **Steel & Mines Department, Government of Odisha**, vide letter dated **28 April 2022**, a **Supplementary Lease Deed** for Block-A over **89.961 ha** was executed on **27 April 2023** in favour of **Sri Avin Jain**, Power of Attorney holder of **Smt. Sobha Jain**.

The entire mining lease area lies within the **Baitarani Reserve Forest** and forms part of **Survey of India Toposheet No. F45N5 (73G/5)**. The lease area is bounded by latitudes **21°58'04.701" N to 21°58'42.918" N** and longitudes **85°23'26.729" E to 85°23'59.175" E**.

At present, a proposal for **diversion of 79.367 ha of forest land**, including **2.822 ha earmarked for the safety zone** along the lease boundary, in addition to **10.594 ha of forest land already diverted**, has been submitted under **Section 2(ii) of the Forest (Conservation) Act, 1980**. The **MoEF&CC, Government of India**, has accorded **Stage-I (in-principle) approval**, vide File No. 8-31/2015FC(E-91135) dated 13.02.2026, subject to compliance with stipulated conditions.

As per **Standard Condition No. 2.xxi (d)** of the Stage-I approval, the User Agency is required to prepare a **scheme for construction of check dams and retention/toe walls to arrest sliding of excavated material along the contours**. In compliance with the said condition, the present comprehensive scheme has been prepared for the entire mining lease area of 89.961 ha.

There are no perennial water streams within or in the immediate vicinity of the lease area. Hence, the possibility of choking of natural streams does not arise. Further, no agricultural land or habitation exists within a 10-km radius of the mining lease area, and therefore, no adverse impact on cultivation is anticipated.

2. LOCATION OF THE MINING LEASE AREA

The Dalpahar Iron & Manganese Mine, covering 89.961 ha, is located within the Baitarani Reserve Forest under Keonjhar Forest Division, near Bichakundi Village, Barbil Tahasil, Keonjhar District, and Odisha. The lease area falls under Survey of India Toposheet No. F45N5 (73G/5) and lies between latitudes 21°58'04.701" N to 21°58'42.918" N and longitudes 85°23'26.729" E to 85°23'59.175" E.

3. TOPOGRAPHY

The mining lease area forms part of a **hilly terrain within the Baitarani Reserve Forest** and is characterized by **undulating topography with steep slopes**. The general trend of the hill ranges from **NNE to SSW**. Elevation within the lease area varies from approximately **723 m RL to 553 m RL**.

No perennial nallah exists within the lease area. **Sona Nadi**, a seasonal stream, flows towards the north at a distance of about **1 km** west of the lease boundary.

4. SOIL TYPE

The area is characterized by a lateritic surface overlain by a thin soil cover with thickness ranging from 0.5 m to 4.0 m. The soil colour varies from yellowish-brown to reddish-brown and grey. Due to historical mining activities and deforestation, soil erosion has occurred along slopes, and soil cover is predominantly preserved only in areas with natural vegetation.

The soil/alluvium is mainly silty and clayey, interspersed with pebbles and cobbles of chert, jasper, banded hematite jasper (BHJ), and hematite ore.

5. CLIMATE

The area experiences a tropical climate, with summer extending from March to May, during which temperatures may reach up to 45°C. The south-west monsoon commences in June and continues until September, with an average annual rainfall of about 1500 mm. Winters are confined to November, December, and January, with minimum temperatures dropping to around 4°C.

6. DRAINAGE

There is no perennial drainage channel within the mining lease area. Sona Nadi, flowing northward on the western side of the lease area at a distance of approximately 1.0 km, serves as the main drainage system of the region.

7. LAND USE PATTERN

During the life of the mine, about 81.491 hectares will be utilized for mining, Dumping, Stacking, Mineral Processing, Road, Infrastructure, etc and 8.47 hectares will be maintained as Safety Zone & green belt. The details of land use pattern will be as follows:

Item wise Proposed Land Use Pattern in Forest Land of Total Lease Hold Area

Sl. No.	Pattern of utilization		Total forest area to be utilized in Ha.
1	Mining Including Mines Road		40.050
2	Waste/Over Burden Dump with Env. Protective Measures		12.890
3	Utility Services	Mineral Processing Unity &Stock Yard	19.07
		Storage of Top Soil	3.817
		Internal Transporting Road	2.910
		Temp.Infrastructure (Office, Workshop,Crech,Elect.Sub-station,U/g cable, Parking plaza,etc)	2.754
4	Green Belt		5.357
		Sub-Total	**86.848**
5	Safety Zone along the Lease Boundary		3.113
		Grand Total	**89.961**

8. EXISTING VEGETATION

The area supports natural dry deciduous forest vegetation, comprising species such as Sal, Kurum, Kangara, Asan, Dhaura, Kendu, Jamun, Mango, etc., with an average canopy density of less than 0.6. The existing vegetation pattern has evolved under the influence of edaphic and climatic conditions typical of the reserve forest ecosystem.

9. FACTORS RESPONSIBLE

In mining activities, the following factors are responsible for soil erosion in the mining lease area.

- The mining activities and overburden dumps are the major sources of drainage of soil and other substances in different places within the ML area.
- The instant mining lease area comprises of undulating plains, hilly slopes and drainage and through them causes soil erosion from the top side and get accumulated in the bottom sides/ lower areas.
- The forms of erosion observed in this region include mainly rill and gully erosion. The storm water runoffs from the hills, mine faces and OB dump slope areas also carry substantial amounts of solids in the lower order streamlets and choke the higher order streams.
- These lower order streamlets have high erosion capacity due to steep gradient and transportation of rock fragments with high velocity of the stream and deposition of same in the connecting high order streams due to velocity drop.
- Streams can also erode by undercutting their banks resulting in mass-wasting processes like slumps or slides. When the undercut material falls into the stream, the fragments are transported and deposited in the stream bed.

10. OBJECTIVE OF THE SCHEME:

The objectives of the proposed scheme are as follows:

- To comply with the stipulation of Condition No. 2.xxi (b) of the Stage-I Forest Clearance approval, which requires the User Agency to prepare a scheme for planting of adequate drought hardy plant species and sowing of seeds in the appropriate area within mining lease to arrest soil erosion
- To minimize the soil erosion by planting drought hardy species over the overburden dumps.
- Sowing of seeds in the appropriate area within the Mining Lease to ensure vegetation from the sown seeds to arrest soil erosion.
- To provide a green cover under the implementation of above objectives to meet the requirement of the above condition of MoEF& CC.

11. MEASURES PROPOSED TO BE CARRIED OUT

Efforts will be undertaken to establish plantations of drought-resistant and indigenous plant species to improve the ecological condition of degraded lands within the mining lease area. Suitable species such as Neem (Azadirachta indica), Karanja (Pongamia pinnata), Asan (Terminalia alata), Kurum (Schleichera oleosa), Amla (Emblica officinalis), and Mundi (Mitragyna parviflora) will be planted considering their adaptability to local climatic and edaphic conditions.

In addition, soil-binding grasses like Vetiver (Vetiveria zizanioides) will be introduced in vulnerable areas to reduce soil erosion and enhance slope stability. Plantation of Murga (Agave sisalana) will be carried out along the toe of dump slopes, where it will act as a live hedge or bio-fencing. This will not only help in stabilizing the dump slopes but also aid in reclaiming eroded areas.

The selection of species for greenbelt development will be finalized in consultation with the State Forest Department to ensure ecological suitability and sustainability.

Considering the site-specific soil and moisture conditions, priority will be given to the plantation of indigenous and drought-hardy species to ensure better survival and ecological suitability. Agave plantation is specifically proposed along the slopes and toes of OB Dump-I, Dump-II, Dump-III, and Dump-IV to effectively control soil erosion and facilitate long-term stabilization of the dumps.

In addition, sowing of soil-binding grasses over an area of 0.96 hectares along the haul road slopes is proposed to minimize surface runoff, enhance soil cohesion, and prevent erosion.

The list of species to be adopted for the plantation is as follows:

1. *Adina cordifolia*(Kurunta)
2. *Ficus religiosa*(Aswastha)
3. Azadirachta indica(Neem)
4. *Pongamiapinnata* (Karanja)
5. *Aegle marmelos (Bel)*

Plantation activities shall be undertaken during the month of July, preferably in the first or second week, coinciding with the onset of monsoon to ensure adequate soil moisture for plant establishment. Saplings will be planted in pre-dug pits of size 45 cm × 45 cm × 45 cm.

A basal dose of NPK fertilizer shall be applied at the time of planting to promote early growth, along with suitable insecticides to protect against termite and insect infestation. Proper care shall be taken during planting to ensure healthy survival and growth of the saplings.

Planting design will be planned in a systematic manner. Fruit-bearing tree species and bamboo rhizomes shall not be planted in close proximity to avoid competition for nutrients and space. A minimum spacing of 2.5 m × 2.5 m will be maintained, and on every fourth planting position, suitable species variation will be introduced to enhance biodiversity and ecological balance.

Similarly, extensive plantation of Agave on the dump slopes and sowing of grass seeds (**Vetiveriazizanioides**) in the slope area of the haul road will also be undertaken to enhance slope stabilization and promote moisture conservation.

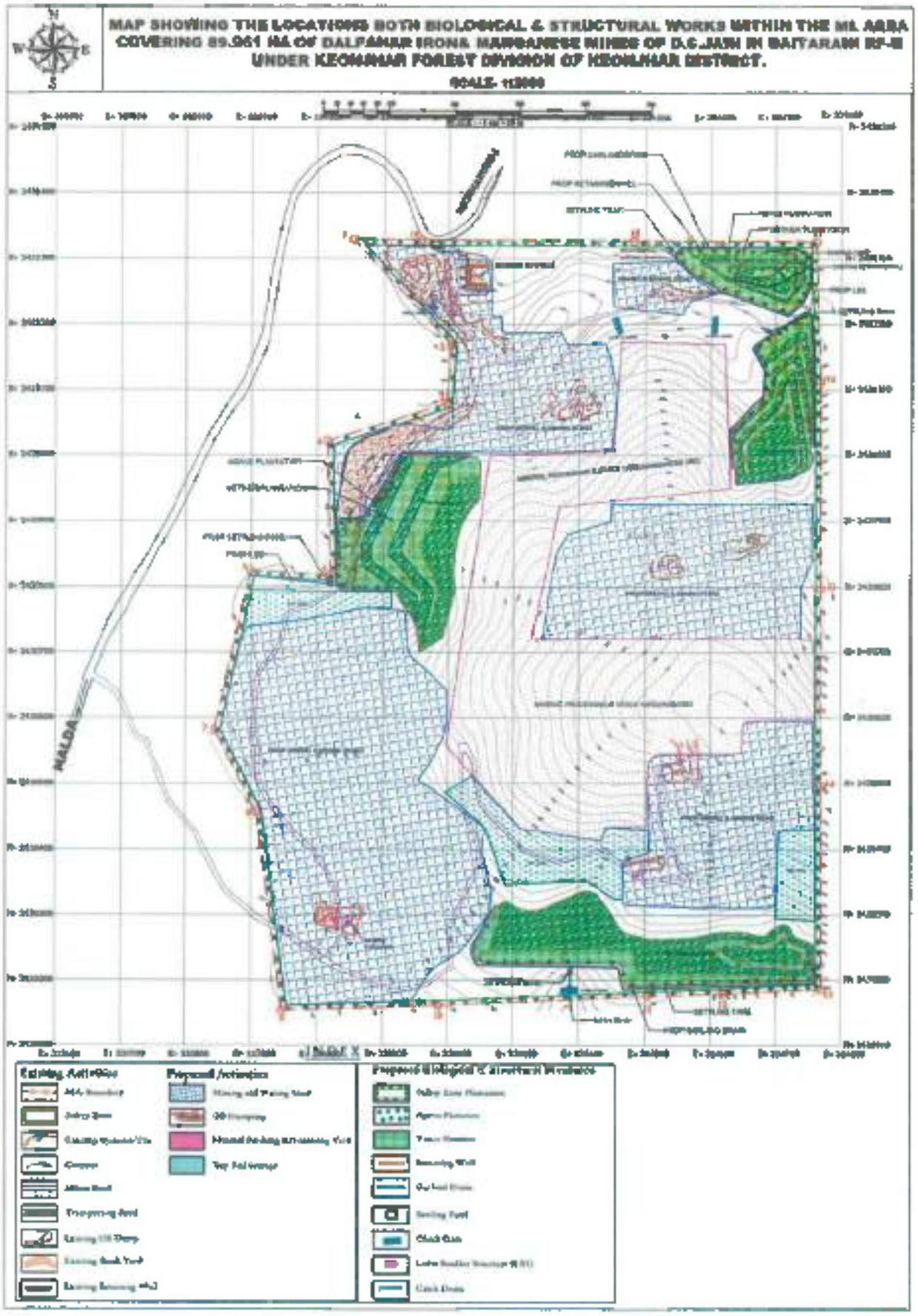
The details regarding the proposed afforestation programme and broadcasting of grass seeds in the Laserda–Pacheri Manganese & Iron Mines are presented below.

Location wise proposed plantation is as follows:

Category	Location	Area in Ha.
Vertiver Plantation	OB dump I, II, III, IV	11.50
soil binding grasses	Along Slop of Haul Road	0.96
Drought hardy plant species	Safety Zone along the Lease boundary	3.138

Category	Location	Length in mtrs
Agava Plantation	Toe of the OB dump I, II, II, IV	1650

Map showing the location of all biological and structural conservation measures



CHOICE OF SPECIES

The selection of plant species shall be based on the following criteria:
(i) drought tolerance, and
(ii) adaptability to xerophytic conditions of the area, characterized by low rainfall, poor soil fertility, and resistance to biotic interference.

Accordingly, species will be selected from the inventory of local forest flora to ensure ecological compatibility and higher survival rates. The proposed species include Chukunda (Cassia siamea), Kusum (Schleichera oleosa), Bel (Aegle marmelos), Karanja (Pongamia pinnata), Kurum (Adina cordifolia),), etc.

In addition, suitable soil-binding grasses will be introduced to enhance soil stability and reduce erosion. The species of grass seeds proposed for broadcasting are provided in the subsequent table.

The selected plant species should not only be capable of thriving under site-specific conditions but should also exhibit desirable characteristics such as rapid growth, evergreen nature, large crown cover, and small, smooth-surfaced leaves. Since it is difficult to find all these attributes in a single species, a mixed plantation approach comprising a combination of suitable species has been adopted.

The details of the proposed grass species are given below:

Name of Grass Species	Usage	Habitat / Soil
Chrysopogon fulvus	Fodder	Red Soil/black cotton soil
Eremopogon foveolatus	Fodder	Skeletal soil
Sporobolus marginatus	Fodder	Sandy soil
Heteropogon contortus	Non-Fodder	Eroded soil
Cymbopogon martini	Non-Fodder	Eroded soil
Cynodon dactylon	Fodder	Wide range soil

12.PLANTATION OPERATIONS PLAN

The following operations will be undertaken for successful implementation of the plantation programme:

i) Raising of Nursery

A nursery with a capacity of 4,000 (18 months old) saplings per annum is proposed to meet the minimum requirement of planting material. In case of any shortfall, additional saplings will be procured from the State Forest Department nurseries.

A decentralized nursery will be established at the planting site during January–February, considering the availability of water and minimal biotic interference. The selected nursery site will be properly fenced and provided with an entry gate for protection and accessibility.
Polythene bags of size 12" × 8" × 400 gauge will be filled with a mixture of soil, sand, and well-decomposed cow dung manure in the ratio of 3:1:1. These will be arranged in half-sunken beds, accommodating approximately 1,000 bags per bed. Adequate spacing will be maintained between beds to facilitate movement for routine operations such as watering, weeding, manuring, and plant protection measures.

Seed Treatment and Sowing:
Treated seeds will be dibbled in pre-soaked polythene bags during the month of March.
Regular watering will be carried out daily, along with timely weeding and other intercultural operations, until the onset of the monsoon, i.e., by the third week of June. Temporary overhead shade structures may be provided during daytime to protect seedlings from excessive heat and removed during nighttime.

The cost norms for raising the nursery are provided in Annexure-I.

---

ii) Alignment and Pitting

Alignment and pitting operations will be carried out during March–April. Pits of size 45 cm × 45 cm × 45 cm will be dug, maintaining a spacing of 2.5 m × 2.5 m between plants.

iii) Actual Planting

Planting will be undertaken after the onset of the first monsoon showers and completed by end of July.

Seedlings will be planted in pre-dug pits maintaining the specified spacing. Species selection will be based on soil suitability.

- **Basal dose:** NPK fertilizer @ 30 grams per plant
- **Protection:** Anti-termite insecticide applied in each pit

Casualties observed will be replaced using surplus seedlings. Replacement planting will also be carried out during the second year.

iv) Weeding, Soil Working & Manuring

To ensure proper establishment and growth:

- **First & Second Year:**
  - Two weeding operations:
    - **August–September (Area weeding)**
    - **October–November (Strip weeding)**
- **Third Year:**
  - **One area weeding** during August

After each weeding:

- Soil working will be done around each plant within a 0.5 m radius
- **Manuring:** NPK @ 30 grams per plant

v) Application of Insecticides

To protect young plants from pest attacks, insecticides will be applied at recommended doses and intervals.

- Spraying will be conducted preferably on sunny days before forenoon for maximum effectiveness.

vi) Fire Line Tracing and Maintenance

To prevent fire hazards:

- Plantation area will be divided into blocks with 3.0 m wide fire lines
- Fire lines will be cleared during **February–March**
- Dry biomass and debris along fire lines will be **burnt under strict supervision**

This operation will be continued for **three years.**

vii) Post-Plantation Care

Post-plantation maintenance will be ensured for five years to maximize survival rate.

Key activities include:

- **Watering:**
  - Regular watering depending on rainfall
  - During dry season (**March–June**), watering will be frequent
  - First-year saplings: **3 times per week**
- **Manuring:**
  - Use of organic manure such as **animal dung, agricultural waste, and kitchen waste**
- **Protection Measures:**
  - Young saplings will be protected using gabions/tree guards
  - Diseased or dead plants will be removed and replaced
- **Monitoring:**
  - Regular monitoring of growth, health, and survival rate
  - Timely remedial measures will be undertaken

13. INSPECTION, MONITORING AND EVALUATION:

For the successful implementation of the above mitigative measures, regular and intensive inspection along with technical guidance from the concerned technical wing will be essential. Adequate provision for fuel and conveyance charges for technical experts shall be made by the user agency to ensure effective execution and monitoring of these programmes. A budgetary allocation of 15% of the total project cost has been earmarked for this purpose. etc.) shall be provided by User Agency for effective implementation of the proposals.

14. EXECUTING AGENCY:

The works under the present scheme shall be executed by the User Agency through its specialized departments, headed by qualified personnel, with the support of outsourced manpower and machinery. To ensure effective implementation, the User Agency shall establish dedicated execution and supervision cells, along with the necessary infrastructural facilities.

In order to maintain high standards of quality, in-house supervision shall be carried out by competent personnel. All activities will be undertaken in close coordination with the Forest Department.

The entire work is proposed to be completed within a period of three years following obtaining final forest clearance. Thereafter, maintenance activities shall be carried out on a regular and continuous basis.

15. REQUIREMENT OF FUNDS:

The total cost of implementation is estimated at **Rs. 3,64,252.00 (Rupees Three lakh Sixty-Four Thousand Two Hundred Fifty Two) only per annum.** The expenditure for sowing of grass seeds shall be incurred every year throughout the life of the mine. The budget may be revised periodically to account for any increase in the cost of materials and labour.

TOTAL COST OF THE PROJECT

Sl. No.	Description of the Work Wage Rate Rs.478/-	Fund Required (in Rs.)
I.	**Biological Measures**	
A	Rising of Nursery for 4000 (18 months) Seedlings @ Rs 51.70 per seedling (The cost norm Enclosed as **Annexure-1**)	2,06,800.00
B	Cost for Vetiver Plantation with 10 years maintenance over 11.50 ha @ Rs.1,12,404per Ha (The cost norm **Enclosed as Annexure-2**)	The financial forecast of these items has already been provided in the scheme imposed in Condition No. 2.xxi (a). So, no extra budgetary provision has been suggested
C	Cost of agave plantation on the toe of Dump with 10 years maintenance for a distance of 1.85 km (1850 m) @ Rs.12,20,300/- per Km.(.(**The cost norm Enclosed as Annexure-3**)	
D	Block Plantation of Safety Zone (1000 no /ha.) over 3.138 ha. @ Rs. 2,99,567/- (as per base norm of Matrix for the year 2026 27) (**Annexure-4**).	The financial forecast of these items has already been provided in the scheme imposed in Condition No. 2.xx (a,b & c).So, no extra budgetary provision has been suggested
E	Cost for sowing of grass seeds of the slope of the haul roads over 0.96ha @ @ Rs.59, 532/ha /-.((The cost norm Enclosed as **Annexure-5**)	57,150 72
	Total	2,63,950.72
	Inspection, monitoring and evaluation @15%	39,592.61
	Sub-Total	3,03,543.33
	Price Escalation @20%	60,708.67
	Grant Total	Rs 3.64,252.00

(Rupees Three lakh Sixty-Four Thousand Two Hundred Fifty Two) only

Asst. Conservator of Forest
I/C. Champua Forest Range

Technically Approved
Regional Chief Conservator of Forests
Rourkela Circle

Divisional Forest Officer,
Keonjhar Division

ANNEXURE-1

Nursery Cost Norm for raising of 1000 (18 months) seedlings								
Wage Rate @ 462 Rs per Man Day								
Sl. No	Items of work	Preferable Period of Execution	Unit	Unity Cost in Rs	No./Qty.	Labour Cost (Rs.)	Material cost (Rs.)	Total cost (Rs.)
1st Financial Year (Seedlings Cost for 3 Months)								
1	Cost of Polythine Bag (12" x 8"x 400 gauge) 80 nos./kg=12.5 kg@Rs 208per kg (including GST)	Nov- Dec	Kg	208	12.5	0	2600	2600
	Procurement of raw & crude Polypot Mixture							
2	(i) Soil	Nov- Dec	Ch	15	70	0	1050	1050
	(ii) Sand	Nov- Dec	Ch	20	35	0	700	700
	(iii) COW/ Vermi compost/ Bio-Fertilizers,etc.	Nov- Dec	Ch	40	35	0	1400	1400
	(iv) Insecticide/ Bio-Pesticide	Nov- Dec	Kg	150	6	0	900	900
3	Preparationof Soil Mixture includes Pulverisation, Straining & mixing the ingredients Properly	Nov- Dec	MD	462	8	3696	0	3696
4	Filling of polythene bags & Setting in the bed	Nov- Dec	MD	462	12	5544	0	5544
5	Collection of Seed Grading & Treatment	Dec	MD	462	2	924	100	1024
6	Preparation of germination bed,Sowing of seed and Mulching including cost of materials	Jan	MD	462	1	462	100	562
7	Dibbling of seeds/Pricking out the Seedlings from germinstion beds , transplanting in the poly bags and providing sheds including cost of materials	Feb	MD	462	2	924	500	1424
8	Watering for 5 months	Jan - Mar	MD	462	10	4620	0	4620
9	Contingencies (Water can, Buckets, Nursery shed, Electricty charges/ Diesel charges Maintenance of pump set and accesories & any other)					0	500	500
	Total				98	16170	7850	24020
2nd finance year								
1	Watering for 3 months	April-June	MD	462	30	4620	0	4620
2	Weeding,Sorting,Grading & other operations	April Mar	MD	462	12	5544	0	5544
3	Cost of Insecticide/Bio-pesticide/Bvamruta/Herbal based plant growing products					0	580	580
4	Watering	Oct - Mar	MD	462	20	9240	0	9240
5	Contingencies (Electricty charges/ Diesel charges Maintenance of pump set and accesories & any other)					0	670	670
	Total				42	19404	1220	20624
3rd finance year April-June								
1	Watering for 3 months	April-June	MD	462	10	4620	0	4620
2	Weeding Sorting,Grading , Root cutting & other operations	April-June	MD	462	3	1386	0	1386
3	Cost of Insecticide/Bio-pesticide/Bvamruta/Herbal based plant growing products	April-June				0	800	800
4	Contingencies (Electricty charges/ Diesel charges Maintenance of pump set and accesories & any other)					0	250	250
	Total				13	6006	1050	2836

ABSTRACT

Sl.No	Year	No of ManDay	Labour Cost (	Material cost (Rs.)	Total cost
1	1st Finance Year (3 Months)	98	16170	7850	24020
2	2 nd Finance Year (12 Months)	42	19404	1220	20624
3	3 rd Finance Year (3 Months)	13	6006	1050	7056
	Total	80	41580	10120	51700
Cost per 18 months old Seedling = Rs. 51700/1000= Rs. 51.70					

ANNEXURE – 2					
Estimate for Vetiver Plantation (Bona) on the OB dump slopes per ha.					
Cost norm, Wages - Rs.462/-					
Sl. No	**Name of the Work**	**Man Days**	**Manpower Cost**	**Material Rs.**	**Total Cost in Rs**
1st YEAR OPERATION					
1	Site clearance, alignment and stocking	2	924	0	924
2	Cost of lining materials including transportation.	0	0	1,500	1,500
3	Staking and digging of pits.	20	9,240	0	9,240
4	Cost of Clumps 500 per Ha including transportation.	0	0	16,000	16,000
5	Carriage and planting	30	13,860	0	13,860
6	Soil working and application of fertilisers(twice)	10	4,620	0	4,620
7	Cost of fertiliser	0	0	1,500	1,500
8	Watch and ward	2	924	0	924
	Total	**64**	**29,568**	**19,000**	**48,568**
2nd YEAR OPERATION					
9	Causality replacement (20%) including cost of clumps.	10	4,620	3,200	7,820
10	Weeding and application of fertilisers	20	9,240	0	9,240
11	Cost of fertilisers and insecticides	0	0	1,500	1,500
12	Watch and ward	2	924	0	924
	Total	**32**	**14,784**	**4,700**	**19,484**
3rd YEAR OPERATION					
13	Weeding, soil working and application of fertilisers.	10	4,620	0	4,620
14	Plant protection measures including watch and ward	2	924	0	924
	Total	**12**	**5,544**	**0**	**5,544**
4TH YEAR TO 10TH YEAR		**84**	**38,808**	**0**	**38,808**
	Grand Total	**192**	**88,704**	**23,700**	**1,12,404**

ABSTRACT

Year of operation	Cost norm per Ha
1st year	48,568
2nd year	19,484
3rd year	5,544
4th to 10th year	38,808
Total	**1,12,404**

ANNEXURE – 3

COST NORM FOR AGAVE PLANTATION (FOR 5 ROWS & 40 MTRS.)

Wage Rate: 462.00

Sl.No	Name of the Work	Man-Day	Man Power Cost	Material	Total
	FIRST YEAR OPERATION				
1	Site clearance alignment and stacking	2	924	0	924
2	Cost of lime materials including transportation	0	0	660	660
3	Digging pits and application of lime	6	2,772	0	2,772
4	Cost of 200 Ac. (sucker) including transportation	0	0	3320	3,320
5	Carriage and planting	2	924	0	924
6	Soil working and application of fertilizers (twice) and lime	8	3,696	0	3,696
7	Cost of fertilizer	0		740	740
8	Contingency	0		740	740
	Total:-	**18**	**8,316**	**5460**	**13,776**
	SECOND YEAR OPERATION				
1	Causality replacement (20%) including cost of suckers and pitting	2	924	664	1,588
2	Weeding and application of fertilizer and lime	6	2,772	0	2,772
3	Cost of fertilizer insecticides & lime			500	500
	Total:-	**8**	**3,696**	**1,164**	**4,860**
	THIRD YEAR OPERATION				
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
	FOUR YEAR OPERATION				
1	Weeding, cleaning, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
	FIVE YEAR OPERATION				
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**

SIX YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
SEVEN YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
EIGHT YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
NINE YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
TEN YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
				Grand Total : -	**48,812**

Cost norm for agave fencing with five rows per km for 10 Year 48812/40 X 1000 = **Rs.12,20,300/-**

ANNEXURE-4

COST ESTIMATE FOR BLOCK PLANTATION OF 1000 SEEDLINGS / Ha.

ANNEXURE-4

BASIS COST NORMS FOR COMPENSATORY AFFORESTATION (BLOCK PLANTATION)
@ 1000 PLANTS PER HECTARE (18 months old seedling)

WAGE RATE Rs.211/- PER MANDAY

Sl. No	Items of work	Preferable Period of Executing	No of Mandays	Labour Cost (in Rs.)	Material Cost (in Rs.)	Total cost (in Rs.)
1	2	3	4	5	6	7
	0th Year (Advance work) Pre-Planting Operation					
1	Survey, Demarcation and Pillar erecting	Nov/Dec	2	422	0	422
2	Preparation of Treatment Map (Digital Map)	Nov/Dec	1	211	200	411
3	Site preparation (Clearance & removal of shrubs)	Nov/Dec	17	3737	0	3737
4	Construction of 1.5M pit weir Increasing Path	Feb/Mar	1	211	0	211
5	Measurement and marking of pits	Feb/Mar	1	211	0	211
6	Digging of pits (45 cm x 45 cm X 45 cm) in soil and in rocky soil	Feb/Mar	60	12660	0	12660
7	Construction of Temporary Labour Shed, Drinking water facility and Fencing etc.	Jan/Mar	4	0	3800	3800
	Total		87	17727	3800	21527
	1st Year/Planting Year					
1	Refilling of pits by placing the stagnant soil of the pit, application of organic components/ CRM/ FYM & mixing the same properly	Jun/Jul	7.5	2332.50	1000	3332.50
2	Transportation of 18 months old polythene bag seedlings in lined truck /tractor trips (by Departmental/Hired vehicle) including loading & unloading etc. (Average lead of 10 Kms) & stacking the seedling @ 1000 seedling/ (1100 nos.)	Jul/Aug	0	0	4600	4600
3	Watering without supply of plantation site	Jul/Aug	2	422	0	422
4	Conveyance of polypot seedlings on head load from the stacking site to individual pit/planting site, applying inoculable, fertilizers & planting after covering the soil with other applied materials & pressing the soil properly around the planted seedlings	Jul/Aug	22.5	4997.50	0	4997.50
5	Cost of Fertilizer & insecticide: [a]NPK/Mix-fertilizer @ 50 gms/plant as basal dose = 50kg @ Rs.30/- per kg = Rs. 1500.00 [b] Urea/Vermicompost/Mix Khata/any other fertilizer in two subsequent doses @ Rs. 750.00 (c) Insecticide/ Bio-pesticide @ 5 gms/plant= 5 kg @ Rs.150/- per kg = Rs. 750.00	Jul/Aug	0	0	2000	2000
6	Casualty Replacement @ 10% (100 nos.)	Jul/Aug	2.5	777.5	0	777.5
7	1st weeding & Hoeing	Aug/Sept	17	3737	0	3737
8	2nd Weeding, Soil working (1mt. diameter around the plant) & Hoeing	Oct/Nov	15	4665	0	4665
9	Fire line tracing (2 m. wide fire line over 400 m. long) including maintenance of fire line/fire path	Feb/Mar	3	933	0	933
10	Watch & Ward including watering as per requirement	Apr/May	15	3737	0	3737
	Total		76.50	17731.50	14400.00	32131.50
	2nd Year Maintenance					
1	Transportation of 100 seedlings from Nursery to plantation site including loading, unloading & conveyance by Tractor @ Rs.6/- per seedling	Jul	0	0	600	600
2	Casualty replacement- 10%	Jul	2.5	777.5	0	777.5
3	Cost of Fertilizer & insecticide: A] Cost of insecticide/ Bio-pesticide @ 5 gms/plant = 0.5 kg @ Rs.150/- per kg = Rs.75/- B]Urea/NPK/Bio-fertilizer/Vermicompost/Mix Khata/any other fertilizer @Rs. 2000/-	July/Aug	0	0	2075	2075
4	Weeding (Complete weeding), Hoeing & Soil working (1mt. diameter around the plants)	Sep/Oct	15	4665	0	4665
5	Fire line tracing (2 m. wide fire line over 400 m. long) including maintenance of inspection path	Feb/Mar	3	933	0	933
6	Watch & Ward including watering as per requirement	Apr/May	15	3737	0	3737
7	Maintenance of Temporary Labour Shed, Drinking water facility and Fencing etc.	Apr/May		0	1000	1000
	Total		35.5	10972.5	4675	15647.5

Sl. No.	Items of work	Periodicity (Period of Execution)	No of Mandays	Labour Cost (in Rs)	Material Cost (in Rs.)	Total cost (in Rs.)
1	2	3	4	5	6	7
	2nd Year Maintenance					
1	Cost of Fertilizer(Urea/NPK/Bio-fertilizer/Vermicompost/Mo Blanc/any other fertilizer	Feb/Aug	6	0	2000	2000
2	Weeding (Complete weeding), Watering & Soil working (Hoeing around the plants)	Sep/Oct	15	4065	0	4065
3	Fire line tracing (2 m. wide fire line over 400 m long) including maintenance of inspection path	Feb/Mar	1	993	0	993
4	Watch & Ward including maintenance of watchers hut	Apr/Mar	18	5940	0	5940
5	Maintenance of Temporary Labour Shed, Drinking water facility and First Aid etc.	Apr/Mar	0	0	1000	1000
	Total		40	11198	3000	14906
	3rd Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m long) including maintenance of inspection path	Feb/Mar	3	993	0	993
2	Watch & Ward including maintenance of watchers hut	Apr/Mar	18	5940	0	5940
	Total		21	6933	0	6933
	4th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m long)	Feb/Mar	3	993.00	0	993
2	Watch & Ward	Apr/Mar	18	5940	0	5940
	Total		21	6933	0	6933
	5th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	993.00	0	993.0
2	Repair of boundary fencing and cut of undesirable bushes	Jun/Nov	3	993.00	0	993.0
3	Watch & Ward	Apr/Mar	18	5940.00	0	5940.0
	Total		24	7926	0	7926.0
	6th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	993.00	0	993
2	Watch & Ward	Apr/Mar	18	5940.00	0	5940
	Total		21	6933	0	6933
	7th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	993.00	0	993
2	Watch & Ward	Apr/Mar	18	5940.00	0	5940
	Total		21	6933	0	6933
	8th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	993.00	0	993
2	Watch & Ward	Apr/Mar	18	5940.00	0	5940
	Total		21	6933	0	6933
	9th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	993.00	0	993
2	Watch & Ward	Apr/Mar	18	5940.00	0	5940
	Total		21	6933	0	6933
	10th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	993	0	993
2	Watch & Ward	Apr/Mar	18	5940.00	0	5940
	Total		21	6933	0	6933

Year wise Abstract of Cost Norm (showing seedling cost separately)

Sl. No	Items of work	Productive Period of Plantation	No of Persons	Labour Cost (in Rs.)	Material Cost (in Rs.)	Total cost (in Rs.)	
1	2	3	4	5	6	7	8
Sl. no	Year	No. of mandays	Labour cost (in Rs)	Material Cost (in Rs.)	Monitoring, Evaluation, Learning, Documentation and Small Office Contingency (5%) of (4+5)	Cost of Seedlings @Rs.10.0 per seedlings	TOTAL COST(in Rs)
1	2	3	4	5	6	7	8
1	1st year	87.0	17431.0	3000.0	973.00	0.00	21404.00
2	2nd year	76.5	23298.0	14850.0	1907.40	35343.00	76898.40
3	3rd year	30.0	13770.0	1470.0	762.00	8415.00	24417.00
4	4th year	26.0	11594.0	1188.0	739.00	0.00	13521.00
5	5th year	21.0	4591.0	0.0	229.00	0.00	4820.00
6	6th year	21.0	4591.0	0.0	229.00	0.00	4820.00
7	7th year	34.0	7446.0	0.0	372.00	0.00	7818.00
8	8th year	21.0	4591.0	0.0	229.00	0.00	4820.00
9	9th year	21.0	4591.0	0.0	229.00	0.00	4820.00
10	10th year	21.0	4591.0	0.0	229.00	0.00	4820.00
11	11th year	21.0	4591.0	0.0	229.00	0.00	4820.00
	Total	330.0	72139.0	20508.0	5923.40	43758.00	176328.40

Note

1. Every work to be given to the lowest bidder of the Gram Panchayat available nearby to the site of plantation.
2. 10% unskilled fruit bearing trees would be given to the plantation.
3. Any specific Skill oriented training work like UREP, Kathy Plugging, Bhoomi Trench, Contour Trench, Gabion Bund, etc may be taken up
4. Green Net fencing can be erected instead of RR plantation. Labour available in the form of grass and Bamboo fringe fencing may be preferred
5. Watering facilities for protective watering may be adopted as per the availability of water.
6. The Cost Norms of various items may be changed with the approval of the competent HOD/CPA keeping the overall cost norm fixed by each Financial Year

A/C.O (Forest Division & PIO, PC Act)

Matrix for Model-I A Conventional CA Plantation (AR) 2000 plants per Ha

In Rupees

Sl. NO.	Component/ activity/ Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	XXI	Total Cost (10 Years)
Base Norm		27800	15651	27301	15745	8857	6457	7857	6857	5857	6457	8157											
1	2021-22	21800	330434	24582	18228	8385	6753	10802	9644	10183	10497	11189											234718
2	2022-23		13416	106456	25814	20137	6762	9589	11027	20230	10595	14189	15777										246454
3	2023-24			24586	140329	27105	20094	9190	9648	14578	10587	14233	13817	12518									358777
4	2024-25				25835	116265	28480	23798	9850	20130	17157	11168	13728	12519	12989								371716
5	2025-26					27105	122378	29883	27754	20139	10637	17765	11727	12515	12989	10678							285301
6	2026-27						28481	126182	31377	18262	10640	11188	13402	12913	17981	13575	14256						298567
7	2027-28							29884	104981	32946	24475	11172	13727	14273	13029	12878	14314	14987					326546
8	2028-29								31378	141811	34593	15649	11791	12813	14777	13575	14257	14987	15715				330220
9	2029-30									12967	145367	16975	20968	12578	13029	15516	14254	14990	15715	16581			346786
10	2030-31										16584	15806	19139	20374	13984	13575	15182	14967	15779	16421	17336		364327

APCCF (Forest Diversion & NO, FC Act)

Annexure - 5

COST OF GRASS SEED SOWING PER HA.

Wage Rate Rs.462.00

Sl No	Purpose	No of Labour / Quantity of materials	Rate (Rs.)	Amount (Rs.)
1	Spreading of good top soil	03 Nos	462 / labour	1386
2	Adding FYM and good earth	2 TL FYM	1506.48 /TL FYM	6025.92
		2TL good earth	1506.48 /TL Good earth	
3	Cost of grass seed 500Kg/ per ha		95/kg	47,500.00
4	Broadcasting	10 nos.	462.00/ labour	4620.00
				59531.92
			Total	**Or,**
				59,532.00

SCHEME
FOR
CONSTRUCTION OF CHECK DAMS, RETENTION/TOE WALLS TO ARREST SLIDING DOWN OF THE EXCAVATED MATERIAL ALONG THE CONTOUR

in compliance

with

Condition No.2.xxi (c) of

Stage-I approval granted vide Online Proposal No.FP/OR/MIN/9360/2015 Dated.13.02.2026

of Govt. of India, Ministry of Environment, Forests & Climate Change,

New Delhi.

FOR

DALPAHAR IRON & MANGANESE MINES
(BLOCK-A)
OF
SRI AVIN JAIN

SCHEME FOR CONSTRUCTION OF CHECK DAMS, RETENTION/TOE WALLS TO ARREST SLIDING DOWN OF THE EXCAVATED MATERIAL ALONG THE CONTOUR

1. INTRODUCTION

The mining lease for **Dalpahar Iron & Manganese Mines (Block-A)**, covering an area of **89.961 ha**, was originally granted in favour of **Late Sri Dharmchand Jain** on **09 June 1986** for a period of 20 years, i.e., up to **08 June 2006**, in **Baitarani Reserved Forest-A** under **Barbil Tahasil, Keonjhar Forest District**.

Prior to the expiry of the lease, an application for **Renewal of Mining Lease (RML)** was submitted on **01 June 2005** within the stipulated time. Accordingly, the lease was deemed to have been extended in terms of **Rule 24A(1) of the Mineral Concession Rules, 1950**.

However, due to delays in submission of the succession certificate and in obtaining statutory clearances, the lease was declared **lapsed** by the **Government of Odisha, Steel & Mines Department**, on **01 May 2015**. Against this order, a petition was filed before the **Hon'ble High Court of Odisha**. Pursuant to the directions of the Hon'ble Court and subsequent hearings, the **Government of Odisha**, vide order dated **06 September 2019**, declared that the mining lease had not lapsed and extended the validity of the lease up to **08 June 2036** in favour of **Sri Avin Jain**, Power of Attorney holder of **Smt. Sobha Jain**, wife of Late Sri Dharmchand Jain, under the provisions of the **MMDR (Amendment) Act, 2015**.

Subsequently, based on the approval of the **Steel & Mines Department**, Government of Odisha, vide letter dated **28 April 2022**, a **Supplementary Lease Deed** for Block-A over **89.961 ha** was executed on **27 April 2023** in favour of **Sri Avin Jain**, Power of Attorney holder of **Smt. Sobha Jain**.

The entire mining lease area lies within the **Baitarani Reserve Forest** and forms part of **Survey of India Toposheet No. F45N5 (73G/5)**. The lease area is bounded by latitudes **21°58'04.781" N** to **21°58'42.918" N** and longitudes **85°23'26.729" E** to **85°23'59.175" E**.

At present, a proposal for **diversion of 79.367 ha** of forest land, including **2.822 ha earmarked for the safety zone along the lease boundary**, in addition to **10.594 ha** of forest land already diverted, has been submitted under **Section 2(ii) of the Forest (Conservation) Act, 1980**. The **MoEF&CC, Government of India**, has accorded **Stage-I (in-principle) approval**, vide File No. 8-31/2015FC(E-91135) dated 13.02.2026, subject to compliance with stipulated conditions.

As per **Standard Condition No. 2.xxi (c)** of the Stage-I approval, the User Agency is required to prepare a **scheme for construction of check dams and retention/toe walls to arrest sliding of excavated material along the contours**. In compliance with the said condition, the present comprehensive scheme has been prepared for the entire mining lease area of **89.961 ha**.

There are no perennial water streams within or in the immediate vicinity of the lease area. Hence, the possibility of choking of natural streams does not arise. Further, no agricultural land or habitation exists within a 10-km radius of the mining lease area, and therefore, no adverse impact on cultivation is anticipated.

2. LOCATION OF THE MINING LEASE AREA

The Daipahar Iron & Manganese Mine, covering 89.961 ha, is located within the Baitarani Reserve Forest-A under Keonjhar Forest Division, near Bichakundi Village, Barbil Tahasil, Keonjhar District, and Odisha. The lease area falls under Survey of India Toposheet No. F45N5 (73G/5) and lies between latitudes 21°58'04.701" N to 21°58'42.918" N and longitudes 85°23'26.729" E to 85°23'59.175" E.

3. TOPOGRAPHY

The mining lease area forms part of a hilly terrain within the Baitarani Reserve Forest and is characterized by undulating topography with steep slopes. The general trend of the hill ranges from NNE to SSW. Elevation within the lease area varies from approximately 723 m RL to 553 m RL.

No perennial nallah exists within the lease area. Sona Nadi, a seasonal stream, flows towards the north at a distance of about 1 km west of the lease boundary.

4. OBJECTIVES OF THE SCHEME

The objectives of the present scheme are:

a) To comply with Condition No. 2.xxi (c) of the Stage-I forest clearance granted by MoEF&CC, Government of India.
b) To prevent soil erosion and sediment transport due to surface runoff from excavated and dump areas
c) To avoid obstruction to natural drainage and ensure proper rainwater management.
d) To prevent movement of eroded material from mining areas towards natural streams, forest land, and surrounding areas.

5. PROPOSED METHODOLOGY

The following measures are proposed to arrest sliding of excavated material and control erosion:

a) Construction of retaining walls and garland drains around waste dump sites, including repair and strengthening of existing structures, wherever required.
b) Development of waste dumps in terraced form, with terrace heights ranging from 10 to 12 m and widths varying between 6 to 12 m, to enhance slope stability.
c) Provision of inward-sloping soil bunds at the edge of each terrace, particularly at the toe end, to facilitate controlled drainage and rainwater management.
d) Construction of catch drains along steep slopes to intercept surface runoff and reduce erosive velocity.

e) Development of garland drains with settling tanks at the toe of waste dumps to allow sedimentation of silt before discharge.

All inactive and stabilized dump slopes shall be covered with plantation. Existing plantations on dump slopes shall be maintained properly, and casualty replacement shall be undertaken regularly to ensure long-term slope stabilization and ecological restoration.

The Salient features of the drainage management plan are as follows:

1. The overall drainage planning has been done in such a manner that follows the existing pre mining drainage routing to the extent possible, maintaining the overall slope in the direction of pre mining flow direction so that run off distribution is not affected.
2. Garland drains have been planned on the sides of quarries and external dumps (depending on contours).
   The garland drains shall be routed through catch pits and settling tanks to settle out suspended solids in the stormwater. The purified water will be discharged to natural water source.
3. Grass and bushes in drains hold back solid particles during the flow of water in the drain. Small stone barriers constructed across the drain will check water flow and arrest solids.
4. Stone pitching will be made at suitable places to regulate the slope and hence, water flow will not be obstructed.
5. Settling pits and drains shall be cleaned intermittently, especially during the monsoon.
6. Outer side of the cross-check dams on the drainage lines shall be reinforced with green cover of non-browsable species like Jatrophacurcas, Vitexnegundo, and Gliricidia maculate.

6. MEASURES PROPOSED TO BE ADOPTED

Vegetative measures constitute the most economical and sustainable means of erosion control. However, in areas experiencing severe erosion, steep slopes, and high runoff velocity, vegetative measures alone are insufficient to arrest soil loss effectively. Under such conditions, structural (mechanical) measures are essential as preliminary interventions, after which vegetative stabilization can be successfully implemented.

The primary objective of adopting structural measures is to reduce slope length and gradient, control runoff velocity, promote sediment deposition, and thereby minimize soil erosion. These measures act as supplementary supports to biological measures and ensure long-term stability of excavated and dump slopes.

a) Construction of Loose Boulder Structures

The User Agency proposes to construct 25 numbers of loose boulder structures across the proposed garland drains at strategic locations. These structures will function as energy dissipaters, reducing flow velocity, arresting silt and sediment, and facilitating natural vegetation regeneration in downstream areas.

Each loose boulder structure shall have a span of 2.0 m and shall be constructed using locally available boulders in a dry masonry arrangement.

Details of Proposed Loose Boulder Structures

Category	Location	Quantity in (Nos.)	Span (Mtr)
Loose boulder structures	Down gradient side of proposed dump No. I , II, III, IV	20	Each 2mtrs
	Along the down contour	05	Each 2mtrs
	Total	25	

b) Construction of Garland Drains

Garland drains are proposed to intercept and safely divert surface runoff from dump slopes before it reaches natural drainage courses or vacant land. The proposed garland drains shall be **shallow trapezoidal trenches of 2.0 m width and 1.0 m depth**, with an overall length of approximately **2160 running meters.**

The drains will be constructed around **OB Dump Nos. I, II , III, IV & Catch drain** as summarized below:

Details of Proposed Garland Drains

Item	Location	Length x breath & height in mtr	GPS reading
Garland drain	Bottom of proposed OB dump -I	340 x 2 x 1	2431251 N,334752 E To 2431316 N,334632 E
	Bottom of proposed OB dump -II	510 x 2 x 1	2430981 N,334633 E To 2431014 N, 334759 E
	Bottom of proposed OB dump -III	440 x 2 x 1	2430793 N,334114 E To 2431003 N,334234 E
	Bottom of proposed OB dump -IV	670 x 2 x 1	2430228 N, 334762 E To 2430315 N,334274 E
Catch drain	From 4 nos of settling ponds to vacant land	200 x 2 x 1	

c) Terracing of OB Dump Slopes

It is proposed to develop berms and terraces on all three OB dumps over 11.50 Ha during the lease period. The terracing design has been formulated considering the volume of overburden material, dump area availability, and geotechnical stability requirements.

The slope of individual terraces shall be maintained within permissible limits, keeping the angle of repose of the material at approximately 28°. Terracing operations will be carried out using existing mining machinery and internal resources, ensuring systematic slope stabilization and facilitation of plantation activities.

d) Construction of Masonry Check Dams

A total of four (4) masonry check dams are proposed to be constructed outside the active mining zone but within the lease area, at suitable downstream locations. These structures are intended to reduce runoff velocity, trap sediments, and prevent downstream siltation from higher elevations.

Based on catchment delineation using topographical sheets, peak discharge has been estimated. Considering the design discharge and assumed flow depth, the span, height, top width, bottom width, and apron dimensions of each check dam have been finalized with the assistance of qualified technical experts.

Each structure shall be designed and checked for stability against sliding, overturning, and structural failure, with proper abutments and earth filling provided on both banks to ensure safe passage of excess runoff through the structure without lateral breaches.

The existing check dams and check wires shall be regularly maintained. A lump-sum annual maintenance provision of ₹1.00 lakh per structure has been earmarked for upkeep and repairs.

e) Construction of Retaining Walls / Toe Walls around OB Dumps

Retaining walls (toe walls) are proposed to withstand lateral earth pressure and prevent outward movement of dump material, particularly where the natural ground slope exceeds the angle of repose.

A total length of 1960 running metres of retaining walls is proposed around four OB dumps. The retaining walls shall have a standard dimension of 2.0 m width and 1.0 m height. The details of the retaining wall of the proposed dump to be constructed are summarized in the following table:

Details of Proposed Retaining Walls

Item	Location	Length, breath & height in mtr	GPS reading
Retaining wall	Bottom of proposed OB dump -I	340 x 2 x 1	2431231 N,334752 E To 2431316 N,334632 E
	Bottom of proposed OB dump -II	510 x 2 x 1	2430981 N,334633 E To 2431014 N, 334759 E
	Bottom of proposed OB dump -III	440 x 2 x 1	2430793 N,334114 E To 2431003 N,334234 E
	Bottom of proposed OB dump -IV	670 x 2 x 1	2430228 N, 334762 E To 2430315 N,334274 E

f) Construction of Settling Tanks

A total of **four (4) settling tanks**, each of **20 cubic metres capacity**, are proposed at the toe of each dump slope. These structures will facilitate **sedimentation of suspended solids** from runoff before its controlled discharge, thereby reducing downstream silt load

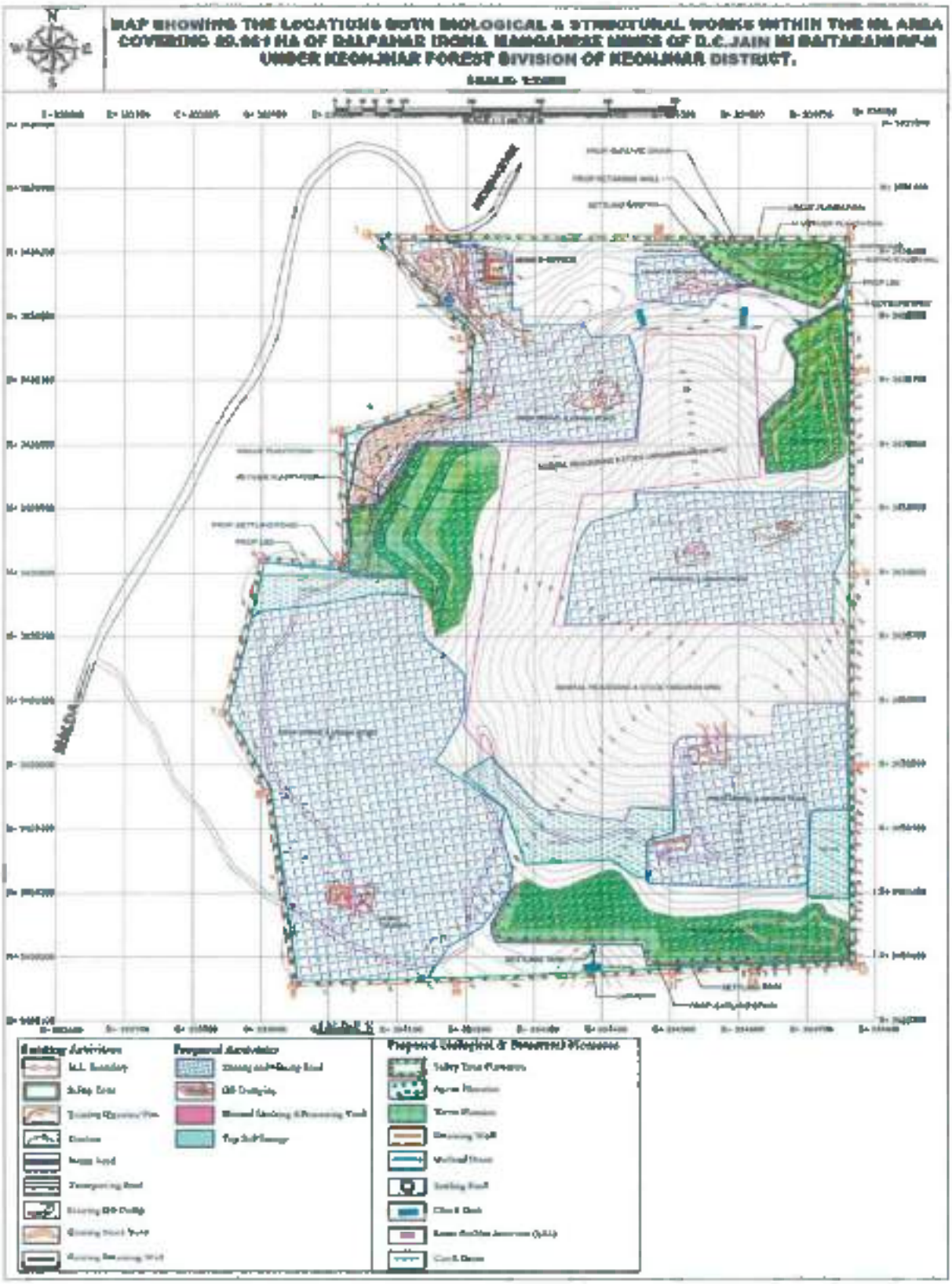
g) De-siltation and Maintenance

Periodic de-siltation of settling tanks shall be undertaken to maintain their effective capacity and prevent overflow or choking. De-siltation works will be carried out **at least once before and once after the monsoon season**, or more frequently depending on site conditions and sediment load.

The implementation and maintenance schedule shall be site-specific, based on the extent of sediment accumulation and hydraulic performance of the structures.

A map showing the location of all biological and structural conservation measures within the mining lease area of **Dalpahar Iron & Manganese Mines (89.961 ha)** is enclosed as **Plate-I**.

Map showing the location of all biological and structural conservation measures



7. INSPECTION, MONITORING AND EVALUATION

For effective and successful implementation of the proposed mitigation measures, a system of regular inspection, monitoring, and technical evaluation shall be instituted. Periodic inspections and continuous technical guidance from the concerned technical wings shall be essential to ensure that all structural and biological measures are executed in accordance with approved designs, specifications, and timelines.

The User Agency shall make adequate provisions towards fuel, conveyance, and logistical support for technical experts and supervisory personnel engaged in inspection and monitoring activities. These inspections shall assess the structural integrity, hydraulic performance, and functional effectiveness of the erosion control measures and facilitate timely corrective actions wherever required.

A budgetary provision equivalent to 15% of the total project cost has been earmarked exclusively for inspection, monitoring, evaluation, and associated supervisory activities to ensure sustained performance of the implemented measures.

8. EXECUTING AGENCY

The works proposed under the present Scheme shall be executed by the User Agency, which shall deploy its specialized technical departments headed by qualified and experienced personnel, supported by outsourced skilled manpower and appropriate machinery.

For efficient execution and quality assurance, the User Agency shall establish dedicated execution and supervision cells, equipped with the necessary infrastructural facilities. Continuous in-house supervision by competent technical personnel shall be ensured to maintain prescribed construction standards and workmanship.

All activities under the Scheme shall be implemented in close coordination with the Forest Department, ensuring compliance with forest conservation norms and site-specific environmental requirements.

The entire scope of work under this Scheme shall be completed within a period of three (3) years from the commencement of mining operations. Thereafter, routine operation and maintenance of all structural and biological measures shall be carried out on a regular and sustained basis to ensure long-term effectiveness and stability.

9. REQUIREMENT OF FUNDS

The financial forecast of an amount Rs. 3,23,19,786/-for construction of Stabilization of over burden Dumps, Retention/ Toe Walls to arrest sliding down of the excavated material along the contour utilizing, Construction of Check Dam, Retaining wall, Garland/Catch Drain, Settling Tank and Loose Boulder Structure of 2m span with Distillation & maintenance work has already been provided in the Scheme for mitigative measures to minimize soil erosion and chocking of streams as per condition No.2.xxi (a) of the Stage I approval So, to avoid repetition of the financial forecast, no budgetary provision has been furnished here.

FINANCIAL FORECAST OF THE PROJECT

1.	**Structural Measures** Wages rate @Rs.462/-	
A	25 no's of Loose Boulder Structure 2mt @ **Rs. 25911/-per no.**	The financial forecast of these items has already been provided in the scheme imposed in Condition No. 2.xxi (a). So, no extra budgetary provision has been suggested.
B	Construction of the Garland drain toe of OB dump over a length of **2160m. @ Rs. 341/- per running meter.**	
C	Terracing of OB dump over area of 11.50 Ha. Or 1,15,000 SqM @ **Rs. 134/- per Sq.M.**	
D	Construction of 4 **no's of check dam@ Rs.2,35,180/-**	
E	Construction of **retaining wall over a length of 1960m.@ Rs.2313/-**	
F	Construction of 4 no. of Settling Tank of **20 CuM (each) Capacity @ Rs 645per CuM**	
2.	Distillation work for Garland drain, settling pond & check dam twice in a year (On LS)	
3.	Maintenances of Retaining wall and Check dam & Check wire	
Inspection, monitoring and evaluation @ 15% of the total Project cost		
	Total:	
	Price escalation @ 20%	
	GRAND TOTAL	

Divisional Forest Officer,
Keonjhar Division

Asst. Conservator of Forests
I/C, Champua Forest Range

Technically Approved
Regional Chief Conservator of Forests
Rourkela Circle

SCHEME
FOR
STABILIZING THE OVERBURDEN DUMPS BY APPROPRIATE GRADING/BENCHING SO AS TO ENSURE THAT ANGLES OF REPOSE AT ANY GIVEN PLACE IS LESS THAN 28°

in compliance

with

Condition No.2.xxi (d) of

Stage-I approval granted vide Online Proposal No.FP/OR/MIN/9360/2015 Dated.13.02.2026

of Govt. of India, Ministry of Environment, Forests & Climate Change, New Delhi.

FOR

DALPAHAR IRON & MANGANESE MINES (BLOCK-A) OF SRI AVIN JAIN

SCHEME FOR STABILIZING THE OVERBURDEN DUMPS BY APPROPRIATE GRADING/BENCHING SO AS TO ENSURE THAT ANGLES OF REPOSE AT ANY GIVEN PLACE IS LESS THAN 28°

PREFACE

The stabilization of overburden (OB) dumps is an essential component of environmentally responsible and scientifically managed mining operations, particularly in ecologically sensitive and hilly terrains. Improperly designed or unmanaged dump slopes may lead to erosion, slope failure, sliding of excavated material, and consequent degradation of the surrounding environment. Therefore, the adoption of appropriate grading, benching, structural safeguards, and biological stabilization measures is necessary to ensure long-term dump stability and environmental protection.

The **Dalpahar Iron & Manganese Mines (Block-A)**, covering an area of **89.961 hectares**, is situated within the **Baitarani Reserve Forest-A under Barbil Tahasil of Keonjhar District, Odisha**. The lease area falls in undulating hilly terrain with significant elevation differences and receives substantial monsoonal rainfall, making the area vulnerable to slope instability and soil erosion if suitable preventive measures are not adopted. Mining operations in the lease are expected to generate a substantial quantity of overburden and waste materials in the form of alluvial soil, BHJ, and BHQ, which require systematic handling and scientifically designed dumping practices.

The **Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India**, while granting **Stage-I (in-principle) approval vide File No. 8-31/2015-FC (E-91135) dated 13.02.2026**, stipulated under **Condition No. 2.xxi (d)** that the User Agency shall prepare a detailed scheme for stabilization of overburden dumps by appropriate grading and benching so as to ensure that the angle of repose at any given place remains less than 28°. In compliance with the said stipulation, the present scheme has been prepared for the entire mining lease area.

This scheme presents a comprehensive framework for stabilization of OB dumps through a combination of **engineering measures** and **biological reclamation practices**. The engineering measures include systematic terracing and benching of dump slopes, construction of retaining/toe walls, garland drains, catch drains, settling tanks, and loose boulder structures for effective runoff control and arrest of sediment movement. The biological measures include plantation of **Vetiver grass, Agave**, and other soil-binding grasses to enhance slope stability, bind loose material, reduce erosion, and promote ecological recovery.

The principal aim of this scheme is to ensure that dump slopes remain stable, erosion-resistant, and environmentally compatible throughout the life of the mine and beyond. The proposed measures have been designed to minimize the risk of dump failure, prevent siltation of nearby drainage channels, and facilitate long-term reclamation and restoration of the disturbed land.

This document is thus intended to serve as a practical and statutory guide for the implementation of dump stabilization measures in conformity with approved mining practices, forest clearance conditions, and sound principles of environmental management and sustainable mining.

ECUTIVE SUMMARY

This scheme has been prepared for the Daitpahar Iron & Manganese Mines (Block-A), located in the Baitarani Reserve Forest-A, Keonjhar District, Odisha, over a total lease area of 89.961 ha, in compliance with Condition No. 2.xxi (d) of the Stage-I Forest Clearance approval granted by the MoEF&CC vide File No. 8-31/2015-FC (E-91135) dated 13.02.2026. The condition requires the User Agency to prepare a scheme for stabilization of overburden dumps through appropriate grading and benching, ensuring that the angle of repose at any point remains below 28°.

The lease area is characterized by hilly and undulating topography, with elevations ranging from 723 m RL to 553 m RL, and experiences a tropical monsoonal climate with average annual rainfall of about 1500 mm. These conditions make the area prone to runoff-induced erosion and instability of overburden dump slopes if adequate preventive and corrective measures are not adopted.

During the conceptual period of mining, approximately 12.26 million cubic metres of waste in the form of alluvial soil, BHJ, and BHQ will be generated. Out of this, 5.56 million cubic metres will be utilized for backfilling of exhausted pits, while the balance will be disposed of in four proposed overburden dumps covering 12.890 ha. The maximum height of these dumps is proposed to be 30 m, developed in two terraces, with proper benching and grading.

The scheme proposes a combination of biological and structural measures for dump stabilization. Biological measures include Vetiver plantation over 11.50 ha on dump slopes, Agave plantation along 1850 m around the toe of the dumps, and broadcasting of selected soil-binding grass species to reduce erosion and improve slope binding. Fire line tracing and maintenance have also been proposed to protect the plantations and reclaimed areas from forest fire damage.

Structural measures include-

- **Terracing and benching** of all dump slopes to maintain the overall slope angle below 28°;
- Construction of **retaining/toe walls** of total length 1960 m around the dump toes;
- Construction of **garland drains and catch drains** of total length 2160 m to safely channel runoff;
- Construction of 25 **loose boulder structures** across drains for silt retention and flow moderation; and
- Construction of **4 settling tanks**, each of 20 **cu.m capacity**, for sediment settlement and management of runoff water.

The scheme also provides for regular de-silting, periodic maintenance of all protective structures, and a dedicated system of inspection, monitoring, and evaluation, for which 15% of the total project cost has been earmarked. The works will be executed by the User Agency through qualified technical personnel in coordination with the Forest Department, and the full scope of work is proposed to be completed within three years from the commencement of mining operations.

Overall, the scheme is designed to ensure physical stability of OB dumps, control erosion and sedimentation, protect surrounding land and drainage systems, and promote long-term environmental restoration in the mining lease area.

1. INTRODUCTION

The mining lease for **Dalpahar Iron & Manganese Mines (Block-A)**, covering an area of **89.961 ha**, was originally granted in favour of **Late Sri Dharmchand Jain** on **09 June 1986** for a period of **20 years, i.e., up to 08 June 2006**, in **Baitarani Reserved Forest-A** under **Barbil Tahasil, Keonjhar Forest District**. Prior to the expiry of the lease, an application for **Renewal of Mining Lease (RML)** was submitted on **01 June 2005** within the stipulated time. Accordingly, the lease was deemed to have been extended in terms of **Rule 24A(1) of the Mineral Concession Rules, 1950**.

Subsequently, based on the approval of the **Steel & Mines Department, Government of Odisha**, vide letter dated **28 April 2022**, a **Supplementary Lease Deed** for Block-A over **89.961 ha** was executed on **27 April 2023** in favour of **Sri Avin Jain**, Power of Attorney holder of **Smt. Sobha Jain**.

The entire mining lease area lies within the **Baitarani Reserve Forest-A** and forms part of **Survey of India Toposheet No. F45N5 (73G/5)**. The lease area is bounded by latitudes **21°58'04.701" N to 21°58'42.918" N** and longitudes **85°23'26.729" E to 85°23'59.175" E**.

At present, a proposal for **diversion of 79.367 ha of forest land**, including **2.822 ha earmarked for the safety zone** along the lease boundary, in addition to **10.594 ha of forest land already diverted**, has been submitted under **Section 2(ii) of the Forest (Conservation) Act, 1980**. The **MoEF&CC, Government of India**, has accorded **Stage-I (in-principle) approval**, vide File No. 8-31/2015FC(E-91135) dated 13.02.2026, subject to compliance with stipulated conditions.

As per **Standard Condition No. 2.xxi (d)** of the Stage-I approval, the User Agency is required to **prepare a scheme for construction of check dams and retention/toe walls to arrest sliding of excavated material along the contours**. In compliance with the said condition, the present comprehensive scheme has been prepared for the entire mining lease area of **89.961 ha**.

There are **no perennial water streams** within or in the immediate vicinity of the lease area. Hence, the possibility of choking of natural streams does not arise. Further, **no agricultural land or habitation exists within a 10-km** radius of the mining lease area, and therefore, no adverse impact on cultivation is anticipated.

2. LOCATION OF THE MINING LEASE AREA

The Dalpahar Iron & Manganese Mine, covering 89.961 ha, is located within the Baitarani Reserve Forest under Keonjhar Forest Division, near Bichakundi Village, Barbil Tahasil, Keonjhar District, and Odisha. The lease area falls under Survey of India Toposheet No. F45N5 (73G/5) and lies between latitudes 21°58'04.701" N to 21°58'42.918" N and longitudes 85°23'26.729" E to 85°23'59.175" E.

3. TOPOGRAPHY

The mining lease area forms part of a hilly terrain within the Baltarani Reserve Forest and is characterized by undulating topography with steep slopes. The general trend of the hill ranges from NNE to SSW. Elevation within the lease area varies from approximately 723 m RL to 553 m RL.

No perennial nallah exists within the lease area. Sona Nadi, a seasonal stream, flows towards the north at a distance of about 1 km west of the lease boundary.

4. SOIL TYPE

The area is characterized by a lateritic surface overlain by a thin soil cover with thickness ranging from 0.5 m to 4.0 m. The soil colour varies from yellowish-brown to reddish-brown and grey. Due to historical mining activities and deforestation, soil erosion has occurred along slopes, and soil cover is predominantly preserved only in areas with natural vegetation.

The soil/alluvium is mainly silty and clayey, interspersed with pebbles and cobbles of chert, jasper, banded hematite jasper (BHJ), and hematite ore.

5. CLIMATE

The area experiences a tropical climate, with summer extending from March to May, during which temperatures may reach up to 45°C. The south-west monsoon commences in June and continues until September, with an average annual rainfall of about 1500 mm. Winters are confined to November, December, and January, with minimum temperatures dropping to around 4°C.

6. DRAINAGE

There is no perennial drainage channel within the mining lease area. Sona Nadi, flowing northward on the western side of the lease area at a distance of approximately 1.0 km, serves as the main drainage system of the region.

7. LAND USE PATTERN

During the life of the mine, about 81.491 hectares will be utilized for mining, Dumping, Stacking, Mineral Processing, Road, Infrastructure, etc and 8.47 hectares will be maintained as Safety Zone& green belt. The details of land use pattern will be as follows:

Item wise Proposed Land Use Pattern in Forest Land of Total Lease Hold Area

Sl.No.	Pattern of utilization		Total forest area to be utilized in Ha.
1	Mining Including Mines Road		40.050
2	Waste/Over Burden Dump with Env. Protective Measures		12.890
3	Utility Services	Mineral Processing Unity &Stock Yard	19.07
		Storage of Top Soil	3.817
		Internal Transporting Road	2.910
		Temp.Infrastructure (Office, Workshop,Crech,Elect.Sub-station,U/g cable, Parking plaza,etc)	2.754
4	Green Belt		5.357
		Sub-Total	**86.848**
5	Safety Zone along the Lease Boundary		3.113
		Grand Total	**89.961**

8. EXISTING VEGETATION

The area supports natural dry deciduous forest vegetation, comprising species such as Sal, Kurum, Kangara, Asan, Dhaura, Kendu, Jamun, Mango, etc., with an average canopy density of less than 0.6. The existing vegetation pattern has evolved under the influence of edaphic and climatic conditions typical of the reserve forest ecosystem.

9.PHASE WISE MINING ACTIVITY AND MANAGEMENT OF OVERBURDEN DUMP:

a. Phase Wise Mining Activity And Management Of Over Burden Dump

Mining operations will be carried out in a systematic phase-wise manner within the lease area to achieve the targeted production quantity. As the ore body persists at depth, reclamation and rehabilitation will be carried out after the complete extraction of the ore body. At present, the overburden will be dumped with all necessary environmental protection measures for the reclamation of the mined-out pit in a phased manner.

b. Over Burden/Waste Generation

During the conceptual period, a total of 12.26 million cubic meters of waste will be generated in the form of alluvial soil, BHJ and BHQ (both as overburden and intercalated waste). Therefore, waste management will mainly involve the dumping and handling of alluvial soil, BHJ and BHQ. Out of the total generated waste, 5.56 million cubic meters will be utilized for backfilling

m the exhausted pits, and the remaining quantity will be disposed of in the proposed four waste dumps and partly used for road maintenance.

For dumping of overburden/waste, 12.890 ha of barren land (proved through core drilling) has been earmarked within the lease area. The maximum height of the dumps will be 30 meters, developed in two terraces.

The Location of the dumps is given below: -

Co-Ordinate of the Dumps location		
Dump No.	Latitude	Longitude
Dump-I	21°58' 39.402" N to 21°58' 42.562" N	85°23' 50.825" E to 85°23' 58.111" E
Dump-II	21°58' 30.980" N to 21°58' 39.508" N	85°23' 54.057" E to 85°23' 58.354" E
Dump-III	21°58' 22.484" N to 21° 58'32.247" N	85°23' 33.167" E to 85°23' 40.622" E
Dump-IV	21°58' 5.975" N to 21°58' 10.898" N	85°23' 40.708" E to 85°23' 58.745" E

c. The salient features of OB / waste dump management practices

i) Retaining walls and garland drains will be provided around the proposed dumps. The following precautionary measures will be adopted during waste disposal:

ii) i) The ultimate slope of the dump will be maintained at about 28°, with the slope of individual terraces not exceeding 37°.

iii) ii) The height of each terrace will be maintained at 10 m.

iv) iii) Each terrace will have an inward slope, with catch drains provided on the inner side of the terrace.

v) iv) The catch drains of individual terraces will be connected to the garland drain located along the outer periphery of the dump.

vi) v) These catch drains will be provided with half-round concrete open pipes followed by settling tanks to prevent wash-off of dump materials.

vii) vi) Each terrace will have berms at the outer edge to reduce gully formation due to rainwater wash-off.

viii) vii) A retaining wall will be constructed at the toe of the dump to arrest the waste material and facilitate consolidation. The retaining wall constructed during the plan period will cater to the requirement of the entire plan period.

ix) viii) Vetiver grass plantation will be carried out on the dump slopes. In addition, Agave plantation will be undertaken around the base of the dump slopes for stabilization and moisture conservation. The fibrous and spreading root system of these plants will help bind the dump material and protect it from wash-off during the rainy season.

.10. THE OBJECTIVES OF THE SCHEME

The objectives of the proposed plan are as follows:

1. To comply with the stipulation of Condition No. 2.xxi(d) of the Stage-I Forest Clearance approval, which requires the User Agency to prepare a scheme for stabilization of the Over Burden (OB) dumps through appropriate grading and benching so as to ensure that the angle of repose at any point remains less than 28°.

2. **To adopt proper management and scheduling of overburden materials** so as to minimize external dumping and optimize the utilization of excavated waste materials.
3. **To provide suitable methodologies and implement the proposed measures in a time-bound manner** to prevent slope failures, thereby ensuring the stability of OB dump slopes.
4. **To stabilize the overburden dumps through plantation and biological reclamation measures.**
5. **To prevent the overflow and erosion of soils from fines and OB dump areas**, thereby avoiding siltation in nearby streams and natural drainage channels.

11. PROPOSED METHODOLOGY

Due to the geological characteristics of the mining lease area, the proposed waste dumps will be higher than the adjoining ground level. During periods of heavy rainfall, the topsoil from the slopes of the dumps may flow downward and disturb the topography of the surrounding land until the dump surface is fully stabilized through biological measures.

To control this situation, retaining walls of 1 m height with a total length of 1960 m, as per the approved mining plan, have been proposed along the peripheral contour of the dumps and 2160 m of garland drain will be constructed around the dump periphery to prevent the possible flow of materials from the dump slopes and to manage surface runoff effectively.

Further, waste dumping has been planned in a systematic manner so that backfilling of the mined-out pits can be undertaken in the future, with the objective of reclaiming the degraded land and restoring the environmental condition of the area.

The methods to be adopted for stabilization of OB dumps are as follows:

i) Biological Measures

Soil erosion and sediment generation in areas covered with forests are expected to be minimal. However, as an additional preventive measure, plantation of Vetiver grass has been proposed on the slopes of the four (04) OB dumps. In addition, Agave plantation is proposed around the toe of the OB dumps to further stabilize the dump slopes and control soil erosion.

a. Vetiver & Agave Plantation

The Vetiver plantation on the dump no. 1, 2, 3 & 4 over an area of 11.5 ha will be carried out. Similarly, extensive plantation of Agave will also be carried out around the bottom of the dump slopes for stabilization and moisture conservation. The cost norm of block plantation @ 1000 trees per ha has been provided in Annexure- 1&2 of Vetiver plantation & Agave plantation respectively. The details are as follows: -

Category	Location	Area (in Ha.)
Vetiver Plantation	OB dump I, II, III, IV	11.50

Category	Location	Length (Metre)
Agave Plantation	Toe of the OB dump I, II, III, IV	1850 m.

b. soil binding grasses

Some soil-binding grasses will also be introduced in the area to stabilize the dump slopes and minimize soil erosion. The species of grass seeds proposed for broadcasting are listed in the table below.

Plant species selected for plantation should not only be capable of flourishing in the local climatic conditions but should also possess characteristics such as rapid growth rate, evergreen nature, large crown volume, and small leaves with smooth surfaces. Since it is difficult to obtain all these desirable traits in a single species, a combination of suitable grass species has been considered for plantation in the area.

The details of the proposed grass species are given below.

Name of Grass Species	Usage	Habitat / Soil
Chrysopogon fulvus	Fodder	Red Soil/black cotton soil
Eremopogon foveolatus	Fodder	Skeletal soil
Sporobolus marginatus	Fodder	Sandy soil
Heteropogon contortus	Non-Fodder	Eroded soil
Cymbopogan martini	Non-Fodder	Eroded soil
Cynodon dactylon	Fodder	Wide range soil

c. Fireline Tracing & Maintenance

Fire causes significant damage to forests during the fire season. To prevent fire incidents, the area should be divided into suitable blocks by establishing fire lines. The boundaries of plantation patches and these blocks should be cleared of forest growth to a width of three meters during February–March. The cut vegetation and accumulated dry leaves along these lines should be burnt under strict supervision. This operation should be carried out for a period of three years. Approximately two man-days will be utilized per day for three months each year, and the same manpower will continue to be engaged for the next five years for maintenance and monitoring. The budgetary allocation for this activity has been considered under inspection, monitoring, and evaluation.

II) Structural Measures

Vegetative means of erosion control are the most feasible and economic measures. However, as the pressure on land is increasing, need is felt to bring even highly eroded land underutilization. In these lands, vegetative measures are not adequate to keep down the erosion. Some structural measures are required to be taken before vegetative measures are adopted. Structural measures, therefore, serve as a supplement to vegetative measures. The objective behind building mechanical structures is to reduce the degree and length of the slope, reducing run-off and consequently reducing soil erosion.

a) Construction of Loose Boulder Structures

The User Agency has planned to construct 25 no. of loose boulder structures across the proposed Garland Drain. These loose boulder structures across the proposed garland drain at various

locations will help in stabilization of silt & sediment as well as prevention of soil erosion & enrichment of vegetation & greenery development & the location is as follows: -
Loose boulder structures across the proposed garland drain of 2 mtr span

Category	Location	Quantity in (Nos.)	Span (Mtr)
Loose boulder structures	Down gradient side of proposed dump No. I , II, III, IV	20	Each 2mtrs
	Along the down contour	05	Each 2mtrs
		25	

The cost norm and Design of the Loose Boulder Structure have been provided

Annexure-3.

b) Construction of the Garland drain & Catch drain:

A shallow trench (2.0 m wide x 1 m deep) over 2.60 mt for draining surface water before it releases to the vacant land or natural water course. Details of the proposed Garland drain to be constructed around Dump No. I , II, III, IV summarized as follows: -

Item	Location	Length x breath & height in mtr	GPS reading
Garland drain	Bottom of proposed OB dump -I	340 x 2 x 1	2431251 N,334752 E To 2431316 N,334632 E
	Bottom of proposed OB dump -II	510 x 2 x 1	2430981 N,334633 E To 2431014 N, 334759 E
	Bottom of proposed OB dump -III	440 x 2 x 1	2430793 N,334114 E To 2431003 N,334234 E
	Bottom of proposed OB dump -IV	670 x 2 x 1	2430228 N, 334762 E To 2430315 N,334274 E
Catch drain	From 4 nos of settling ponds to vacant land	200 x 2 x 1	

The cost norm & Design of the garland drain have been provided in Annexure-4.

c) Terracing of OB Dump Slope

It is proposed to construct berms & terraces at all four OB dumps during the lease period. Considering the volume of OB materials & the area earmarked for dumping. The slope of individual terraces should be within the permissible range, considering the angle of repose of the soil and space available, thereby maintaining the angle of repose to be around 28°. The terracing will be done through the internal resources by deploying the operating mining equipment. The cost norm of Terrace development has been provided in Annexure-5.

d) Retaining Walls/Toe Walls around OB Dumps

A retaining wall over 1960 mtr is a structure designed and constructed to resist the lateral pressure of soil when there is a designed change in ground elevation that exceeds the angle of repose of the soil.
The proposed retaining walls will be constructed around all 4 dumps of 1960 mtrs. The details of the retaining wall of the proposed dump to be constructed are summarized in the following table:

Item	Location	Length, breath & height in mtr	GPS reading
Retaining wall	Bottom of proposed OB dump -I	340 x 2 x 1	2431251 N,334752 E To 2431316 N,334632 E
	Bottom of proposed OB dump -II	510 x 2 x 1	2430981 N,334603 E To 2431014 N, 334759 E
	Bottom of proposed OB dump -III	440 x 2 x 1	2430793 N,334114 E To 2431003 N,334234 E
	Bottom of proposed OB dump -IV	670 x 2 x 1	2430228 N, 334762 E To 2430315 N,334274 E

The cost norm and design structure of the retaining wall have been provided in Annexure-6.

e) Construction of the Settling tank: -

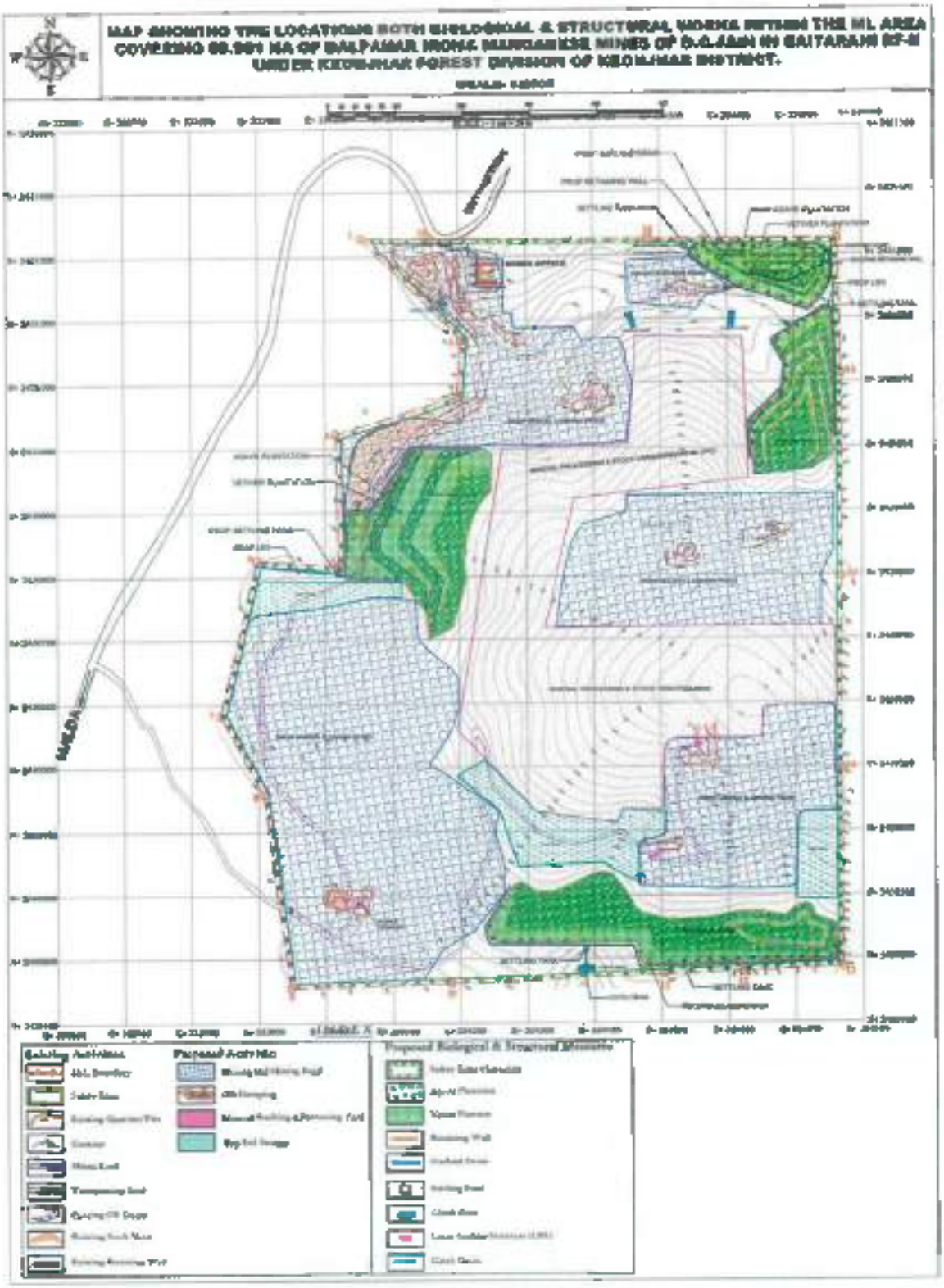
Four nos. of settling tankswill be constructed at the lower level of each dump slope of 20 cum (Each) to stabilise rainwater properly. The cost norm and design and design structure of the settling tank have been provided in Annexure-7.

f) De-siltation

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

measures within the mining lease area of **Dalpahar Iron & Manganese Mines (89.961 ha) is enclosed as Plate-I**

Map showing the location of all biological and structural conservation measures



12. INSPECTION, MONITORING AND EVALUATION

For effective and successful implementation of the proposed mitigation measures, a system of regular inspection, monitoring, and technical evaluation shall be instituted. Periodic inspections and continuous technical guidance from the concerned technical wings shall be essential to ensure that all structural and biological measures are executed in accordance with approved designs, specifications, and timelines.

The User Agency shall make adequate provisions towards fuel, conveyance, and logistical support for technical experts and supervisory personnel engaged in inspection and monitoring activities. These inspections shall assess the structural integrity, hydraulic performance, and functional effectiveness of the erosion control measures and facilitate timely corrective actions wherever required.

A budgetary provision equivalent to 15% of the total project cost has been earmarked exclusively for inspection, monitoring, evaluation, and associated supervisory activities to ensure sustained performance of the implemented measures.

13. EXECUTING AGENCY

The works proposed under the present Scheme shall be executed by the User Agency, which shall deploy its specialized technical departments headed by qualified and experienced personnel, supported by outsourced skilled manpower and appropriate machinery.

For efficient execution and quality assurance, the User Agency shall establish dedicated execution and supervision cells, equipped with the necessary infrastructural facilities. Continuous in-house supervision by competent technical personnel shall be ensured to maintain prescribed construction standards and workmanship.

All activities under the Scheme shall be implemented in close coordination with the Forest Department, ensuring compliance with forest conservation norms and site-specific environmental requirements.

The entire scope of work under this Scheme shall be completed within a period of three (3) years from the commencement of mining operations. Thereafter, routine operation and maintenance of all structural and biological measures shall be carried out on a regular and sustained basis to ensure long-term effectiveness and stability

14. REQUIREMENT OF FUNDS

The financial provision of Rs.3,71,34,963/- for stabilization of overburden dumps and construction of retention/toe walls to prevent sliding of excavated material along the contour including measures such as check dams, retaining walls, catch drains, settling tanks, and loose boulder structures (2 m span), along with biological interventions like vetiver and agave plantation—has already been incorporated in the scheme for mitigative measures aimed at minimizing soil erosion and preventing choking of streams, in compliance with Condition No. 2(xxi)(a) of the Stage-I approval.

Accordingly, to avoid duplication, no separate budgetary provision has been proposed herein

TOTAL COST OF THE PROJECT

Sl. No.	Description of the Work	Fund Required (in Rs.)
1.	**Biological Measures**	
A	Cost for Vetiver Plantation with 10 years maintenance over 11.50 ha @ Rs. Rs.1,12,404/- per Ha. (The cost norm **Enclosed as Annexure-1**)	The financial forecast of these items has already been provided in the scheme for imposed in Condition No. 2.xxi (a). So, no extra budgetary provision has been suggested
B	Cost of agave plantation on the toe of Dump with 10 years maintenance for a distance of 1.85 km (1850 m) @ Rs. Rs.12,20,300/ per Km.**(The cost norm Enclosed as Annexure-2)**	
2.	**Structural Measures**	
A	25 no. of Loose Boulder Structure 2**mt @ Rs. 25911/-per no.**(The cost norm **Enclosed as Annexure-3**)	financial forecast of these items has already been provided in the scheme for appropriate mitigative measures to minimize soil erosion and choking of streams imposed in Condition No. 2.xxi (a). So, no extra budgetary provision has been suggested
B	Construction of Garland drain toe of OB dump & catch drain over a length of **2160 m. @ Rs. 341/- per running meter.**(The cost norm **Enclosed as Annexure-4**)	
C	Terracing of OB dump over area of 11.50 Ha. Or 1,15,000 SqM @ **Rs. 134/-perSq.M.** (The cost norm **Enclosed as Annexure-5**)	
D	Construction of **retaining wall over a length of 1960 m.@ Rs.2313/-.** (The cost norm **Enclosed as Annexure-6**)	
E	Construction of **4 nos.** of Settling Tank of 20 CuM Capacity each @645per CuM.[The cost norm **Enclosed as Annexure-7**)	
	Sub-Total:	
3.	Distillation work for the Garland drain settling pond & check dam twice a year (On LS)	
4.	Maintenance of retaining wall and check dam & Check wire (On LS)	
	Sub-Total:	
	Total:	
5.	Inspection, monitoring and evaluation @ 15% of the total Project cost	
	Sub- Total:	
6	Price escalation @ 20%	
	G.TOTAL	

Technically Approved
Regional Chief Conservator of Forests
Rourkela Circle

Divisional Forest Officer,
Keonjhar Division

Annexure – 1					
Estimate for Vetiver Plantation (Basu) on the OB dump slopes per ha.					
Cost norm, Wages – Rs.462/-					
Sl. No	**Name of the Work**	**Man Days**	**Manpower Cost**	**Material Rs.**	**Total Cost in Rs**
1st YEAR OPERATION					
1	Site clearance, alignment and stacking	2	924	0	924
2	Cost of lining materials including transportation.	0	0	1,500	1,500
3	Staking and digging of pits.	20	9,240	0	9,240
4	Cost of Clumps 500 per Ha including transportation.	0	0	16,000	16,000
5	Carriage and planting	30	13,860	0	13,860
6	Soil working and application of fertilisers(twice)	10	4,620	0	4,620
7	Cost of fertiliser	0	0	1,500	1,500
8	Watch and ward	2	924	0	924
	Total	**64**	**29,568**	**19,000**	**48,568**
2nd YEAR OPERATION					
9	Causality replacement (20%) including cost of clumps.	10	4,620	3,200	7,820
10	Weeding and application of fertilisers	20	9,240	0	9,240
11	Cost of fertilisers and insecticides	0	0	1,500	1,500
12	Watch and ward	2	924	0	924
	Total	**32**	**14,784**	**4,700**	**19,484**
3rd YEAR OPERATION					
13	Weeding, soil working and application of fertilisers.	10	4,620	0	4,620
14	Plant protection measures including watch and ward	2	924	0	924
	Total	**12**	**5,544**	**0**	**5,544**
4TH YEAR TO 10TH YEAR		**84**	**38,808**	**0**	**38,808**
	Grand Total	**192**	**88,704**	**23,700**	**1,12,404**

ABSTRACT

Year of operation	Cost norm per Ha
1st year	48,568
2nd year	19,484
3rd year	5,544
4th to 10th year	38,808
Total	**1,12,404**

Annexure – 2

COST NORM FOR AGAVE PLANTATION (FOR 5 ROWS & 40 MTRS.)

Wage Rate: 462.00

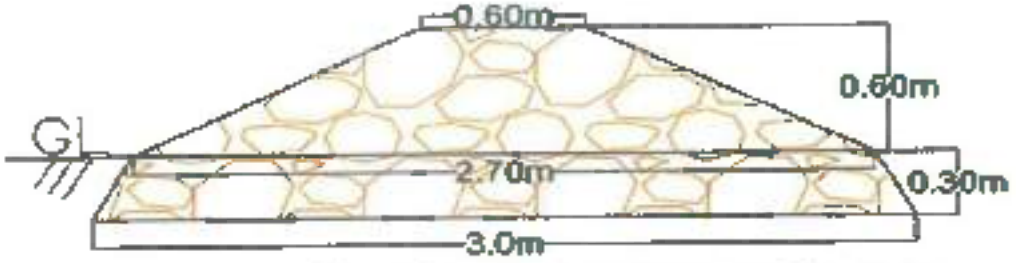
Sl.No	Name of the Work	Man-Day	Man Power Cost	Material	Total
FIRST YEAR OPERATION					
1	Site clearance alignment and stacking	2	924	0	924
2	Cost of lime materials including transportation	0	0	660	660
3	Digging pits and application of lime	6	2,772	0	2,772
4	Cost of 200 Ac. (sucker) including transportation	0	0	3320	3,320
5	Carriage and planting	2	924	0	924
6	Soil working and application of fertilizers (twice) and lime	8	3,696	0	3,696
7	Cost of fertilizer	0		740	740
8	Contingency	0		740	740
	Total:-	**18**	**8,316**	**5460**	**13,776**
SECOND YEAR OPERATION					
1	Causality replacement (20%) including cost of suckers and pitting	2	924	664	1,588
2	Weeding and application of fertilizer and lime	6	2,772	0	2,772
3	Cost of fertilizer insecticides & lime			500	500
	Total:-	**8**	**3,696**	**1,164**	**4,360**
THIRD YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
FOUR YEAR OPERATION					
1	Weeding, cleaning, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**

FIVE YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
SIX YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
SEVEN YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
EIGHT YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
NINE YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
TEN YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	**6**	**2,772**	**1000**	**3,772**
				Grand Total : -	**48,812**

Cost norm for agave fencing with five rows per km for 10 Year 48812/40 X 1000 = **Rs.12,20,300/-**

Annexure –3

Design of Losse Boulder Structures (LBS)



Cross Sectional View of LBS

Detail Estimate of Loose Boulder Structure (L.B.S.)

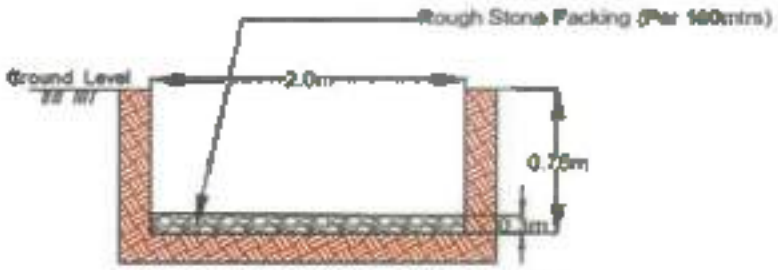
Span of 2 Mtr. Size

SL No.	Item of activity	Cost per unit (Rs.)	Total unit(No/ Cum)	Total cost (in Rs.)
1.	Levelling the unshaped surface of the selected site & layout the structure foundation L.S. 1 MD.	478	1	478.00
2.	Excavation of foundation in hard soil within initial lead of 50 mtr. Including rough dressing and breaking of clods to maximum size 5 cm. to 7 cm. laying in layer not exceeding 0.3 in depth to strengthening both side U/S approx. bund of loose boulder structure.	197.10	3.63	715.47
	Base with apron- 1 x 3.70 x 3.00 x 0.30 **= 3.33**			
	Wing wall- 4 x 0.50 x 0.50 x 0.30 **= 0.30**			
	@ Rs.19710.00 per 100 cum.			
3.	**Rough stone dry packing**	2859.35	8.63	24733.38
	up to GL			
	Base with apron- 1 x 3.70 x 3.00 x 0.30 **=3.33**			
	Wing wall- 4 x 0.50 x 0.50 x 0.30 **= 0.30**			
	Above GL			
	Super structure 1 x 2.00 x (2.70 + 0.60)/2 x 0.60 **=1.980**			
	Wing wall- 4 x 0.50 x 0.50 x 0.50 **=0.50**			
	Side wall-			
i.	2 x (0.50 + 1.10)/2 x 0.9 x 0.5 **=0.72**			
ii.	2 x (0.5 + 1.10)/2x 1.2 x 0.5 **= 0.96**			
iii.	2 x 0.6 x 0.6 x 0.5 **=0.36**			
iv.	2 x 1.0 x 0.5 x 0.5 **=0.50**			
	@ Rs.2859.35 per cum			
	G. Total per Loose Boulder Structure of span of 2 Mtrs			**25926.85 or Rs.25930/-**

25910.85 or 25911

ANNEXURE: 4

Design of Garland Drain



Cross Sectional View of Garland Drain

Detail Estimate of construction of Garland Drain

Sl No	Description of Items	No	Length	Width	Height	Qty	Unit	Rate	Amount
1	Cleaning of Jungles & bushes	1.0	200.00	7.00		1400.00	Sqm	4.00	5600.00
2	Earth work in hard soil in embankment roads within 50 mtrinitial lead &1.50 mtrinitial lift including rough dressing &breaking clods to Maximum 5.00c.m. to 7.00 c.m.&laying layers not exceeding 0.30 mtr depth as per specification approved by department along with proper compaction with H.R.R Excavation	1	200.00	2.00	0.75	300.00	Cum	197.1	59130.00
3	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be Supplied by the Company through contractual manner)	2	3.00	2.00	0.30	3.60	Cum	919.47	3310.09
									68040.09
		Rate per two Hundred meter Length				Total			Say Rs. 68040/-

Rate/Running metre length – Rs. 340.20 or Rs.341/-

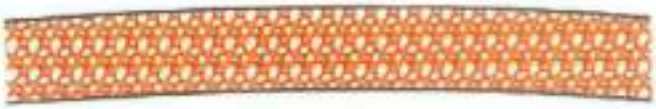
Annexure -5

ENGAGEMENT OF HEMM (HEAVY EARTH MOVING MACHINERIES) ON THE OB DUMP SLOPE FOR TERRACING

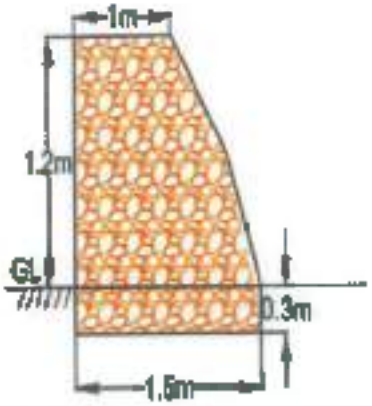
Location - Over Burden Dump –work efficiency per hour – 18SqM on the dump.
Width & height of the terrace - 5 m. & 5 m.
Rate for engagement of HEM machine per SqM - Rs. 2400/hr.
i.e. Rs. 2400/18
=Rs. 133.33/-, say Rs. 134/-

Annexure – 6

Design of RETAIING WALL



PLAN VIEW OF RETAINING WALL



CROSS SECTION VIEW OF RETAINING WALL

Detail Estimate of Retaining wall of loose local Boulder with cement-Sand Patching over the surface of Boulder wall

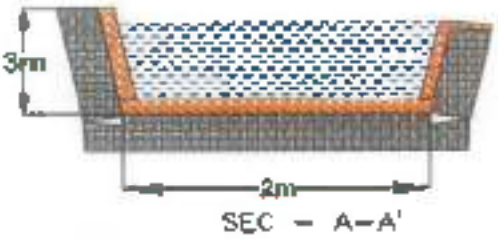
Sl. No.	Description of Items	No	Length	Width	Height	Qty	Unit	Rate	Amount in Rs
1	2	3	4	5	6	7	8	9	10
For one K.M.Length									
1	Cleaning of Jungles & bushes	1	1000	1.5		1500	Sq m	4.00	6000.00
2	Earth work in hard soil in embankment roads with in 50 mtr initial lead &1.50 mtr initial lift including rough dressing &breaking clods to Maximum 5.00c.m. to 7.00 c.m.& laying layers not exceeding 0.30 mtr depth as per specification approved by department along with proper compaction with H.R.R Excavation	1	1000	1.5	0 3	450	Cu m	197.1	88,695.00
3	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be Supplied by our Company)	1	1000	(1.00+ 1.50)/2	1.20	1500	Cu m		
		1	1000	1.50	0.30	450	Cu m		
		Total				1950	Cu m	919.47	1792966.50
4	Irregular cement sand patches on the both side of the wall with 2" thick cement sand mortar (1:6) on top	1	1000	1.00		1000	Sq m		
		2	1000	1.20		2400	Sq m		
						3400	Sq m	125.00	425000.00
		Rate per one K.M. Length				Total			23,12,661.5 Say Rs. 23,12,668/-

Cost of Running Meter Length Rs. 2313/-

Asstt. Conservator of Forest
DC, Champua Forest Range

Design of SETTLING TANK

PLAN VIEW OF SETTLING TANK



CROSS SECTIONAL VIEW OF SETTLING TANK

ESTIMATE FOR PER RMT CONSTRUCTION OF SETTLING TANK
(Length: 3m., width: 2.0m. height: 1m.)

Sl No	Description of Items	No	Length	Width	Height	Qty	Unit	Rate	Amount
1	Earth work in hard soil in embankment roads within 50 mtr initial lead &1.50 mtr initial lift including rough dressing &breaking clods to a Maximum 5.00c.m. to 7.00 c.m., & laying layers not exceeding 0.30 mtr depth as per specification approved by the department, along with proper compaction with H.R.R Excavation	1	3.00	2.00	1.0	6.00	Cum	197.1	1182.60
2	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be supplied by our Company)	1	3.00	4.00	0.20	2.40	Cum	919.47	2206.73
3	Transportation charges for 5.00 K.M lead by truck load from quarry to work site with all costs of , labour, T. & P. etc. all complete in all respects as per specification and direction of	As same as Item No-2				2.40	Cum	200.00	480.00
								Rate per one No Settling tank of 6 Cum	3869.33
Cost for								**Per 1 Cum Rs.645/-**	**Rs.3870.0**

SCHEME
FOR
MANAGEMENT OF TOP SOIL

In compliance

with

Condition No.2.xxl (e) of

Stage-I approval granted vide Online Proposal No.FP/OR/MIN/9360/2015 Dated.13.02.2026

of Govt. of India, Ministry of Environment, Forests

& Climate Change,

New Delhi.

AT

DALPAHAR IRON & MANGANESE MINES (BLOCK-A) OF SRI AVIN JAIN

SCHEME FOR MANAGEMENT OF TOP SOIL AT DALPAHAR IRON & MANGANESE MINES

PREFACE

Mining activities, particularly in hilly forested terrain, require careful management of topsoil to ensure environmental sustainability and effective land reclamation. Topsoil is a valuable natural resource containing essential nutrients, organic matter, and microorganism's necessary for vegetation growth and ecological restoration. Therefore, its proper conservation, handling, storage, and utilization form a critical component of responsible mining practices.

The **Dalpahar Iron & Manganese Mines (Block–A)**, covering an area of **89.961 hectares** in the **Baitarani Reserve Forest-A under Barbil Tahasil, Keonjhar District, Odisha**, is presently under consideration for diversion of forest land under the provisions of the **Forest (Conservation) Act, 1980. The Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India**, while granting **Stage-I (in-principle) approval vide File No. 8-31/2015-FC (E-91135) dated 13 February 2026**, stipulated several environmental safeguards to ensure that mining operations are conducted in an environmentally responsible manner.

One of the important conditions of the approval, **Standard Condition No. 2.xxi (c)**, requires the User Agency to prepare a comprehensive scheme for the management for collection of topsoil, along with the construction of check dams and retention/toe walls along contours to prevent sliding and erosion. Proper topsoil management is essential not only for controlling soil erosion and sedimentation but also for facilitating effective mine reclamation and ecological restoration of disturbed areas.

In compliance with the above condition, the present **Scheme for Management of Top Soil at Dalpahar Iron & Manganese Mines** has been prepared. The scheme outlines systematic measures for **identification, stripping, collection, preservation, protection, and scientific utilization of topsoil generated during mining operations**. It also incorporates suitable **engineering and bio-engineering measures** such as **check dams, toe walls, contour stabilization, and vegetation development** to prevent soil loss and maintain slope stability.

The primary objective of this scheme is to ensure that the topsoil generated during mining is conserved as a valuable resource and reused effectively for reclamation, afforestation, and green belt development, thereby maintaining ecological balance within the mining lease area and its surroundings.

This document provides a structured framework for environmentally responsible mining practices, aligning with statutory requirements and sustainable land management principles throughout the life of the mine.

EXECUTIVE SUMMARY

The present Scheme for Management of Top Soil at Dalpahar Iron & Manganese Mines (Block-A) has been prepared in compliance with Standard Condition No. 2.xxi (e) of the Stage-I Forest Clearance approval granted by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India, vide File No. 8-31/2015-FC (E-91135) dated 13.02.2026. The condition requires the User Agency to formulate a comprehensive plan for management of topsoil and associated protective measures such as check dams and retention/toe walls to prevent erosion and sliding of excavated material along the contours.

The mining lease area covers 89.961 hectares and is located within the Baitarani Reserve Forest, under Barbil Tahasil, Keonjhar District, Odisha. The area is characterized by hilly and undulating terrain, with elevations ranging from 723 m RL to 553 m RL, lateritic soil cover of varying thickness, and a tropical climate with an average annual rainfall of about 1500 mm. Due to these site conditions, scientific handling and preservation of topsoil is essential to prevent erosion, maintain soil fertility, and support reclamation and afforestation activities during and after mining.

As per the approved Mining Plan, about 19,100 m³ of topsoil will be generated during the current plan period from mining over 7.76 ha of virgin land. In the long term, approximately 0.081 million m³ of topsoil is expected to be generated from an additional 32.575 ha of virgin area proposed for future mining. The generated topsoil will be stripped separately before excavation, carefully transported, and stored in designated stockpiles over an area of about 3.817 ha to avoid mixing with overburden or mineral waste.

The scheme provides for scientific topsoil management through three major stages: collection, storage, and utilization. Topsoil will be removed separately using suitable mining machinery, transported to earmarked storage locations, and preserved in low-height stockpiles to prevent compaction and fertility loss. To protect the stored soil from erosion during monsoon, retaining walls of 810 m length and garland drains of 850 m length are proposed around the stockpile area. In addition, grass seeds will be broadcast over the topsoil dumps and regular maintenance will be undertaken to stabilize the surface and reduce soil loss. The scheme therefore, provides a practical and environmentally sound framework for conservation, protection, and productive reuse of topsoil, slope stabilization and ecological restoration in the Dalpahar Iron & Manganese Mines lease area.

The preserved topsoil will be utilized progressively for reclamation of mined-out pits, spreading over backfilled areas, bench plantation, and afforestation/green belt development within the lease area. A stock register and measurement book will be maintained by the User Agency to record the generation and utilization of topsoil, and annual records will be furnished to the reviewing authorities.

The total estimated cost for implementation of the Top Soil Management Scheme is Rs. 1,18,00,700/- (Rupees One Crore Eighteen Lakh Seven Hundred only), including costs towards stripping, transportation, leveling, grass seeding, garland drain, retaining wall, inspection, monitoring, evaluation, and price escalation. The entire expenditure shall be borne by the User Agency as part of the mining project cost.

1. INTRODUCTION

The mining lease for **Dalpahar Iron & Manganese Mines (Block-A)**, covering an area of **89.961 ha**, was originally granted in favour of **Late Sri Dharmchand Jain** on **09 June 1986** for a period of 20 years, i.e., up to **08 June 2006**, in **Baitarani Reserved Forest-A** under **Barbil Tahasil, Keonjhar Forest District**. Prior to the expiry of the lease, an application for **Renewal of Mining Lease (RML)** was submitted on **01 June 2005** within the stipulated time. Accordingly, the lease was deemed to have been extended in terms of **Rule 24A(1) of the Mineral Concession Rules, 1950.**

Subsequently, based on the order of the **Steel & Mines Department, Government of Odisha**, vide letter dated **28 April 2022**, a **Supplementary Lease Deed** for Block-A over **89.961 ha** was executed on 27 **April 2023** in favour of **Sri Avin Jain**, Power of Attorney holder of **Smt. Sobha Jain.**

The entire mining lease area lies within **the Baitarani Reserve Forest** and forms part of **Survey of India Toposheet No. F45N5 (73G/5).** The lease area is bounded by latitudes **21°58'04.701" N to 21°58'42.918" N** and longitudes **85°23'26.729" E to 85°23'59.175" E.**

At present, a proposal for **diversion of 79.367 ha of forest land**, including **2.822 ha earmarked for the safety zone** along the lease boundary, in addition to **10.594 ha of forest land already diverted**, has been submitted under **Section 2(ii) of the Forest (Conservation) Act, 1980. The MoEF&CC, Government of India**, has accorded **Stage-I (in-principle) approval**, vide File No. 8-31/2015FC(E-91135) dated 13.02.2026, subject to compliance with stipulated conditions.

As per **Standard Condition No. 2.xxi (e)** of the Stage-I approval, the User Agency is required to prepare a **scheme for management of top soil** in compliance with the said condition, **the present comprehensive scheme has been prepared for the entire mining lease area of 89.961 ha.**

There are **no perennial water streams** within or **in the** immediate vicinity of the **lease area. Hence, the possibility** of choking of natural streams does not arise. **Further, no agricultural land or habitation exists within a 10-km radius** of the mining **lease area, and therefore,** no adverse impact on cultivation is **anticipated.**

2. LOCATION OF THE MINING LEASE AREA

The Dalpahar Iron & Manganese Mine, covering 89.961 ha, is located within the Baitarani Reserve Forest **under Keonjhar Forest Division, near Bichakundi Village, Barbil Tahasil, Keonjhar District, and Odisha. The lease area falls under** Survey of India Toposheet No. F45N5 (73G/5) **and lies between latitudes** 21°58'04.701" N to 21°58'42.918" N **and longitudes** 85°23'26.729" E to 85°23'59.175" E.

3. TOPOGRAPHY

The mining lease area forms part of a **hilly terrain within the Baitarani Reserve Forest** and is characterized by **undulating topography with steep slopes**. The general trend of the hill ranges from **NNE to SSW**. Elevation within the lease area varies from approximately 723 m RL to 553 m RL.

No perennial nallah exists within the lease area. **Sona Nadi**, a seasonal stream, flows towards the **north** at a distance of about 1 km west of the lease boundary.

4. SOIL TYPE

The area is characterized by a lateritic surface overlain by a thin soil cover with thickness ranging from 0.5 m to 4.0 m. The soil colour varies from yellowish-brown to reddish-brown and grey. Due to historical mining activities and deforestation, soil erosion has occurred along slopes, and soil cover is predominantly preserved only in areas with natural vegetation.

The soil/alluvium is mainly silty and clayey, interspersed with pebbles and cobbles of chert, jasper, banded hematite jasper (BHJ), and hematite ore.

5. CLIMATE

The area experiences a tropical climate, with summer extending from March to May, during which temperatures may reach up to 45°C. The south-west monsoon commences in June and continues until September, with an average annual rainfall of about 1500 mm. Winters are confined to November, December, and January, with minimum temperatures dropping to around 4°C.

6. DRAINAGE

There is no perennial drainage channel within the mining lease area. Sona Nadi, flowing northward on the western side of the lease area at a distance of approximately 1.0 km, serves as the main drainage system of the region.

7. LAND USE PATTERN

During the life of the mine, about 81.491 hectares will be utilized for mining, Dumping, Stacking, Mineral Processing, Road, Infrastructure, etc and 8.47 hectares will be maintained as Safety Zone& green belt. The details of land use pattern will be as follows:

Item wise Proposed Land Use Pattern in Forest Land of Total Lease Hold Area

Sl.No.	Pattern of utilization		Total forest area to be utilized in Ha.
1	Mining Including Mines Road		40.050(32.575 ha virgin area + 7.475 ha broken area)
2	Waste/Over Burden Dump with Env. Protective Measures		12.890
3	Utility Services	Mineral Processing Unity &Stock Yard	19.07
		Storage of Top Soil	3.817
		Internal Transporting Road	2.910
		Temp.Infrastructure (Office, Workshop,Crech,Elect.Sub-station,U/g cable, Parking plaza,etc)	2.754
4	Green Belt		5.357
		Sub-Total	**86.848**
5	Safety Zone along the Lease Boundary		3.113
		Grand Total	**89.961**

8.TOP SOIL MANAGEMENT.

Top soil is the most fertile layer of the earth and contains organic matter, nutrients, and microorganisms essential for plant growth. proper management of top soil is necessary so that it can be effectively utilized for reclamation and plantation activities after mining. This comprehensive top soil management plan has been prepared keeping in view of the conservation, regeneration and afforestation in and around the site where top soil will be stored

In order to manage the top soil, the following suggestions are put forth and to be practiced.

- ✓ Top soil likely to be generated is to be stored at earmarked place.
- ✓ Dump may have a slope less than 28°
- ✓ Cover the top soil with a tarp / coir mat.
- ✓ Broadcast grass seed over the top soil.
- ✓ During reclamation process the top soil may be utilized to cover the top after filling and covered the area under tree planting.

✓ Bring the soil under tree planting as soon as possible and covered with mulch to prevent the soil from washing or blowing away.

✓ Generation of Top Soil & its utilization will be recorded in a measurement book and copy of the same to be provided to reviewing authorities annually.

9. PRESENT SCENARIO

As per the approved Mining Plan, about 19,100 m^3 of topsoil will be generated during the plan period from mining over 7.76 ha of virgin land. This topsoil will be stored at a designated site covering 0.44 ha with proper mitigation measures to prevent erosion and loss. The stored topsoil will be utilized phase-wise for plantation activities during the mining plan period.

It is further envisaged that approximately 0.081 million m^3 of topsoil will be generated when an additional 32.575 ha of virgin land is permitted for mining in the future. The generated topsoil will be stored in earmarked areas covering about 3.817 ha with proper protective measures. To prevent erosion and loss of soil during heavy rains, a retaining wall of 810 m length and a garland drain of 850 m length will be constructed along the peripheral contour of the stockpiles.

The generated topsoil will be utilized for reclamation of mined-out pits and for plantation purposes. A stock register for the production and utilization of topsoil will be maintained by the User Agency. This quantity will be generated during the course of mining operations, mainly during the expansion of the mining area

10. PLANS FOR TOP SOIL MANAGEMENT

This Topsoil Management Plan describes the procedures for soil stripping and stockpiling to minimize topsoil degradation and to ensure the maximum availability of suitable soil for future rehabilitation within the mining lease area of Dalpahar Iron & Manganese Mines. Topsoil will be stripped from areas proposed for excavation and stored separately in designated locations.

A. Collection of Top Soil

Before the commencement of mining activities in the virgin area, the top soil available within this area will be carefully stripped. The stripping will be carried out separately from overburden and mineral so that the fertility of the soil is preserved. Mechanical equipment such as excavators and dumpers will be used to remove the top soil layer without mixing it with subsoil or waste materials.

i.Identification of Top Soil

Before starting mining operations, the thickness and extent of topsoil in the area should be identified through field surveys. Normally the top 10–30 cm of soil is considered topsoil as it contains most of the nutrients and biological activity.

ii. Stripping of Top Soil

Topsoil is removed separately from sub-soil using suitable equipment such as dozers, scrapers, or excavators.

- The stripping depth generally ranges from 10–30 cm depending on soil thickness.
- Vegetation and organic matter present on the surface are removed along with the soil.
- Care is taken to avoid mixing of topsoil with subsoil or overburden material.

iii. Transportation

After stripping, the collected topsoil is transported to designated storage or utilization areas using dumpers or trucks. The material should be handled carefully to minimize repeated handling and soil degradation.

B. Storage of Top Soil

If the soil cannot be used immediately, it is stored in stockpiles.

- Stockpiles are generally kept below 2–2.5 m height to avoid compaction and loss of soil structure.
- The storage site should be well-drained and located away from water bodies.
- Long-term stockpiles may be stabilized with grass or cover crops to prevent erosion.
- The retaining wall and garland drain will be provided along the peripheral contour of the stockpiles to avoid erosion and loss of soil during heavy rains

Construction of the Garland drain & Catch drain:

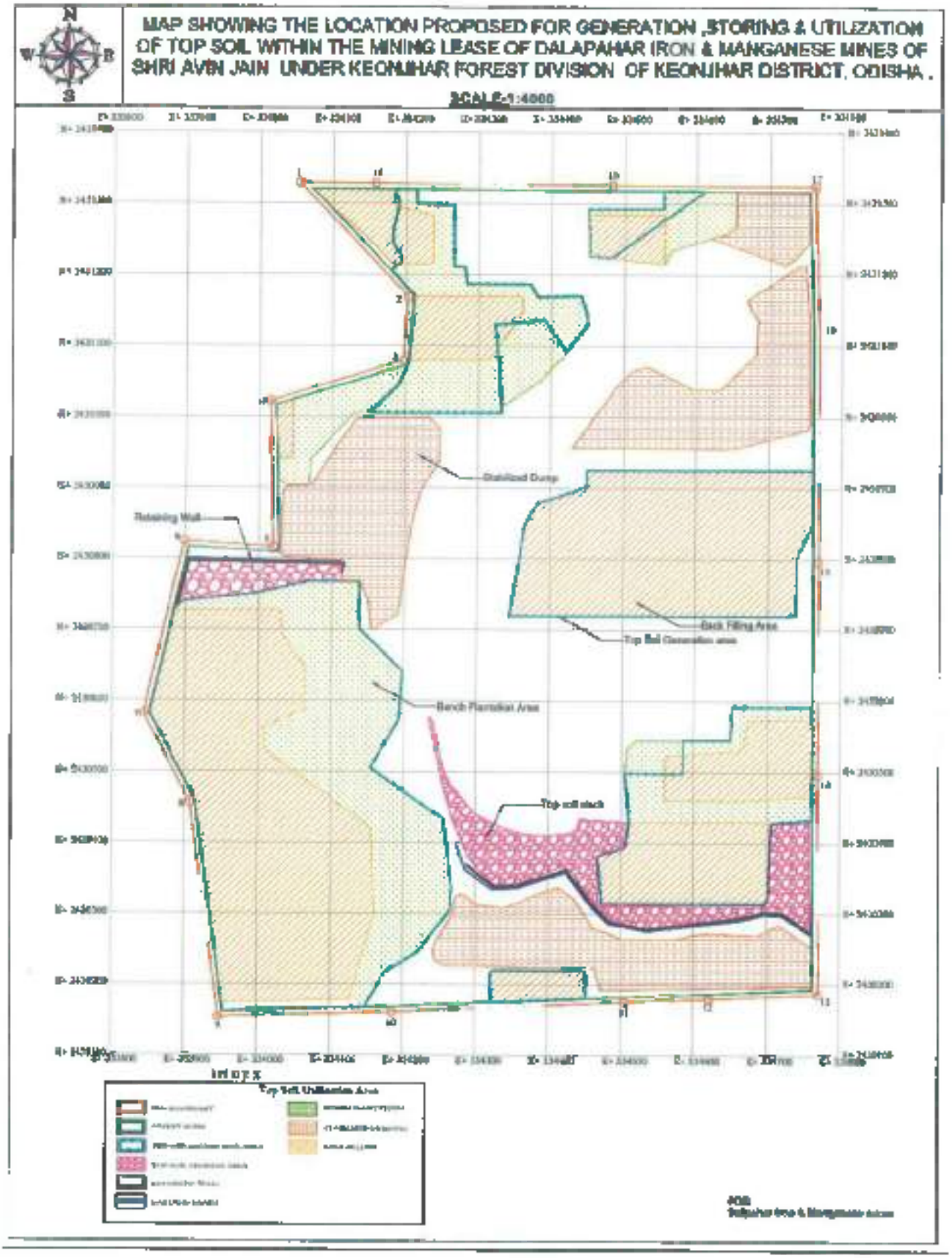
Details of the proposed Garland drain and retaining wall to be constructed around top soil storage areasummarized as follows: -

Item	Location	Length x breath & height in mtr	GPS reading
Garland drain	Around Top sail storage	850 x 2 x 1	2430271 N,334760 E To 2430368 N, 334288 E & 2430794 N 334115 E To 2430800 N, 333902 E
Retaining wall	Around Top sail storage	810 x1.5 x 1	

C. Utilization of Top Soil

The preserved top soil will be utilized during mine reclamation and rehabilitation activities and for filling the pits during plantation. It will be spread over stabilized overburden dumps and backfilled areas, and bench plantationto facilitate plantation and ecological restoration. The spreading thickness of the top soil will generally be maintained between 15–30 cm, depending on availability

Map showing the location of the top soil generation, storing & utilization



11. INSPECTION, MONITORING AND EVALUATION

Intensive inspection and technical guidance from the concerned technical wing will be required for the successful implementation of the above topsoil management programme. Adequate fuel and conveyance charges for technical experts shall be provided by the user agency to ensure proper supervision and execution of these activities. A budgetary provision of 15% of the total project cost has been earmarked for this purpose.

12. REQUIREMENT OF FUNDS

Top soil removal/storage will be as per mining plan and the soil will be utilized for taking up plantations in backfill and other areas. The total cost of the project is given as below.

TOTAL COST OF THE PROJECT

Sl. No.	Description of the work	Funds Required
1	Virgin forest area from where top soil can be collected:32.575 ha Stripping cost: 0.5ha/hr@ Rs 1900.00. Therefore, 32.575 ha stripping will take 65.15 hrs. and @ Rs 1900/- per hr., the total cost comes to be:65.15 hrs x Rs. 1900/-	Rs.1,23,785.00
	Loading & transporting cost from the site to top soil stockpiles comes to be : 32.575 ha = 325750 x 0.25 m (Collection of top soil) = 81,437 Cum or 81450 cum x 1.8 (tonnage factor)= 146610 mt x Rs. 38/- (Loading & Transportation @ Rs. 38/ton)	Rs.55,71,280.00
	Cost of leveling with 1050 manpower (140 ton/Laboure) @ Rs 462/- = 1050 x Rs. 462	Rs.4,85,100.00
	Sub Total	**Rs.61,80,065.00**
2	Cost for sowing of grass seeds over 3.817 ha @Rs 37,006.00/-ha **(Annexure-I)**.	Rs. 1,41,252.00
3	Maintenance of grass seed @ (6 mandays weekly for period of six month). Total 144 mandays for six months:144 x Rs. 462.00	Rs. 66,528.00
4	Garland drain over a length of 850 m x Rs. 341/m **(Annexure-II)**.	Rs. 2,89,850.00
5	Retaining wall over a length of 810 m x Rs. 2313/m **(Annexure-III)**.	Rs. 18,73,530.00
	Sub-total	Rs.85,51,225.00
6	Inspection, monitoring & evaluation @15% of the total project cost	Rs. 12,82,683.75

	Total	Rs 98,33,908.75
7	Price escalation @20%	Rs. 19,66,781.75
	Grand Total	Rs.1,18,00,690.50 or say Rs. 1,18,00,700.00

(Rupees one crore eighteen lakh seven hundred) only

The total cost of the implementation of Top soil management scheme will be Rs. 1,18,00,700.00 (Rupees one crore eighteen lakh seven hundred) onlyas detailed above which will be borne by User Agency at their project cost. The cost of the scheme may subject to increase in amount considering the increase in materials and labour charges which will also be borne by the User Agency.

13. EXECUTION.

This is a part of the mining operation and to be executed by the User agency by own cost.

Asst. Conservator of Forest
I/C. Champua Forest Range

Divisional Forest Officer,
Keonjhar Division

Technically Approved

Regional Chief Conservator of Forests
Rourkela Circle

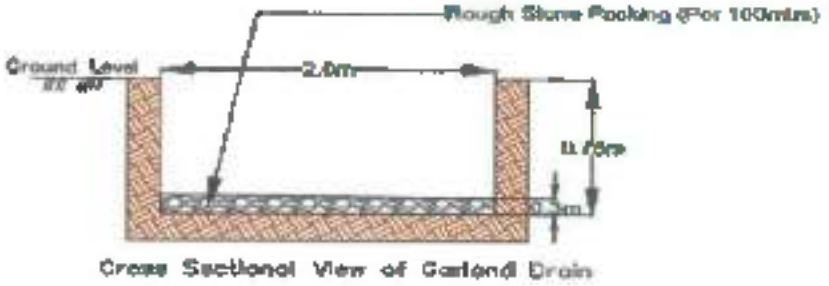
Annexure-I

Estimate for sowing of grass seeds per ha.

Cost of broadcasting of grass seeds per ha. Labour rate Rs.462.00/- per day				
Sl. No.	Purpose	No. of Labour/quantity of materials	Rate (in Rs.)	Amount in Rs.
1	Spreading of good top soil	03 Nos	462.00/- Labour	1386.00
2	Adding FYM and good earth	2 TL FYM	5625/TL FYM	11250.00
		2 TL Good earth	6750/TL Good earth	13500.00
3	Cost of grass seed 25 Kg/per ha		250/Kg	6250.00
4	Broad casting	10 nos	462.00/-Labour	4620.00
			Total	**37,006.00**

ANNEXURE: II

Design of Garland Drain



Cross Sectional View of Garland Drain

Detail Estimate of construction of Garland Drain

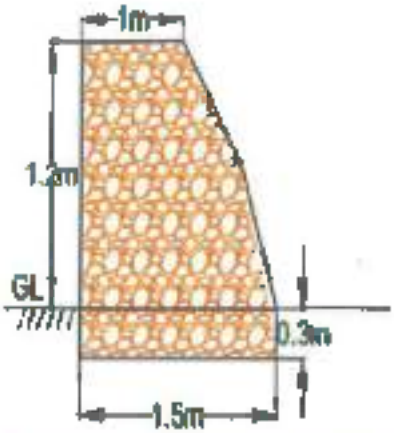
Sl No	Description of Items	No	Length	Width	Height	Qty	Unit	Rate	Amount
1	Cleaning of Jungles & bushes	1.0	200.00	7.00		1400.00	Sqm	4.00	5600.00
2	Earth work in hard soil in embankment roads within 50 mtrinitial lead &1.50 mtrinitial lift including rough dressing &breaking clods to Maximum 5.00c.m. to 7.00 c.m.&laying layers not exceeding 0.30 mtr depth as per specification approved by department along with proper compaction with H.R.R Excavation	1	200.00	2.00	0.75	300.00	Cum	197.1	59130.00
3	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be Supplied by the Company through contractual manner)	2	3.00	2.00	0.30	3.60	Cum	919.47	3310.09
									68040.09
		Rate per two Hundred meter Length				Total			Say Rs. 68040/-

Rate/Running metre length – Rs. 340.20 or Rs.341/-

Annexure – III

Design of RETAIING WALL

PLAN VIEW OF RETAINING WALL



CROSS SECTION VIEW OF RETAINING WALL

Detail Estimate of Retaining wall of loose local Boulder with cement-Sand Patching over the surface of Boulder wall

Sl. No.	Description of Items	No	Length	Width	Height	Qty	Unit	Rate	Amount in Rs
1	2	3	4	5	6	7	8	9	10
For one K.M.Length									
1	Cleaning of Jungles & bushes	1	1000	1.5		1500	Sq m	4.00	6000.00
2	Earth work in hard soil in embankment roads with in 50 mtr initial lead &1.50 mtr initial lift including rough dressing &breaking clods to Maximum 5.00c.m. to 7.00 c.m.& laying layers not exceeding 0.30 mtr depth as per specification approved by department along with proper compaction with H.R.R Excavation	1	1000	1.5	0.3	450	Cu m	197.1	88,695.00
3	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be Supplied by our Company)	1	1000	(1.00+1.50)/2	1.20	1500	Cu m		
		1	1000	1.50	0.30	450	Cu m		
		Total				1950	Cu m	919.47	1792966.50

4	Irregular cement sand patches on the both side of the wall with 2" thick cement sand mortar (1:6) on top	:	1000	1.00		1000	Sq m		
		2	1000	1.20		2400	Sq m		
						3400	Sq m	125.00	425000.00
		Rate per one K.M. Length				Total			23,12,661 5 Say Rs. 23,12,665/-

Cost of Running Meter Length Rs. 2313/-

SCHEME FOR

GAP PLANTING AND SOIL MOISTURE CONSERVATION ACTIVITIES TO RESTOCK AND REJUVENATE THE DEGRADED OPEN FOREST LOCATED IN THE AREA WITHIN 100 Mtrs. FROM OUTER PERIMETER OF THE MINING LEASE

in compliance

with

Condition No.2.xxiii of

Stage-I approval granted vide Online Proposal No.FP/OR/MIN/9360/2015 Dated.13.02.2026

of Govt. of India, Ministry of Environment, Forests & Climate Change,

New Delhi.

FOR

DALPAHAR IORN & MANGANESE ORE MINES

(BLOCK-A)

ML AREA OVER 89.961 HA.

GAP PLANTING AND SOIL MOISTURE CONSERVATION ACTIVITIES TO RESTOCK AND REJUVENATE THE DEGRADED OPEN FOREST LOCATED IN THE AREA WITHIN 100 Mtrs. FROM OUTER PERIMETER OF THE MINING LEASE

1. INTRODUCTION

The mining lease of **Dalpahar Iron & Manganese Mines (Block-A)** over an area of **89.961 ha** was originally granted in favour of **Late Shri Dharmchand Jain** on **9 June 1986** for a period of **20 years**, valid up to **08.06.2006**, in **Baitarani Reserved Forest-A** under **Barbil Tahasil, Keonjhar Forest District, Odisha.**

Prior to expiry of the original lease period, a **Renewal of Mining Lease (RML)** application was submitted on **01.06.2005**, well within the stipulated timeframe. Accordingly, the lease was deemed to have been extended under the provisions of **Rule 24A(1) of the Mineral Concession Rules, 1950.**

Subsequently, due to delay in submission of the succession certificate and in obtaining statutory clearances, the mining lease was declared **lapsed** by the **Government of Odisha, Steel & Mines Department**, vide order dated **01.05.2015**. Aggrieved by the said order, a writ petition was filed before the **Hon'ble High Court of Odisha.**

Pursuant to the directions of the Hon'ble High Court and subsequent hearings before the Steel & Mines Department, the **Government of Odisha** issued an order on **06.09.2019**, stating that the mining lease had not lapsed and that the validity of the lease over **89.961 ha** stood extended up to **08.06.2036**, in favour of **Shri Avin Jain**, Power of Attorney holder of **Smt. Sobha Jain** (wife of Late Shri Dharmchand Jain), under the provisions of the **MMDR (Amendment) Act, 2015**. This was further confirmed vide letter dated **28.04.2022** issued by the Steel & Mines Department, Government of Odisha.

Based on the above, the **State Government of Odisha** executed a **Supplementary Lease Deed** for **Dalpahar Iron & Manganese Mines (Block-A)** over an area of **89.961 ha** in favour of **Shri Avin Jain**, Power of Attorney holder of **Smt. Sobha Jain**, on **27.04.2023.**

At present, a proposal for diversion of **79.367 ha** of forest land, including **2.822 ha** earmarked as **safety zone along the mining lease boundary**, in addition to **10.594 ha** of forest land already **diverted**, within the mining lease of **Dalpahar Iron & Manganese Mines**, has been submitted under **Section 2(ii) of the Forest (Conservation) Act, 1980**. The **Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India**, vide Letter No. **File No. 8-31/2015FC(E-91135) dated 13.02.2026**has accorded **in-principle (Stage-I) approval**, subject to compliance with stipulated conditions.

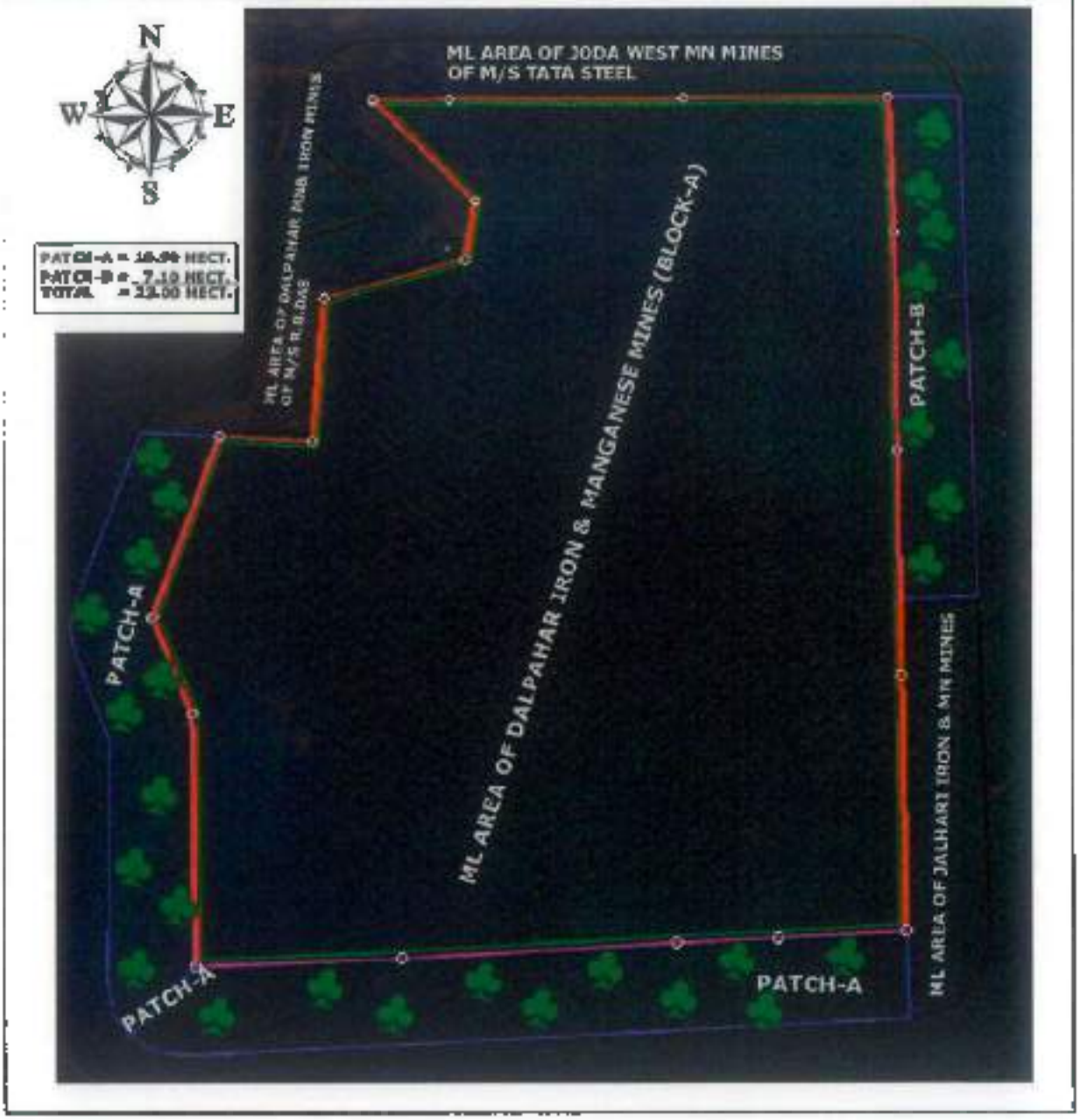
As per **Condition No. 2.xxiii of the Stage-I approval**, the User Agency is required to prepare and implement a scheme for **gap planting and soil moisture conservation activities to restock and rejuvenate degraded open forest**, if any, located within **100 metres from the outer perimeter of the mining lease boundary**. In compliance with the said condition, the present comprehensive scheme has been prepared.

The **northern side mining lease boundary** (Pillar Nos. 17 to 19 and 19 to 1) of Dalpahar Iron & Manganese Mines (Block-A) is contiguous with **Joda West Manganese Mines of Tata Steel Ltd.** The **north-western boundary** (Pillar Nos. 1 to 6) adjoins **Dalpahar Iron & Manganese Mines of R.B. Das,** while the **south-eastern boundary** (Pillar Nos. 13 to 14) is common with **Jalhari Iron & Manganese Mines.**

Except for the above common boundary stretches, the remaining areas within **100 metres of the outer mining lease perimeter,** comprising approximately **23 ha of degraded open Reserved Forest,** are available for **gap/block plantation,** proposed at a density of **200 seedlings per hectare.**

Location of the area 23.00 ha proposed for Gap Plantation within 100mtrs from outer perimeter of ML boundary.

GOGGLE IMAGE SHOWING THE AREA SUITABLE FOR GAP PLANTATION OVER 23.00 HA LOCATED WITHIN 100 MTRS FROM OUTER PERIMETER OF THE ML AREA OF DALPAHAR IRON & MN MINES OF SRI D.C.JAIN IN BAITARANI RESERVE FOREST UNDER KEONJHAR FOREST DIVISION IN KEONJHAR DISTRICT,ODISHA



2. LOCATION OF THE MINING LEASE AREA

The entire mining lease area of Dalpahar Iron & Manganese Mines (Block-A) covering 89.961 ha is located within the Baitarani Reserved Forest-A, under Keonjhar Forest Division, near Malda Village, Barbil Tahasil, Keonjhar District, Odisha.

The lease area falls within the Survey of India Topographical Sheet No. F45N5 (73G/5) and is geographically bounded by latitudes 21°58'04.701" N to 21°58'42.918" N and longitudes 85°23'26.729" E to 85°23'59.175" E.

3. TOPOGRAPHY

The mining lease area forms part of the Baitarani Reserve Forest and lies within a predominantly hilly and undulating terrain with very steep slopes. The general trend of the hill ranges is NNE–SSW.

The elevation within the lease area varies from approximately 553 m RL to 723 m RL. There is no perennial nala within the lease boundary. However, Sona Nadi flows in a northward direction on the western side of the lease area at an approximate distance of 1.0 km, influencing the regional drainage pattern.

4. SOIL TYPE

The area is characterized by lateritic formations, overlain by a thin soil mantle with thickness ranging from 0.5 m to 4.0 m. The soil colour varies from yellowish-brown to reddish-brown and grey.

Due to historical mining activity and deforestation, the soil has undergone significant erosion, particularly along slopes, and is mainly preserved in patches with existing vegetation cover. The soil/alluvium is predominantly silty to clayey in nature, intermixed with pebbles and cobbles of chert, jasper, banded hematite jasper (BHJ), and hematite iron ore.

5. CLIMATE

The area falls under a tropical climatic zone. Summer extends from March to May, with maximum temperatures rising up to 45°C during peak summer days. The south-west monsoon commences in June and continues up to September, with an average annual rainfall of approximately 1500 mm.

Winter is experienced during November, December, and January, when temperatures may drop to a minimum of about 4°C.

6. DRAINAGE

There is no perennial stream or nala within the mining lease area. Sona Nadi, located about 1.0 km west of the lease boundary, serves as the main drainage channel of the region and drains the surrounding catchment area.

7. EXISTING VEGETATION

The area supports **natural dry deciduous forest** vegetation comprising species such as **Sal, Kurum, Kangara, Asan, Dhaura, Kendu, Jamun, Mango**, etc. The existing **canopy density is generally below 0.4, indicating a degraded open forest condition.**

The present vegetation structure **has evolved under the influence of local edaphic conditions, climatic factors, anthropogenic pressure, and past mining activities**, which have collectively contributed to forest degradation.

8. OBJECTIVES OF THE SCHEME

The objectives of the proposed Gap Plantation and Soil & Moisture Conservation Scheme are as follows:

1. To comply with **Condition No. _2xxlii of the Stage-I Forest Clearance approval issued by MoEF&CC, Government of India**.
2. To **restock and rejuvenate degraded open forest areas within 100 m of the mining lease boundary.**
3. To implement **soil and moisture conservation measures** for improving micro-edaphic conditions and site productivity.
4. To **tend and strengthen existing vegetation**, thereby improving canopy density, species composition, and overall forest health.

9. PLANTING PLAN

The planting plan has been prepared based on **site-specific ecological requirements**, considering **geomorphology, soil texture, soil depth, fertility status, slope characteristics**, and the **susceptibility of the site to erosion and moisture stress.**

Appropriate soil and moisture conservation interventions will be undertaken prior to and during plantation activities, as depicted in the **treatment map**. The treatment map will clearly indicate **the species to be planted and site-specific treatments** proposed for different patches. This map shall be strictly followed during field implementation.

Species Proposed for Plantation

Sl. No.	Local Name	Scientific Name
1	Jamun	*Syzygium cumini*
2	Kurum	*Adina cordifolia*
3	Dhaura	*Anogeissus acuminata*
4	Khair	*Acacia catechu*
5	Sisoo	*Dalbergia sissoo*
6	Neem	*Azadirachta indica*

Sl. No.	Local Name	Scientific Name
7	Bahada	*Terminalia bellirica*
8	Harida	*Terminalia chebula*
9	Karanja	*Pongamia pinnata*
10	Amla	*Emblica officinalis*

10 PRE-PLANTING OPERATION

10(i)-RAISING OF PLANTATION STOCK- NURSERY-

A nursery with a capacity of 5,000 (18 months old) saplings per annum is proposed to meet the minimum requirement of planting material. In case of any shortfall, additional saplings will be procured from the State Forest Department nurseries.

A decentralized nursery will be established at the planting site during January–February, considering the availability of water and minimal biotic interference. The selected nursery site will be properly fenced and provided with an entry gate for protection and accessibility.

Polythene bags of size 12" × 8" × 400 gauge will be filled with a mixture of soil, sand, and well-decomposed cow dung manure in the ratio of 3:1:1. These will be arranged in half-sunken beds, accommodating approximately 1,000 bags per bed. Adequate spacing will be maintained between beds to facilitate movement for routine operations such as watering, weeding, manuring, and plant protection measures.
Seed Treatment and Sowing:

Treated seeds will be dibbled in pre-soaked polythene bags during the month of March. Regular watering will be carried out daily, along with timely weeding and other intercultural operations, until the onset of the monsoon, i.e., by the third week of June. Temporary overhead shade structures may be provided during daytime to protect seedlings from excessive heat and removed during night-time. The cost norms for raising the nursery are provided in **Annexure-I**.

10(ii)-SURVEY, DEMARCATION & PILLAR POSTING, GPS READING WITH MAPPING-

The planting area of the 2 patches over 23.00 ha has been properly surveyed and demarcated. The boundary post will be fixed at each corner, at each place where the boundary line of the site crosses a road or a prominent path and at each other prominent point with 4 feet tall RCC post. The name of the plantation site, species, year of plantation and area will be reflected on the corner boundary post. A map showing the planting area along with the GPS coordinates of its boundary has been enclosed in the scale of 1:4000.

Patch wise Gap Plantation over23.00 Ha of the land, located within 100 Mtrs from the Outer Perimeter ofML Boundary as below:

PATCH WISE GAP PLANTATION AREA OVER 23.00 HA LOCATED WITHIN 100 MTRS FROM THE OUTER PERIMETER OF ML BOUNDARY	
Location	**Area in Ha**
Patch-1	15.90
Patch-2	7.10
Total	**23.00**

GPS READING OF THE BOUNDARY OF GAP PLANTATION AREA OVER 23.00 HA. LOCATED WITHIN 100 MTRS FROM THE OUTER PERIMETER OF ML BOUNDARY.

Location	Pillar Id	Easting	Northing	Area in Ha
Patch-A	A1	334772.652	2430086.412	15.90
	A2	334508.382	2430076.004	
	A3	334139.67	2430063.41	
	A4	333950.994	2430053.979	
	A5	333921.429	2430057.238	
	A6	333905.88	2430062.767	
	A7	333882.329	2430077.983	
	A8	333860.175	2430104.369	
	A9	333848.575	2430135.696	
	A10	333810.475	2430426.894	
	A11	333754.898	2430536.288	
	A12	333745.895	2430562.467	
	A13	333744.319	2430593.812	
	A14	333797.471	2430831.737	
	MLP-6	333898.35	2430824.636	
	MLP-7	333844.052	2430581.583	
	MLP-8	333907.404	2430456.887	
	MLP-9	333947.046	2430153.902	
	MLP-10	334186.074	2430160.803	
	MLP-11	334504.175	2430175.157	
	MLP-12	334621.374	2430179.7	
	MLP-13	334770.797	2430186.426	
Patch-B	B1	334862.929	2431324.195	7.10
	B2	334864.341	2431114.05	
	B3	334866.557	2430796.551	
	B4	334867.954	2430596.526	
	B5	334769.667	2430597.023	
	MLP-15	334769.443	2430796.459	
	MLP-16	334769.088	2431112.563	
	MLP-17	334762.971	2431324.712	
		Total		23.00 ha

10(iii)- SITE PREPARATION AND SILVICULTURAL OPERATION INCLUDING CLEARANCE OF WEED, CLIMBER CUTTING, HIGH STUMP CUTTING, SINGLING OF SHOOTS-

The clearing of the site involving removal of invasive weeds, bushes, climbers, high stumps and singling of shoots will be taken up preferably by the end of February and latest by the end of March. Pits of the dimension 45 x 45x 45 cm. will be dug @ 200 per ha in the available gaps, preferably 2 months before or at least a month before planting of seedlings

11.PLANTING OPERATION

Planting of seedlings will be taken up in the month of July. The polythene covering of the balls of earth will be carefully removed before planting. Care will be taken to see that the ball of the earth is not broken while doing so. The seedling with the ball of earth will then be placed firmly in the pit and buried at such a depth that the root collar is well below the surface of the soil. The soil around the plant will be well compacted with theheel as a final step so that there is a proper bond between the ball and the surrounding soil. The earth close to the collar will be slightly elevated so that rainwater does not accumulate very close to the plant.

12.POST PLANTING OPERATION

12(i)-CASUALTY REPLACEMENT

The entire area will be gone over in the same order as the plantation was carried out and casualties, if any, will be replaced as soon as the main plantation operation is over.

12(ii)-WEEDING AND SOIL WORKING

Regular and efficient weeding will start immediately after sprouting of the stumps is complete or after the seedlings have started throwing up new buds.

12(iii)-MANURING AND INSECTICIDE APPLICATION

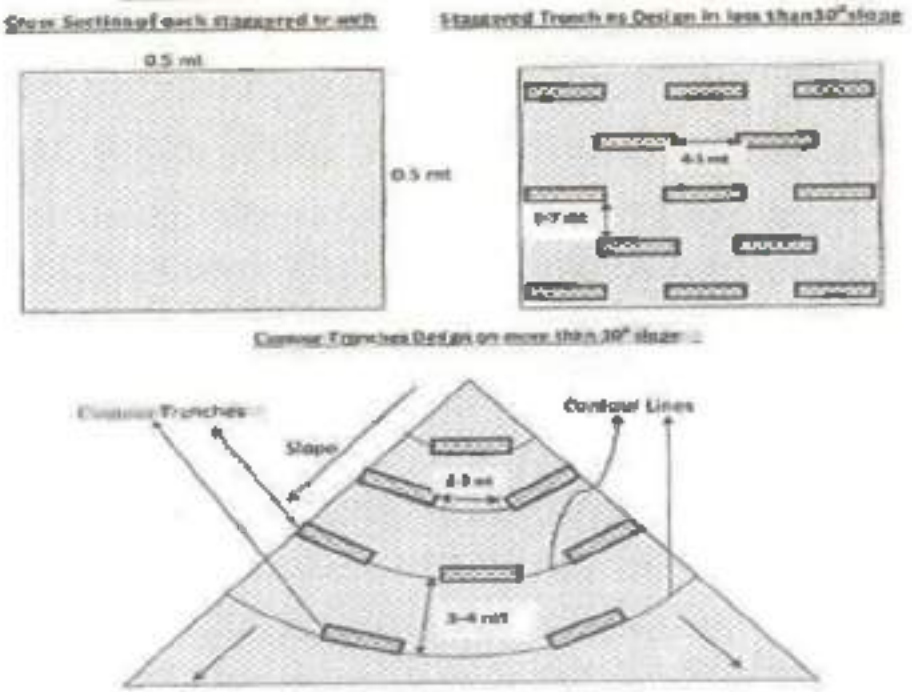
On degraded sites, urban compost or farmyard manure, wherever available, will be added to the soil while refilling the pits. As regards artificial fertilizers, the minerals required and dosage @ 50 grams of patent mixtures like 'Gromor' or N.P.K. (2:2:1) will be applied in two split doses, one in August and the other in September.

12(iv)-SOIL MOISTURE CONSERVATION MEASURES

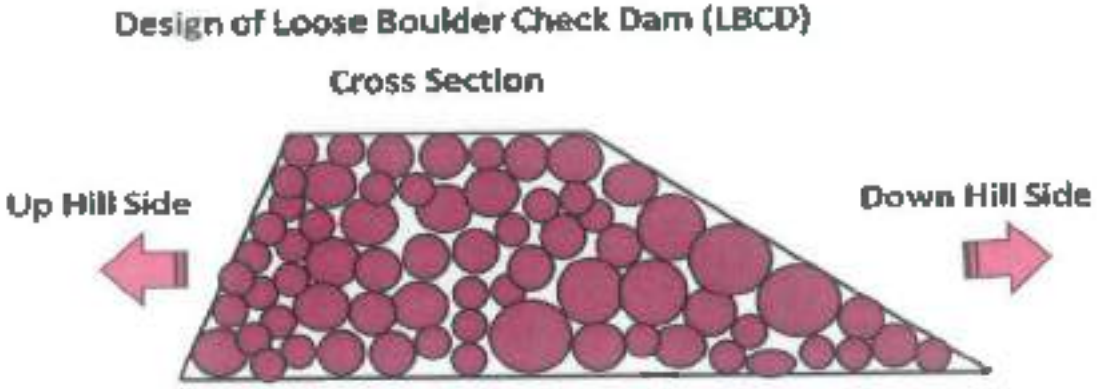
Soil Moisture Conservation Measures,structures like Staggered Trench, Contour Trench, Graded earthen bund, LBCD, Wire mesh LBCD, sub-surface dyke & WHS as per the slope & site requirement will be constructed in the plantation area.

Design/Cross Section of Soil Moisture Conservation Measures structures

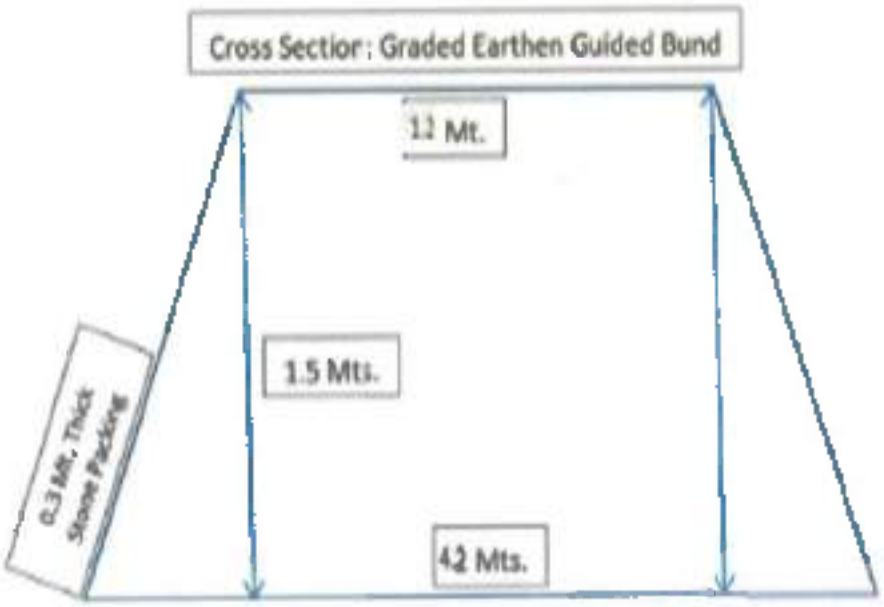
1. Staggered Trench (ST) and Contour Trench (CT)



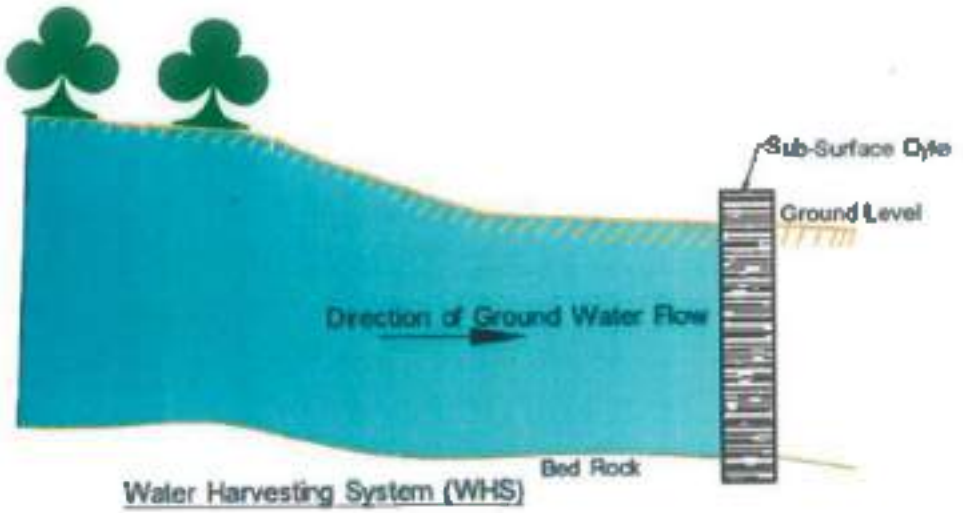
2. Loose Boulder Check Dam (LBCD)

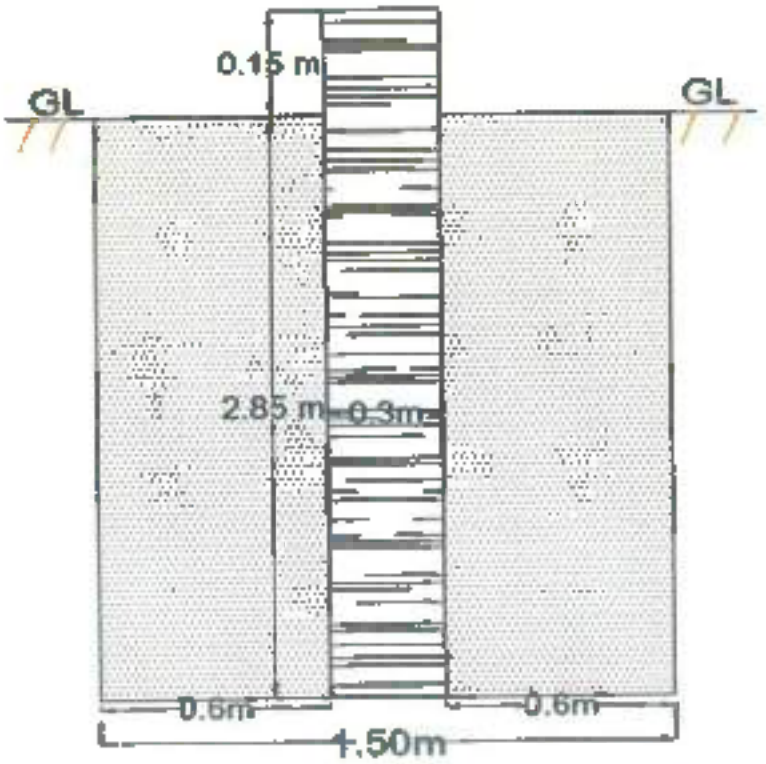


3. Graded Earthen Bund (GEB)



4. Water Harvesting System (WHS) and Sub-Surface Dyke (SSD)





Cross Sectional View of SSD

12(v)-PROTECTION AGAINST FIRE AND GRAZING

Fire line tracing will be undertaken to protect the plantation from forest fire hazards, and watch & ward arrangements will be provided as per approved norms to safeguard the plantation from grazing and other biotic interferences. The cost of fire line tracing and watch & ward has been duly included in the budgetary provision under inspection and monitoring.

13. INSPECTION, MONITORING AND EVALUATION

For the successful implementation of the above scheme, intensive inspection and technical guidance from the concerned technical wing are required. Sufficient fuel/ conveyance charges for technical experts shall be provided by the user agency for the proper execution of these programmes. Budgetary provision of 15% of the total project cost has been earmarked for this score.

14. EXECUTING AGENCY

The works in the present Scheme shall be executed by the User Agency having specialized departments headed by qualified persons with outsourced manpower and machinery. To facilitate this, the user agency shall establish its own executing and supervision cells along with the required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in coordination with the Forest Department.

15. REQUIREMENT OF FUNDS

The total cost for the implementation of the Scheme will be **Rs.Rs.56,94,414/-(Rupees Fifty Six Lakh Ninety Four Thousand Four Hundred Fourteen) Only**for the implementation of the above mitigation measures, the above expenditure will be made over aten-year ten years period. Therefore, the budget provision of will be kept by the user agency for implementation of the above mitigation measures over a period of the next ten years. This budget will be subject to increase in amount considering the increase in materials and labour charges. The tentative annual expenditure planned for the next ten years for the implementation of mitigative measures is given in the following table: -

TOTAL COST OF THE PROJECT

Sl.No.	Description of the Work	Fund Required (in Rs.)
1.	**Biological Measures**	
A	Rising of Nursery 5000 (18 months)seedlings @ Rs.51.70 per seedling.(The cost norm Enclosed as **Annexure-I**).	2,58,500.00
B	RDF Plantation (200 no./ha.) over 23 ha. @ Rs. 1,22,694/- (as per base norm of Matrix for the year 2026-27) (**Annexure-II**).	28,21,962.00
	Sub-Total:	**30,80,462.00**
2.	**Structural Measures**	
A	Soil Moisture Conservation (SMC) over 23 ha @ Rs. 45,475/- per ha (as per base norm of Matrix for the year 2026-27) (**Annexure-III**).	**10,45,925.00**
	Total (1+2):	**41,26,387.00**
inspection, monitoring @ 15%		6,18,958.05
TOTAL		**47,45,345.05**
Price escalation @ 20%		9,49,069.01
Grant Total		56,94,414.060r say **Rs.56,94,414/-**
(Rupees FiftySix Lakh Ninety FourThousand Four Hundred Fourteen) Only		

Divisional Forest Officer,
Keonjhar Division

Asst. Conservator of Forest
I/C. Champua Forest Range

Technically Approved

Regional Chief Conservator of Forests
Rourkela Circle

Annexure-1

Nursery Cost Norm for raising of 1000 (18 months) seedlings								
Wage Rate @ 462 Rs per Man Day								
Sl. No	Items of work	Perferable Period of Execution	Unit	Unity Cost in Rs	No./Qty.	Labour Cost (Rs.)	Material cost (Rs.)	Total cost (Rs.)
1st Financial Year (Seedlings Cost for 3 Months)								
1	Cost of Polythine Bag (12" x 8"x 400 gauge) 80 nos./kg=12.5 kgs@ Rs 208per kg (including GST)	Nov- Dec	Kg	208	12.5	0	2600	2600
	Procurement of raw & crude Polypot Mixture							
2	(i) Soil	Nov- Dec	Cft	15	70	0	1050	1050
	(ii) Sand	Nov- Dec	Cft	20	35	0	700	700
	(iii) COIR/ Vermi compost/ Bio-fertilizers,etc.	Nov- Dec	Cft	40	35	0	1400	1400
	(iv) Insecticide/ Bio Pesticide	Nov- Dec	Kg	150	6	0	900	900
3	Preparation of Soil Mixture includes Pulverisation, Straining & mixing the ingredients Properly	Nov- Dec	MD	462	8	3696	0	3696
4	Filling of polythene bags & Setting in the bed	Nov- Dec	MD	462	12	5544	0	5544
5	Collection of Seed Grading & Treatment	Dec	MD	462	2	924	100	1024
6	Preparation of germination bed,Sowing of seed and Mulching including cost of materials	Jan	MD	462	1	462	100	562
7	Dibbling of seeds/Pricking out the Seedlings from germination beds , transplanting in the poly bags and providing sheds including cost of materials	Feb	MD	462	2	924	500	1424
8	Watering for 3 months	Jan - Mar	MD	462	10	4620	0	4620
9	Contingencies (Water can, Buckets, Nursery shed, Electricty charges/ Diesel charges Maintenance of pump set and assosaries & any other)					0	500	500
	Total				98	16170	7850	24020
2nd finance year								
1	Watering for 3 months	April-June	MD	462	10	4620	0	4620
2	Weeding,Sorting,Grading & other operations	April-Mar	MD	462	12	5544	0	5544
3	Cost of Insecticide/Bio-pesticide/Vermiwash/Herbal based plant growing products					0	550	550
4	Watering	Oct - Mar	MD	462	20	9240	0	9240
5	Contingencies (Electricty charges/ Diesel charges Maintenance of pump set and assosaries & any other)					0	670	670
	Total				42	19404	1220	20624
3rd finance year April-June								
1	Watering for 3 months	April-June	MD	462	10	4620	0	4620
2	Weeding,Sorting,Grading , Root cutting & other operations	April-June	MD	462	3	1386	0	1386
3	Cost of Insecticide/Bio-pesticide/Vermiwash/Herbal based plant growing products	April-June				0	800	800
4	Contingencies (Electricty charges/ Diesel charges Maintenance of pump set and assosaries & any other)					0	250	250
	Total				13	6006	1050	7056

ABSTRACT

Sl.No	Year	No of ManDay	Labour Cost (	Material cost (Rs.)	Total cost
1	1st Finance Year (3 Months)	98	16170	7850	24020
2	2 nd Finance Year (12 Months)	42	19404	1220	20624
3	3 rd Finance Year (3 Months)	13	6006	1050	7056
Total		90	41580	10120	51700
Cost per 18 months old Seedling = Rs. 51700/1000= Rs. 51.70					

Annexure-II

COST STRUCTURE OF PLANTATION, PROVISION OF FUNDS AND UTILIZATION

ANNEXURE-6

Gross Cost Norms for Compensatory Afforestation through Aided Natural Regeneration (ANR) @ 200 Seedlings/Ha. [18 months old seedling]

WAGE RATE Rs- 311/- PER MANDAY

Sl. No	Items of work	Preferable Period of Execution	No of Mandays	Labour Cost (in Rs.)	Material Cost (in Rs.)	Total cost (in Rs.)
	0th Year (Advance work) Pre-Planting Operation					
1	Survey, Demarcation and Pillar posting	Nov/Dec	2	622	0	622
2	Preparation of Treatment Map (Digital Map)	Nov/Dec	1	311	100	411
3	Site preparation	Nov/Dec	2	622	0	622
4	Silvicultural operations including clearance of weed, cutting of climber, high stump cutting, lopping of shoots & removal of cut material after drying from the field to shed space.	Jan/Feb	14	4665	0	4665
5	Alignment and marking for digging of pits	Feb/Mar	0.5	156	0	156
6	Digging of pits (45 cm x 45 cm X 45 cm) in hard and gravelly soil	Feb/Mar	8	2488	0	2488
	Total		28.5	8863.5	100.0	8963.5
	1st Year/Planting Year					
1	Refilling of pits by altering the dugout soil of the pits, application of organic compounds/ CDM/ FYM & mixing the same perfectly.	June/Jul	1.5	466.5	1000	1467
2	Transportation of 18 months old polythene bag seedlings in Mini truck / tractor from the permanent/illegal nursery to planting site including loading & unloading. (Average lead of 10 Kms) & Stacking the seedling @ Rs 6/- / Seedling. (220 nos.)	Jul/Aug	4	0	1320	1320
3	Weeding polythene bag seedlings at stacking site of plantation	Jul/Aug	0.5	155.5	0	156
4	Conveyance of polythene bag seedlings on head load from the stacking site to the individual dugout pits within the planting site, applying insecticide, fertilizer & planting after scooping the soil with other applied materials and pressing the soil perfectly around the planted seedling.	Jul/Aug	4.5	1398.5	0	1400
5	Cost of Fertilizer & Insecticide (a) NPK/ Bio-fertilizer @ 50 gms/plant as basal dose = 10kg @ Rs.30/- per kg = Rs. 300.0 (b) Urea/Vermicompost/Bio fillers/any other fertilizer @ Rs. 150.00 (c) Insecticide/ Bio-pesticide @ 5gms/plant= 1 kg @ Rs.150/- per kg = Rs. 150/-	Jul/Aug	0	0	600	600
6	Casualty Replacement @ 10% [20 nos.]	Jul/Aug	0.5	156	0	156
7	1st weeding & Mawaring	Aug/Sept	2	622	0	622
8	2nd Weeding, Soil working (Last Casualty among the plants) & Mawaring	Oct/Nov	3	933	0	933
9	Fire line cleaning & inspection path	Feb/Mar	3	933	0	933
10	Watch & Ward including watering as per requirement	Aug-Jun	8	2488	0	2488
	Total		23	7153	2920	10073
	2nd Year Maintenance					

Sl. No	Name of work	Preferable Period of execution	No of Mandays	Labour Cost (in Rs.)	Material Cost (in Rs.)	Total cost (in Rs.)
1	Transportation of 28 seedlings from Nursery to plantation site including loading, unloading & conveyance by Tractor @ Rs.8/- per seedling	Jul	0	0	120	120
2	Planting for casualty replacement	Jul	0.5	353	0.0	353
3	Cost of fertilizer & Insecticides A) Cost of Insecticide/ Bio-pesticide(Thiomet/ Ramac) @ 5 gms/plant = 0.1 Kg@ Rs.150/- per kg = Rs.15/- B) Urea/NPK/Bio-fertiliser/Vermicompost/Bio Bhatia/any other fertilizers Rs. 560/-	Jul	0	0	575	575
4	Weeding (Complete weeding), Mounding & Soil working (1mt. diameter around the plants)	Sep/Oct	4	1244	0.0	1244
5	Fire line tracing (2 m. wide fire line over 400 m long) & inspection path	Feb/Mar	3	933	0.0	933
6	Watch & Ward including watering as per requirement	Apr/May	12	3732	0.0	3732
	Total		19.5	6064.5	695.0	6759.5
	3rd Year Maintenance					
1	Cost of Fertilizer - Urea/NPK/Bio-fertiliser/Vermicompost/No Bhatia/any other fertilizers Rs. 560/-	Sep/Oct	0	0	560	560
4	Weeding (Complete weeding), Mounding & Soil working (1mt. Diameter around the plants)	Aug/Sep	4	1244	0	1244
5	Fire line tracing (2 m. wide fire line over 400 m long) & inspection path	Feb/Mar	3	933	0	933
6	Watch & Ward including watering as per requirement	Apr/May	12	3732		3732
	Total		19.0	6909.0	560.0	6469.0
	4th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m long) & inspection path	Feb/Mar	3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/May	12	3732	0	3732
	Total		15	4665	0	4665
	5th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length) & inspection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/May	12	3732.00	0	3732
	Total		15.0	4665.0	0	4665
	6th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length) & inspection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/May	12	3732.00	0	3732
	Total		15.0	4665.0	0.0	4665.0
	7th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length) & inspection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/May	12	3732.00	0	3732
	Total		15.0	4665.0	0.0	4665.0
	8th Year Maintenance					

Sl. No	Items of work	Preferable Period of Execution	No of Mandays	Labour Cost (in Rs.)	Material Cost (in Rs.)	Total cost (in Rs.)
1	Pre fire tracing (2 m. wide fire line over 400 m length) &inspection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732.00	0	3732
	Total		15.0	4665.0	0.0	4665.0
	2th Year Maintenance					
1	Pre fire tracing (2 m. wide fire line over 400 m length) &inspection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732.00	0	3732
	Total		15.0	4665.0	0.0	4665.0
	10th Year Maintenance					
1	Pre fire tracing (2 m. wide fire line over 400 m length) &inspection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732.00	0	3732
	Total		15.0	4665.0	0.0	4665.0

Year wise Abstract of Cost Norm (showing seedling cost separately)

Sl. No	Year	No. person days	Labour cost @ Rs. 311/- per day (Rs)	Material Cost (in Rs.)	Monitoring Evaluation, Learning, Documentation and Other Contingency (5%) of (4+5+6)	Cost of Seedlings @Rs.50.11 per seedlings	TOTAL COST
1	2	3	4	5	6	7	8
1	0th year	29.5	8963.5	160	436.50	0.00	9400.0
2	1st year	23.5	7159.0	2920	427.00	11060.00	21566.0
3	1st year	19.5	6069.5	695	240.50	1805.00	8810.0
4	2nd year	19.5	5909.5	540	237.50	0.00	6687.0
5	3th year	15.0	4665.0	0	235.00	0.00	4900.0
6	4th year	15.0	4665.0	0	235.00	0.00	4900.0
7	5th year	15.0	4665.0	0	235.00	0.00	4900.0
8	6th year	15.0	4665.0	0	235.00	0.00	4900.0
9	7th year	15.0	4665.0	0	235.00	0.00	4900.0
10	8th year	15.0	4665.0	0	235.00	0.00	4900.0
11	9th year	15.0	4665.0	0	235.00	0.00	4900.0
	Total	196.0	60815.0	4275.0	3184.5	12907.1	79274.0

Note:

1 Invoices must be given in the indigenous local species available locally to the site of plantation

2 Local indigenous fruit bearing trees must be practiced in Plantation

3 Site specific Soil conservation work like SWC, Gully Plugging, Staggered Trench, Contour Bund, Graded Bund, etc. may be taken up

4 Chain link fencing can be adopted in the fit plantation taken up outside the forest area and Bamboo/ Wire fencing may be provided to the plantation taken up in degraded forest area.

5 Watering facilities for preservation of water & watering may be adopted as per the availability of water.

6 The Unit Norms of Vertical Forestry will be finalized with the approval of the concerned CCF/ Divisional overall cost norm fixed for each Financial Year

ADCCF (Forest Conversion & NO, FC Act)

Matrix for ANR-200 Plants/ Ha

In Rupees

Sl. No.	Consecutive year of Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	XXI	Total Cost
Base Rate		8406	21508	28005	45700	48000	48000	48000	48000	48000	48000	48000											
1	2021-22	9408	23648	30806	7756	52834	61126	64432	67454	70912	74046	78019											868131
2	2022-23		9690	28778	9267	81644	41264	64432	67454	70912	74647	78018	82118										3009854
3	2023-24			30784	74967	9730	65611	64432	67454	70912	74647	78218	82109	86471									305985
4	2024-25				10883	26216	10917	65979	67454	70912	74647	78219	82110	86619	90852								111286
5	2025-26					11424	27526	80726	94428	70912	74647	78218	82118	86621	90850	95076							116852
6	2026-27						11954	28903	11764	93939	74647	78218	82118	86621	90852	95078	99880						122884
7	2027-28							11507	30947	11827	10644	78219	82118	86621	90852	95076	99878	104879					128829
8	2028-29								13237	35964	13618	26894	82118	86621	90852	95076	99880	104877	110081				135278
9	2029-30									14858	33647	13228	13648	86621	90852	95078	99880	104879	110081	115663			142035
10	2030-31										14582	35128	13691	13288	95852	95076	99880	104878	110086	115663	121191		149337

APCCF (Forest Diversion & NO, FC Act)

Annexure- III

Cost Norms for Creation of Compensatory Afforestation with Stabilization of Soil Moisture Conservation (SMC)

Annexure-III

Cost norms for creation of Compensatory Afforestation with Stabilization of Soil & Conservation of Moisture (SMC)

WAGE RATE Rs.313/-PER DAY

Sl. No	Name of Activity	Time Schedule Period of Operation	Total Cost
	0th Year (Pre-Plantation Operations)		
1	Nil		0
	1st Year		
2	Soil Conservation consisting all measures like Ring pit/ Trench, Pre-plantation pit, Disease control, Gap/Dead earthen bund, 4 BCA, Weed cycle I, II, III, Soil moisture Cycle & Wild as per the project & site requirement etc. LS	April/Sept	28,215
	2nd Year		
3	Maintenance of SMC measures @ 15 % of 1st yr cost	April/Sept	3,032
	3rd Year		
4	Maintenance of SMC measures @ 15 % of 1st yr cost	April/Sept	3,032
	4th Year		
5	Maintenance of SMC measures @ 15 % of 1st yr cost	April/Sept	3,032
	5th Year		
6	Maintenance of SMC measures @ 15 % of 1st yr cost	April/Sept	3,032
	Total		40,343.0

Abstract

Sl. No	Year	No. of man days	Labour cost @ Rs.313/- per day	Supervision Cost	Total cost (Rs.)
1	0th year	0.0	0.0	0.0	0.0
2	1st year	0.0	0.0	28,215.0	28,215.00
3	2nd year	0.0	0.0	3,032.00	3,032.00
4	3rd year	0.0	0.0	3,032.00	3,032.00
5	4th year	0.0	0.0	3,032.00	3,032.00
6	5th year	0.0	0.0	3,032.00	3,032.00
	Total	0.00	0.00	40,343.0	40,343.0

Different types of SMC measures may be taken up as per site requirements of the plant Wise allocation of the target & specification of different measures may be decided.

APCCF (Forest Conservation & WL/PC Act)

Matrix for (SMC)

In Rupees

Sl. NO.	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
Base Norm		0	20235	3032	3032	3032	3032											
1	2021-22	0	22246	3447	3510	3653	3870											40650
2	2022-23		0	23287	3509	3686	3869	4054										42415
3	2023-24			0	33401	3684	3870	4062	4257									39284
4	2024-25				0	36577	3868	4064	4265	4480								41248
5	2025-26					0	29802	4061	4267	4478	4704							42330
6	2026-27						0	27030	41644	44888	4702	4939						45473
7	2027-28							0	28443	4697	4706	4937	5186					47369
8	2028-29								0	29859	4722	4939	5186	5446				50136
9	2029-30									0	30364	4936	5186	5443	5717			52642
10	2030-31										0	27878	5183	5445	5715	6018		55234

APCCF (Forest Diversion & NO, FC Act)

SCHEME
FOR

DE-SILTING OF VILLAGE TANKS AND OTHER WATER BODIES LOCATED WITHIN 05 KM FROM THE MINE LEASE BOUNDARY SO AS TO MITIGATE THE IMPACT OF SILTATION OF SUCH TANKS/ WATER BODIES

in compliance

with

Condition No.2.xxiv of

Stage-I approval granted vide Online Proposal No.FP/OR/MIN/9360/2015 Dated.13.02.2026

of Govt. of India, Ministry of Environment, Forests

& Climate Change,

New Delhi.

FOR

DALPAHAR IORN & MANGANESE ORE MINES

(BLOCK-A)

ML AREA OVER 89.961 HA.

OF

SRI AVIN JAIN

SCHEME FOR DE-SILTING OF VILLAGE TANKS AND OTHER WATER BODIES LOCATED WITHIN 05 KM FROM THE MINE LEASE BOUNDARY SO AS TO MITIGATE THE IMPACT OF SILTATION OF SUCH TANKS/ WATER BODIES

1. INTRODUCTION

The mining lease of **Dalpahar Iron & Manganese Mines (Block-A)**, covering an area of **89.961 ha**, was originally granted in favour of **Late Shri Dharm Chand Jain** on **09 June 1986** within **Baitarani Reserved Forest-A**, under **Barbil Tahasil of Keonjhar Forest Division**, for a period of **20 years**, valid up to **08.06.2006**.

Prior to expiry of the lease period, an application for **Renewal of Mining Lease (RML)** was submitted on **01.06.2005**, within the stipulated timeframe. Accordingly, the lease was treated as **deemed to be extended** in terms of **Rule 24A(1) of the Mineral Concession Rules, 1960**.

Subsequently, due to delay in submission of the succession certificate and non-receipt of statutory clearances within the prescribed period, the lease was declared **lapsed** by the **Government of Odisha, Steel & Mines Department** vide order dated **01.05.2015**. Aggrieved by the said order, a writ petition was filed before the **Hon'ble High Court of Odisha**.

Pursuant to the directions of the Hon'ble **High Court** and subsequent hearings before the Steel & Mines Department, the **Government of Odisha**, vide order dated **06.09.2019**, held that the **mining lease had not lapsed**. Accordingly, the validity of the mining lease over **89.961 ha** was extended up to **08.06.2036** in favour of **Shri Avin Jain**, Power of Attorney holder of **Smt. Sobha Jain (wife of Late Shri Dharm Chand Jain)**, in accordance with the **MMDR (Amendment) Act, 2015**, as communicated vide letter dated **28.04.2022**. Consequent upon this, the **Supplementary Lease Deed** for Block-A was executed by the **State Government of Odisha** on **27.04.2023**.

At present, a proposal for diversion of **79.367 ha of forest land**, including **2.822 ha earmarked as safety zone along the mining lease boundary**, in addition to **10.594 ha of forest land already diverted**, has been submitted under **Section 2(ii) of the Forest (Conservation) Act, 1980**. The **MoEF&CC, Government of India**, has accorded **in-principle (Stage-I) approval**, subject to fulfillment of stipulated conditions, vide Letter No. **F.No. 8-31/2015FC(E-91135) dated 13.02.2026**.

As per one of the conditions of the **Stage-I approval**, the **User Agency** is required to **prepare and implement a Desiltation Scheme for village tanks and other water bodies located within a 5 km radius of the mining lease boundary**, in order to mitigate the impacts of siltation caused by mining and associated activities.

In compliance with the above condition, the present **Desiltation Scheme** has been prepared for implementation in the villages falling within the influence area of the mining lease, covering the **entire mining lease area and its surroundings**.

2. LOCATION OF THE MINING LEASE AREA

The entire mining lease area of **Dalpahar Iron & Manganese Mines**, measuring **89.961 ha**, falls within the **Baitarani Reserved Forest**, under **Keonjhar Forest Division**, near **Bichakundi Village, Barbil Tahasil, Keonjhar District**, Odisha.

The mine forms part of **Survey of India Toposheet No. F45N5 (73G/5)** and is geographically bounded by the following coordinates:

- **Latitude:** 21°58'4.701" N to 21°58'42.918" N
- **Longitude:** 85°23'26.729" E to 85°23'59.175" E

3. TOPOGRAPHY

The project area forms part of the **Baitarani Reserve Forest** and lies within a **predominantly hilly terrain**. The mining lease area is characterized by **an undulating landscape with steep slopes and sharp relief**. The general trend of the hills is NNE–SSW.

The elevation of the lease area ranges from **553 m RL to 723 m RL**. There is **no perennial nala** within the mining lease area. **Sona Nadi**, a seasonal river, flows due north along the western side of the lease area at an approximate distance of **1 km**.

4. SOIL TYPE

The area is characterized by a **lateritic surface**, overlain by a thin soil cover with thickness varying **from 0.5 m to 4.0 m**. The soil colour ranges from **yellowish brown to reddish brown and grey**.

Due to extensive mining activities and deforestation, **soil erosion has occurred along slopes**, with soil mainly preserved in areas having vegetation cover. The soil/alluvium is predominantly **silty to clayey, containing pebbles and cobbles of chert, jasper, banded hematite jasper (BHJ), and hematite iron ore.**

5. CLIMATE

The **area falls under a tropical climatic zone**. Summer extends from **March to May**, with maximum temperatures reaching up to **45°C** during peak summer. The **south-west monsoon** sets in during **June** and continues till **September**.

The **area receives an average annual rainfall of about 1500 mm**. Winter occurs during **November to January**, with minimum temperatures dropping to around 4°C.

6. DRAINAGE

There is **no perennial drainage channel** within the mining lease area. **Sona Nadi**, flowing due north at a distance of approximately **1.0 km** west of the lease area, acts as the **main drainage channel** of the region.

7. RAINFALL

Rainfall in the catchment area and within a 10 km radius buffer zone shows considerable variation. Based on rainfall data of the last seven years, the average annual rainfall of Keonjhar District is 1523 mm, of which nearly 92% occurs during the monsoon months.

The average rainfall in the project area is approximately 1400 mm per annum.

8. FACTORS RESPONSIBLE FOR SILTATION

Siltation is a common problem affecting ponds, tanks, lakes, and water reservoirs. It occurs due to the deposition of eroded soil particles, decaying leaves, grasses, vegetation, and decomposed organic matter at the bottom of water bodies.

In the project area, soil erosion is the primary factor contributing to siltation. The steep gradients, high rainfall intensity, mining operations, waste dumps, excavated areas, and naturally denuded surfaces accelerate erosion. During rainfall events, surface runoff carrying silt and suspended particles enters village ponds and tanks.

Over time, successive layers of silt accumulate, leading to reduction in pond depth and water holding capacity. As the ponds age, their effectiveness as water storage structures diminishes. At this stage, desiltation becomes essential to restore their original capacity.

Regular desiltation of pond bottoms, along with preventive soil conservation measures, is considered the best practice for controlling siltation and improving water resource sustainability.

9. SELECTION OF PONDS

In compliance with Condition No. 2.xxiv of the Stage-I approval, a GPS-based survey of village ponds located within a 5 km radius of the mining lease boundary was conducted.

A total of eight (8) village ponds were identified and surveyed within the buffer area. These ponds are located in the villages of Roida, Khandbandha, Bholbeda, Kamrjoda, Chilikapat, Khuntapani, and Kundurpani.

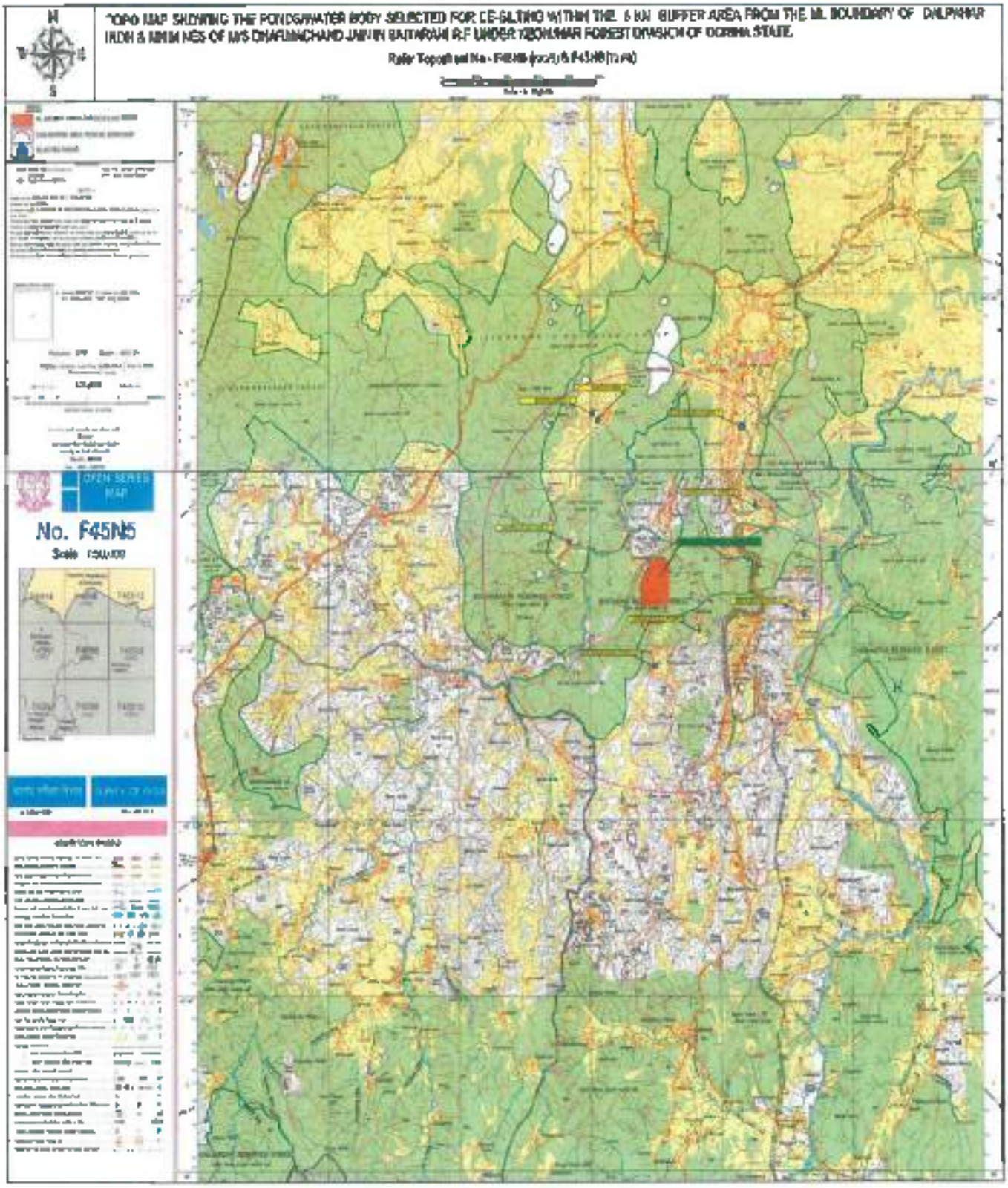
The locations of the identified ponds within the 5 km vicinity of the lease area are shown in Survey of India Topo Sheets No. F45N5 (73G/5) and F45H8 (73F/8) and are enclosed as Plate-1.

GPS COORDINATE & DIMENSION OF THE PONDS SELECTED FOR DESILTING

Pond No.	Name of the Location of the Water Body	One point GPS Reading		Dimension in (Length x Breadth x Height)	Remarks
		Easting	Northing		
1	Roida village pond-1	85° 22' 33.01"	22° 00' 46.01"	55 x 50 x 3	Scope for De-siltation & construction of Embankment
2	Roida village pond-2	85° 22' 38.13"	22° 00' 41.74"	50 x 37 x 2.5	Scope for De-siltation & construction of Embankment
3	Bholbeda village pond	85° 26' 36.86"	21° 57' 56.23"	36 x 31 x 2.5	Scope for De-siltation & construction of Embankment
4	Kundurpani Village Pond	85° 22' 07.11"	21° 58' 56.31"	32 x 31 x 2.5	Scope for De-siltation & construction of Embankment
5	ChilikaPat Village Pond	85° 24' 37.89"	21° 57' 41.78"	40 x 33 x 2.5	Scope for De-siltation & construction of Embankment
6	Khandbandha Village Pond	85° 23' 46.24"	21° 57' 11.05"	67 x 32 x 2	Scope for De-siltation
7	Kamarjoda Pond	85° 25' 23.96"	22° 00' 36.49"	57 x 53 x 2.5	Scope for De-siltation & construction of Embankment
8	Khuntapani Village Pond	85° 25' 39.91"	21° 59' 29.22"	64 x 54 x 2.5	Scope for De-siltation & construction of Embankment

SATELLITE IMAGE SHOWING LOCATION OF THE SELECTIVE VILLAGE TANKS/WATER BODIES FOR DE-SILTING AND IMPROVEMENT WITHIN 5KM BUFFER AREA OF LASERDA PACHERI MN & IRON ORE BLOCK

The topo map showing the location of the ponds/water body



Matrix to indicate the benefits to be derived by individual villagers from pond renovation

10. DEMOGRAPHIC FEATURES OF HUMAN TO BE BENEFITED BY SELECTED POND

Si. No	Village	Male	Female	Total Population
1	Roida	421	404	825
2	Bholbeda	284	258	542
3	Khandbandh	648	613	1261
4	Kundurpani	249	237	486
5	Chilika Pat	54	41	95
6	Kamarjoda	671	654	1325
7	Khuntapani	385	372	757

Name of Water body	Population Benefitted	Cattle to be Benefitted	Irrigation to be Derived	Pisciculture Benefit
Roida pond-1	XXX	XX	Not Possible	X
Roida pond-2	XXX	XX	Not Possible	X
Bholbeda pond	XXX	XX	XX	X
Kundurpani pond	XXX	XX	XX	X
ChilikaPat Pond	XXX	XX	XX	X
Khandbandha Pond	XXX	XX	Not Possible	X
Kamarjoda Pond	XXX	XX	Not Possible	X
Khuntapani Pond	XXX	XX	Not Possible	X

Note:-1. XXX = Maximum Benefit,

2. XX = Average Benefit,

3. X = Low Benefit.

11. METHODOLOGY

The desiltation of the selected village ponds shall be undertaken in a systematic and phased manner, with the objective of restoring their original water holding capacity and minimizing future silt accumulation.

Desiltation Schedule and Timing

It is proposed to carry out **complete desiltation of the selected ponds once every five years**, amounting to **two desiltation cycles during the ten-year plan period**. Desiltation works shall preferably be undertaken during the **dry summer months (March–April)**, when the ponds are dry or nearly dry and the accumulated silt is fully exposed.

Mode of Silt Removal

The **dried silt shall be removed either manually or mechanically**, depending upon the **quantity of silt accumulation and site conditions**:

- **Ponds with silt accumulation exceeding 500 m³** shall be desilted **mechanically**.
- **Ponds with smaller quantities of silt** shall be desilted **manually** by engaging local labour.

For mechanical desiltation, **small excavators such as 0.9 m³ backhoe loaders / small hydraulic shovels or pay loaders**, along with **10-tonne tippers**, shall be deployed. One backhoe with one tipper is proposed to complete desiltation of a pond within **two to three days**, depending on silt volume. Machinery deployment shall be **properly planned** to ensure completion of works within the shortest feasible timeframe and with minimal disturbance.

In the case of smaller ponds or locations with limited access, desiltation shall be carried out **manually** using sufficient manpower.

Scope of Work

The desiltation and pond improvement works shall comprise the following components:

a) **Total desiltation once every five years** (two times during the ten-year plan period).

b) **Implementation of preventive measures** during the subsequent four years to minimize re-siltation of the ponds.

c) **Embankment stabilization through** grass turfing, stone pitching, and plantation of suitable vegetation to prevent soil erosion and reduce inflow of silt.

d) **Construction of bathing ghats, cloth changing rooms, and Tulsi Chauras**, wherever feasible, as part of pond improvement and community utility enhancement.

First-Year Preventive Measures

In the first year of implementation, the following preventive and improvement measures shall be undertaken to reduce future siltation:

- Construction of **pond embankments**, wherever required.
- **Strengthening of existing embankments** to check entry of surface runoff into the pond.

- **Regular removal of aquatic weeds** to maintain water quality and storage capacity.
- **Stone pitching on embankment slopes and grass turfing** to prevent bank erosion.
- **Plantation of trees on the top of embankments** for long-term stabilization.
- **Plantation of fruit-bearing and economically useful trees** such as **Lemon, Custard Apple, Guava, Papaya, Mango, and Litchi**, to be undertaken by the **CSR wing** with active participation of local villagers.

Subsequent Two-Year Plan and Management

During the **subsequent two years** following desiltation, the rate of **silt accumulation** is expected to be minimal. Any minor silt deposition during this period **shall be addressed through manual desiltation**, engaging **local labour**, thereby also contributing to **employment generation.**

Preventive Measures and Maintenance

To ensure long-term sustainability of the ponds, **preventive measures** shall be emphasized. Activities such as **pond bank strengthening, stabilization through earthwork and stone pitching, grass seeding, and plantation of appropriate species shall be undertaken during the first year,** followed by **regular maintenance during the next four years.**

Dewatering of Village Ponds

Prior to desiltation, **dewatering of ponds** shall be carried out using **a company-owned pump**. As this facility is available in-house, the cost of dewatering has **not been included in the scheme expenditure.**

Desiltation Operation

After complete or partial dewatering, the **accumulated silt shall be removed** either **manually by deploying labour** or through **excavator and dumper combinations**, as per site-specific requirements.

Pond No.	Name of the Location of the Water Body	Dimension in (Length x Breadth x Height)	De-Silting Quantity in Cum	Stone dry packing Area in Sqm
1	Roida village pond-1	55 x 50 x 3	50 X 45 X 1 = 2250	(55+50) X 2 = 210
2	Roida village pond-2	50 x 37 x 2.5	45 X 32 X 1 = 1440	(50+37) x 2 = 174
3	Bholbeda village pond	36 x 31 x 2.5	31 x 26 x 1 = 806	(36 + 31) x 2 = 134
4	Kundurpani Village Pond	32 x 31 x 2.5	27 x 26 x 1 = 702	(32 + 31) x 2 = 126
5	Chilka Pat Village Pond	40 x 33 x 2.5	34 x 28 x 1 = 952	(40 + 33) x 2 = 146
6	Khandbandha Village Pond	67 x 32 x 2	52 x 27 x 0.5 = 702	Not required

7	Kamarjoda Pond	57 x 53 x 2.5	52 x 48 x 1 = 2496	(57+53) x2 = 220
8	Khuntapani Village Pond	64 x 54 x 2.5	59 x 48 x 1 = 2832	(64 + 54) x 2 = 236
		Total	**12,188**	**1,246**

(e) **Earthwork Excavation:**

Wherever required, soil has to be removed for deepening the pond to increase the water holding capacity of the pond.

(f) **Bathing Ghat:**

In each pond, there is a proposal of 2 no's of bathing ghats for men and women separately by using local boulders and an approximate rate Rs 60,000/per bathing Ghat.

(g) **Cloth Changing Room:**

Proposed to construct one room near the women's bathing ghat of each pond for the change of clothes by women after bath. The cost norm has been provided in Annexure-1.

(h) **Sitting Platform on the embankment of the Pond(s):**

In each Pond, a masonry platform will be provided where the villagers (aged persons and youth) can sit during summer evenings. This platform will also serve the purpose of puja/kanna and Nyaya Nishap, etc. The cost norm has been provided in Annexure-2.

(i) **Tulusi Chaura:**

Proposal for the construction of a Tulusi Chaura at each pond for the village people. The cost norm has been provided in Annexure-3

(j) **Ramp to water body :**

Proposed for the Preparation of a ramp on one side of the pond with slope for the village cattle & Goat to go inside the pond for drinking water, as per the requirement and consulting with the villagers.

12. INSPECTION AND MONITORING

All the works under the present scheme shall be executed by the User Agency with outsourced manpower and machinery. To facilitate this, the User Agency shall establish its own executing and supervision cells along with the required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in coordination with the local administration.

13. MOTIVATION OF PEOPLE:

As per Govt. resolution of 2011, the villagers of the adjoining villages, i.e. Bichakundi,Dalpahar basti & Kundurpani to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the above villages and resolution regarding support to plantation activities will be made. To motivate the people in this direction, they will be provided with incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the total cost has been earmarked for expenditure on this score

14. REQUIREMENT OF FUNDS

The total cost of this Scheme for de-silting and improvement of the selected 8 no's of ponds in all villages is ₹ 1,12,89,900/- (Rupees One Crore Twelve Lakh Eighty Nine Thousand Nine hundred) only The detailed estimate of de siltation and ancillary activities has been summarized in **Annexure-1, 2 & 3**

Detailed expenditure of 8 No's of pond for De-siltation, construction of Embankment with 2 no's of Bathing Ghat & 1 on of cloth changing room of each pond .					
Sl. No	Description of Items	Qty	Unit	Rate	Amount (₹)
1	Excavation, loading, unloading & carriage by mechanical means of all kinds of soil including stony earth, gravel & morrum etc inter spread with boulders up to 1/2 cum size with all lifts & de-lifts including trimming of slopes & bed to design section & depositing the excavated materials away from work site as per the specification & directed by EIC with an initial lead of 1.00 KM from the place of excavation complete (Annexure-1).	12188 for 2 times in 10 years	CuM	197.1	48,04,509.60
2	Providing rough stone (15cm-30cm) dry packing in apron & all top four sides berm with local Boulder (boulder supplied by management).	1246	SqM	919.47	11,45,659.60
3	Construction of bathing ghat with local boulder	8 nos.	Each L.S	60,000	4,80,000.00
4	Room near bathing ghat for change of clothes by women.(Annexure-2)	8 Nos.	Each L.S	1,03,200	8,25,600.00
5	Construction of Beach on the embankment for sitting.(Annexure-3)	16 Nos.	2 nos in each L.S	4,712	75,392.00
6	Construction of Tulsi Chaura (Annexure-4)	8 Nos.	Each L.S	16,240	1,29,920.00
7	Preparation of ramp on one side of the pond with slope for the village cattle to go near the water body on L.S. @ ₹ 20,000/- per pond	8 Nos	Each L.S.	20,000	1,60,000.00
8	Provision for annual maintenance of pond for cleaning aquatic weed, if any from pond & cutting of bushes from Apron & Berms @ ₹ 30000 per annum for 2 year.	2 years for 8 ponds	Per yr	30,000	4,80,000.00
9	Maintenance of Bathing Ghat	8 nos.	Each L.S	10,000	80,000.00
			Sub-Total		81,81,081.22
	15% of the total cost for motivation of VSS / People involved				12,27,162.18
			Sub-Total		94,08,243.40
			Escalation 20%		18,81,648.68
			Grant Total		1,12,89,892.38 Or say Rs. 1,12,89,900/-
(Rupees One Crore Twelve Lakh Eighty Nine Thousand Nine hundred) only					

Asst. Conservator of Forest
I/C. Champua Forest Range

Technically Approved
Regional Chief Conservator of Forests
Rourkela Circle

Divisional Forest Officer,
Keonjhar Division.

Excavation, loading, unloading & carriage by mechanical means of all kinds of soil including stony earth, gravel & murrum

S.No	Category	Description	R.Hrs/ Month	Productivity (Cu.mtr/Hr)	HSD Ltrs	HSD cost (Rs/Hr)	Maintenance cost (Rs/Hr)	Total cost (Rs)	Total cost per Cum
1	Desilting material Loading	PC 300	1	28	25	2,390	1,700	4,090	146.09
2	Desilting materialHauling	Dumper	1	50	12	1,152	1,400	2,552	51.04
Total						3,542	3,100	6,642	197.1

Room at the Bathing Ghat for change of Clothing by Women

Estimate Of Change room									
SL NO	DESCRIPTION OF ITEMS	UNIT	NOS	L	B	H	QUANTITY	Rate	Amount (₹)
1	**Earthwork in excavation**								
	Changing Room	M^3	1	12.00	0.50	0.50	3.00		
		M^3	1	2.40	2.40	0.30	1.73		
							4.73	197.1	932.28
2	**Sand Filling**								
	Changing Room	M^3	1	2.40	2.40	0.05	0.29		
							0.29	1200	348.00
3	**Plain cement concrete 1:3:6**								
	Changing Room	M^3	1	12.00	0.50	0.10	0.60		
		M^3	1	2.40	2.40	0.10	0.58		
							1.18	4600	5428.00
5	**Brick Work (1:6) (Below G.L)**								
6	In Foundation **Brick Work (1:6) (Above G.L)**	M^3	1	12.00	0.38	0.40	1.82	5400	9828.00
	In Super Structure	M^3	1	12.00	0.25	3.00	9.00	5400	48600.00
7	**R.C.C (1:1.5:3)**								
	Changing Room	M^3	1	12.00	0.25	0.25	0.75		
			1	2.40	2.40	0.15	0.86		
							1.61	6478	10429.58
8	**Shuttering with 12 mm thick plywood**								
	Changing Room	M^2	2	12.00		0.25	6.00		
							6.00	300	1800.00
9	**Reinforcement**								
		MT	1		0.10		0.10	70000.00	7000.00
10	**12 mm thick plaster**								
		M^2	4	2.40		3.00	28.80		
		M^2	5	2.40		3.00	36.00		
							64.80	120	7776.00
									92141.86
	Contingency 12 %								11057.02
									103198.88 Or say 1,03,200.00

Estimate for arrangement of Bench on the periphery of the pond

Estimate Of Bench for sitting									
S.L NO	DESCRIPTION OF ITEMS	UNIT	NOS	L	B	H	QUANTITY	Rate	Amount (₹)
1	Earthwork in excavation								
		M³	2	0.60	0.60	0.50	0.36	197.1	70.96
2	Plain cement concrete 1:3:6								
	Changing Room	M³	2	0.60	0.60	0.10	0.07		
							0.07	4600.00	322.00
3	Brick Work (1:6) (Above G.L)								
	In Super Structure	M³	2	0.60	0.38	0.60	0.27		
							0.27	5400.00	1458.00
4	12 mm thick plaster								
		M²	4	0.60	0.60		1.44		
							1.44	120.00	172.80
5	RCC	M³	2	0.45	1.50	0.06	0.10		
							0.10	6473.00	647.30
6	IPS	M²	2	0.45	1.50		1.35	320.00	432.00
7	Shuttering	M²	2	0.45	1.50		1.35		
							1.35	300.00	405.00
8	Reinforcement	Kg					10.00	70.00	700.00
	Total Amount								4206.66
	Contingency @12%								504.84
	Total								4711.50 or say 4712.00

Annexure- 4

Construction Of Tulasi Chaura On The Bathing Ghat

Estimate Of Pot for Tulshi Tree									
S.L NO	DESCRIPTION OF ITEMS	UNIT	NOS	L	B	H	QUANTITY	Rate	Amount (₹)
1	Earthwork in excavation								
		M^3	1	6.00	0.35	0.30	0.63	197.1	124.17
2	Plain cement concrete 1:3:6								
		M^3	1	6.00	0.35	0.10	0.21		
							0.21	4600.00	966.00
3	Brick Work (1:6) (Above G.L)								
	In Super Structure	M^3	1	6.00	0.25	1.50	2.25	5400.00	12150.00
4	12 mm thick plaster								
		M^2	1	6.00		1.50	9.00		
							9.00	120.00	1080.00
5	Applying Lime Wash								
		M^2		Same qty as item no 4			9.00	20.00	180.00
									14500.00
	Contingency 12 %								1740.00
	Total Amount								16240.00

COMPREHENSIVE SOIL AND MOISTURE CONSERVATION SCHEME

FOR

DALPAHAR IRON & MANGANESE MINES
(BLOCK-A)
OF
SRI AVIN JAIN
in compliance
with
Condition No.2.xxvii of
Stage-I approval granted vide Online Proposal No.FP/OR/MIN/9360/2015 Dated.13.02.2026
of Govt. of India, Ministry of Environment, Forests & Climate Change,
New Delhi.

PREFACE

Mining in hilly and forested terrain brings with it a distinct set of environmental challenges, particularly in relation to land stability, runoff behaviour, erosion intensity, and sediment movement. These concerns become more significant where opencast operations are proposed in undulating landscapes having natural drainage channels, fragile slopes, loose overburden materials, and downstream watercourses vulnerable to siltation. The Dalpahar Iron & Manganese Mines, situated within Baitarani Reserved Forest of Keonjhar District, Odisha, fall within such an ecologically and topographically sensitive setting, where careful planning of soil and moisture conservation measures is essential for ensuring environmentally responsible mining.

The present Soil & Moisture Conservation Plan has therefore been prepared as a systematic and site-specific environmental management document to address the anticipated impacts of excavation, overburden dumping, haul road formation, topsoil handling, and associated land disturbance within the mining lease area and its surrounding influence zone. The plan has been formulated in conformity with the Stage–I Forest Clearance granted by the Ministry of Environment, Forest & Climate Change, Government of India, vide letter dated 13.02.2026 in File No. 8-31/2015-FC (E-91135), particularly the conditions relating to minimization of soil erosion, control of runoff, stabilization of excavated and dumped materials, and prevention of choking and siltation of natural streams and drainage lines.

The lease area of 89.961 hectares is characterized by rugged and undulating terrain with elevations ranging approximately from 553 m to 723 m above mean sea level. No perennial stream flows through the lease area itself; however, seasonal drainage channels originate and pass through the area, and Sona Nadi, located about 1 km to the west, constitutes an important downstream drainage system that requires protection against sediment inflow from mining operations. In such a terrain, exposure of soil and fragmented rock surfaces due to mining can accelerate erosion during monsoon months unless suitable structural and biological measures are put in place in a timely and coordinated manner.

This document accordingly integrates engineering interventions such as garland drains, catch drains, retaining walls, loose boulder structures, check dams, settling tanks, sedimentation arrangements, recharge structures, and dump terracing with biological treatments such as vetiver plantation, agave planting, grass seeding, safety zone plantation, assisted natural regeneration, and soil moisture conservation works in surrounding degraded forest patches. The plan also recognizes the importance of topsoil conservation, recharge enhancement, village pond rejuvenation, and plantation support as essential components of long-term watershed stability and ecological restoration.

The objective of the present SMC Plan is not merely to satisfy a statutory requirement, but to establish a practical and measurable framework for reducing soil loss, retaining moisture, enhancing infiltration, stabilizing disturbed landforms, protecting downstream drainage systems, and progressively restoring ecological functionality within and around the mining project area. It is expected that implementation of the measures proposed herein will substantially reduce erosion risk, improve slope stability, support vegetation establishment, and contribute to sustainable mine environmental management throughout the life of the project.

EXECUTIVE SUMMARY

The Soil & Moisture Conservation Plan for Dalpahar Iron & Manganese Mines has been prepared for the mining lease area of 89.961 hectares located in Baitarani Reserved Forest-A, Barbil Tahasil, Keonjhar District, Odisha, along with the surrounding buffer area for addressing cumulative hydrological and ecological impacts. The plan has been developed in compliance with the Stage–I Forest Clearance conditions issued by the Ministry of Environment, Forest & Climate Change on 13.02.2026, particularly those mandating appropriate mitigative measures for control of soil erosion, runoff, dump instability, and siltation of natural drainage systems.

The mine lease lies in a rugged, sloping, and environmentally sensitive terrain, where mining activities have the potential to alter the natural pattern of runoff and sediment movement. Excavation, formation of mine pits, overburden dumping, mineral processing, haul road development, and temporary removal of vegetation create exposed surfaces that are vulnerable to erosion, particularly during the monsoon season. The presence of seasonal drainage channels within the lease and the proximity of Sona Nadi outside the lease boundary make it necessary to adopt a comprehensive treatment approach so that sediment-laden runoff does not degrade downstream watercourses or adjoining forest land.

The present SMC Plan has therefore been structured around a combination of structural and biological measures designed to reduce runoff velocity, intercept and safely convey storm water, stabilize vulnerable slopes, arrest movement of loose materials, enhance groundwater recharge, and improve soil moisture retention in disturbed as well as adjacent degraded areas. Within the core zone, the plan provides for essential interventions such as silt traps, overflow spillways, catch drains around pits and stockyards, recharge shafts for rainwater harvesting, loose boulder structures in drainage channels, garland drains and retaining walls around overburden dumps, check dams, settling tanks, terracing of dump slopes, and drainage arrangements for topsoil storage areas. Several of these measures are already covered under approved Forest Clearance conditions and the Catchment Area Treatment Plan, and accordingly no duplicate budgeting has been proposed where financial provision already exists.

The biological component of the plan is equally important and includes safety zone plantation, vetiver planting over overburden dump slopes, agave plantation along dump toes, and grass seeding along vulnerable haul road slopes. These measures are intended to provide root reinforcement, improve surface binding, reduce splash erosion, and support long-term stabilization of disturbed areas. The plan further extends into the buffer zone through staggered trenches, vetiver or other soil-binding grasses along stream banks, desilting of village ponds, and forest improvement measures such as RDF plantation, ANR plantation and associated soil moisture conservation works in degraded open forest areas adjoining the lease. These interventions are expected to contribute to moisture retention, improvement of vegetation cover, recharge enhancement, and restoration of local ecological balance.

A significant feature of the plan is that it distinguishes between works already budgeted under specific Forest Clearance conditions and those requiring fresh financial provision under the present SMC estimate. In the core zone, most structural and biological measures have already been financially accommodated under related approved schemes pertaining to CAT, safety zone protection, dump stabilization, and topsoil management. As a result, no separate additional budget has been proposed for the core zone under the present abstract. In the buffer zone, however, a fresh financial provision has been estimated for selected structural and biological interventions, resulting in a total requirement of Rs. 12,38,441/- including Inspection and monitoring charges and price escalation.

The measures proposed under this plan will be implemented in a phased and coordinated manner in accordance with site readiness, monsoon behavior, and progressive development of

mining operations. Monitoring of effectiveness will be undertaken through regular inspection of drains, retaining walls, check dams, settling structures, plantation survival, slope conditions, and downstream sediment load conditions.

Through systematic implementation, the plan is expected to reduce soil erosion, arrest sediment transport, improve stability of overburden dumps and disturbed slopes, increase infiltration and groundwater recharge, enhance vegetation establishment, and protect downstream drainage systems from siltation and obstruction. The Soil & Moisture Conservation Plan thus provides a practical and legally compliant framework for integrating mine development with watershed protection and ecological stabilization in the Dalpahar mining landscape.

Expected Outcomes in nutshell

Implementation of the proposed plan will result in:

- Reduction in soil erosion and sediment transport
- Prevention of siltation of natural drainage systems
- Improvement in groundwater recharge and soil moisture retention
- Stabilization of overburden dumps and degraded slopes
- Enhancement of vegetation cover and ecological restoration
- Improvement in water availability in surrounding areas
- Support to biodiversity conservation, including avifauna

WHY SOIL AND WATER CONSERVATION?

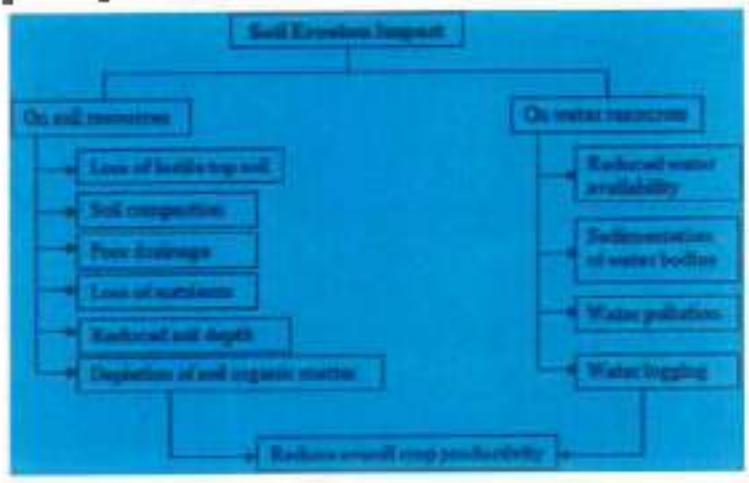
Land is one of the most valuable natural resources and forms the physical base for biomass production and life-support systems. It is a finite and non-renewable resource. In India, the total geographical area is about 329 million hectares, characterized by diverse landforms, climatic conditions, and varying land-use capabilities.

Figure 1: Soil Erosion due to Surface Runoff

Conservation of land and water resources is essential for ensuring sustainable development, maintaining ecological balance, and enhancing land productivity. A proper understanding of land capability and suitability is necessary for optimal utilization and management of natural resources.

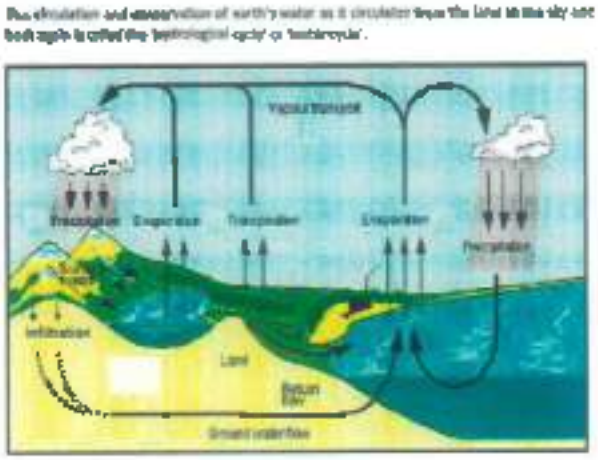
Approximately 800 hectares of arable land are lost annually due to ravine formation. Land degradation is further aggravated by activities such as open-cast mining, deforestation, overgrazing, excessive rainfall, and improper land management practices. These factors lead to accelerated soil erosion, reduced soil fertility, and declining agricultural productivity.

Figure 2: Impact of Soil Erosion on Land and Water Resources



Land and water are interdependent natural resources essential for sustaining life and supporting economic activities. However, continuous depletion of land resources and deterioration in soil quality have been observed due to soil erosion and associated factors. Soil erosion adversely affects the physical properties of soil and leads to the loss of essential nutrients required for plant growth.

Figure 3: Soil-Water Interaction in Hydrological Cycle



It is estimated that nature takes 600–1000 years to form just 2.5 cm of topsoil, whereas it can be lost within a short period due to erosion. Nearly 600 million tonnes of productive soil are lost

annually in India, affecting around 80 million hectares of cultivated land. Soil loss from unprotected land may range from 120 tonnes/ha/year to as high as 300 tonnes/ha/year.

Soil erosion not only results in the loss of fertile topsoil but also leads to increased runoff, loss of nutrients, and reduction in soil moisture. It further causes siltation of rivers, reservoirs, and drainage channels, thereby reducing their carrying capacity and affecting irrigation and water storage systems. In addition, it increases the risk of floods and adversely impacts agriculture, forestry, and water availability.

Therefore, the implementation of appropriate soil and water conservation measures is essential to reduce land degradation, control erosion, improve soil moisture retention, enhance groundwater recharge, and ensure sustainable management of natural resources.

BENEFITS OF THE PROPOSED SOIL & MOISTURE CONSERVATION PLAN

The implementation of the proposed Soil & Moisture Conservation (SMC) measures within the mining lease area and its surrounding catchment will provide several environmental and hydrological benefits. These measures are designed to regulate surface runoff, reduce soil erosion and improve soil moisture conditions in the project area.

The major benefits expected from the implementation of the proposed SMC measures are as follows:

- **Reduction in Soil Erosion:**

Structural measures such as check dams, loose boulder structures and staggered trenches will reduce the velocity of runoff water and minimize soil erosion from exposed slopes and disturbed areas.

- **Control of Sediment Transport:**

Drainage line treatment structures will trap sediments carried by runoff and prevent siltation of nearby streams, nalas and water bodies.

- **Improvement of Groundwater Recharge:**

Water harvesting structures, trenches and check dams will enhance infiltration of rainwater and contribute to groundwater recharge.

- **Stabilization of Slopes and Dumps:**

Biological measures such as vetiver grass plantation and vegetation development will stabilize overburden dumps and degraded slopes, preventing landslides and soil loss.

- **Restoration of Water Bodies:**

Desalting of ponds and water bodies in nearby villages will improve their storage capacity and water availability.

- **Improvement in Soil Moisture Conditions:**

Increased infiltration and reduced runoff will enhance soil moisture availability, supporting vegetation growth.

- **Ecological Restoration:**

Plantation and soil conservation measures will help restore degraded forest areas and improve biodiversity in the surrounding landscape.

EXPECTED OUTCOMES

Implementation of the proposed Soil & Moisture Conservation Plan is expected to generate several environmental and socio-economic benefits for the mining area and nearby villages.

The key capected outcomes are as follows:

1. **Environmental Improvement**

The implementation of SMC measures will reduce the adverse environmental impacts of mining operations by improving vegetation cover and reducing soil erosion and sediment transport.

2. **Employment Generation**

Construction and maintenance of soil and water conservation structures such as check dams, trenches, plantation activities and desilting works will generate employment opportunities for local communities.

3. **Improvement in Water Availability**

Desilting of ponds and development of water harvesting structures will improve water availability for local communities and livestock, particularly during dry seasons.

4. **Groundwater Recharge**

Reduction in runoff velocity and enhancement of infiltration will increase groundwater recharge and improve water availability in nearby wells and boreholes.

5. **Improvement in Vegetation Cover**

Plantation and biological stabilization measures will improve vegetation density in degraded areas and contribute to ecological restoration of the surrounding forest landscape.

6. **Long-term Environmental Stability**

The combined implementation of structural and biological conservation measures will improve soil stability, enhance moisture retention and ensure sustainable environmental conditions within the mining lease area and its surrounding catchment.

1. INTRODUCTION

The Dalpahar Iron & Manganese Mines (Block–A), covering an area of 89.961 hectares, is located within Baitarani Reserved Forest-A under Barbil Tahasil of Keonjhar District, Odisha. The mining lease forms part of the mineral-rich **Keonjhar–Sundargarh** iron ore belt and is situated in a forested and hilly terrain characterized by significant ecological sensitivity.

The mining lease was originally granted in favour of Late Sri Dharmchand Jain on 09 June 1986 for a period of 20 years. Subsequently, the lease underwent statutory processes including renewal application, deemed extension, and legal proceedings. As per the orders of the Hon'ble High Court of Odisha and the Government of Odisha, the lease validity has been extended up to 08 June 2036 in accordance with the provisions of the MMDR (Amendment) Act, 2015. A Supplementary Lease Deed for Block–A was executed on 27 April 2023.

The mining lease area lies within Survey of India Toposheet No. F45N5 (73G/5) and is geographically bounded between:

- Latitude: 21°58'04.70" N to 21°58'43.04" N
- Longitude: 85°23'26.72" E to 85°23'59.17" E

A proposal for diversion of forest land under the Forest (Conservation) Act, 1980 has been submitted, and the project has received Stage–I (In-Principle) Forest Clearance from the Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India vide letter dated 13.02.2026.

As per the stipulated conditions of the Stage–I approval, particularly Condition No. 2.xxvii and related provisions, it is mandatory to prepare and implement a **Comprehensive Soil & Moisture Conservation (SMC) Plan** to minimize soil erosion and prevent choking of natural drainage systems within and around the mining lease area.

The mining lease area is characterized by undulating and hilly terrain, with elevations ranging from approximately 553 m to 723 m above mean sea level (MSL). Although no perennial drainage channel exists within the lease area, several seasonal nalas originate from the hill slopes and contribute to the regional drainage network. The Suna Nadi, an important natural drainage channel, flows at a distance of about 1 km towards the western side of the lease area.

Open-cast mining activities such as excavation, overburden dumping, haul road development, and removal of vegetation expose large areas of soil and rock surfaces. These disturbed landforms are highly susceptible to soil erosion, sediment transport, and slope instability, particularly during the monsoon season.

In view of the above, the present Soil & Moisture Conservation Plan has been prepared for both the core zone (mining lease area) and buffer zone, integrating a combination of engineering (structural) and biological measures. The plan aims to:

- Control surface runoff and reduce soil erosion
- Stabilize overburden dumps and disturbed slopes
- Prevent siltation of natural drainage systems
- Enhance groundwater recharge and soil moisture retention
- Improve vegetation cover and ecological stability

The plan incorporates various scheme components prepared in compliance with Forest Clearance conditions, including gap plantation, drainage line treatment, dump stabilization, topsoil management, safety zone development, desilting of water bodies, and biodiversity conservation measures.

2. LOCATION OF THE MINING LEASE AREA

The lease area of **Dalpahar Iron & Manganese Mines (Block–A)** is located in Baitarani Reserved Forest-A, **Barbil Tahasil, Keonjhar District, Odisha**, approximately **5 km south-west of Joda Town**. The area is well connected by road via **Bichhakundi village**. The nearest railway station is **Jaroli Railway Station**, situated at a distance of about **2.7 km towards the south-east (SE)** of the lease area.

A brief description of the mining lease area, including its location, coordinates, and accessibility, is presented in Table 1 below.

Table 1: Location Details of the Mining Lease Area

Particulars	Description
Location	Baitarani Reserved Forest-A, Barbil Tahasil, Keonjhar District, Odisha
Lease Area	89.961 Ha
Coordinates	Latitude: 21°58'43.04" N – 21°58'04.70" N Longitude: 85°23'59.17" E – 85°23'26.72" E
Nearest Village	Dalpahar – 0.5 km
Nearest Town	Joda – 5.0 km
Nearest Railway Station	Jaroli Railway Station – 2.7 km (SE)

Figure 4: DGPS Survey Mining Lease Boundary Superimposed on High Resolution Satellite Imagery

Figure 5: Location Map of Dalpahar Iron & Manganese Mines

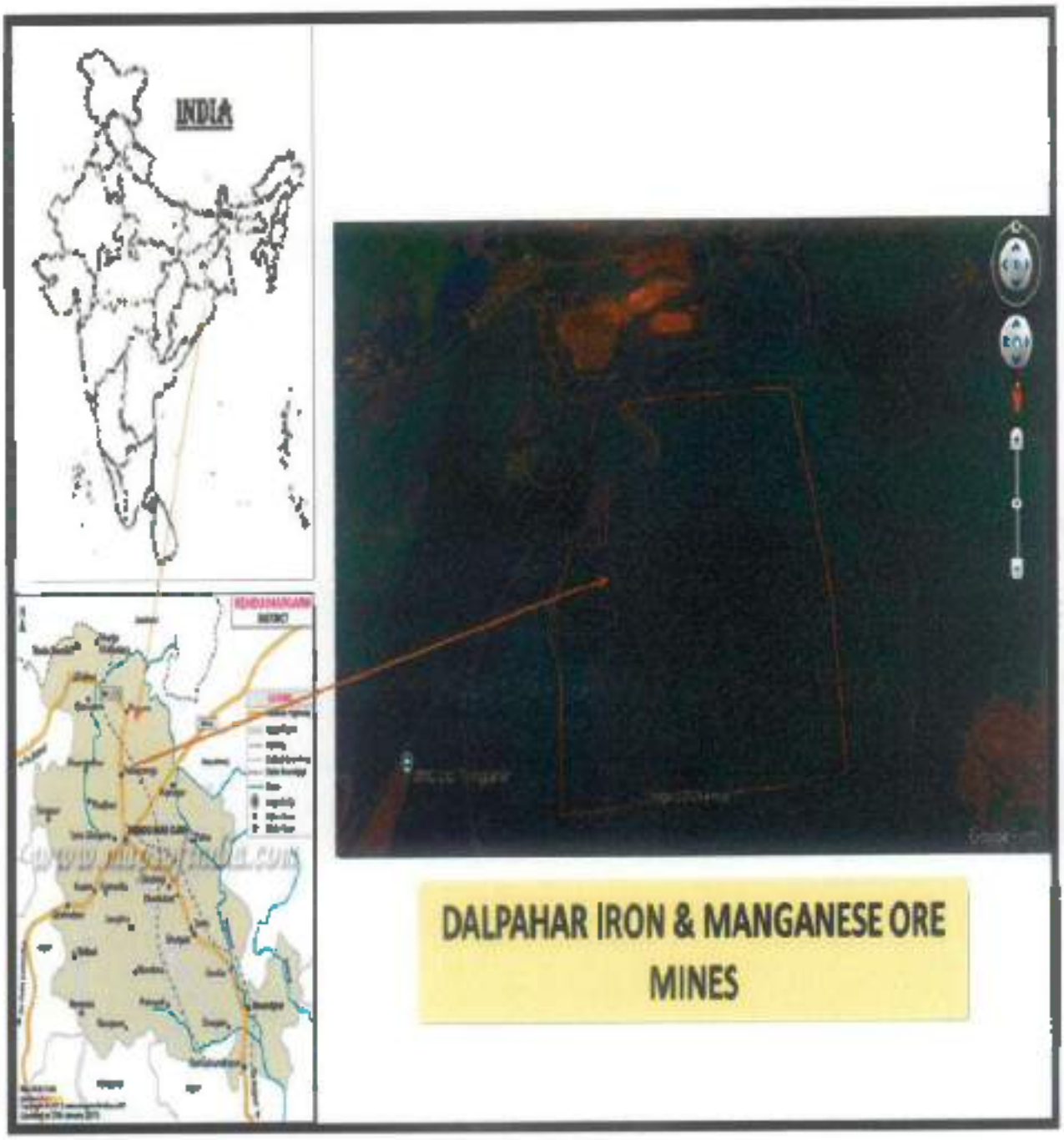
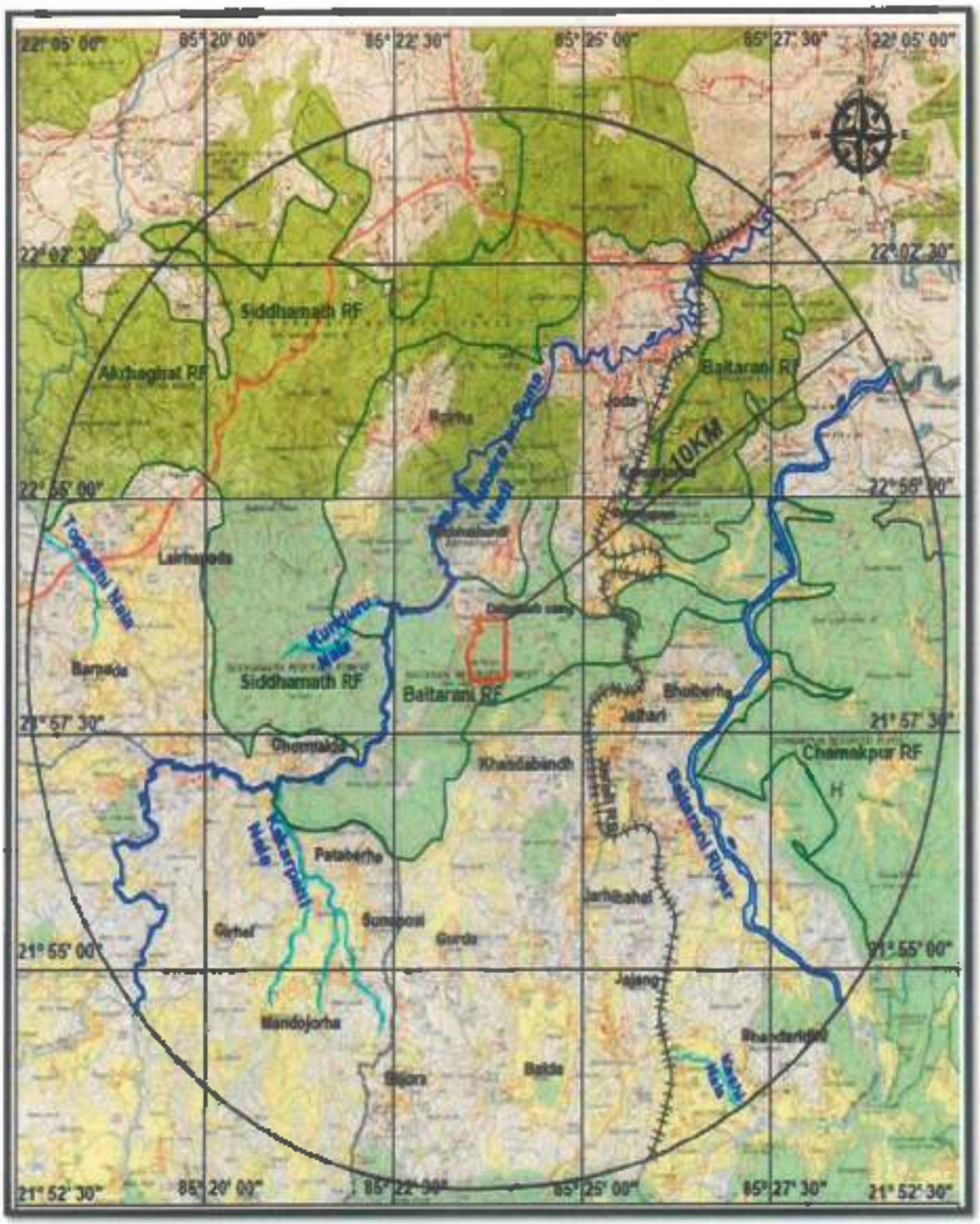


Figure 6: 10 km Radius Topographic Map of the Mining Leuse Area



2.1 Topography

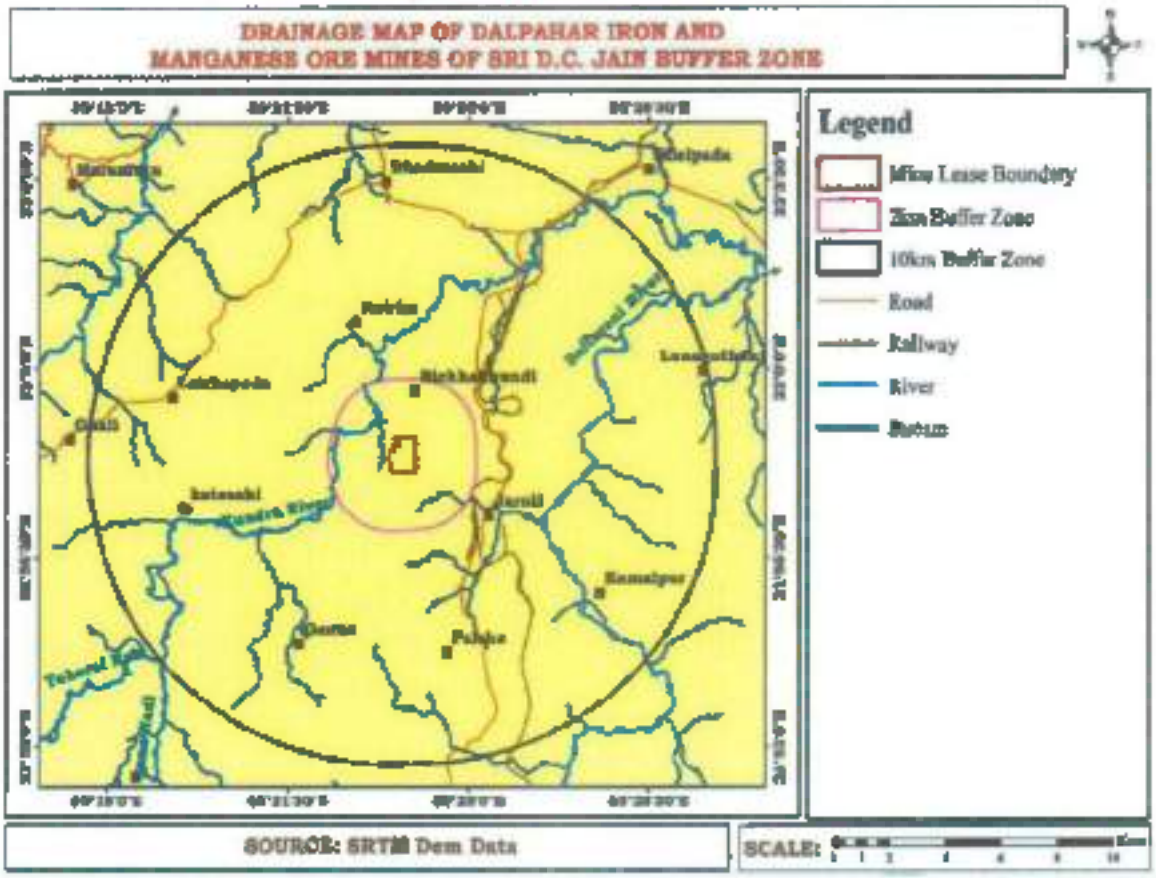
The mining lease area forms part of the Baitarani Reserved Forest and is characterized by undulating and hilly terrain typical of the mineralized belt of Keonjhar district. The elevation within the lease area varies considerably due to the presence of hill slopes and ridges.

The highest contour within the lease area is about 723 m above Mean Sea Level (MSL) located in the south-eastern portion, while the lowest elevation is about 553 m MSL occurring in the south-western part of the lease area.

The general trend of the hill ranges in the region is NNE–SSW, which influences the direction of surface runoff and drainage pattern. The steep slopes and exposed surfaces created due to mining activities make the area susceptible to soil erosion and sediment transport during the monsoon season.

In order to minimize soil erosion and improve moisture retention in the catchment, various soil and moisture conservation measures such as staggered trenches, loose boulder check dams, wire-mesh check dams, vegetative stabilization and plantation activities have been proposed within the lease area and its surroundings.

Figure 7: Drainage Map of Dalpahar Iron & Manganese Mines and Buffer Zone



2.2 Drainage

There is no perennial nala flowing within the mining lease area. However, several seasonal drainage channels originate from the surrounding hill slopes and ultimately join the regional drainage system.

The Sona Nadi, which is an important natural drainage channel in the region, flows towards the north of the lease area at a distance of approximately 0.8–1.0 km on the western side.

During the monsoon period, runoff generated from exposed mine benches, overburden dumps, haul roads and other disturbed surfaces may carry suspended sediments towards the downstream drainage channels if not properly managed. Therefore, suitable drainage line treatment measures such as construction of check dams, loose boulder structures, garland drains, settling ponds and vegetative stabilization have been incorporated in the Soil & Moisture Conservation Plan to regulate runoff velocity, reduce sediment transport and prevent siltation of natural streams.

These interventions are expected to improve groundwater recharge, stabilize slopes and maintain the ecological balance of the surrounding forest landscape.

2.3 Climate & Rainfall Data

2.3.1 Climatic Conditions

The project area falls under a tropical monsoon climatic regime characterized by three distinct seasons, namely summer, monsoon, and winter. These seasonal variations significantly influence surface runoff, soil erosion potential, and overall hydrological behavior of the mining lease area and surrounding catchment.

The maximum temperature during the summer months (April to June) generally ranges between 38°C to 42°C, while the minimum temperature during winter months (December to January) varies between 10°C to 15°C. The average annual temperature in the region remains around 25°C to 28°C.

2.3.2 Rainfall Characteristics

The region receives substantial rainfall predominantly during the south-west monsoon season (June to September). The average annual rainfall in the Barbil–Keonjhar region ranges between 1,100 mm and 1,600 mm.

Based on the analysis of the last 10 years of rainfall data obtained from the India Meteorological Department (IMD) and Odisha State Disaster Management Authority (OSDMA), the estimated average annual rainfall for the project area is approximately 1,377.9 mm (1.38 m).

The 10-year rainfall data is presented in Table 2 below:

Table 2: Last 10-Year Rainfall Data (in mm) — Keonjhar District

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Annual Average Rainfall
2016	20.7	14.6	8.5	64.4	42.9	197.6	319.2	167.3	114.3	27.1	0.2	22.7	1009.5
2017	1.7	54.0	25.7	2.3	137.1	145.0	270.4	348.5	166.2	58.3	4.0	0.0	1211.2
2018	0.9	0.0	35.4	15.1	117.5	162.0	320.5	230.5	161.2	160.1	25.0	0.1	1228.4
2019	0.0	0.0	0.8	133.3	95.7	185.8	360.6	375.1	351.5	113.4	0.2	49.6	1666.0
2020	0.0	55.2	40.2	59.6	116.6	143.3	232.2	327.3	353.6	161.6	0.8	4.2	1494.7
2021	39.9	55.0	49.0	152.9	153.2	272.9	170.7	605.7	137.8	76.4	5.0	0.0	1718.5
2022	0.6	3.7	6.2	37.3	342.7	154.2	232.8	178.7	361.2	88.2	27.8	60.2	1493.6
2023	32.7	17.6	0.4	17.9	90.9	137.7	326.9	404.8	175.5	87.4	0.0	0.0	1291.7
2024	0.2	0.0	51.9	68.4	60.8	212.5	274.4	392.4	266.1	128.0	10.3	25.5	1490.5
2025	29.3	6.1	49.1	7.5	96.9	109.7	208.2	301.7	250.8	89.5	7.0	19.0	1174.8

2.3.3 Seasonal Distribution of Rainfall

Pre-Monsoon Season (March to May):

Rainfall during this period is moderate and mainly occurs due to localized convective storms. Rainfall gradually increases from March and becomes significant in May, indicating the onset of monsoon conditions.

Monsoon Season (June to September):

This period accounts for the majority of annual rainfall. Rainfall increases sharply in June with the onset of the south-west monsoon and peaks during July and August. Monthly rainfall often exceeds 200 mm and may reach 300–400 mm, indicating high rainfall intensity. Approximately 70–80% of the annual rainfall is received during this period, leading to high surface runoff and increased erosion potential.

Post-Monsoon Season (October to November):

Rainfall decreases significantly during this period, although occasional rainfall events occur due to retreating monsoon and cyclonic disturbances from the Bay of Bengal.

Winter Season (December to February):

Rainfall during winter is minimal and has negligible influence on catchment hydrology.

2.3.4 Humidity and Wind Pattern

Relative humidity varies seasonally, with values ranging between 75% to 90% during monsoon and 40% to 60% during summer.

The predominant wind direction is generally:

- South-West to North-East during monsoon, and
- North-East to South-West during winter

The average wind velocity in the region ranges between 3 km/hr to 10 km/hr.

2.4 Significance for Soil & Moisture Conservation

The high-intensity and concentrated rainfall during the monsoon season (June–September) is the primary factor governing surface runoff generation, soil erosion, and sediment transport in the Dalpahar mining area.

The undulating terrain (elevation ranging from 553 m to 723 m RL), combined with exposed mine surfaces, overburden dumps, and disturbed soil conditions, significantly increases the susceptibility of the area to erosion during heavy rainfall events.

Further, the variability in annual rainfall (ranging from 1009.5 mm to 1718.5 mm) necessitates conservative design of Soil & Moisture Conservation (SMC) structures to withstand peak rainfall conditions.

2.5 Land Use / Land Utilization Pattern

During the life of the mine, about 81.491 hectares will be utilized for mining, dumping, stacking, mineral processing, roads, and infrastructure, and 8.470 hectares will be maintained as Safety Zone and Green Belt. The details of the land use pattern for the total lease hold area of Dalpahar Iron & Manganese Mines (Block-A) over 89.961 Ha are as follows:

Sl. No.	Pattern of Utilization	Details / Sub-Category	Total Forest Area to be Utilized (Ha)
1	Mining Including Mines Road	Virgin Area	32.575
		Broken / Already Disturbed Area	7.475
	Sub-Total — Mining		40.050
2	Waste / Overburden Dump (with Environmental Protective Measures)		12.890
3	Utility Services	Mineral Processing Unit & Stock Yard	19.070
		Storage of Top Soil	3.817
		Internal Transporting Road	2.910
		Temporary Infrastructure (Office, Workshop, Creche, Electrical Sub-Station, U/G Cable, Parking Plaza, etc.)	2.754
	Sub-Total — Utility Services		28.551
4	Green Belt		5.357
	Sub-Total		86.848
5	Safety Zone along the Lease Boundary	To be permanently protected & maintained	3.113
	Grand Total (Mining Lease Area)		89.961

2.6 Details of the 10 km buffer zone around the mining lease

The 10 km radius buffer zone surrounding the Dalpahar Iron & Manganese Mines (Block–A) extends across the states of Odisha and Jharkhand. Within Odisha, the buffer area primarily falls under Keonjhar District, with a small portion extending into Sundargarh District, covering the Keonjhar and Bonai Forest Divisions. A part of the buffer zone also extends into West Singhbhum District of Jharkhand, falling under the Saranda Forest Division.

For the purpose of environmental planning, the study area has been divided into two zones:

- **Core Zone**: The mining lease area (89.961 Ha), directly affected by mining activities
- **Buffer Zone**: The surrounding 10 km radius area, indirectly influenced by mining operations

The present section focuses on the **buffer zone**, which has been analyzed to understand the regional environmental setting, including administrative distribution, surrounding mining activities, forest cover, transportation infrastructure, and drainage systems. This assessment is essential for planning appropriate **Soil & Moisture Conservation (SMC) measures**, as the surrounding terrain and drainage characteristics significantly influence runoff behavior and sediment transport.

Table 3: Area Distribution within 10 km Buffer Zone – Odisha

Sl. No.	Particulars	Area (Ha)
1	Area within Keonjhar District	30535
2	Area within Sundargarh District	4295
	Total	34830

2.3.1 Mining Leases within the Buffer Zone

The mining lease Boundary of Joda west Mn mines of M/s Tata Steel,Dalpahar Iron & Mn mines of M/s R.B.Das & Jalhari Iron & Mn Ore Mine of M/s Anandam Mineral directly adjoins the boundary of the Dalpahar Iron & Manganese Mines (Block–A),Other than several major iron ore and manganese mines are located within the 10 km buffer zone in the mineral-rich Keonjhar–West Singhbhum belt. These mining activities contribute to cumulative environmental impacts, particularly on drainage and sediment load.

Table 4: Working Mining Leases within 10 km Buffer Area		
Sl. No.	Name of Lessee	Name of Mine
1	Tata Steel Ltd	Joda EastIronore mines
2	Sarojin Pradhan	Baitarani Iron ore mines
3	OMC Ltd	Tiringi pahar Iron Ore Mine
4	Sree Metaliks Ltd	Khandabandha Iron ore Mines
5	OMC Ltd.	Khandbandha Iron Ore Mines
6	OMC Ltd	Bansapani IronOre Mine
7	Tata Steel Ltd	Khandabandha Iron & Mn Mines
8	M.G. Mahanty	Patabeda Iron Ore Mine
9	JSW Steel Ltd	Ganua Iron & Mn Mines
10	Jagat Janani Services pvt. ltd	jururi iron ore mines
11	OMC Ltd	Jajang Jururi Iron& Mn Mines
12	Tata Steel Ltd	Tiringi pahar Mn Ore Mine
13	OMC Ltd.	Roida Iron & Mn Mines

2.3.1 Nearest Railway Sidings

Railway infrastructure plays an important role in transportation of minerals in the region. Several railway sidings located within the 10 km buffer area provide connectivity to major industrial hubs.

Table 6: Nearest Railway Sidings		
Sl. No.	Name of Siding	Division
1	Jururi	South Eastern Railway (SER)
2	Banspani	South Eastern Railway (SER)
3	Nayagarhia	South Eastern Railway (SER)

2.3.2 Reserved Forests within the Buffer Area

The enter Mining Lease area of Dalpahar Iron & Mines is comes under Baitarani Reserve Forest of keonhjar forest division .Other than in the 10 km buffer zone surrounding the mining lease area is dominated by reserved forest tracts, which form part of the ecologically important forest landscape of Keonjhar districts. These forests play a crucial role in maintaining biodiversity, regulating surface runoff, and supporting groundwater recharge.

Table 7: Reserved Forests within 10 km Buffer Area		
Sl. No.	Name of Reserved Forest	Covering Division
1	Sidhamalli RF	Keonjhar Division
2	Thakurani RF	Keonjhar Division
3	Lakraghat RF	Keonjhar Division

2.3.3 Rivers and Nallahs within the Buffer Area

The regional drainage system within the 10 km buffer zone consists of several rivers and seasonal nalas which ultimately contribute to the larger river systems of the region. These drainage channels play an important role in transporting runoff during the monsoon season.

Understanding the drainage pattern of the area is essential for planning and designing suitable soil and moisture conservation measures such as check dams, loose boulder structures, staggered trenches, water harvesting structures, and desiltation works proposed under this plan.

Table 8: Rivers / Nallahs within 10 km Buffer Area		
Sl. No.	Name of River / Nallah	District
1	Suna River	Keonjhar& Sundargarh
2	Baitarani River	Keonjhar
3	Topadihi Nala	Keonjhar
4	Kunduru Nala	Keonjhar
5	Tapaikiri Nala	Keonjhar
5	Kakarpani Nala	Sundargarh

2.3.4 Integration with Soil & Moisture Conservation Measures

Considering the undulating terrain, forested catchments, seasonal drainage channels, and ongoing mining activities, the present Soil & Moisture Conservation (SMC) Plan incorporates a combination of structural and biological measures in both:

- Core Zone (Mining Lease Area)
- Buffer Zone (10 km radius)

The proposed measures are aimed at controlling surface runoff, minimizing soil erosion, stabilizing disturbed slopes, and enhancing groundwater recharge.

The major Soil & Moisture Conservation measures proposed under this plan include:

- Wire Mesh Loose Boulder Check Dams (WMLBCD)
- Loose Boulder Check Dams (LBCD)
- Staggered Trenches

- Water Harvesting Structures
- Vetiver and Grass Plantation for slope stabilization
- Desilting of ponds and water bodies
- Topsoil management and slope stabilization measures

The implementation of these measures will help in reducing soil erosion, regulating runoff velocity, enhancing groundwater recharge, and maintaining ecological stability within the mining lease area as well as the surrounding 10 km buffer zone.

3. OPEN-CAST MINING AND SURFACE EROSION PROBLEMS

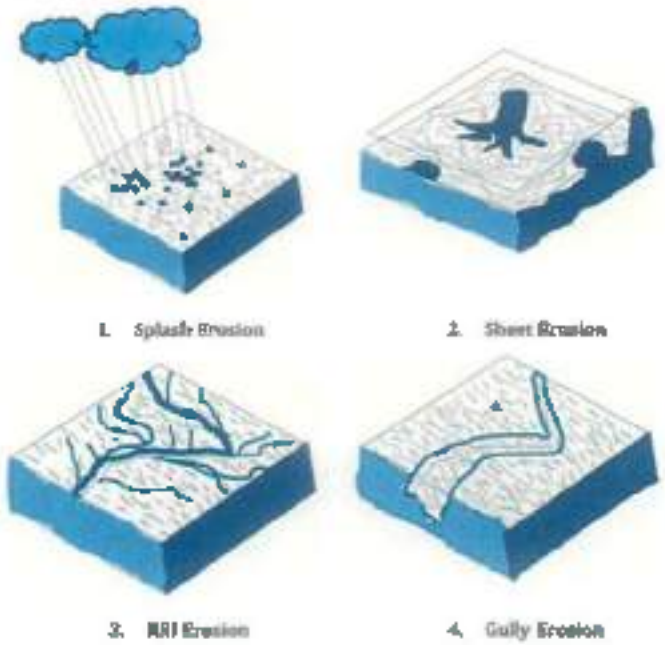
Open-cast mining operations significantly alter the natural land surface and drainage characteristics of an area. The removal of vegetation cover, excavation of mineral deposits, and dumping of overburden materials expose large areas of loose soil and rock fragments, making the terrain highly susceptible to soil erosion and sediment transport, particularly during the monsoon season.

In mining areas, sub-grade dumps, overburden (OB) dumps, exposed mine faces, and haul roads are major sources of erosion. Surface runoff generated during rainfall events flows over these disturbed surfaces and carries large quantities of soil particles and rock fragments into nearby drainage channels. This sediment-laden runoff ultimately enters lower order streams and may cause siltation and choking of natural drainage systems.

The common forms of erosion observed in such mining areas include:

- Splash erosion
- Sheet erosion
- Rill erosion
- Gully erosion

Figure 8: Types of Soil Erosion Commonly Observed in Mining Areas



These processes gradually remove fertile topsoil, destabilize slopes, and contribute to sediment deposition in downstream water bodies.

In hilly terrain such as the present mining lease area, the runoff generated from mine benches, overburden dumps, sub-grade dumps, and hill slopes often flows through small drainage channels and gullies. Due to steep gradients and high runoff velocity, these channels possess high erosive capacity and transport large quantities of sediment downstream.

Streams may also experience bank undercutting, which can trigger mass wasting processes such as slumps and slope failures. The eroded material is subsequently transported by flowing water and deposited in the beds of streams, nalas, and reservoirs.

3.1 Factors Affecting Soil Erosion and Sediment Transport

The magnitude of soil erosion and sediment transport in mining areas depends on several natural and anthropogenic factors, including:

a. Climatic conditions, particularly rainfall intensity and duration
b. Soil and spoil material erodibility
c. Slope gradient and slope length
d. Ground cover and vegetation density
e. Soil conservation and erosion control practices
f. Catchment drainage characteristics

Open-cast mining activities significantly modify these factors by altering the natural topography, removing vegetation, and exposing loose soil materials, thereby increasing the vulnerability of the area to erosion.

3.2 Areas Susceptible to Erosion in the Mining Lease

Severe sediment production may occur in the following locations within and around the mining area:

a. Topsoil stockpiles
b. Spoil piles
c. Waste dumps and overburden dumps
d. Bare topsoil areas
e. Steep outer dump slopes
f. Mine ramps and haul roads
g. Excavated mine faces

Mining operations such as scalping, drilling, blasting, material handling, transportation, and topsoil removal often create compacted surfaces and loose spoil materials containing high proportions of fine particles. These fine particles remain suspended in runoff water for long durations and may not settle easily.

As a result, sediment-laden runoff from mining areas may travel long distances before deposition occurs, often settling only when the flow reaches check dams, settling ponds, or other water impoundment structures.

3.3 Need for Soil & Moisture Conservation Measures

Considering the nature of open-cast mining operations and the presence of steep slopes, exposed soil surfaces, and seasonal drainage channels in the area, the mining lease is susceptible to soil erosion and sediment transport, particularly during the monsoon season. Uncontrolled runoff from mine benches, overburden dumps, haul roads, and other disturbed areas may carry suspended sediments into nearby streams and drainage channels.

Therefore, it is essential to implement appropriate soil and moisture conservation measures to control runoff velocity, minimize soil erosion, stabilize disturbed slopes, and prevent siltation of natural drainage systems. The details of the structural and biological measures proposed under the present Soil & Moisture Conservation Plan for mitigating erosion and improving the hydrological conditions of the mining lease area and its surrounding catchment are described in the subsequent sections of this report.

4. OBJECTIVE OF THE SOIL & MOISTURE CONSERVATION (SMC) PLAN

The primary objective of the proposed Soil & Moisture Conservation (SMC) Plan is to comply with the environmental safeguard requirements stipulated under the Stage–I Forest Clearance approval granted by the Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India. The plan aims to mitigate the potential impacts of open-cast mining activities on soil stability, drainage systems, and surrounding forest ecosystems within and around the mining lease area.

Open-cast mining operations involve removal of vegetation cover, excavation of mineral deposits, and dumping of overburden materials, which often lead to increased surface runoff, soil erosion, and sediment transport during rainfall events. If not properly controlled, these processes may result in siltation of natural drainage channels, degradation of nearby forest areas, and deterioration of water quality in downstream rivers and streams.

Therefore, the present Soil & Moisture Conservation Plan has been prepared to implement appropriate structural and biological measures for controlling soil erosion, conserving soil moisture, stabilizing disturbed slopes, and improving the hydrological conditions of the mining lease area and its surrounding catchment.

The specific objectives of the proposed SMC Plan are as follows:

- To facilitate the natural hydrological functioning of the mining lease area and surrounding catchment by regulating surface runoff and promoting groundwater recharge.
- To reduce soil erosion and sediment transport from exposed mine surfaces, overburden dumps, haul roads, and other disturbed areas.
- To prevent siltation of nearby streams, nalas, and downstream water bodies through the construction of suitable drainage line treatment structures such as check dams, loose boulder structures, and settling ponds.
- To stabilize overburden dumps and degraded slopes through engineering measures and biological stabilization techniques such as vetiver grass plantation and vegetation development.
- To enhance vegetative cover and soil moisture retention capacity in the mining lease area through plantation and soil conservation practices.
- To conserve and manage topsoil resources for use in reclamation and ecological restoration activities.
- To undertake desiltation and restoration of nearby ponds and water bodies to improve their water holding capacity and groundwater recharge potential.
- To improve the micro-edaphic conditions of the soil and support regeneration of vegetation in degraded forest areas.
- To contribute towards the long-term ecological stability of the mining lease area and the surrounding 10 km buffer zone.

5. SCOPE OF WORK

The scope of the present Soil & Moisture Conservation (SMC) Plan includes identification, planning and implementation of appropriate structural and biological measures to control soil erosion, regulate surface runoff and enhance groundwater recharge within the mining lease area and its surrounding catchment.

The major components covered under the scope of this plan include the following:

1. Baseline survey and site assessment using modern tools such as GIS, remote sensing and field verification to understand terrain characteristics, drainage pattern and erosion-prone areas.
2. Assessment of soil erosion and drainage conditions within the mining lease area and identification of vulnerable zones such as overburden dumps, hill slopes, drainage lines and disturbed surfaces.
3. Design and planning of soil and moisture conservation structures such as check dams, loose boulder check dams (LBCD), wire mesh loose boulder check dams (WMLBCD), staggered trenches and water harvesting structures.
4. Stabilization of slopes and degraded areas through biological measures including vetiver grass plantation, vegetation development and soil binding techniques.
5. Topsoil conservation and management for use in land reclamation and restoration of disturbed mining areas.
6. Desilting and restoration of nearby ponds and water bodies to improve their storage capacity and groundwater recharge potential.
7. Preparation of cost estimates and implementation schedule for the proposed soil and moisture conservation measures.
8. Monitoring and maintenance planning to ensure long-term sustainability and effectiveness of the proposed conservation structures.

6. APPROACH & METHODOLOGY

The Soil & Moisture Conservation Plan has been prepared based on field investigations, analysis of terrain conditions and drainage characteristics of the mining lease area and its surrounding catchment.

The methodology adopted for preparation of this plan includes the following steps:

1. Consultation with relevant stakeholders and review of available project documents and environmental data.
2. Field reconnaissance survey to assess terrain features, vegetation cover, drainage channels and erosion-prone areas.
3. Mapping of drainage network and catchment characteristics using GIS and available secondary data sources.

4. Identification of gullies, drainage lines and degraded slopes requiring soil and moisture conservation interventions.
5. Selection of suitable SMC structures based on site conditions such as slope gradient, soil depth, drainage pattern and catchment size.
6. Preparation of design and layout of structures including staggered trenches, loose boulder check dams, wire mesh check dams and water harvesting structures.
7. Preparation of cost estimates for the proposed SMC structures based on standard cost norms of the Forest & Environment Department, Government of Odisha.
8. Photographic documentation and geo-tagging of proposed intervention sites.
9. Preparation of maintenance and monitoring plan for ensuring long-term performance of the SMC measures.

7. PROPOSED SOIL & MOISTURE CONSERVATION MEASURES

The proposed Soil & Moisture Conservation measures are designed to reduce surface runoff, control soil erosion, enhance groundwater recharge and stabilize disturbed slopes within the mining lease area.

The treatment measures are broadly categorized into:

1. Drainage Line Treatment
2. Ridge Area Treatment
3. Biological Stabilization Measures

7.1 Drainage Line Treatment

Drainage line treatment aims to reduce runoff velocity and promote infiltration of rainwater within the catchment area.

Objectives

- Reduce the velocity of flowing water
- Prevent soil erosion along drainage channels
- Trap sediments carried by runoff
- Improve groundwater recharge

The major drainage line treatment structures proposed include:

- Loose Boulder Check Dams (LBCD)
- Wire Mesh Loose Boulder Check Dams (WMLBCD)
- Check dams and settling structures

7.2 Ridge Area Treatment

Ridge area treatment focuses on controlling runoff at higher elevations of the catchment area before water reaches drainage channels.

This helps in:

- reducing soil erosion at source
- improving soil moisture retention
- promoting infiltration of rainwater

The ridge area treatment measures proposed under this plan include:

- Staggered Trenches
- Vegetative stabilization of slopes

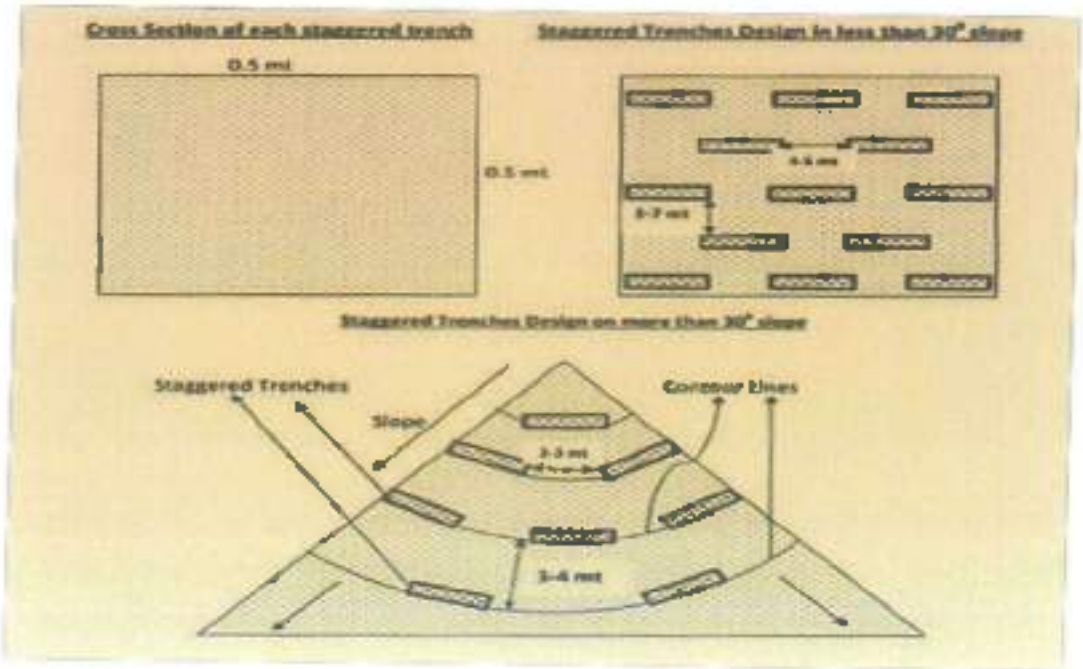
7.2.1 Staggered Trenches

Staggered trenches are shallow trenches constructed along the contour of hill slopes to intercept surface runoff and promote infiltration.

Purpose:

- Reduce surface runoff velocity
- Prevent soil erosion
- Improve soil moisture retention
- Support vegetation growth

Figure 9: Typical Layout and Cross Section of Staggered Trenches



7.2.2 Loose Boulder Check Dam (LBCD)

Loose Boulder Check Dams are constructed across small drainage channels using locally available boulders. These structures help in reducing runoff velocity and trapping sediments transported by flowing water.

Functions

- Check the velocity of water
- Reduce sediment transport
- Prevent gully erosion
- Enhance groundwater recharge

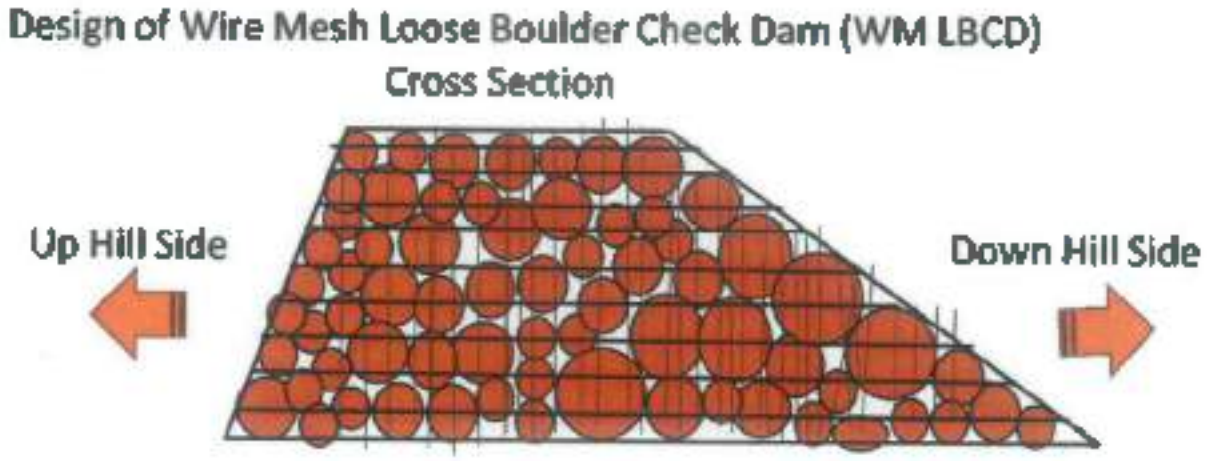
7.2.3 Wire Mesh Loose Boulder Check Dam (WMLBCD)

Wire mesh loose boulder check dams are similar to LBCD structures but are reinforced with wire mesh to increase structural stability and durability.

Functions

- Strengthen the boulder structure
- Prevent displacement of boulders during high flow
- Improve sediment retention capacity
- Increase longevity of the structure
-

Figure 10: Cross Section of Wire Mesh Loose Boulder Check Dam (WMLBCD)



7.2.4 Biological Stabilization Measures

Biological measures are essential for stabilizing soil surfaces and preventing erosion in disturbed areas.

The major biological measures proposed include:

- Vetiver and grass plantation
- Vegetation development on slopes
- Plantation in degraded areas

7.3 Topsoil Management Plan

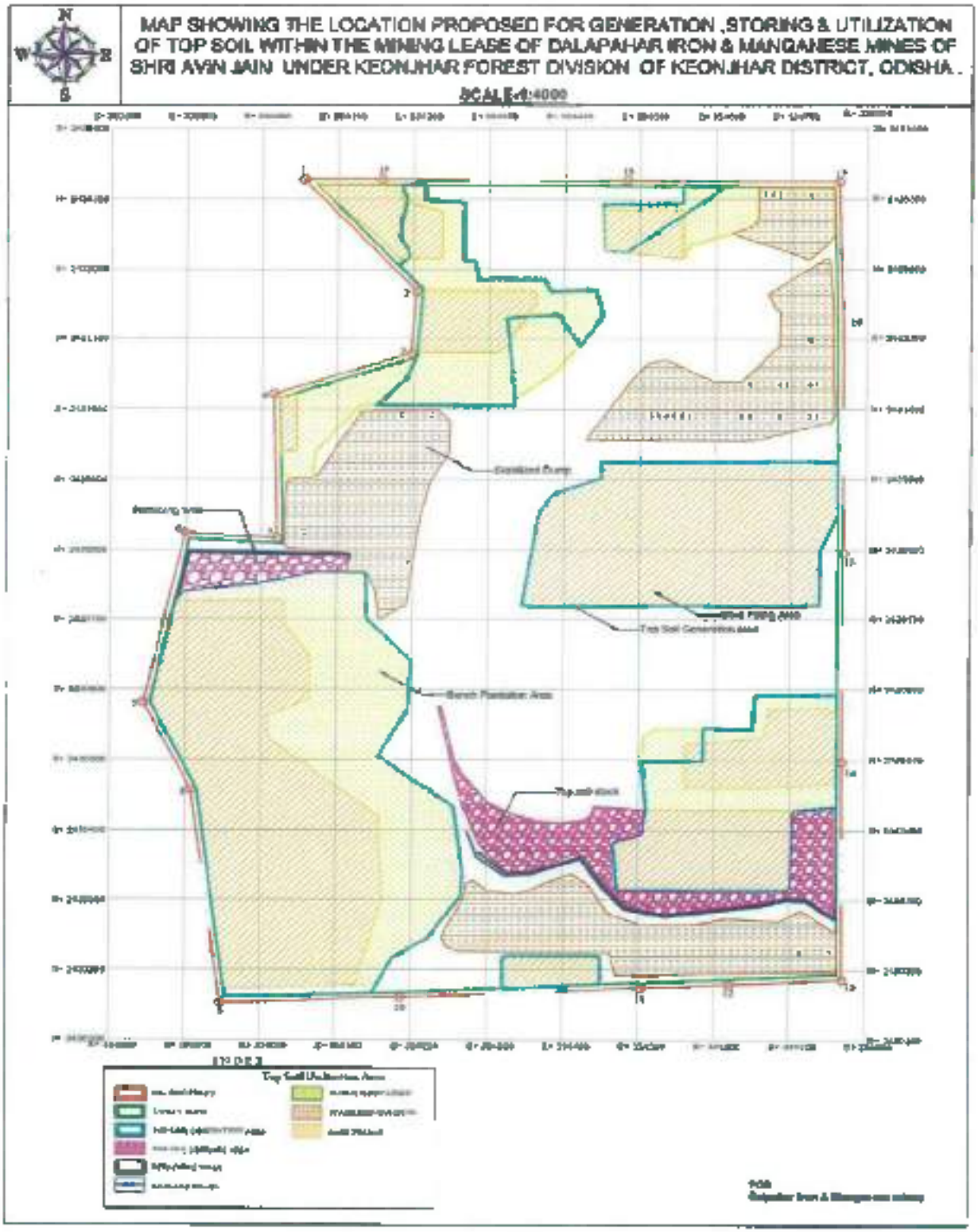
Topsoil generated during mining operations will be carefully stripped, preserved, and utilized for reclamation and plantation activities within the mining lease area. Proper management of topsoil is essential to maintain soil fertility, support vegetation growth, and ensure ecological restoration of disturbed areas.

Topsoil will be stripped from areas proposed for excavation and temporarily stored in designated locations within the lease area. These stockpiles will be properly stabilized through vegetation cover and protective measures to prevent erosion and loss of nutrients.

The stored topsoil will be subsequently utilized for:

- Plantation in safety zone and reclaimed areas
- Stabilization of overburden dumps
- Backfilling and rehabilitation of mined-out areas
- The location of topsoil generation, storage, and utilization areas within the mining lease is shown in the figure below.

Figure 11: Map Showing Topsoil Generation, Storage and Utilization Areas within the Mining Lease of Dalpahar Iron & Manganese Mines (Block–A), Keonjhar District, Odisha.



8. SOIL & MOISTURE CONSERVATION MEASURES WITHIN THE ML LEASE AREA (CORE ZONE)

The core zone comprises the mining lease area (89.961 Ha), which is directly affected by mining activities such as excavation, overburden dumping, haul road development, and material handling.

Due to these activities, the area is highly susceptible to soil erosion, slope instability, and disturbance of natural drainage. Therefore, appropriate Soil & Moisture Conservation (SMC) measures have been proposed to stabilize the terrain, regulate surface runoff, and prevent sediment transport.

The proposed treatment plan follows a ridge-to-valley approach, wherein ridge areas are treated first to reduce runoff generation, followed by stabilization of drainage lines.

8.1 Surface Runoff Management

Surface runoff generated from mine pits, overburden dumps, and other disturbed areas will be managed through a combination of structural and biological measures.

The planning of structures has been carried out considering:

- Natural drainage pattern
- Slope and topography
- Location of dumps and pits
- Sediment load potential
- Ease of maintenance

8.2 Structural Measures

8.2.1 Exhausted Pit (Primary Collection Structure)

Particular	Details
Purpose	Collection of runoff from mine pit and benches
Capacity	2,00,000 KL
Dimensions	120 m × 75 m × 5 m
Location	Low-lying area near drainage convergence

8.2.2 Sedimentation Pond (Secondary Structure)

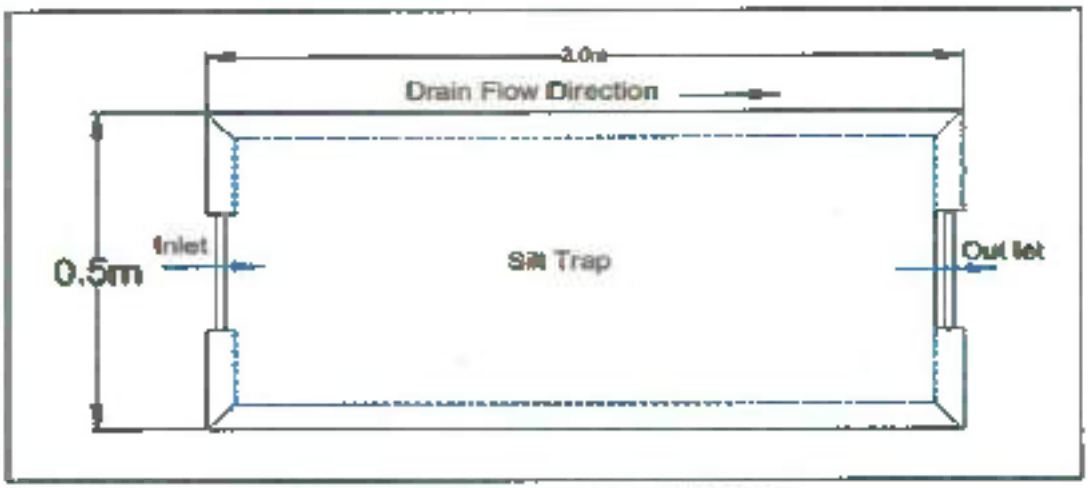
Particular	Details
Purpose	Sediment settling from OB dump runoff
Capacity	2,00,000 KL
Dimensions	80 m × 60 m × 3 m
Location	Downstream of OB dump

8.2.3 Silt Traps

Silt traps will be constructed upstream of the pond and pit to intercept sediments.

Location	Size (m)	Quantity
Upstream of Pit	3 × 1.5 × 1.5	1
Upstream of Pond	3 × 1.5 × 1.5	1

Figure 12: Design of Silt Trap



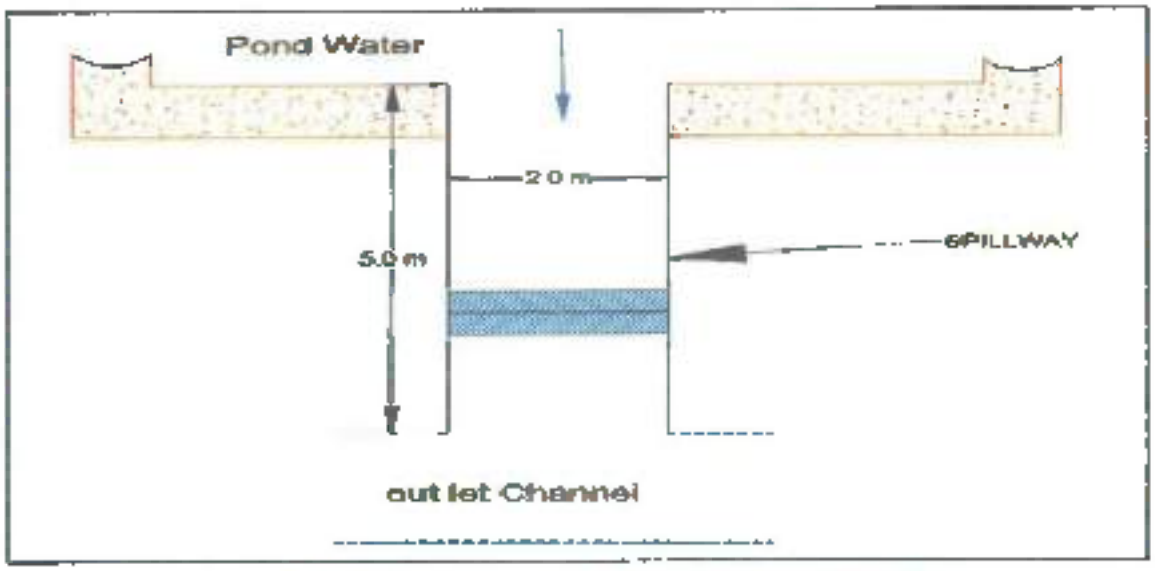
PLAN VIEW OF SILT TRAP

8.2.4 Spillway Provision

Spillways will be provided to safely discharge excess runoff.

Location	Size (m)	Quantity
Pit & Pond	5 × 2 × 1	2

Figure 13: Spillway Design



PLAN VIEW OF SPILLWAY

8.2.5. Periodic desilting schedule

A periodic desilting schedule of a pond/pit and the Settling Tanks is important to maintain its storage capacity, reduce silt accumulation, and ensure proper water management. In mine reclamation or water management plans, desilting is usually done at fixed intervals based on sediment load.

Activity	*Frequency*	*Time of Year*
Inspection of pond & inlets	Twice a year	Pre-monsoon & Post-monsoon
Minor desilting	Every year	April–May
Major desilting	Every 3–5 years	Summer / dry season
Cleaning of silt traps & drains	Before and after monsoon	May & October

8.2.6 Provision of garland drains to channel runoff

Drainage channels are engineered channels designed to safely convey storm water runoff from mining areas, infrastructure zones, and disturbed slopes to natural drainage systems without causing erosion.

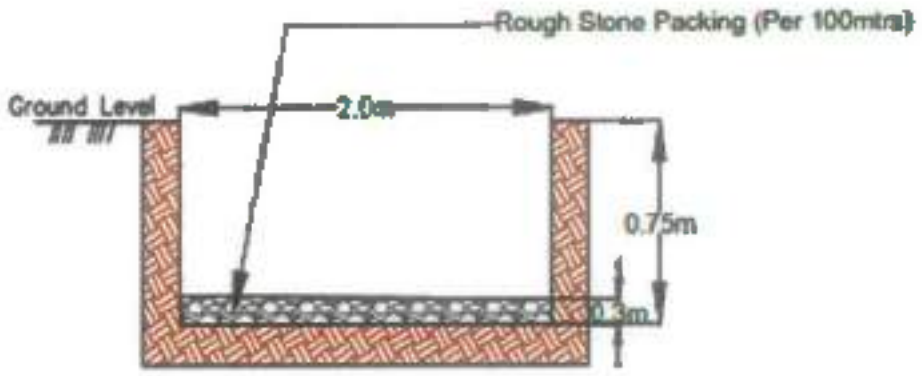
Suggested Location

- Around mine pits and working benches.
- Around stockyards and Mineral processing area.
- At slope toe areas of dumps.

The construction of Garland/catch drainissummerized as follows:

Item	Location	Length x breath & height in mtr	GPS reading
Garland drain	Bottom of proposed OB dump -I	340 x 2 x 1	2431251 N,334752 E To 2431316 N,334632 E
	Bottom of proposed OB dump -II	510 x 2 x 1	2430981 N,334633 E To 2431014 N, 334759 E
	Bottom of proposed OB dump -III	440 x 2 x 1	2430793 N,334114 E To 2431003 N,334234 E
	Bottom of proposed OB dump -IV	670 x 2 x 1	2430228 N,334762 E To 2430315 N,334274 E
Garland drain	Top Soil storage area	850 x 2 x 1	2430271 N,334760 E To 2430368 N,334288 E & 2430794 N,334115 E To 2430800 N,333902 E
Catch drain	From 4 no's of settling ponds to main channel	200 x 2 x 1	
Catch drain	Around mine pits	2500 x2 x1	Covering 5 no of pits
Catch drain	Around stockyards and Mineral processing area	1300 x2 x1	

Design of Garland /Catch Drain



Cross Sectional View of Garland Drain

8.2.7 Construction of Guard Wall / Retaining

Guard walls or retaining walls are structural support systems constructed at the toe of waste dump slopes to provide stability and prevent material slippage and erosion.

Suggested Location

At the toe of overburden dump slopes.

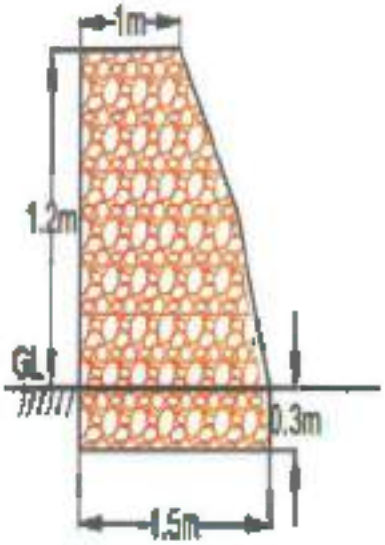
At the top soil storage area

The construction of Retaining wall is summarized as follows:

Item	Location	Length, breath & height in mtr	GPS reading
Retaining wall	Bottom of proposed OB dump -I	340 x 1.5 x 1	2431251 N,334752 E To 2431316 N,334632 E
	Bottom of proposed OB dump -II	510 x 1.5 x 1	2430981 N,334633 E To 2431014 N, 334759 E
	Bottom of proposed OB dump -III	440 x 1.5x 1	2430793 N,334114 E To 2431003 N,334234 E
	Bottom of proposed OB dump -IV	670 x 1.5 x 1	2430228 N, 334762 E To 2430315 N,334274 E
	Storage of Top soil	810 x 1.5 x 1	2430271 N,334760 E To 2430368 N, 334288 E & 2430794 N,334115 E To 2430800 N,333902 E

Design Of Retaining Wall

PLAN VIEW OF RETAINING WALL

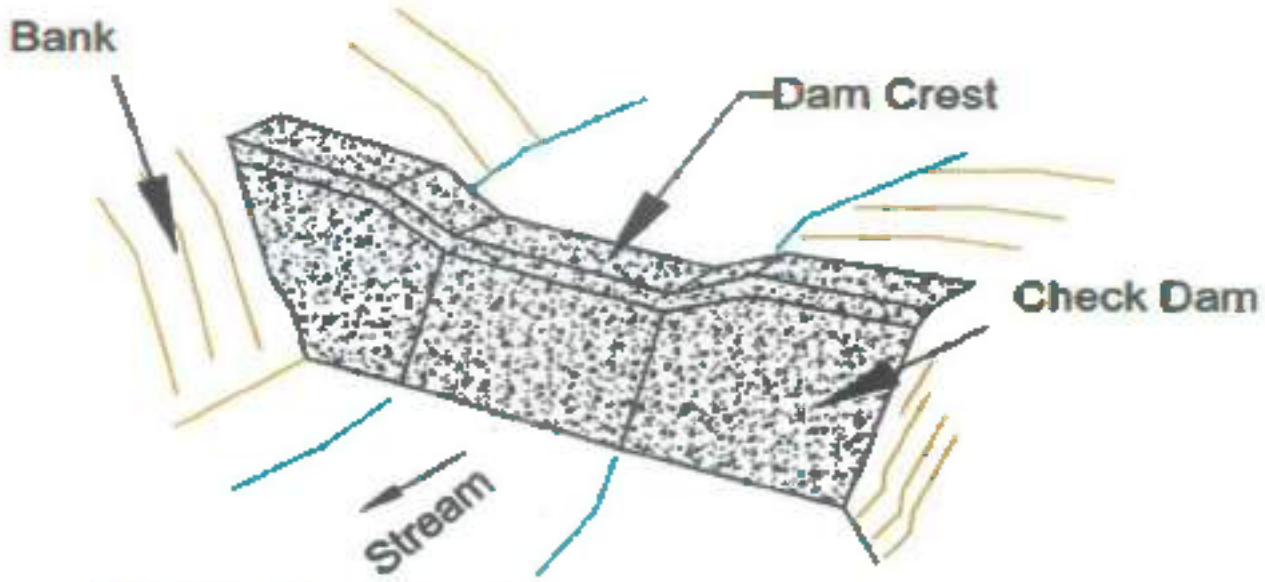


CROSS SECTION VIEW OF RETAINING WALL

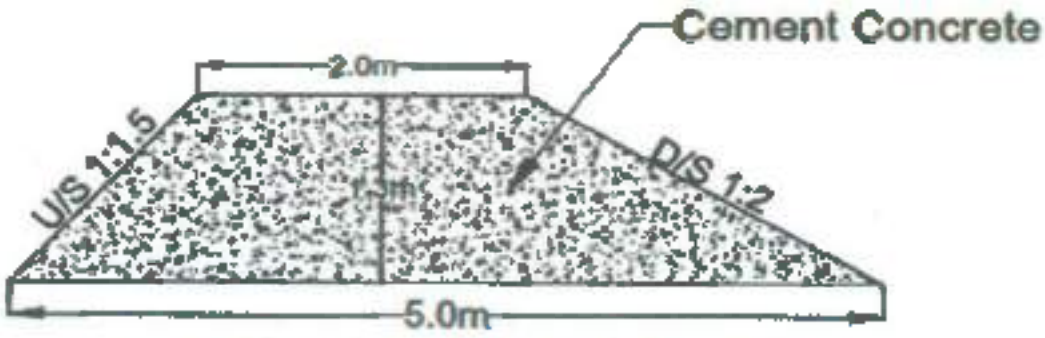
8.2.8 Check Dams

There are four (4) Check dams are proposed to constructed across seasonal drainage channels to slow down surface runoff, reduce erosion, and promote groundwater recharge. These structures help in trapping sediments carried by runoff and reduce downstream siltation. Check dams are suggested in the valley portions where runoff accumulation is high. These are suggested in valley portions where runoff accumulation is high.

Design of Check Dam



Side View of Check Dam



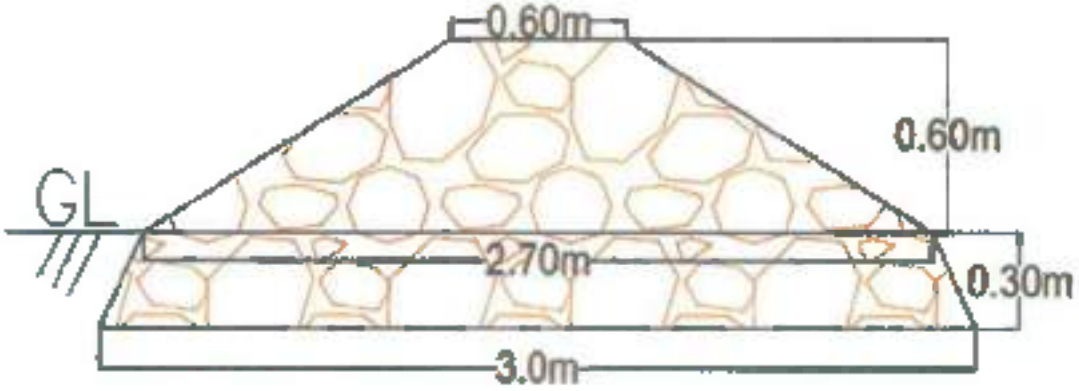
Cross Sectional View of Check Dam

8.2.9 Loose Boulder Structure (LBS)

A total of thirty-five (35) Loose Boulder Structures (LBS) are proposed to be constructed across the garland drains and natural drainage channels to reduce runoff velocity, control soil erosion by trapping sediments, and promote groundwater recharge by allowing water to percolate into the ground.

Out of the total proposed LBS, twenty-five (25) structures will be constructed in the garland drains around the toe of the dumps and Along the down contour, while the remaining ten (10) structures will be constructed across the drainage channels.

Design of Loose Boulder Structures (LBS)



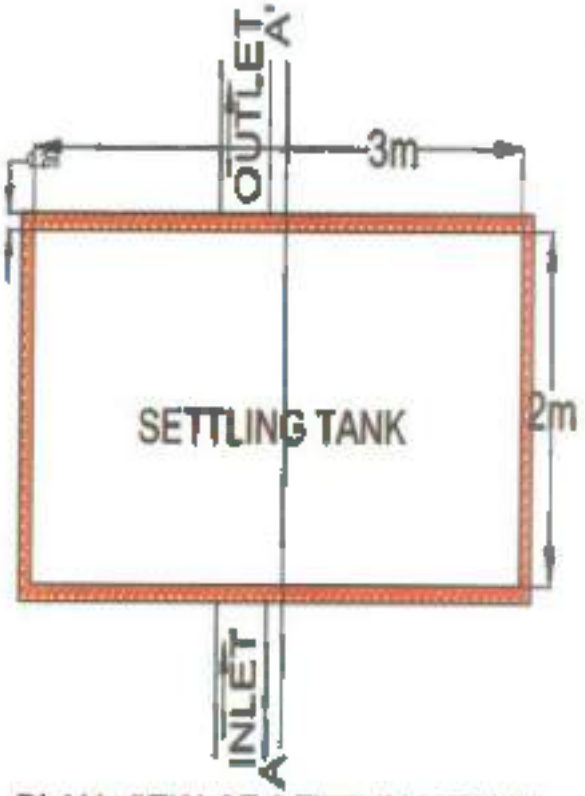
Cross Sectional View of LBS

8.2.10 Construction of the Settling tank

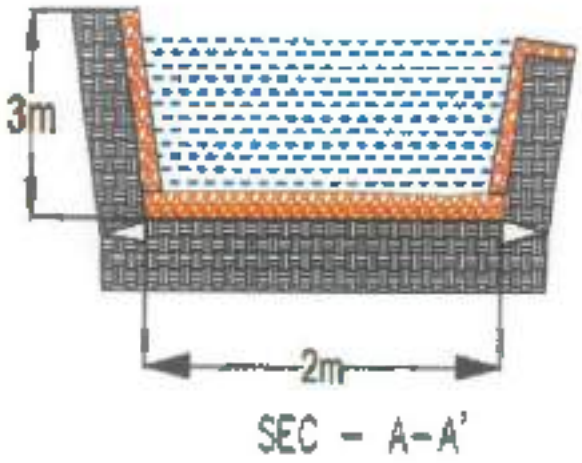
Four (04) settling tanks are proposed to be constructed at the lower level of each dump slope, each having a capacity of about 20 m^3, to ensure proper stabilization and management of rainwater runoff. The primary objective of these settling tanks is to retain suspended particles and sediments carried by surface runoff, allowing the sediments to settle before the water is discharged into the natural drainage system. This helps in reducing siltation, controlling soil erosion, and improving the quality of water entering downstream drainage channels

The runoff water from the dump will be first guided through garland drains, which will channel the water into the settling tank. Inside the tank, the velocity of water is reduced, allowing suspended solids, silt, and fine particles to settle at the bottom. The relatively clear water will then overflow through a properly designed outlet or spillway and discharge into the nearby drainage channel.

Design Of Settling Tank



PLAN VIEW OF SETTLING TANK



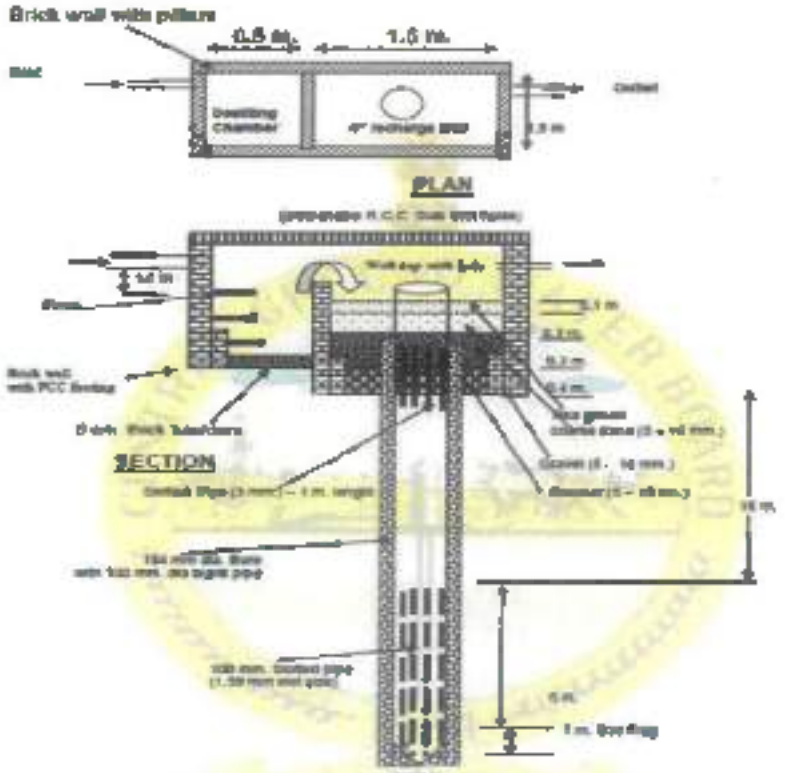
CROSS SECTIONAL VIEW OF SETTLING TANK

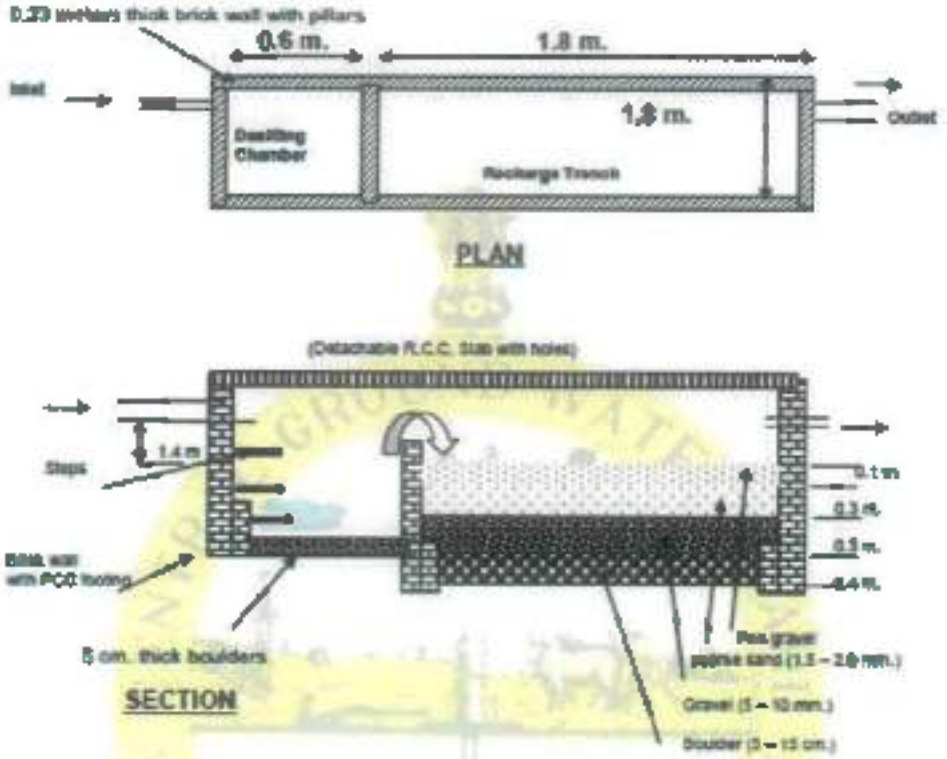
8.2.11Rain Water Harvesting Management

As per the data provided by the India Meteorological Department (IMD), the maximum daily rainfall recorded for the area is 0.204 m. Therefore, the design of the groundwater recharge system has been carried out considering this maximum rainfall value to ensure adequate recharge capacity.

RUNOFF CONSIDERED FOR DESIGN OF RECHARGE PIT					
Description	**Area available (HA)**	**Area (SQ. M)**	**Runoff Co-effieient**	**Avg Annual Rain Fall (M)**	**Generated Runoff During Existing Period (In Cum/day)**
Infrastructure / Utility	2.18	21800	0.8	0.204	3557.76

Indicative design for Rooftop Rainwater Harvesting Structure and Recharge (For Groundwater Abstraction up to 10 m 3 /d)





(All the dimensions are inner)

Since the project pertains to an iron ore mining operation, there is a possibility of groundwater contamination due to dust deposition and runoff during rainfall events. Therefore, the above recharge structure has been designed to mitigate such impacts and facilitate controlled groundwater recharge.

Based on the rainfall analysis, it is estimated that approximately 3560 KLD of runoff may be generated during a single day (considering 16 hours of rainfall). Accordingly, the recharge system has been designed to accommodate 222.50 KLD of runoff, ensuring effective management and recharge of stormwater.

It is proposed to install two (02) nos. of recharge shafts, each having a capacity of 110 KLD, within the mining lease area to facilitate groundwater recharge and effective rainwater management.

8.3. BIOLOGICAL MEASURES

Biological measures for soil conservation involve the use of vegetation and eco-friendly practices to prevent soil erosion, improve soil structure, and enhance moisture retention. These methods are especially suitable for degraded lands, mining areas, and slopes.

8.3.1.Plantation

Soil erosion and sediment generation in forest-covered areas are inherently minimal due to natural vegetation cover. However, to further strengthen environmental protection and slope stability within the mining lease area, additional measures are proposed.

Block plantation at a density of 1000 seedlings per hectare will be undertaken within the safety zone along the lease boundary, covering an area of 3.138 hectares. This will enhance the vegetative barrier, reduce surface runoff, and improve ecological stability.

In addition, Vetiver plantation (Vetiveria zizanioides) is proposed across all four OB dumps to effectively control soil erosion and promote moisture retention. Agave plantation will be carried out around the toe of the OB dumps, which are located in the north-eastern region (Dump-I & Dump-II), southern region (Dump-III), and southern side (Dump-IV), to ensure long-term slope stabilization.

Further, sowing of Soil binding grass seeds along the slopes of the haul roads will be undertaken to minimize soil loss, enhance slope binding, and improve moisture conservation within the mining lease area of Dalpahar Iron & Manganese Mines.

The Location of the dumps is given below: -

	Co-Ordinate of the Dumps location	
Dump No.	**Latitude**	**Longitude**
Dump-I	21°58' 39.402" N to 21°58' 42.562" N	85°23' 50.825" E to 85°23' 58.111" E
Dump-II	21°58' 30.980" N to 21°58' 39.508" N	85°23' 54.057" E to 85°23' 58.354" E
Dump-III	21°58' 22.484" N to 21° 58'32.247" N	85°23' 33.167" E to 85°23' 40.622" E
Dump-IV	21°58' 5.975" N to 21°58' 10.898" N	85°23' 40.708" E to 85°23' 58.745" E

Location wise proposed plantation will be as follows:

7.5 mtrs SZ area along the Mining Lease boundary	Block Plantation	3.138 Ha	3138 trees

The list of species to be adopted for the plantation is as follows:

Sl. No.	Local Name	Scientific Name
1	Amla	Emblica officinalis
2	Karania	Pongamia pinnata
3	Asan	Terminalia elliptica
4	Kurum	Adina cordifolia
5	Simarouba	Simarouba glauca
6	Neem	Azadirachta indica
7	Bamboo	Dendrocalamus strictus
8	Chakunda	Senna siamea
9	Sisoo	Dalbergia sissoo

Planting shall be done during July in pre-dug pits of size 45 cm X 45 cm X 45 cm. A basal dose of N.P.K fertiliser shall be applied at the time of planting, besides mixing with insecticides to prevent termites & insects. Planning for plantation shall be such that they should not be planted in proximity. A minimum distance of 2.5 mt X 2.5 mt shall be maintained on every fourth plant in planting either of the species. Care should be taken to complete the planting during July while rains are still on during the first or second week of July.

Vetiver , Agave Plantation &Soil binding grass

The Vetiver plantation on the dump no. 1, 2, 3 & 4 over an area of 11.5 ha will be carried out. Similarly, extensive plantation of Agave will also be carried out around the bottom of the dump slopes for stabilization and moisture conservation. The cost norm of block plantation @ 1000 trees per ha has been provided in Annexure- 1&2 of Vetiver plantation & Agave plantation respectively. The details are as follows: -

Category	Location	Area in Ha.
Vertiver Plantation	OB dump I, II, III, IV	11.50
soil binding grasses	Along Slop of Haul Road	0.96
Drought hardy plant species	Safety Zone along the Lease boundary	3.138

Category	Location	Length in mtrs
Agava Plantation	Toe of the OB dump I, II, III, IV	1850

8.3.2choice of species:

The choice of species will be based on the following parameters: (i) Drought hardy and (ii) it should resist the xerophytic nature of the locality, i.e., with less rainfall, less soil fertility, and to resist biotic interference. Selection of the plant species shall be based on the inventory of the local forest species like Chakunda (Cassia siamea) Kusum (Schleichera oleosa), Bel (Aegle marmelos), Karanja (Pongamia pinnata), Kurum (Adina cordifolia), Amla (Emblica officinalis) etc. Some soil binding grasses will also be introduced. The species of grass seeds to be broadcast are given in the following table. Plant species suitable for plantation should not only be able to flourish in the area but must also have a rapid growth rate, an evergreen habit, a large crown volume, and small leaves with smooth surfaces. All these traits are difficult to get in a single species Therefore, a combination of species has been taken into consideration as stated above.

Name of Grass Species	Usage	Habitat / Soil
Chrysopogon fulvus	Fodder	Red Soil/black cotton soil
Eremopogon foveolatus	Fodder	Skeletal soil
Sporobolus marginatus	Fodder	Sandy soil
Heteropogon contortus	Non-Fodder	Eroded soil
Cymbopogon martini	Non-Fodder	Eroded soil
Cynodon dactylon	Fodder	Wide range soil

8.3.3. Weeding

Two weeding have been proposed along with soil working and manuring in the first year and due weeding, soil working and manuring of 2 doses of 15g each in a gap of 15 days in the second year and weeding ploughing in the third year. The first weeding, along with manuring, should be taken up soon after completion of the plantation and the second weeding and soil working should be taken up after one month of the first weeding. Weeding should be done at a radius of one meter and soil working should be done to a depth of 15 cm. All the weeding along with soil work should be completed during November to December. The first weeding should be done along with the replacement of causality that may occur during planting in the first year and after replacement of causality in the 2nd year.

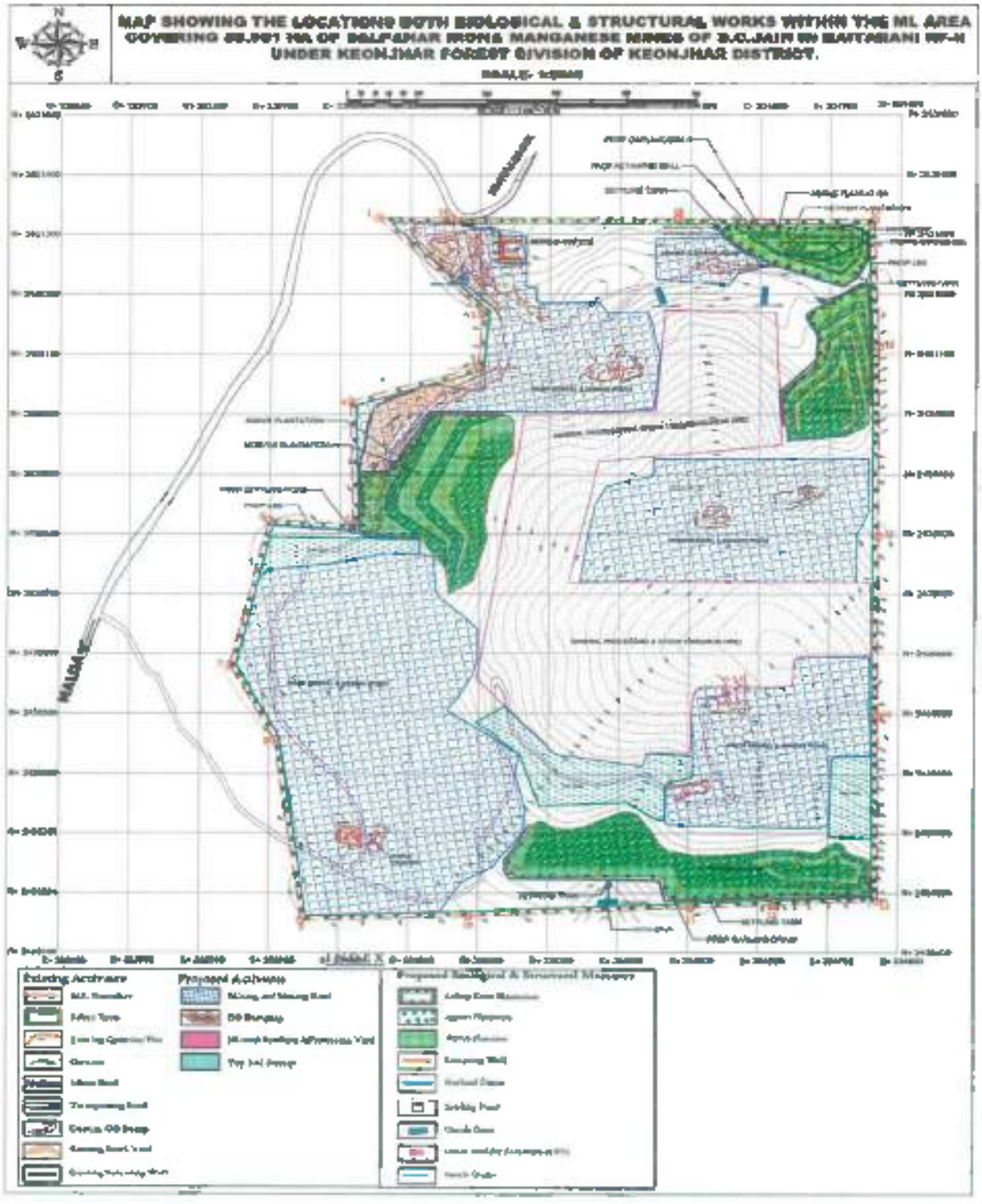
8.3.4.Application of Insecticides.

The plantation site, after cleaning and burning, good quality seedlings may cause an influx of insects that usually eat and damage the tender leaves and shoots of the plants. To get rid of such insect attacks, the application of insecticides should be taken up in required doses at desired intervals. Spraying of insecticides shall be done preferably on a sunny day and before forenoon.

8.4. Overall Benefits of Recommended Structures

- Reduces soil erosion and sediment generation.
- Maintains natural drainage and hydrological balance.
- Enhances groundwater recharge potential.
- Improves slope and dump stability.
- Prevents siltation of downstream water bodies.

Map showing the location of both biological and structural works within the ML area of Dalpahar Iron & Mn Mines over 89.961 ha.



9. INSPECTION, MONITORING AND EVALUATION

For the successful implementation of the above Comprehensive Soil & Moisture Conservation Plan in core zone, thorough inspection and technical guidance from the relevant technical wing are necessary. The user agency shall provide sufficient fuel and conveyance charges for technical experts to ensure the proper execution of these programs. A budgetary allocation of 15% of the total project cost has been set aside for this purpose.

10. EXECUTION

The works in the core zone of the present Scheme shall be executed by the User Agency having specialized departments headed by qualified persons with outsourced manpower and machinery. To facilitate this, the user agency shall establish its own executing and supervision cells along with the required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in coordination with the Forest Department and will be completed within 2 years after getting the final forest clearance. Maintenance work will be continued regularly.

11. REQUIREMENT OF FUNDS

For the implementation of Soil and Moisture Conservation measures within the Lease Area (Core Zone), a total cost of Rs. 8,52,34,640/- has already been estimated under various schemes to comply with the conditions stipulated in the Stage-I approval. Therefore, no additional budgetary provision has been proposed under the present scheme for the Core Zone.

However, considering the potential increase in the cost of materials and labour during the implementation period, an additional 20% escalation has been incorporated into the total estimated cost to accommodate future price variations.

"The details of the structural and biological measures already undertaken to comply with the conditions stipulated under Condition Nos. 2(xi), 2(xxi)(a), 2(xxi)(e), 2(xx)(a, b & c), and 2(xxi)(b) are as follows:

Sl. No.	Description of the Work (Core Zone)	Fund Required (in Rs.)
1	STRUCTURAL MEASURES	
A	POND (Secondary Sedimentation Pond) size- 80m(L) x 60m (B) x 3m(D) for 14400 cum @ Rs.397/cum (The cost norm Enclosed as **Annexure-1**)	The cost provision for this item has already been included in the approved Catchment Area Treatment (CAT) Plan as per Forest Clearance Condition No. 2.xi; hence, no additional budgetary provision is considered in the present estimate.
B	Construction of 2 no's of silt traps up stream of the Exhausted Pit and pond= Rs.31948/- x 2nos (The cost norm Enclosed as **Annexure-2**)	
C	Construction of 2 no's of over flow spillway of the Exhausted Pit and pond= Rs. 41575/-x 2nos (The cost norm Enclosed as **Annexure-3**)	
D	Catch drain Around mine pits, stockyards and Mineral processing area over a length of 3800m @ Rs. 341/per running meter.(The cost norm Enclosed as **Annexure-4**)	
E	Installation of 2 no's of Recharge shaft for Rainwater Harvesting = 2 x Rs 11,88,293/- (The cost norm Enclosed as **Annexure-5**)	
F	Construction of 10 no. of Loose Boulder Structure(2mt) in the drainage channel @ Rs. 25911/-per no. (The cost norm Enclosed as **Annexure-6**)	
	Distillation work for the drain channel and water recharge pond/pit twice a year (On LS)	
G	Construction of Garland drain toe of OB dumps & catch drain to over a length of 2160 m. @ Rs. 341/per running meter. (The cost norm already Enclosed as **Annexure-4**)	The financial forecast of these items has already been provided in the scheme imposed in Condition No. 2.xxi (a) for appropriate mitigative measures to minimize soil erosion and choking of streams. So, no extra budgetary provision has been suggested
H	Construction of retaining wall over a length of 1960 m.@ Rs.2313/ per running meter. (The cost norm Enclosed as **Annexure-7**)	
I	Construction of 25 no. of Loose Boulder Structure 2mt @ Rs. 25911/-per no.(The cost norm already Enclosed as **Annexure-6**)	
J	Construction of 4 nos. of check dam@ Rs.2,35,180/-. (The cost norm Enclosed as **Annexure-8**)	
K	Construction of 4 nos. of Setling Tank of 20 CuM Capacity each @645per CuM.(The cost norm Enclosed as **Annexure-9**)	

L	Terracing of OB dump over area of 11.50 Ha. Or 1,15,000 SqM @ Rs. 134/-perSq.M. (The cost norm Enclosed as **Annexure-10**)	
M	Distillation work for the Garland drain settling pond & check dam twice a year and Maintenance cost of Retaining wall & Check dams (On LS)	
N	Construction of Garland drain around the top soil storage area over a length of 850m @ Rs. 341/per running meter and retaining wall over a length of 810 m.@ Rs.2313/-. (The cost norm already Enclosed as **Annexure-4 & 7**)	The financial forecast of these items has already been provided in the scheme imposed in ConditionNo.2.xxi (e) for top soil Management So, no extra budgetary provision has been suggested
2	**BIOLOGICAL MEASURES**	
A	Block Plantation of Safety Zone (1000 no./ha.) over 3.138 ha. @ Rs. 2,99,567/- with SMC cost over 3.138 ha @ Rs.45,475/- (as per base norm of Matrix for the year 2026-27) **(Annexure-11 & 11A)** with the cost for Chain link Fencing and Soil conservation measures of 3.138 ha.	The financial forecast has already been provided in the scheme Safety Zone Fencing, Protection and Regeneration imposed in Condition No.2.xx (a,b& c). So no extra budgetary provision has been suggested.
B	Cost for Vetiver Plantation with 10 years maintenance over 11.50 ha @ Rs. 1,12,404/- per Ha. (The cost norm Enclosed as **Annexure-12).**	The financial forecast of these items has already been provided in the scheme imposed in Condition No. 2.xxi (a) for appropriate mitigative measures to minimize soil erosion and choking of streams. So, no extra budgetary provision has been suggested.
C	Cost of agave plantation on the toe of Dump with 10 years maintenance for a distance of 1.85 km (1850 m) @ Rs. 12,20,300/- per Km.((The cost norm Enclosed as **Annexure-13)**	
D	Cost for sowing of grass seeds of the slope of the haul roads over 0.96ha @ Rs. 59,532/ha. (The cost norm Enclosed as **Annexure-14)**	The financial forecast of these items has already been provided in the scheme imposed in Condition No. 2.xxi (b) for planting of adequate drought hardy plant species and sowing of seeds in the appropriate area. So, no extra budgetary provision has been suggested.
	Total	**0.00**

Asst. Conservator of Forest
I/C, Champua Forest Range

Divisional Forest Officer,
Keonjhar Division

Technically Approved
Regional Chief Conservator of Forests
Rourkela Circle

B. BUFFER ZONE

12. SOIL & MOISTURE CONSERVATION MEASURES IN BUFFER ZONE

The buffer zone comprises forest land, village areas, drainage channels, and degraded patches influenced by mining and natural processes.

The area is characterized by undulating terrain, seasonal drainage, and forest cover, making it susceptible to soil erosion and sediment transport during monsoon. Therefore, appropriate Soil & Moisture Conservation (SMC) measures have been proposed to stabilize the catchment, reduce runoff velocity, and improve moisture retention.

The treatment plan follows a ridge-to-valley approach, wherein upper slopes are treated through biological measures, and drainage lines are treated with structural interventions.

12.1. Structural Measures

12.1.1. Percolation / Collection Pond

- Purpose: Collection of runoffs from slope of Hill area
- Length: 80 m
- Width: 50 m
- Depth: 3 m
- Volume: 12000 cum
- Suggested Location: In a lower elevation area near the convergence point of the hill slope within the Baitarani Reserve Forest
- Coordinates:
- Latitude: 21°58' 33.74"N, Longitude: 85°24'0.82"E
  to
  Latitude: 21°58' 33.93"N , Longitude: 85°24'3.47"E

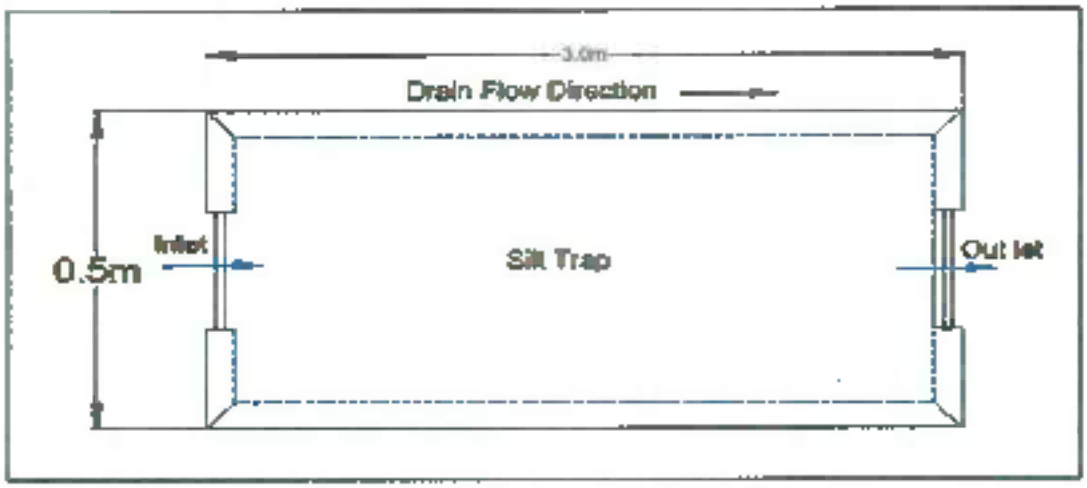
Additional Engineering Recommendations

Construction of silt traps

Silt traps should be constructed upstream of the pond inlet to intercept and retain sediments carried by surface runoff before the water enters the pond. These structures help in reducing silt deposition within the pond, thereby maintaining its storage capacity and improving water quality. The construction of silt trap is summarized as follows:

Item	Location	Length x breath & height in mtr	unity	Volume
silt trap	Upstream of pit	3m x 1.5m x 1.5m	1	6.75 cum

Design of Silt Trap



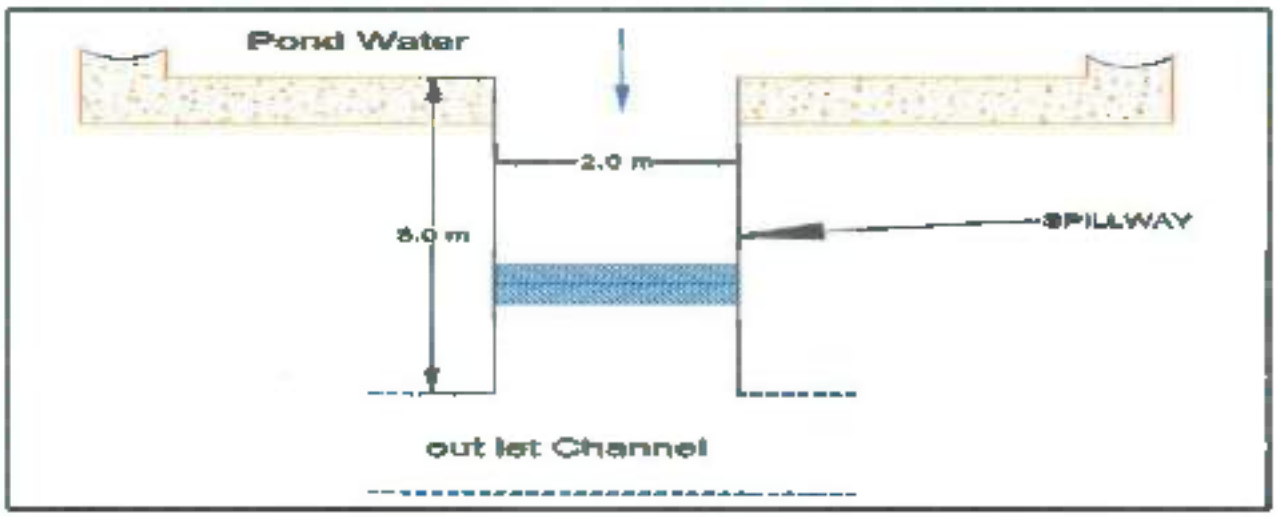
PLAN VIEW OF SILT TRAP

Provision of overflow spillway

An overflow spillway shall be provided at the pond to safely discharge excess water during heavy rainfall or peak runoff conditions. The spillway prevents overtopping and possible damage to the embankment by allowing controlled release of surplus water. The construction of Spillway is summarized as follows:

Item	Location	Length x breath & height in mtr	unity
spillway	pond	5 m x 2 m x 1 m	1

Design of Small Spill Way



PLAN VIEW OF SPILLWAY

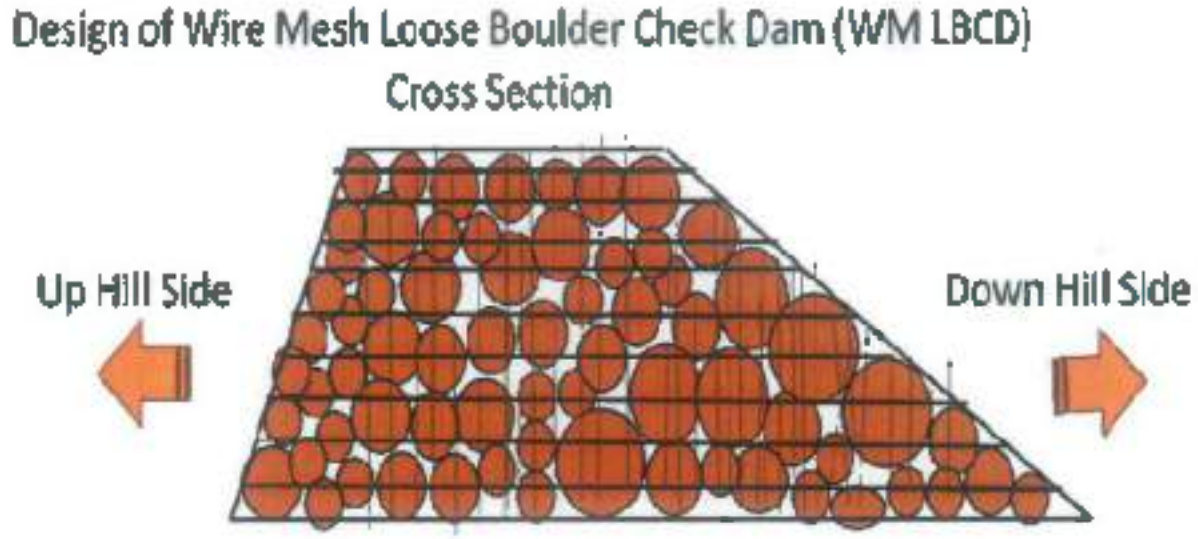
12.1.2 .Wire Mesh Loose Boulder Check Dams (WMLBCD)

Two (2) WMLBCD (Wall Masonry Loose Boulder Check Dams) are proposed to be constructed across seasonal drainage channels connected to Suna Nadi to slow down surface runoff, reduce soil erosion, and promote groundwater recharge. These structures will also help trap sediments carried by runoff and thereby reduce downstream siltation

The construction details of the proposed check dams are summarized as follows

Sl.No	Location	Coordinate	Dimension	Volume
1	Dalpahar Basti (Baitarani R.F.-A)	21°58'29.36"N 85°23'21.69" E	Length-8 m Bottom width-5m Top width- 1.5m Height-1 m	26 cum
2	Baitarani R.F-A	21°58'45.17"N 85°23'52.79" E	Length-15 m Bottom width-5m Top width- 1.5m Height-1.2 m	58.5 cum
Total				84.5 cum

Design of Wire Loose Boulder Check Dam



12.1.3 Staggered Trenches

Staggered trenches are widely adopted soil and moisture conservation structures, especially in sloping and forested terrains. These trenches intercept and slow down surface runoff, thereby minimizing soil erosion and preventing loss of fertile topsoil and facilitate percolation of rainwater into the soil, improving soil moisture availability and contributing to groundwater recharge.

The details of the area over 20 ha proposed for Staggered Trenches are summarized as follows:

Patch No	Location	Latitude	Longitude	Area in Ha
1	Bank of Suna Nadi in Sidhamatha R.F.	21°58'13.054"N	85°22'5.645"E	20.00
		21°58'0.506"N	85°22'10.476"E	
		21°58'2.171"N	85°22'20.471"E	
		21°58'9.397"N	85°22'24.514"E	
		21°58'18.934"N	85°22'21.824"E	

12.1.4. De-silting of Village Pond/ Water Bodies within 5 km of the Mine Lease Boundary

Periodic de-silting of village pons located within a 5 km radius of the mine lease boundary shall be undertaken to mitigate the impact of siltation caused by surface runoff and sediment transport from mining activities. Over time, suspended particles and eroded soil from the surrounding catchment areas may accumulate in nearby tanks and ponds, reducing their water holding capacity and affecting their ecological and irrigation functions.

Under this measure, accumulated silt and sediments deposited in the bed of village tanks, ponds, and other natural water bodies will be removed periodically to restore their original storage capacity and maintain proper water flow. The removed silt may be utilized for agricultural field leveling, soil improvement, or strengthening of embankments, wherever feasible and with the consent of local authorities and community members.

This activity will help to:

- Restore the **water storage capacity** of village tanks and ponds.
- Prevent **overflow and flooding during heavy rainfall.**
- Improve **groundwater recharge and water availability** in surrounding areas.

location & dimension with scope of work of the ponds selected for desilting as follow:

Pond No.	Name of the Location of the Water Body	One point GPS Reading		Dimension in (Length x Breadth x Height)	Remarks
		Easting	Northing		
1	Roida village pond-1	85° 22' 33.01"	22° 00' 46.01"	55 x 50 x 3	Scope for De-siltation & construction of Embankment
2	Roida village pond-2	85° 22' 38.13"	22° 00' 41.74"	50 x 37 x 2.5	Scope for De-siltation & construction of Embankment
3	Bholbeda village pond	85° 26' 36.86"	21° 57' 56.23"	36 x 31 x 2.5	Scope for De-siltation & construction of Embankment
4	Kundurpani Village Pond	85° 22' 07.11"	21° 58' 56.31"	32 x 31 x 2.5	Scope for De-siltation & construction of Embankment
5	ChilikaPat Village Pond	85° 24' 37.89"	21° 57' 41.78"	40 x 33 x 2.5	Scope for De-siltation & construction of Embankment
6	Khandbandha Village Pond	85° 23' 46.24"	21° 57' 11.05"	67 x 32 x 2	Scope for De-siltation
7	Kamarjoda Pond	85° 25' 23.96"	22° 00' 36.49"	57 x 53 x 2.5	Scope for De-siltation & construction of Embankment
8	Khuntapani Village Pond	85° 25' 39.94"	21° 59' 29.22"	64 x 54 x 2.5	Scope for De-siltation & construction of Embankment

12.2. BIOLOGICAL MEASURE

12.2.1 Gap Planting Located In The Area Within 100 Mtrs. From Outer Perimeter of the Mining Lease.

Gap planting and soil moisture conservation measures are proposed to restock and rejuvenate the degraded open forest located in the area within 100 mtrs. from outer perimeter of the mining lease area and strengthen the degraded open forest area located within 100 m from the outer perimeter of the mining lease. Due to sparse vegetation cover and soil disturbance in this zone, ecological restoration interventions are necessary to improve forest density, enhance biodiversity, and stabilize soil.

Gap planting will be carried out over 23.0 Ha in open patches where natural vegetation is sparse or absent. Suitable native and site-specific species will be planted to improve canopy cover and ecological balance. The spacing and density of planting will depend on the size of gaps and site conditions. Priority will be given to indigenous species that are drought-tolerant and well adapted to the local forest ecosystem. The objective is to gradually convert degraded open forest into moderately dense vegetation cover.

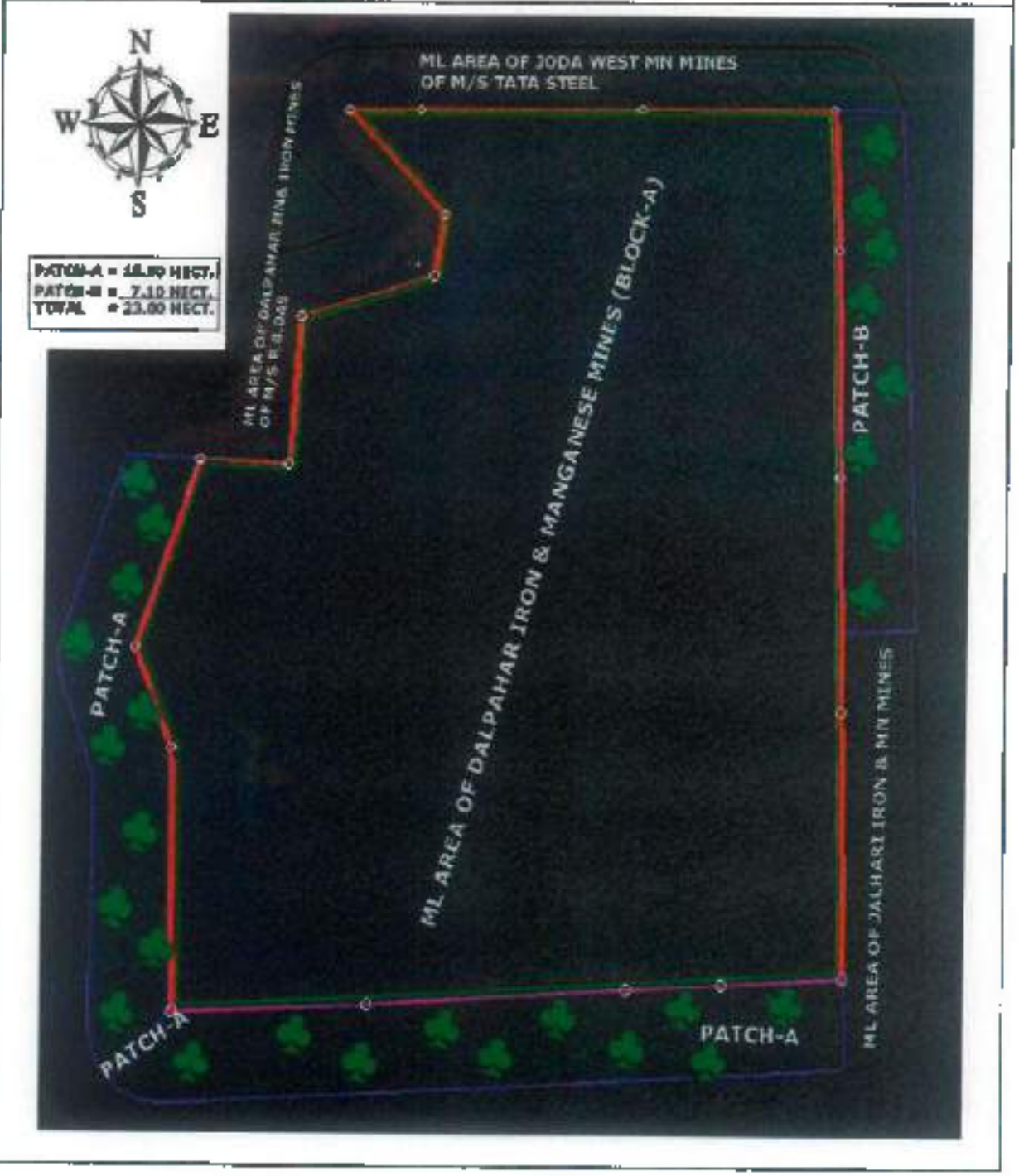
These measures will help in reducing surface runoff, minimizing soil erosion, and increasing groundwater recharge. The combined approach of gap planting and soil moisture conservation will improve vegetation regeneration, enhance ecological stability, and contribute to the long-term restoration of the degraded forest area surrounding the mining lease.

PATCH WISE GAP PLANTATION AREA OVER 23.00 HA LOCATED WITHIN 100 MTRS FROM THE OUTER PERIMETER OF ML BOUNDARY	
Location	**Area in Ha**
Patch-1	15.90
Patch-2	7.10
Total	**23.00**

The details of the Gap planting and soil moisture conservation measures are discussed in the Scheme prepared for Gap planting and soil moisture conservation measures are proposed to restock and rejuvenate the degraded open forest located in the area within 100 mtrs. from outer perimeter of the mining lease area and strengthen the degraded open forest area located within 100 m from the outer perimeter of the mining lease with compliance to condition no. No.2.xxiii of the Stage-I approval. The total financial outlay Rs. 56,94,414/-was provided for the implementation of these activities.

Location of the area 23.00 ha proposed for Gap Plantation within 100mtrsouter perimeter of ML boundary.

GOGGLE IMAGE SHOWING THE AREA SUITABLE FOR GAP PLANTATION OVER 23.00 HA LOCATED WITHIN 100 MTRS FROM OUTER PERIMETER OF THE ML AREA OF DALPAHAR IRON & MN MINES OF SRI D.C.JAIN IN BAITARANI RESERVE FOREST UNDER KEONJHAR FOREST DIVISION IN KEONJHAR DISTRICT,ODISHA



12.2.2. Assisted Natural Regeneration (ANR) Plantation

Due to mining activities, the natural vegetation within the catchment area is likely to be degraded. Therefore, Assisted Natural Regeneration (ANR) plantation over 5.55 ha has been proposed as a biological measure under the Catchment Area Treatment Plan to restore the degraded vegetation cover. ANR is a forest restoration approach that encourages the natural regeneration of existing vegetation by protecting and supporting naturally occurring seedlings and rootstock present in the area. Instead of establishing an entirely new plantation, this method focuses on improving the growth and survival of naturally regenerated species through protective measures, cleaning, soil working, and regular maintenance, thereby helping to stabilize the catchment area, reduce soil erosion, and improve ecological balance.

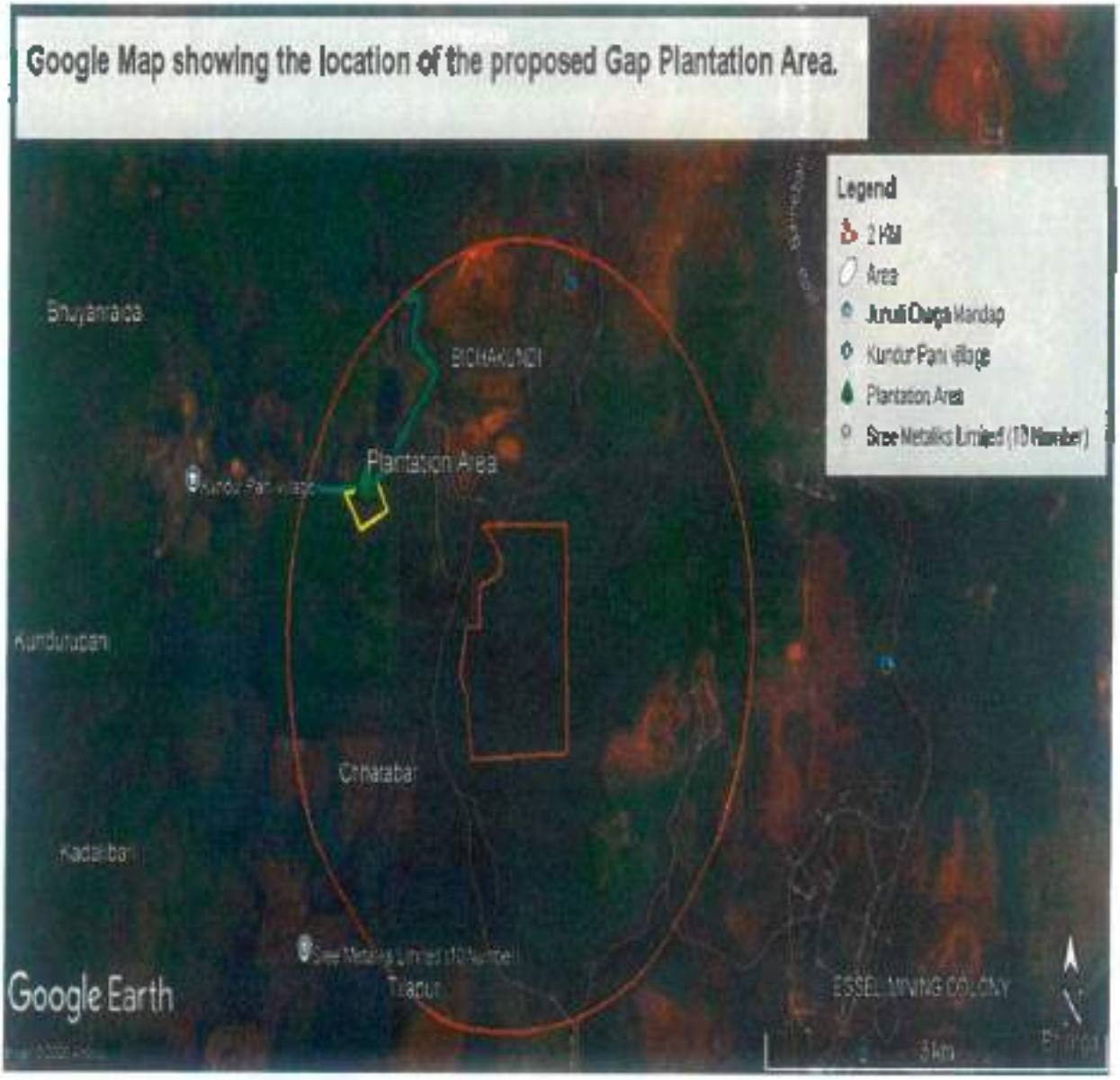
Key Objectives

- To restore degraded vegetation cover within the catchment area by encouraging the growth of native plant species.
- To improve vegetation density and biodiversity, thereby strengthening the soil binding capacity of the catchment slopes.
- To reduce soil erosion, sediment yield, and surface runoff within the catchment area.
- To enhance soil moisture retention and groundwater recharge in the treated catchment.
- To improve the overall ecological stability and hydrological condition of the catchment area.

Activities Involved in ANR

- Identification and Protection of Natural Regeneration
- Cleaning and Weeding
- Soil Working and Moisture Conservation
- Gap Planting (Where Required)
- Protection Measures
- Maintenance and Monitoring

Boundary GPS Coordinates of the area of 5.55 ha proposed for ANR plantation		
Location	**Latitude**	**Longitude**
Baitarani R.F.-A	21°58'42.17"N	85°22'56.38"E
	21°58'45.15"N	85°23'4.75"E
	21°58'50.35"N	85°23'0.79"E
	21°58'50.20"N	85°22'57.64"E
	21°58'48.48"N	85°22'53.83"E
	21°58'48.25"N	85°22'51.32"E


Google Map showing the location of the proposed Gap Plantation Area.
Legend
2 KM
Area
Jurudi Durga Mandap
Kundur Pani village
Plantation Area
Sree Metaliks Limited (10 Number)
Shyamalaa
BICHAKUNDI
Plantation Area
Kundurupani
Chhatabar
Kadalbar
Tiadur
ESSEL MINING COLONY
Google Earth
3 km

SITE PREPARATION AND SILVICULTURAL OPERATION INCLUDING CLEARANCE OF WEED, CLIMBER CUTTING, HIGH STUMP CUTTING, SINGLING OF SHOOTS.

The clearing of the site involving removal of invasive weeds, bushes, climbers, high stumps and singling of shoots will be taken up preferably by the end of February and latest by the end of March. Pits of the dimension 45 x 45 x 45 cm. will be dug @ 200 per ha in the available gaps, preferably 2 months before or at least a month before planting of seedlings.

PLANTING OPERATION

Planting of seedlings will be taken up in the month of July. The polythene covering of the balls of earth will be carefully removed before planting. Care will be taken to see that the ball of the earth is not broken while doing so. The seedling with the ball of earth will then be placed firmly in the pit and buried at such a depth that the root collar is well below the surface of the soil. The soil around the plant will be well compacted with the heel as a final step so that there is a proper bond between the ball and the surrounding soil. The earth close to the collar will be slightly elevated so that rainwater does not accumulate very close to the plant.

Species Proposed for Plantation

Sl. No.	Local Name	Scientific Name
1	Jamun	*Syzygium cumini*
2	Kurum	*Adina cordifolia*
3	Dhaura	*Anogeissus acuminata*
4	Khair	*Acacia catechu*
5	Sisoo	*Dalbergia sissoo*
6	Neem	*Azadirachta indica*
7	Bahada	*Terminalia bellirica*
8	Harida	*Terminalia chebula*
9	Karanja	*Pongamia pinnata*
10	Amla	*Emblica officinalis*

POST PLANTING OPERATION

CASUALTY REPLACEMENT

The entire area will be gone over in the same order as the plantation was carried out and casualties, if any, will be replaced as soon as the main plantation operation is over.

WEEDING AND SOIL WORKING

Regular and efficient weeding will start immediately after sprouting of the stumps is complete or after the seedlings have started throwing up new buds.

MANURING AND INSECTICIDE APPLICATION

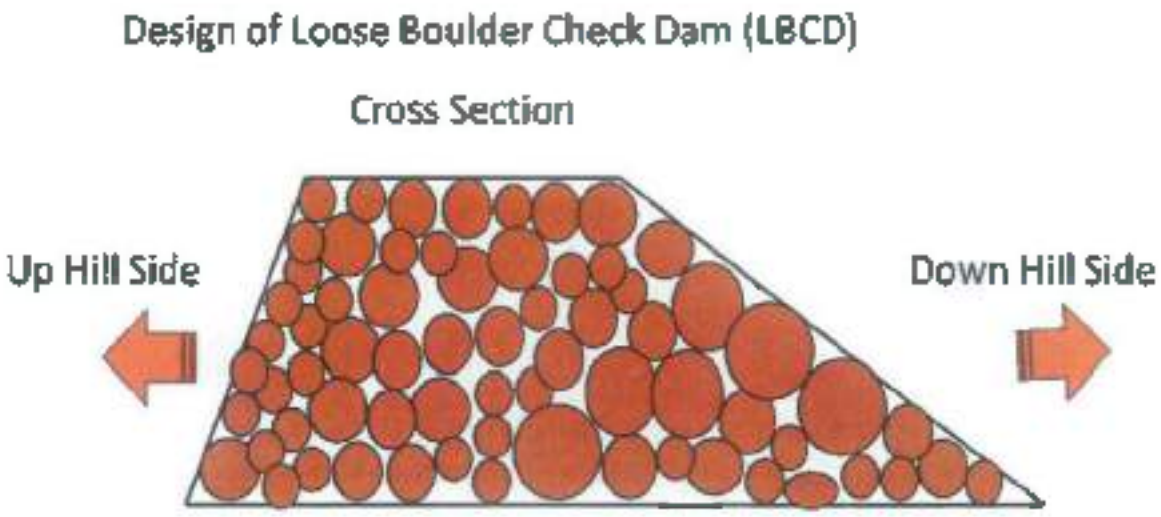
On degraded sites, urban compost or farmyard manure, wherever available, will be added to the soil while refilling the pits. As regards artificial fertilizers, the minerals required and dosage @ 50 grams of patent mixtures like 'Gromor' or N.P.K. (2:2:1) will be applied in two split doses, one in August and the other in September.

SOIL MOISTURE CONSERVATION MEASURES

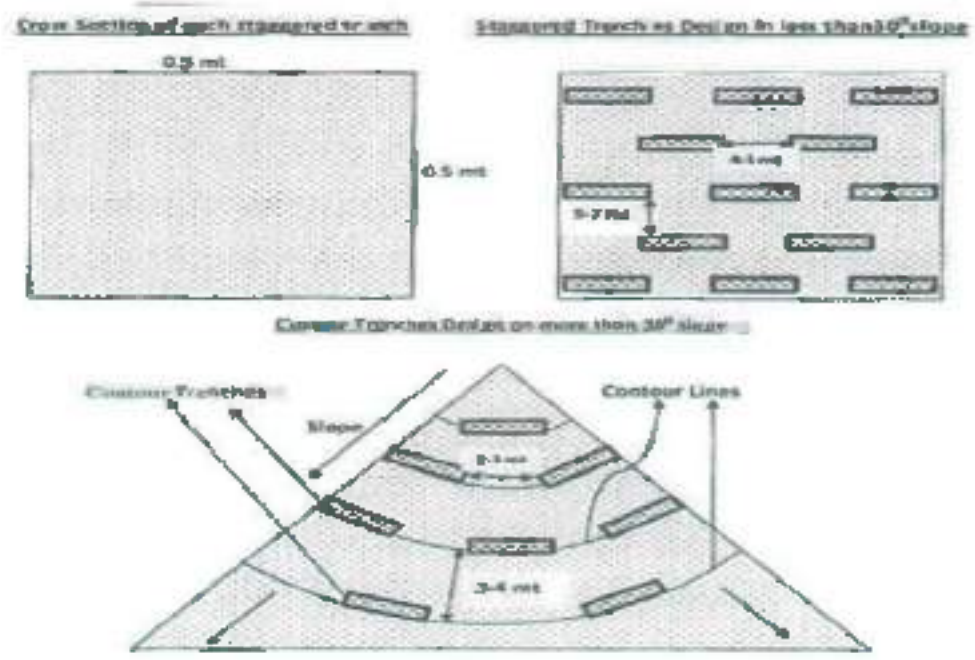
Soil Moisture Conservation Measures structures like Staggered Trench, Contour Trench, Graded earthen bund, LBCD, Wire mesh LBCD, sub-surface dyke & WHS as per the slope & site requirement will be constructed in the plantation area.

Design/Cross Section of Soil Moisture Conservation Measures structures

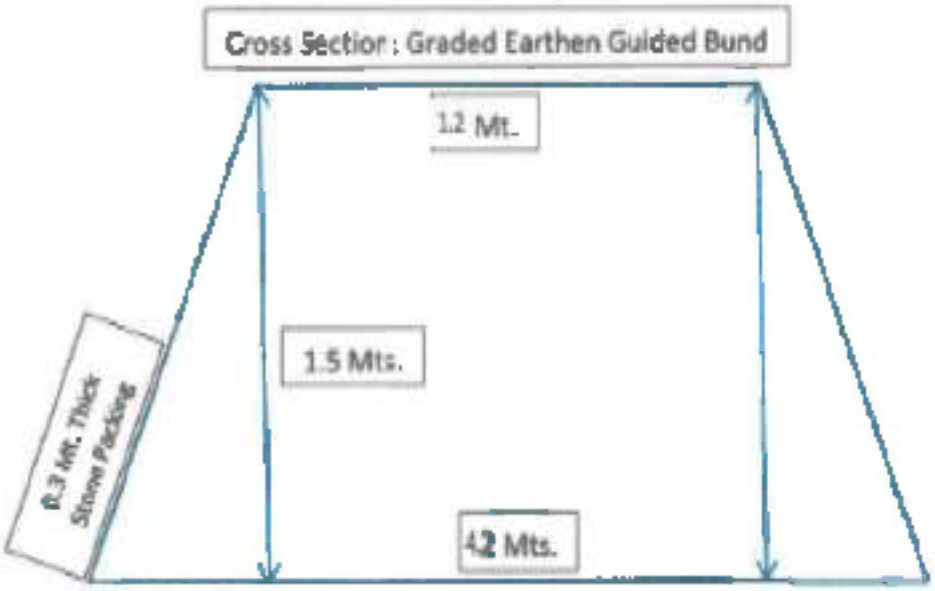
Loose Boulder Check Dam (LBCD)



Staggered Trench (ST) and Contour Trench (CT)



Graded Earthen Bund (GEB)



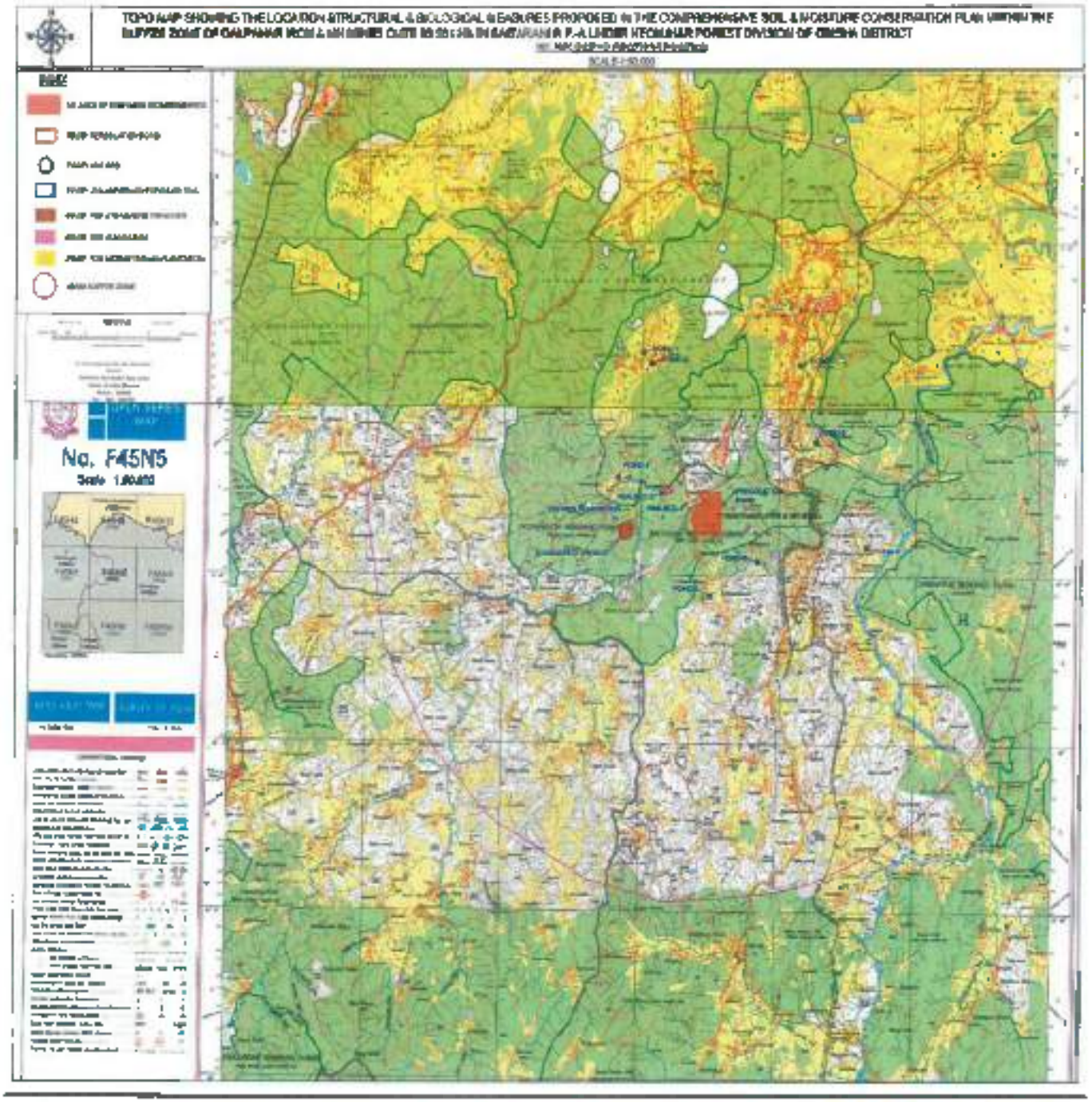
12.2.3. Vetiver/Soil Binding Grass Plantation In Hill Slope Washable Area

The Vetiver System can be an important tool to reduce erosion (by up to 90%), reduce and conserve rainfall runoff (by as much as 70%), improve ground water recharge, remove pollutants from water, reduce the risk of flooding, and improve economic benefits to communities. As researches and field studies in many countries indicate that vetiver grass not only significantly helps reduce landslides and soil erosion but also improves crop yields.

Location of the area of 2.130ha proposed for Vetiver/Soil Binding Grass Plantation

Patch No	Location	Latitude	Longitude	Area in Ha.
1	SIDHAMATHA R.F	21°58 '21.488 "N	85°22 '23.831 "E	1.757
		21°58 '29.998 "N	85°22 '19.382 "E	
		21°58 '30.374 "N	85°22 '20.325 "E	
		21°58 '26.532 "N	85°22 '24.834 "E	
		21°58 '21.672 "N	85°22 '24.567 "E	
2		21°57 '45.791 "N	85°22 '18.675 "E	0.373
		21°57 '47.388 "N	85°22 '18.271 "E	
		21°57 '49.386 "N	85°22 '19.861 "E	
		21°57 '49.272 "N	85°22 '20.069 "E	
		21°57 '48.214 "N	85°22 '19.7 "E	
		21°57 '45.672 "N	85°22 '20.288 "E	
			TOTAL	2.130

Map showing the structural & Biological measures in the buffer Zone



13. INSPECTION, MONITORING AND EVALUATION

For the successful implementation of the above treatment plan of catchment area in Buffer zone, thorough inspection and technical guidance from the relevant technical wing are necessary. The user agency shall provide sufficient fuel and conveyance charges for technical experts to ensure the proper execution of these programs. A budgetary allocation of 15% of the total project cost has been set aside for this purpose.

14. EXECUTION.

The works in the buffer zone of the present Scheme shall be executed by the User Agency having specialized departments headed by qualified persons with outsourced manpower and machinery under supervision of Divisional Forest Officer, Keonjhar division. The entire work shall be carried out in coordination with the Forest Department and will be completed within 3 years after getting the final forest clearance. Maintenance work will be continued regularly.

15. REQUIREMENT OF FUNDS

For the implementation of Soil and Moisture Conservation measures within the Buffer Zone . a total cost of Rs. 2,48,87,153/- has already been estimated under va The details of the structural and biological measures already undertaken in buffer zone to comply with the conditions stipulated under Condition Nos. 2(xi). 2(xxiii). 2(xxiv).rious schemes to comply with the conditions stipulated in the Stage-I approval.

Further, Rs. 12,38,441 additional budgetary provision has been proposed under the present scheme for the Buffer Zone.

However, considering the potential increase in the cost of materials and labour during the implementation period, an additional 20% escalation has been incorporated into the total estimated cost to accommodate future price variations.

Sl. No.	Description of the Work (Buffer Zone)	Fund Required (in Rs.)
1	STRUCTURAL MEASURES	
A	Percolation Pond (size- 80m(L) x 50m (B) x 3m(D) for 12000 cum @ Rs.387/cum (The cost norm Enclosed as Annexure-15)	The cost provision for this item has already been included in the approved Catchment Area Treatment (CAT) Plan as per Forest Clearance Condition No. 2.xi; hence, no additional budgetary provision is proposed under the present SMC Plan.
B	Construction of of silt traps up stream of the pond= Rs.31948 x 1no (The cost norm already Enclosed as Annexure-2)	
C	Construction of over flow spillway of the pond= Rs.41575 x 1no (The cost norm already Enclosed as Annexure-3)	
D	Construction of two nos Wire Mesh Loose Boulder Check Dams (WMLBCD) for 84.5 cum@ Rs.5700/- per cum. (The cost norm Enclosed as Annexure-16)	
E	De-silting of 8 nos Village Pond of 12118 cum with ancillary activities within 5 km of the Mine Lease Boundary.	The financial forecast of these items has already been provided in the scheme imposed in Condition No. 2 xxiv for . So, no extra budgetary provision has been suggested.
F	Digging of Staggered Trenches over in Sidhamatha R.F. under Keonjhar Forest Division over 20.00 Ha.@ Rs.32900 per Ha. (The cost norm Enclosed as Annexure-17)	6,58,000.00
	1. Total	Rs. 6,58,000.00
	BIOLOGICAL MEASURE	
A	RDF Plantation (200 no./ha within 100 mtrs. from outer perimeter of the mining lease over 23 ha. @ Rs. 1,22,694/- per ha and Soil Moisture Conservation (SMC) over 23 ha @ Rs. 45,475/- per ha (as per base norm of Matrix for the year 2026-27) (Annexure-18 & Annexure-19 respectively).	The financial forecast of these items has already been provided in the scheme i to restock and rejuvenate the degraded open forest located in the area within 100 mtrs. from outer perimeter of the mining lease imposed in Condition No. 2.xxiii . So, no extra budgetary provision has been suggested.
B	ANR Plantation at Baitarani R.F. (200 no/Ha) over 5.5 ha @ Rs. 1,22,694/- (as per base norm of Matrix for the year 2026-27 already provided in Annexure-18).	The cost provision for this item has already been included in the approved Catchment Area Treatment (CAT) Plan as per Forest Clearance Condition No. 2.xi. hence, no additional budgetary provision is proposed under the present SMC Plan.
C	Soil Moisture Conservation (SMC) regarding ANR Plantation at Baitarani R.F. over 5.5 ha @ Rs. 45,475/- per ha /- (as per base norm of Matrix for the year 2026-27 already provided in Annexure-19).	
D	Plantation of Vetiver/Soil Binding Grass on the banks of Suna Nadi over 2.13 ha @ Rs.1,12,404 per Ha. (The cost norm already Enclosed as Annexure-12)	2,39,421.00

	2. Total	2,39,421.00
	Sub Total (1+2)	8,97,421.00
	Inspection and monitoring charges @ 15%	1,34,613.15
	Sub-Total	10,32,034.15
	Price escalation @ 20%	2,06,406.83
	Grant Total	12,38,440.98 or say Rs.12,38,441/-

(Rupees Twelve Lakh Thirty-Eight Thousand Four Hundred Forty-One) only

ABSTRACT OF THE TOTAL COSTS FOR THE COMPREHENSIVE SOIL & MOISTURE PLAN WITHIN THE CORE ZONE AND BUFFER ZONE OF DALPAHAR IRON & MANGANESE MINES.

SL.No.	IMPLEMENTATION AREA	ESTIMATED FUND IN RS.
1	CORE ZONR (within the ML Area)	Nil
2	BUFFER ZONE	Rs.12,38,441/-
	TOTAL	Rs.12,38,441/-

Asst. Conservator of Forest
I/C, Champua Forest Range

Divisional Forest Officer,
Keonjhar Division

16. POST-PROJECT MANAGEMENT & MAINTENANCE OF SMC STRUCTURES

Proper maintenance and monitoring of the Soil & Moisture Conservation structures are essential to ensure their long-term effectiveness and sustainability. After completion of the construction phase, suitable mechanisms will be established for the maintenance and management of these structures.

Maintenance of Structures

- All SMC structures such as check dams, loose boulder check dams, trenches and water harvesting structures will be periodically inspected and maintained.
- Damaged or weakened structures will be repaired or strengthened whenever required.
- Desilting of check dams and ponds will be carried out periodically to maintain their storage capacity.

Community Participation

Local communities and village-level institutions such as Village Forest Committees (VFC) / Eco-Development Committees (EDC) will be encouraged to participate in the maintenance and protection of SMC structures.

Convergence with Government Programs

The implementation and maintenance of SMC measures may be coordinated with relevant government schemes related to watershed management, rural development and forestry programs to ensure long-term sustainability.

Monitoring and Evaluation

Monitoring of SMC activities will be carried out through the following mechanisms:

- Internal monitoring by the project management team
- Periodic monitoring by forest department officials
- GIS-based monitoring and documentation
- Community-level monitoring through local committees
- Independent third-party evaluation where required

CONCLUSION

The Soil & Moisture Conservation Plan prepared for Dalpahar Iron & Manganese Mines presents a comprehensive and site-responsive framework for addressing the hydrological and geomorphic impacts associated with opencast mining in a rugged forested landscape. The plan recognizes that in a mining area such as Dalpahar, where steep slopes, loose excavated materials, seasonal drainage lines, and monsoonal runoff interact closely, soil erosion and moisture loss cannot be treated as isolated environmental issues. They are directly linked with slope safety, drainage health, downstream water quality, ecological restoration, and long-term sustainability of mining operations.

The proposed conservation strategy is based on the principle that runoff must be intercepted, slowed, conveyed safely, and treated at multiple levels before it can acquire erosive force or carry sediment into natural drainage systems. In the Dalpahar context, this has been translated into a coordinated package of structural measures such as catch drains, garland drains, retaining walls, loose boulder structures, spillways, check dams, settling tanks, recharge shafts, terracing, and sediment control arrangements around pits, dumps, and storage areas. These measures are designed to act as the first line of defence against erosion, slope instability, and silt-laden discharge.

At the same time, the plan rightly places equal emphasis on biological stabilization, recognizing that long-term environmental stability cannot be achieved through civil structures alone. Plantation of vetiver, agave, grasses, and other suitable species over disturbed and vulnerable surfaces will help bind soil, reduce runoff velocity, encourage infiltration, and improve resilience of treated slopes over time. The inclusion of safety zone plantation, degraded forest improvement, assisted natural regeneration, and stream-bank stabilization in the surrounding area further strengthens the landscape approach adopted in the plan.

Another important strength of the present plan lies in its integration with the approved Forest Clearance conditions and related environmental management schemes. By clearly distinguishing those items already covered under CAT, topsoil management, dump stabilization, safety zone treatment, and peripheral afforestation from those requiring additional budget under the present SMC proposal, the plan avoids duplication while maintaining a comprehensive treatment framework. This approach improves financial clarity and ensures that all required conservation interventions are linked to an implementable regulatory structure.

Successful implementation of this plan will depend not only on construction of proposed works, but also on their timely execution, seasonal maintenance, desilting, repair, plantation aftercare, and periodic performance review. Drains and sediment control structures must remain functional before and during every monsoon. Dump slopes must be regularly inspected for signs of erosion or instability. Recharge and water conservation structures must be maintained so that their hydrological purpose is not lost over time. Plantation and grassing components must be protected from grazing, washout, and neglect during the establishment phase. Therefore, monitoring and adaptive maintenance will be central to the long-term success of the plan.

In conclusion, the Soil & Moisture Conservation Plan for Dalpahar Iron & Manganese Mines provides a technically sound, environmentally necessary, and legally compliant strategy for controlling erosion, conserving moisture, stabilizing disturbed landforms, and protecting downstream drainage systems from sedimentation impacts. If implemented in letter and spirit, the plan will substantially improve environmental performance of the mine, support progressive reclamation, reduce cumulative watershed degradation, and contribute to restoration of ecological stability within the mining lease and its surrounding landscape. It therefore forms an essential part of responsible mine planning and sustainable environmental management for the Dalpahar project.

Asst. Conservator of Forest
I/C, Champua Forest Range

Divisional Forest Officer,
Keonjhar Division

ANNEXURE-I

Measure to be taken for construction of pond:

TYPE OF STRUCTURE	POND
LOCATION	Within ML Area (near ML pillar no.5)
Latitude	21°58' 12.96"N
Longitude	85°23'32.17"E
LENGTH	80
WIDTH	60
HEIGHT	3
VOLUME IN CUM	14400
UNITS	1
TOATAL QTY IN CUM	14400
COST /CUM	Rs.387/-
TOTAL COST	Rs. 55,72,800/-

WATER BODY (80m X 60m X 3m)					
SL No	Item of Work	Qty	Unit	Rate (in Rs.)	Amount (in Rs.)
1	Earth Work in excavation in stony earth and gravels mixed with stone and boulders not exceeding .014cum in volume within 50met Initial lead and 1.5met. Initial lift including rough dressing and breaking clods etc. complete.				
	40m x 30m x 3.0m	14400	Cum	373/-	53,71,200.00
2	Extra lift of 1.5meter or part there of over the initial lift of 1..5meter for earth work in all kinds of embankment and roads works and ordinary earthwork in general.				
		7200	Cum	28/-	2,01,600.00
	Total:-				55,72,800.00
		Rate for 1cum			Rs.387.00

Analysis of Rate for Water Body					
1	Earth Work in excavation in stony earth and gravels mixed with stone and boulders not exceeding .014cum in volume within 50met. Initial lead and 1.5met. Initial lift including rough dressing and breaking clods etc. complete.	M.Mulia	0.34	462	157.08
		W.Mulia	0.34	462	157.08
		Total:-			314.16
		Over head charges 7.5%			23.56
		Contractor Profit 10%			31.42
		Total:-			369.14
		Labour Cess 1%			3.69
		Rate per Cum			**372.83 or say Rs.373.00**
2	Extra lift of 1.5meter or part there of over the initial lift of 1.5meter for earth work in all kinds of embankment and roads works and ordinary earthwork in general.	M.Mulia	5	462	2310
		Rate for 100 cum			2310
		Over head charges 7.5%			173.25
		Contractor Profit 10%			231.00
		Total:-			2714.25
		Labour Cess 1%			27.14
		Total:-			2741.39
		Rate per Cum			**27.41 or Rs. 28.00**

ANNEXURE-2

ESTIMATE OF SILT TRAP

1. Typical Silt Trap Design

Recommended Size :

- Length: **3.0 m**
- Width: **1.5 m**
- Depth: **1.5 m**
- Freeboard: **0.30 m**

Construction Materials

- Brick masonry / stone masonry in cement mortar
- PCC base (1:3:6)
- Inlet and outlet stone pitching or concrete protection

2. Approximate Quantity Estimate (One Silt Trap)

a. Excavation

Excavation volume

$= 3.0 \times 1.5 \times 1.5$

$= \mathbf{6.75\ m^3}$

b. PCC Bed (100 mm thick)

$= 3.0 \times 1.5 \times 0.10$

$= \mathbf{0.45\ m^3}$

c. Brick/Stone Masonry (230 mm thick walls)

Perimeter

$= 2(3 + 1.5) = 9\ m$

Wall volume

$= 9 \times 1.5 \times 0.23$

$= \mathbf{3.10\ m^3}$

d. Plaster (12 mm both sides)

Surface area

$= 9 \times 1.5 \times 2$

$= \mathbf{27\ m^2}$

3.Cost Estimate

Item	Quantity	Rate (₹)	Amount (₹)
Excavation	6.75 m^3	200	1,350.00
PCC	0.45 m^3	7,500	3,375.00
Brick/Stone Masonry	3.10m^3	5,500	17,050.00
Plaster	27 m^2	250	6,750.00
		Total	**28,525.00**
		Contingency charges @12%	3423
		G.total	**Rs.31,948.00**

ANNEXURE-3

ESTIMATE OF SPILLWAY

1. Typical Design Spillway

- Spillway type: **Open rectangular masonry / concrete spillway**
- Spillway width: **2.0 m**
- Spillway depth: **1.0 m**
- Spillway length: **5.0 m**
- Side wall thickness: **0.30 m**
- Bed concrete thickness: **0.20 m**

---

2. Quantity Estimate

a. Earthwork Excavation

Excavation for spillway channel

Volume=Length×Width×DepthVolume = Length \times Width \times DepthVolume=Length×Width×Depth

$= 5 \times 2.6 \times 1.2$

= 15.6 m³

---

b. PCC Bed Concrete

Thickness = 0.20 m

Volume=5×2×0.20Volume = 5 \times 2 \times 0.20Volume=5×2×0.20

= 2.0 m³

---

c. Masonry in Side Walls

Wall height = 1.0 m

Thickness = 0.30 m

Volume=2×(5×1×0.30)Volume = 2 \times (5 \times 1 \times 0.30)Volume=2×(5×1×0.30)

= 3.0 m³

---

d. Plastering

Both side walls

Area=2×(5×1)Area = 2 \times (5 \times 1)Area=2×(5×1)

= 10 m²

---

3. Cost Estimate

Item	Quantity	Rate (₹)	Amount (₹)
Excavation	15.6 m³	200	3,120.00
PCC	2.0 m³	7,500	15,000.00
Brick/Stone Masonry	3.0m³	5,500	16,500.00
Plaster	10 m²	250	2,500.00
		Total	**37,120.00**
		Contingency charges @12%	4454.40
		G.total	**Rs.41,574.40 or say Rs.41,575/-**

ANNEXURE: 4

Detail Estimate of construction of Garland Drain

Sl No	Description of Items	No	Length	Width	Height	Qty	Unit	Rate	Amount
1	Cleaning of Jungles & bushes	1 0	200 00	7.00		1400.00	Sqm	4.00	5600.00
2	Earth work in hard soil in embankment roads within 50 mtrinitial lead &1.50 mtrinitial lift including rough dressing &breaking clods to Maximum 5.00c.m. to 7.00 c.m.&laying layers not exceeding 0 30 mtr depth as per specification approved by department along with proper compaction with H.R.R Excavation	1	200.00	2.00	0.75	300.00	Cum	197.1	59130.00
3	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be Supplied by the Company through contractual manner)	2	3.00	2.00	0.30	3.60	Cum	919.47	3310.09
									68040.09
		Rate per two Hundred meter Length				Total			Say Rs. 68040/-

Rate/Running metre length – Rs. 340.20 or Rs.340/-

Cost Estimate for Recharge Shaft

Sl. No	Item Description	Quantity	Unit	Rate (₹)	Amount (₹)
1	Earthwork excavation in ordinary soil (1.5m dia × 10m depth ≈ 222.5 m³)	223	m³	350	78,050
2	Disposal of excavated material	223	m³	150	33,450
3	Brick / RCC lining (if provided)	592	m²	900	5,32,800
4	Providing & laying gravel and pebble filter media	151	m³	1200	1,81,200
5	Coarse sand filling	63	m³	1000	63,000
6	Perforated PVC pipe (160–200 mm dia)	126	m	800	1,00,800
7	RCC slab cover with manhole cover	1	LS	12,000	12,000
				Total	10,01,300.00
				Over head charges 7.5%	75,097.50
				Contractor Profit 10%	1,00,130.00
				Total	11°76,527.50
				Labour Cess 1%	11,765.28
	TOTAL COST PER STRUCTURE				₹ 11,88,292.78 or say ₹11,88,293/-

ANNEXURE: 6

Detail Estimate of Loose Boulder Structure (L.B.S.)

Span of 2 Mtr. Size

Sl. No.	Item of activity	Cost per unit (Rs.)	Total unit(No/ Cum)	Total cost (in Rs.)
1.	Levelling the unshaped surface of the selected site & layout the structure foundation L.S. 1 MD.	462	1	462.00
2	Excavation of foundation in hard soil within initial lead of 50 mtr. Including rough dressing and breaking of clods to maximum size 5 cm. to 7 cm. laying in layer not exceeding 0.3 in depth to strengthening both side U/S approx. bund of loose boulder structure.	197.10	3.63	715.47
	Base with apron- 1 x 3.70 x 3.00 x 0.30 = 3.33			
	Wing wall- 4 x 0.50 x 0.50 x 0.30 = 0.30			
	@ Rs.19710.00 per 100 cum.			
3.	**Rough stone dry packing**	2859.35	8.65	24733.38
	up to GL			
	Base with apron- 1 x 3.70 x 3.00 x 0.30 =3.33			
	Wing wall- 4 x 0.50 x 0.50 x 0.30 = 0.30			
	Above Gl.			
	Super structure : x 2.00 x (2.70 + 0.60)/2 x 0.60 =1.980			
	Wing wall- 4 x 0.50 x 0.50 x 0.50 =0.50			
	Side wall-			
i.	2 x (0.50 + 1.10)/2 x 0.9 x 0.5 =0.72			
ii.	2 x (0.5 + 1.10)/2x 1.2 x 0.5 = 0.96			
iii.	2 x 0.6 x 0.6 x 0.5 =0.36			
iv.	2 x 1.0 x 0.5 x 0.5 =0.50			
	@ Rs.2859.35 per cum			
	G. Total per Loose Boulder Structure of span of 2 Mtrs			**25910.85 or Rs.25911/-**

Detail Estimate of Retaining wall of loose local Boulder with cement-Sand Patching over the surface of Boulder wall

Sl. No.	Description of Items	No	Length	Width	Height	Qty	Unit	Rate	Amount in Rs
1	2	3	4	5	6	7	8	9	10
For one K.M.Length									
1	Cleaning of Jungles & bushes	1	1000	1.5		1500	Sq m	4.00	6000.00
2	Earth work in hard soil in embankment roads with in 50 mtr initial lead &1.50 mtr initial lift including rough dressing &breaking clods to Maximum 5.00c.m. to 7.00 c.m.& laying layers not exceeding 0.30 mtr depth as per specification approved by department along with proper compaction with H.R.R Excavation	1	1000	1.5	0.3	450	Cu m	197.1	88,695.00
3	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be Supplied by our Company)	1	1000	(1.00+1.50)/2	1.20	1500	Cu m		
		1	1000	1.50	0.30	450	Cu m		
		Total				1950	Cu m	919.47	1792966.50
4	Irregular cement sand patches on the both side of the wall with 2" thick cement sand mortar (1:6) on top	1	1000	1.00		1000	Sq m		
		2	1000	1.20		2400	Sq m		
						3400	Sq m	125.00	425000.00
		Rate per one K.M. Length				Total			23,12,661.5 Say Rs. 23,12,665/-

Cost of Running Meter Length Rs. 2313/-

Annexure –8

Detail Estimate of Concrete Structure of Check Dam

J No	Description of Items	No	Length	Width	Height	Qty	Rate	Amount in Rs
1	2	3	4	5	6	7	8	9
1	Earth working in hard soil embankment roads with in 50 mtr initial lead &1.50 mtr initial lift including rough dressing &breaking clods to Maximum 5.00c.m. to 7.00 c.m.&laying layers not exceeding 0.30 mtr depth as per specification approved by department along with proper compaction with H.R.R Excavation							
	Base	1	5.00	5.50	0.50	13.75		
	Wing Wall	4	2.00	0.50	0.50	2.00		
	Appron	2	3.00	5.00	0.20	6.00		
	Cut of wall	2	5.00	0.45	0.50	2.25		
						24.00	197.10	4730.40
2	Plain cement concrete (1:4:8)							
	Base	1	4.00	5.50	0.075	1.65		
	Wing Wall	4	2.00	0.50	0.08	0.30		
	Appron	2	3.00	5.00	0.08	2.25		
	Cut of wall	2	4.00	0.45	0.08	0.27		
						4.47	4600.00	20562.00
3	Cement concrete (1:2:4)							
	Below Ground Level							
	Base	1	4.00	5.50	0.40	8.80		
	Wing Wall	4	2.00	0.50	0.40	1.60		
	Appron	2	3.00	5.00	0.10	3.00		
	Cut of wall	2	4.00	0.45	0.50	1.80		
						15.20		
	Above Ground Level							
	Base	1	4.00	(2.00+5.00)/2	1.00	14.00		
	Wing Wall	4	2.00	0.40	1.00	3.20		
					Total	17.20		
				Grand Total		32.40	6478.00	209887.2
	Rate per one No Check Dam. Length=4.00 mtr H=1.30 mtr Slope U/S=1:1.5 D/S=1:2					Total		2,15,179.60 Say Rs. 235180/-
	(Rupees two lakh thirty five thousand one hundred and eight) only.							

Annexure –9

ESTIMATE FOR PER RMT CONSTRUCTION OF SETTLING TANK
(Length: 3m., width: 2.0m. height: 1m.)

Sl No	Description of Items	No	Length	Width	Height	Qty	Unit	Rate	Amount
1	Earth work in hard soil in embankment roads within 50 mtr initial lead &1.50 mtr initial lift including rough dressing &breaking clods to a Maximum 5.00c.m. to 7.00 c.m., & laying layers not exceeding 0.30 mtr depth as per specification approved by the department, along with proper compaction with H.E.R. Excavation	1	3.00	2.00	1.0	6.00	Cum	197.1	1182.60
2	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be supplied by our Company)	1	3.00	4.00	0.20	2.40	Cum	919.47	2206.73
3	Transportation charges for 5.00 K.M. lead by truck load from quarry to work site with all costs of , labour, T. & P, etc. all complete in all respects as per specification and direction of	As same as Item No-2				2.40	Cum	200.00	480.00
								Rate per one No Settling tank of 6 Cum	3869.33
Cost for								Per 1 Cum Rs.645/-	Rs.3870.0

Annexure –10

ENGAGEMENT OF HEMM (HEAVY EARTH MOVING MACHINERIES) ON THE OB DUMP SLOPE FOR TERRACING

Location – Over Burden Dump –work efficiency per hour – 18SqM on the dump.
Width & height of the terrace – 5 m. & 5 m.
Rate for engagement of HEM machine per SqM – Rs. 2400/hr.
i.e. Rs. 2400/18
=Rs. 133.33/-, say Rs. 134/-

Annexure-11

COST ESTIMATE FOR BLOCK PLANTATION OF 1000 SEEDLINGS / Ha.

ANNEXURE-0

BASE COST NORM FOR COMPENSATORY AFFORESTATION (BLOCK PLANTATION)
@ 1000 PLANTS PER HECTARE (10 months old seedling)

WAGE RATE Rs. 311/- PER MANDAY

Sl. No	Items of work	Preferable Period of Execution	No of Mandays	Labour Cost (in Rs.)	Material Cost (in Rs.)	Total cost (in Rs.)
1	2	3	4	5	6	7
	4th Year (Advance work) Pre-Planting Operation					
1	Survey, Demarcation and Pillar marking	May/Dec	2	622	0	622
2	Preparation of Treatment Map (Digital Map)	Nov/Dec	1	311	100	411
3	Site preparation (Clearing & removal of debris)	Nov/Dec	12	3732	0	3732
4	Creation of 4.00 mt wide Inspection Path	Feb/Mar	1	311	0	311
5	Allotment and marking of plot	Feb/Mar	1	311	0	311
6	Digging of pits (45 cm x 45 cm X 45 cm) in hard and rocky soil	Feb/Mar	40	12440	0	12440
7	Construction of Temporary Labour Shed, Drinking water facility and First-Aid etc.	Jan/Mar	0	0	3500	3500
	Total		57	17727	3600	21327
	1st Year/Planting Year					
1	Refilling of pits by altering the dugout soil of the pit, application of organic compounds/ FYM/ FYM & mixing the same properly	Jun/Jul	7.5	2332.50	5000	7332.50
2	Transportation of 10 months old polythene bag seedlings by mini truck /tractor from the Permanent/Range nursery to planting site including loading & unloading. (Average load of 1000 Nos) & stacking the seedling in Rs.6/- per Seedling (1100 nos.)	Jul/Aug	0	0	6600	6600
3	Watering the planted seedlings at planting site	Jul/Aug	2	622	0	622
4	Conveyance of polypot seedlings on head load from the stacking site to individual dug out pits within the planting site, applying insecticide, fertilizers & planting after scraping the soil with other applied materials & pressing the soil perfectly around the planted seedlings	Jul/Aug	22.5	6997.50	0	6997.50
5	Cost of Fertilizer & Insecticide (a) NPK/Bio-fertilizer @ 50 gms/plant as basal dose = 50kg @ Rs 30/- per kg = Rs. 1500.00 (b) Urea/Vermicompost/Bio Khad/any other fertilizer in two subsequent doses @ Rs. 750.00 (c) Insecticide/ Bio pesticide @ 5 gms/plant=5kg @ Rs.150/- per kg = Rs.750.00	Jul/Aug	0	0	2800	2800
6	Casualty Replacement @ 10% (100 nos.)	Jul/Aug	2.5	777.5	0	777.5
7	1st weeding & Mulching	Aug/Sept	12	3732	0	3732
8	2nd Weeding. Soil working (1mt. diameter around the plant) & Manuring	Oct/Nov	15	4665	0	4665
9	Fire line tracing (2 m. wide fire line over 400 m long) including maintenance of inspection path	Feb/Mar	3	933	0	933
10	Watch & Ward including watering as per requirement	Aug-Mar	57	3732	0	3732
	Total		76.50	23791.50	14500.00	38291.50
	2nd Year Maintenance					
1	Transportation of 100 seedlings from Nursery to plantation site including loading, unloading & transportation by Tractor @ Rs.6/- per seedling	Jul	0	0	600	600
2	Casualty replacement- 10%	Jul	2.5	777.5	0	777.5
3	Cost of Fertilizer & Insecticide A) Cost of Insecticide/ Bio-pesticide @ 5 gms/plant = 0.5 Kg @ Rs.150/- per kg = Rs.75/- B) Urea/NPK/Bio-fertilizer/Vermicompost/Bio Khad/any other fertilizer @Rs. 2800/-	July/Aug	0	0	2875	2875
4	Weeding (Complete weeding & Mulching & Soil working. 1 mt. diameter around the plant)	Sep/Oct	15	4665	0	4665
5	Fire line tracing (2 m. wide fire line over 400 m long) including maintenance of inspection path	Feb/Mar	3	933	0	933
6	Watch & Ward including watering as per requirement	Apr-Mar	10	5000	0	5000
7	Maintenance of Temporary Labour Shed, Drinking water facility and First Aid etc.	Apr-Mar		0	1000	1000
	Total		30.5	11973.5	4475	16448.5

Sl. No	Items of work	Preferable Period of Execution	No of Mandays	Labour Cost (in Rs.)	Material Cost (in Rs.)	Total cost (in Rs.)
1	2	3	4	5	6	7
	2nd Year Maintenance					
1	Cost of Fertiliser(Urea/NPK/Bio-fertilizer/Vermicompost/Mo Khaita/any other fertiliser	July/Aug	0	0	2800	2800
2	Weeding (Complete weeding), Manuring & Soil working 4 feet diameter around the plants)	Sep/Oct	15	4665	0	4665
3	Fire line tracing (2 m. wide fire line over 400 m long) including maintenance of protection path	Feb/Mar	3	933	0	933
4	Watch & Ward including watering as per requirement	Apr/May	18	5598	0	5598
5	Maintenance of Temporary Labour Shed, drinking water facility and First Aid etc.	Apr/May	0	0	1000	1000
	Total		36.0	11196	3800	14996
	4th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m long) including maintenance of protection path	Feb/Mar	3	933	0	933
2	Watch & Ward including maintenance of vegetative fencing	Apr-May	18	5598	0	5598
	Total		21	6531	0	6531
	5th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	933.00	0	933
2	Watch & Ward	Apr/May	18	5598.00	0	5598
	Total		21	6531	0	6531
	6th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	933.00	0	933.0
2	Pruning of branches, Shoots cut of multiple shoots	Jan/Mar	3	933.00	0	933.0
3	Watch & Ward	Apr/May	18	5598.00	0	5598.0
	Total		24	7464	0	7464.0
	7th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	933.00	0	933
2	Watch & Ward	Apr/May	18	5598.00	0	5598
	Total		21	6531	0	6531
	8th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	933.00	0	933
2	Watch & Ward	Apr/May	18	5598.00	0	5598
	Total		21	6531	0	6531
	9th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	933.00	0	933
2	Watch & Ward	Apr/May	18	5598.00	0	5598
	Total		21	6531	0	6531
	10th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	933	0	933
2	Watch & Ward	Apr/May	18	5598.00	0	5598
	Total		21	6531	0	6531

Year wise Abstract of Cost Form (showing seedling cost separately) .

Sl. No	Items of Work	Preferable Period of Execution	No of Mandays	Labour Cost (in Rs.)	Material Cost (in Rs.)	Total cost (in Rs.)	
1	2	3	4	5	6	7	8
Sl. No	Year	No of mandays	Labour cost (at Rs)	Material Cost(in Rs.)	Monitoring, Evaluation, Learning, Documentation and Other Contingency (5%) of [4+5]	Cost of Seedlings @Rs.60.33 per seedlings	TOTAL COST(in Rs)
1	2	3	4	5	6	7	8
1	0th year	30.0	17727.0	3540.0	977.85	0.00	22244.85
2	1st year	280	16551.0	14160.0	1535.55	85341.00	117587.55
3	2nd year	280	16551.0	4720.0	1064.55	39513.00	61848.55
4	3rd year	240	14184.0	2360.0	777.72	0.00	17321.72
5	4th year	240	14184.0	0.0	709.20	0.00	14893.20
6	5th year	240	14184.0	0.0	709.20	0.00	14893.20
7	6th year	240	14184.0	0.0	709.20	0.00	14893.20
8	7th year	240	14184.0	0.0	709.20	0.00	14893.20
9	8th year	240	14184.0	0.0	709.20	0.00	14893.20
10	9th year	240	14184.0	0.0	709.20	0.00	14893.20
11	10th year	240	14184.0	0.0	709.20	0.00	14893.20
	Total	2550.0	150687.0	30780.0	8399.4	124834.0	314700.4

Note:

1. Priority must be given to the indigenous local species available locally in the site of plantation.
2. Wet & indigenous draw bearing areas must be preferred to Plantation.
3. Site specific Soil conservation work like CBCB, Gully Plugging, Staggered Trench, Contour Trench, Crescent Bund, etc. may be taken up.
4. Chain Link fencing can be adopted in the EA plantations which are outside the forest area and Bamboo twigs fencing only be preferred.
5. Watering facilities for procurement of water & watering may be adopted as per the availability of water.
6. The Cost Norm of various items can be changed with the approval of the concerned RCCFs keeping the overall cost norms fixed for each Financial Year.

ACCF (Forest Diversion & FD, FC Act)

Matrix for Model-I A Conventional CA Plantation (AR) 1000 plants per Ha

In Rupees

Sl. NO.	Commence Model Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	XXI	Total Cost (20 Years)
Base Norm		27300	95851	22301	15745	6857	6857	7837	6857	6857	6857	6857											
1	2021-22	21300	100434	24585	18226	8335	8751	10502	9640	10191	10657	21160											284718
2	2022-23		23415	105456	25614	19137	8752	9188	11027	20130	10638	21169	21797										346454
3	2023-24			24585	110929	27105	20094	9190	9648	21578	10657	21170	21727	12911									358772
4	2024-25				25815	116263	20460	21099	8850	20130	12157	21169	21729	12919	12909								278716
5	2025-26					27106	122378	20883	22154	20131	20687	21764	21727	12914	12929	12678							285302
6	2026-27						28481	128182	21577	23462	20640	21169	21408	12919	17931	13578	14264						290567
7	2027-28							23884	134591	32498	24625	21172	21727	14079	12909	13578	14354	14967					318546
8	2028-29								31578	142321	34293	25646	21781	21313	14777	13679	14257	14967	15715				330228
9	2029-30									32967	143167	34329	26928	12913	12929	15516	14254	24970	15715	16501			346788
10	2030-31										43494	255806	30139	28274	12934	13575	16292	14967	15719	16501	17926		364227

APCCF (Forest Diversion & NO, FC Act)

Annexure – 12

Estimate for Vetiver Plantation (Bana) on the OB dump slopes per ha.

Cost norm, Wages - Rs.462/-

Sl. No	Name of the Work	Man Days	Manpower Cost	Material Rs.	Total Cost in Rs
	1st YEAR OPERATION				
1	Site clearance, alignment and stacking	2	924	0	924
2	Cost of lining materials including transportation.	0	0	1,500	1,500
3	Staking and digging of pits.	20	9,240	0	9,240
4	Cost of Clumps 500 per Ha including transportation.	0	0	16,000	16,000
5	Carriage and planting	30	13,860	0	13,860
6	Soil working and application of fertilisers(twice)	10	4,620	0	4,620
7	Cost of fertiliser	0	0	1,500	1,500
8	Watch and ward	2	924	0	924
	Total	64	29,568	19,000	48,568
	2nd YEAR OPERATION				
9	Causality replacement (20%) including cost of clumps.	10	4,620	3,200	7,820
10	Weeding and application of fertilisers	20	9,240	0	9,240
11	Cost of fertilisers and insecticides	0	0	1,500	1,500
12	Watch and ward	2	924	0	924
	Total	32	14,784	4,700	19,484
	3rd YEAR OPERATION				
13	Weeding, soil working and application of fertilisers.	10	4,620	0	4,620
14	Plant protection measures including watch and ward	2	924	0	924
	Total	12	5,544	0	5,544
4TH YEAR TO 10TH YEAR		84	38,808	0	38,808
	Grand Total	192	88,704	23,700	1,12,404

ABSTRACT

Year of operation	Cost norm per Ha
1st year	48,568
2nd year	19,484
3rd year	5,544
4th to 10th year	38,808
Total	1,12,404

Annexure – 13

COST NORM FOR AGAVE PLANTATION (FOR 5 ROWS & 40 MTRS.)

Wage Rate: 462.00

Sl.No	Name of the Work	Man-Day	Man Power Cost	Material	Total
	FIRST YEAR OPERATION				
1	Site clearance alignment and stacking	2	924	0	924
2	Cost of lime materials including transportation	0	0	660	660
3	Digging pits and application of lime	6	2,772	0	2,772
4	Cost of 200 Ac. (sucker) including transportation	0	0	3320	3,320
5	Carriage and planting	2	924	0	924
6	Soil working and application of fertilizers (twice) and lime	8	3,696	0	3,696
7	Cost of fertilizer	0		740	740
8	Contingency	0		740	740
	Total:-	18	8,316	5460	13,776
	SECOND YEAR OPERATION				
1	Causality replacement (20%) including cost of suckers and pitting	2	924	664	1,588
2	Weeding and application of fertilizer and lime	6	2,772	0	2,772
3	Cost of fertilizer insecticides & lime			500	500
	Total:-	8	3,696	1,164	4,860
	THIRD YEAR OPERATION				
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	6	2,772	1000	3,772
	FOUR YEAR OPERATION				
1	Weeding, cleaning, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	6	2,772	1000	3,772

FIVE YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	6	2,772	1000	3,772
SIX YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	6	2,772	1000	3,772
SEVEN YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	6	2,772	1000	3,772
EIGHT YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	6	2,772	1000	3,772
NINE YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	6	2,772	1000	3,772
TEN YEAR OPERATION					
1	Weeding, soil working and application of fertilizers	6	2,772	0	2,772
2	Cost of fertilizer and insecticides			500	500
3	Plant protection measures including material cost			500	500
	Total:-	6	2,772	1000	3,772
				Grand Total : -	48,612

Cost norm for agave fencing with five rows per km for 10 Year 48812/40 X 1000 =Rs.12,20,300/-

Annexure- 14

COST OF GRASS SEED SOWING PER HA.

Wage Rate Rs.462.00

Sl No	Purpose	No of Labour / Quantity of materials	Rate (Rs.)	Amount (Rs.)
1	Spreading of good top soil	03 Nos	462 / labour	1386
2	Adding FYM and good earth	2 TL FYM	1506.48 /TL FYM	6025.92
		2TL good earth	1506.48 /TL Good earth	
3	Cost of grass seed 500Kg/ per ha.		95/kg	47,500.00
4	Broadcasting	10 nos.	462.00/ labour	4620.00
			Total	59531.92 Or, 59,532.00

ANNEXURE-15

Measure to be taken for construction of pond:

Wage Rate Rs.462/- per manday

TYPE OF STRUCTURE	POND
LOCATION	lower elevation area near the convergence point of the hil slope within the Baitarani Reserve Forest
Latitude	21°58' 33.74"N to 21°58' 33.93"N
Longitude	85°24'0.82"E to 85°24'3.47"E
LENGTH	80
WIDTH	50
HEIGHT	3
VOLUME IN CUM	12000
UNITS	1
TOATAL QTY IN CUM	12000
COST /CUM	Rs.387/-
TOTAL COST	Rs. 46,44,000/-

WATER BODY (80m X 60m X 3m)					
SL No	Item of Work	Qty	Unit	Rate (in Rs.)	Amount (in Rs.)
1	Earth Work in excavation in stony earth and gravels mixed with stone and boulders not exceeding .014cum in volume within 50met. Initial lead and 1.5met Initial lift including rough dressing and breaking clods etc. complete.				
	40m x 30m x 3.0m	12000	Cum	273/-	44,76,000.00
2	Extra lift of 1.5meter or part there of over the initial lift of 1.5meter for earth work in all kinds of embankment and roads works and ordinary earthwork in general.				
		6000	Cum	28/-	1,68,000.00
	Total.				46,44,000
		Rate for 1cum			Rs.387.00

Analysis of Rate for Water Body					
1	Earth Work in excavation in stony earth and gravels mixed with stone and boulders not exceeding .014cum in volume within 50met. Initial lead and 1.5met. Initial lift including rough dressing and breaking clods etc. complete.	M.Mulla	0.34	462	157.08
		W.Mulla	0.34	462	157.08
		Total.-			314.16
		Over head charges 7.5%			23.56
		Contractor Profit 10%			31.42
		Total:-			369.14
		Labour Cess 1%			3.69
		Rate per Cum			**372.83 or say Rs.373.00**
2	Extra lift of 1.5meter or part there of over the initial lift of 1.5meter for earth work in all kinds of embankment and roads works and ordinary earthwork in general	M.Mulla	5	462	2310
		Rate for 100 cum			2310
		Over head charges 7.5%			173.25
		Contractor Profit 10%			231.00
		Total:-			2714.25
		Labour Cess 1%			27.14
		Total:-			2741.39
		Rate per Cum			**27.41 or Rs. 28.00**

Model Estimate of Wire Mesh LBCD

Providing & making Gabion structure with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh Gabion Boxes as per IS 16014:2012,MORTH Clause 2500, of required size, Mesh Type 10x12 (D=100 mm with tolerance of ± 2%) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedges with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2mm,supplied @3% by weight of Gabion boxes, filled with boulders with least dimension of 200 mm,

Details of Cost for: 2.00 Cum

SL No.	Description	Unit	Quantity	Rate (In Rs.)	Amount (In Rs.)
MATERIALS:					
1	Crates made of GI Mesh Type 10x12 (D=100 mm with tolerance of ± 2%) Zinc coated, Mesh wire diameter 3.0 mm) For size 2 m X 1m X 1 m. Surface area is 11.00 Sqm	Sqm	11	600	6600
	Stone boulder with least dimension 200 mm	Cum	2	1000	2000
	Total (A)				**8600**
	LABOUR:				
Male		Day	0.1	562	56.2
Mason Second class		Day	0.5	512	256
Man Mukia		Day	1.5	462	693
	Total (B)				**1005.2**
	Total (A+B)				**9605.2**
Add CH Charges @ 7.5% on (A+B)					720.39
Contractor Profit @ 10 % on (A+B)					960.52
	Total:-				11286.11
	Add LC @ 1%				112.86
	Total:-				11,398.97or say 11,400.00
	Cost for 2.00 Cum				11,400.00
	Cost for 1.00 Cum				5,700.00

Annexure- 17

ESTIMATE FOR DIGGING OF STAGGERED TRENCHES Wage Rate 2Rs462/-per Manday	
SPECIFICATION	
Length : 2.5 m	
Width " 0.5 m	
Depth : 0.5 m	
Cross Section : (0.5 m x 0.5 m) = 0.25 sqm	
For Earth Work : (2.5m x 0.25 sqm) = 0.625 cum	
Description	0 – 30 ° Slope
Gap between trenches (Horizontal)	4 – 5 metres
Distance between trenches (Vertical)	5 – 7 metres
Cost of Staggered trench per Ha @ 60 PERSON DAYS @ 462/PD (300 pits)	Rs. 27720 .00
Overhead Charges @7.5 %	Rs. 2079.00
Contractor Profit @10 %	Rs.2772.00
Total	Rs.32571.00
Labour Cess @1%	Rs. 325.71
G.Total	Rs 32896.7 Or say Rs. 32900/-

Annexure-18

COST STRUCTURE OF PLANTATION, PROVISION OF FUNDS AND UTILIZATION

ANNEXURE-II

Unit Cost Norms for Compensatory Afforestation through Aided Natural Regeneration (ANR) @ 200 Seedlings/Ha. (18 months old seedling)

WAGE RATE Rs. 311/- PER MANDAY

Sl. No	Items of work	Preferable Period of Execution	No of Mandays	Labour Cost (in Rs.)	Material Cost (in Rs.)	Total cost (in Rs.)
	0th Year (Advance work) Pre-Planting Operation					
1	Survey, Demarcation and Pillar posting	Nov/Dec	2	622	0	622
2	Preparation of Treatment Map (Digital Map)	Nov/Dec	1	311	100	411
3	Site preparation	Nov/Dec	2	622	0	622
4	Silvicultural operations including clearance of weed, cutting of climber, High stump cutting, stacking of thorny & removal of cut out after drying from the field to black space.	Jan/Feb	15	4665	0	4665
5	Alignment and marking for digging of pits	Feb/Mar	0.5	156	0	156
6	Digging of pits (45 cm x 45 cm X 45 cm) in hard and gravelly soil	Feb/Mar	8	2488	0	2488
	Total		28.5	8863.5	100.0	9063.5
	1st Year Planting Year					
1	Refilling of pits by altering the disgusted soil of the pits, application of organic compounds/ CDM/ FYM & mixing the same perfectly.	June/Jul	1.8	466.5	1000	1467
2	Transportation of 18 months old polythene bag seedlings in hired truck /tractor from the permanent/Mega nursery to planting site including loading & unloading. (Average lead of 10 Kms) & Stacking the seedling @ Rs.6/-/ Seedling (220 nos.)	Jul/Aug	0	0	1320	1320
3	Watering polythene bag seedlings at stacking site of plantation	Jul/Aug	0.5	155.5	0	156
4	Conveyance of polythene bag seedlings on head load from the stacking site to individual disgust pits within the planting site, applying insecticide, fertilizer & planting after scooping the soil with other applied materials and pressing the soil perfectly around the planted seedling.	Jul/Aug	4.5	1399.5	0	1400
5	Cost of Fertilizer & Insecticide (a) NPK/ Bio-fertilizer @ 50 gms/ plant as basal dose = 10kg @ Rs.30/- per kg = Rs. 300.0 (b) Urea/Vermicompost/Bio fertilizer/any other fertilizer @ Rs. 150.00 (c) Insecticide/ Bio-pesticide @ 5 gms/plant= 1 kg @ Rs.150/- per kg = Rs. 150/-	Jul/Aug	0	0	600	600
6	Casualty Replacement @ 10% (20 nos.)	Jul/Aug	0.5	156	0	156
7	1st weeding & Mulching	Aug/Sept	2	622	0	622
8	2nd Weeding, Soil working (Hoe, dispersion around the plants) & Mulching	Oct/Nov	3	933	0	933
9	Fire line cleaning & inspection path	Feb/Mar	3	933	0	933
10	Watch & Ward including watering at per requirement	Aug-Mar	8	2488	0	2488
	Total		23	7153	2920	10073
	2nd Year Maintenance					

Sl. No	Items of work	Preferable Period of Execution	No of Mandays	Labour Cost (In Rs.)	Material Cost (In Rs.)	Total cost (In Rs.)
1	Transportation of 20 seedlings from Nursery to plantation site including loading, unloading & conveyance by Tractor @ Rs.6/- per seedling	Jul	0	0	120	120
2	Planting for casualty replacement	Jul	0.5	1555	0.0	1555
3	Cost of Fertilizer & Insecticides A) Cost of insecticide/ Bio- pesticide(Thimet/ Furadz) @5 gms/plant = 0.1 Kg @ Rs.150/- per kg = Rs.15/- B) Urea/NPK/Bio-fertilizer/Vermicompost/Mo (Rate/any other fertilizers Rs. 560/-	Jul	0	0	575	575
4	Weeding (Complete weeding), Manuring & Soil working, (1mt. diameter around the plants)	Sep/Oct	4	1244	0.0	1244
5	Fire line tracing (2 m. wide fire line over 400 m long) & inspection path	Feb/Mar	3	933	0.0	933
6	Watch & Ward including watering as per requirement	Apr/Mar	12	3732	0.0	3732
	Total		19.5	6064.5	695.0	8759.5
	3rd Year Maintenance					
3	Cost of Fertilizer : Urea/NPK/Bio-fertilizer/Vermicompost/Mo (Rate/any other fertilizers= Rs. 560/-	Sep/Oct	0	0	560	560
4	Weeding (Complete weeding), Manuring & Soil working, (1mt. Diameter around the plants)	Aug/Sep	4	1244	0	1244
5	Fire line tracing (2 m. wide fire line over 400 m long) & inspection path	Feb/Mar	3	933	0	933
6	Watch & Ward including watering as per requirement	Apr/Mar	12	3732		3732
	Total		19.0	5909.0	560.0	6469.0
	4th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m long) & inspection path	Feb/Mar	3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732	0	3732
	Total		15	4665	0	4,665
	5th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length) &inspection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732.00	0	3732
	Total		15.0	4665.0	0	4665
	6th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length) &inspection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732.00	0	3732
	Total		15.0	4665.0	0.0	4665.0
	7th Year Maintenance					
1	Fire line tracing (2 m. wide fire line over 400 m length) &inspection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732.00	0	3732
	Total		15.0	4665.0	0.0	4665.0
	8th Year Maintenance					

Sl. No	Items of work	Preferable Period of Execution	No of Man Days	Labour Cost (in Rs.)	Material Cost (in Rs.)	Total Cost (in Rs)
1	Fire line cutting (2 m. wide fire line over 400 m length) &inspection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732.00	0	3732
	Total		15.0	4665.0	0.0	4665.0
	9th Year Maintenance					
1	Fire line cutting (2 m. wide fire line over 400 m length) &inspection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732.00	0	3732
	Total		15.0	4665.0	0.0	4665.0
	10th Year Maintenance					
1	Fire line cutting (2 m. wide fire line over 400 m length) &inspection path	Feb/Mar	3	933.00	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732.00	0	3732
	Total		15.0	4665.0	0.0	4665.0

Year wise Abstract of Cost Norm (showing seedling cost separately)

Sl. No	Year	No. person days	Labour cost @ Rs. 311/-per day (Rs)	Material Cost (in Rs.)	Monitoring Evaluation, Learning, Documentation and Other Contingency (5%) of (4+5+6)	Cost of Seedlings @Rs.50.31 per seedlings	TOTAL COST
1	2	3	4	5	7	6	8
1	0th year	28.5	8864.5	100	436.50	0.00	9401.0
2	1st year	21.0	21931.0	2920	487.00	31068.00	21568.0
3	2nd year	19.5	6064.5	496	280.50	2056.00	8896.0
4	3rd year	19.0	5909.0	344	271.00	0.00	6780.0
5	4th year	15.0	4665.0	0	435.00	0.00	4800.0
6	5th year	15.0	4665.0	0	135.00	0.00	4800.0
7	6th year	15.0	4665.0	0	135.00	0.00	4800.0
8	7th year	15.0	4665.0	0	135.00	0.00	4800.0
9	8th year	15.0	4665.0	0	135.00	0.00	4800.0
10	9th year	15.0	4665.0	0	135.00	0.00	4800.0
11	10th year	15.0	4665.0	0	135.00	0.00	4800.0
	Total:	195.0	60643.0	4276.0	2748.0	33074	79274.0

Note:

1 Planting must be given in the subsequent kharif season available mainly in the site of plantation.

2 10% unfilled pits during casualty to be replaced in Plantation.

3 Site specific soil conservation work like CCD, Gully Plugging, Stagger Trench, Contour Trench, Graded Bund, etc. may be taken up

4 Chain link Fencing to be adopted in the CA plantation where ever outside the forest area and Barbed wire fencing may be provided in CA plantations where up to Reserved Forest Area.

5 Watering Facilities for proper growth of saplings watering may be adopted as per the availability of water

6 The Cost Norm of various items can be changed with the approval of the competent DCFs keeping the overall cost norm fixed for each Financial Year

DFO (Forest Diversion & NO, FC Act)

Matrix for ANR-200 Plants/ Ha

In Rupees

Sl. No.	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	XXI	Total Cost
Base Norms		6400	21525	8086	6700	4800	4800	4800	4800	4800	4800	4800											
1	2012-13	6400	22645	8826	7384	5856	6126	6452	6754	7082	7446	7819											96131
2	2013-14		9870	29778	9767	6144	6126	6452	6754	7082	7447	7819	8218										100938
3	2014-15			10964	24867	9720	6391	6452	6754	7082	7447	7819	8209	8621									105586
4	2015-16				10829	25815	10217	6879	6754	7082	7447	7819	8216	8843	9083								113286
5	2016-17					11426	24526	10726	9428	7082	7447	7819	8210	8621	9050	9505							118852
6	2017-18						11897	28907	11364	8959	7447	7819	8210	8621	9051	9505	9980						122288
7	2018-19							13587	30397	11827	10894	7819	8210	8621	9051	9505	9978	10479					129829
8	2019-20								13227	31984	12416	10814	8210	8621	9297	9505	9980	10477	11001				135271
9	2020-21									15814	13457	13210	11640	8621	9051	9505	9980	10479	12001	11583			142035
10	2021-22										14892	15330	13691	12089	9057	9505	9980	10479	11005	11581	12191		149187

APCCF (Forest Diversion & NO, FC Act)

Annexure- 19

Cost Norms for Creation of Compensatory Afforestation with Stabilization of Soil Moisture Conservation (SMC)

Annexure-II

Cost norms for creation of Compensatory Afforestation with Stabilization of soil & Conservation of Moisture (SMC)

WAGE RATE Rs. 211/- PER DAY

Sl.No	Name of Works	Preferable Period of Execution	Total Cost
	0th Year (Pre-Planting Operation)		
1	NIL		0
	1st Year		
2	Soil Conservation measure structures like Staggered Trench, Percolation pit, Contour trench, Gradient earthen bund, CCD, Wire mesh CPCT, Soil surface Dyke & Wire mesh like other Suitable requirement as I/C	Apr/Sept.	20,215
	2nd Year		
3	Maintenance of SMC structures @ 15% of initial cost	April	3,032
	3rd Year		
4	Maintenance of SMC structures @ 15% of initial cost	April	3,032
	4th Year		
5	Maintenance of SMC structures @ 15% of initial cost	April	3,032
	5th Year		
6	Maintenance of SMC structures @ 15% of initial cost	April	3,032
	Total		32,343.0

Abstract

Sl. No.	Item	No. person days	Labour cost @ Rs. 211/-per day	Material Cost	Total cost (Rs.)
1	0th year	0.0	0.0	0.0	0.0
2	1st year	0.0	0.0	20,215.0	20,215.00
3	2nd year	0.0	0.0	3,032.00	3,032.00
4	3rd year	0.0	0.0	3,032.00	3,032.00
5	4th year	0.0	0.0	3,032.00	3,032.00
6	5th year	0.0	0.0	3,032.00	3,032.00
	Total	0.00	0.0	32,343.0	32,343.0

Different types of SMC structures may be taken up as per the scope & requirements of the plantation site as per the design & specification of different structures accepted along this document.

ACF (under section 3(2) of FC Act)

Matrix for (SMC)

in Rupees

Sl. NO.	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIV	XV	XVI	Total Cost
Base Power		0	20215	3032	3032	3032	3032										
1	2021-22	0	21276	3942	8510	3883	3830										35832
2	2022-23		0	21287	3509	3686	8609	4064									30415
3	2023-24			0	29401	3684	3830	4087	4267								38284
4	2024-25				0	24671	9868	4084	4295	4485							43340
5	2025-26					0	25400	4061	4257	4478	4704						43910
6	2026-27						0	29295	4264	4480	4702	4939					45875
7	2027-28							0	18443	4697	4704	4937	5186				47969
8	2028-29								0	25867	4701	4939	5184	5445			50136
9	2029-30									0	21360	4936	5186	5441	5717		52642
10	2030-31										0	30908	5189	5446	5715	6003	53274

APCCF (Forest Diversion & MO, FC Act)

MINING LEASE BOUNDARY / DIVERTED BOUNDARY PILLAR CO-ORDINATES WITH DISTANCE BETWEEN PILLAR TO PILLAR OF DALPAHAR IRON & MANGANESE MINES OF M/S AVIN JAIN OF M.L. AREA OVER 89.961 HECTS. IN BAITARANI R.F.UNDER KEONJHAR FOREST DIVISIN OF KEONJHAR DISTRICT OF ODISHA.

SL. No.	Pillar No.	Geodetic System (WGS - 84)		Boundary Line	Distance in mtrs.
		Latitude	Longitude		
1	1	N21°58'42.918"	E85°23'33.784"	1--2	219.33
2	2	N21°58'37.759"	E85°23'39.063"	2--3	91.40
3	3	N21°58'34.859"	E85°23'38.848"	3--4	189.57
4	4	N21°58'32.955"	E85°23'32.541"	4--5	205.37
5	5	N21°58'26.281"	E85°23'32.763"	5--6	121.54
6	6	N22°58'26.491"	E85°23'28.532"	6--7	249.04
7	7	N21°58'18.570"	E85°23'26.729"	7--8	139.87
8	8	N21°58'14.538"	E85°23'28.983"	8--9	305.57
9	9	N21°58'04.701"	E85°23'30.475"	9--10	239.13
10	10	N21°58'05.007"	E85°23'38.804"	10--11	318.42
11	11	N21°58'05.582"	E85°23'49.886"	11--12	117.29
12	12	N21°58'05.769"	E85°23'53.970"	12--13	149.57
13	13	N21°58'06.039"	E85°23'59.175"	13--14	309.00
14	14	N21°58'16.117"	E85°23'59.027"	14--15	301.22
15	15	N21°58'25.872"	E85°23'58.906"	15--16	316.25
16	16	N21°58'36.149"	E85°23'58.778"	16--17	212.24
17	17	N21°58'43.044"	E85°23'58.484"	17--18	310.69
18	18	N21°58'42.993"	E85°23'48.700"	18--19	293.86
19	19	N21°58'42.942"	E85°23'37.411"	19--1	104.04

COUNTERSIGNED

Divisional Forest Officer
Keonjhar Division

Asst, Conservator of Forests
I/C, Champua Forest Range

PHOTO COPY OF THE DIVERTION PILLAR DEMARCATED IN DALPAHAR IRON & MANGANESE MINES

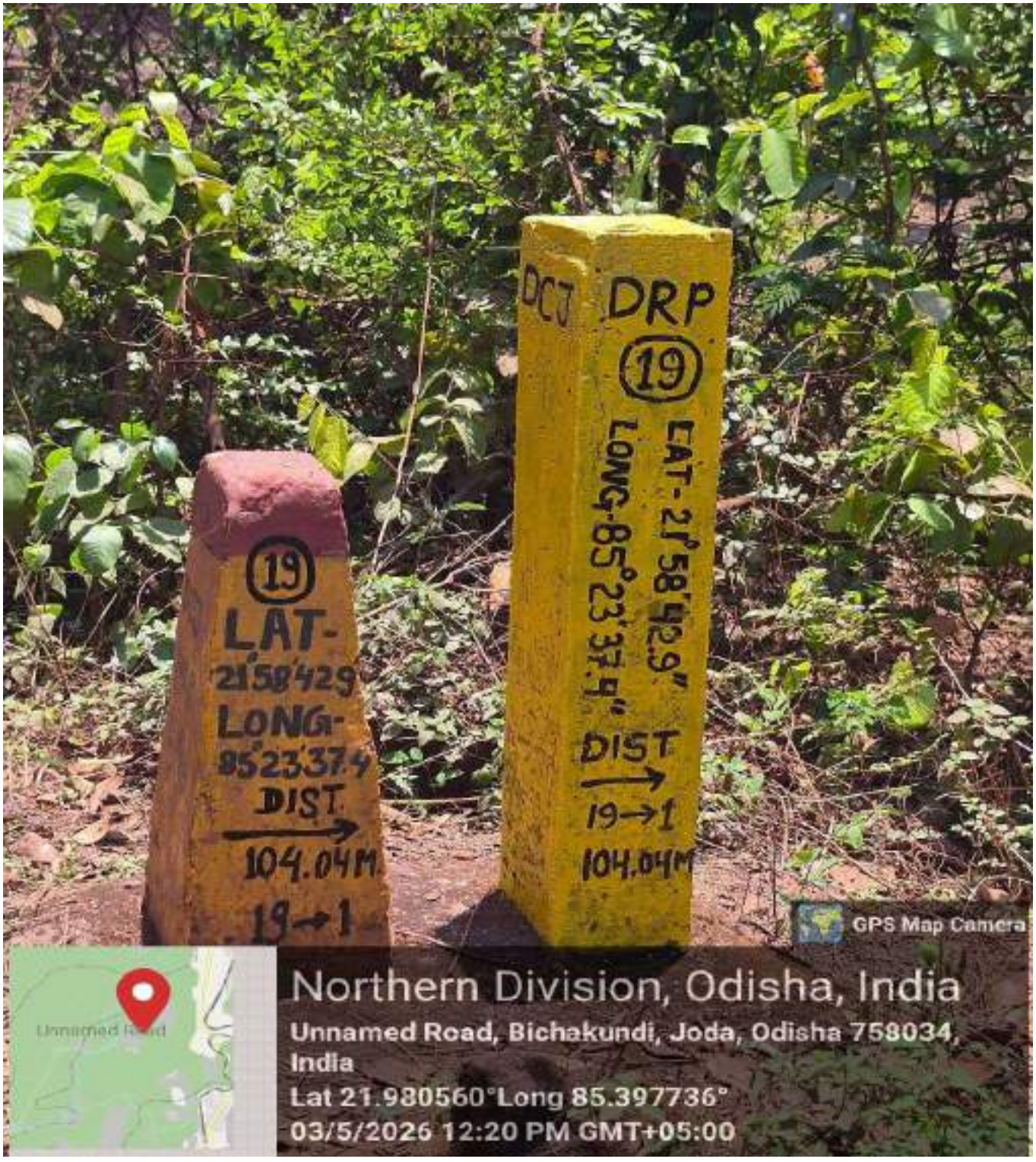


PHOTO COPY OF THE DIVERTION PILLAR DEMARCATED IN DALPAHAR IRON & MANGANESE MINES

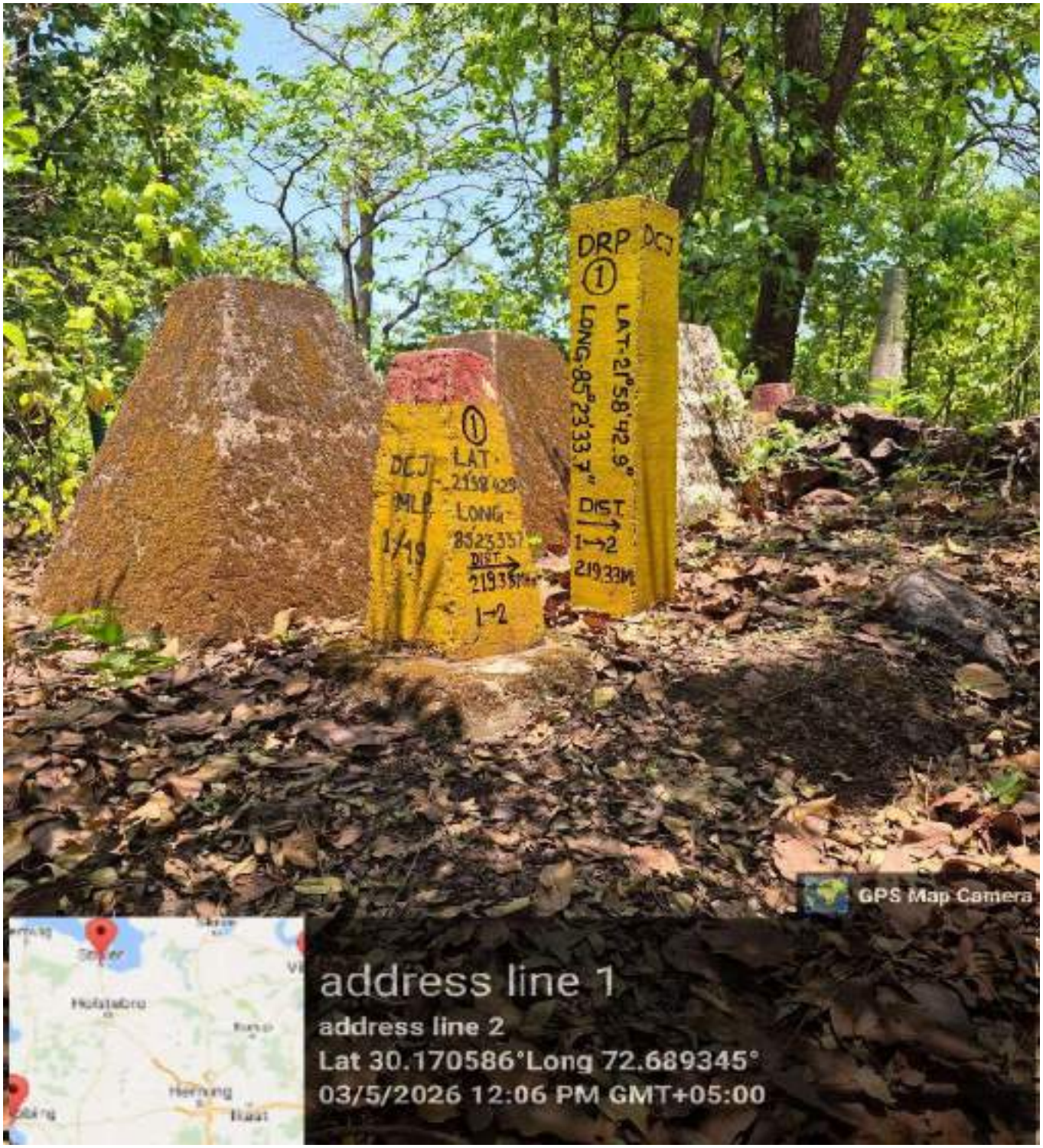


PHOTO COPY OF THE SAFETY ZONE PILLAR DEMARCATED ALONG THE ML BOUNDARY PILLAR OF DALPAHAR IRON & MANGANESE MINES

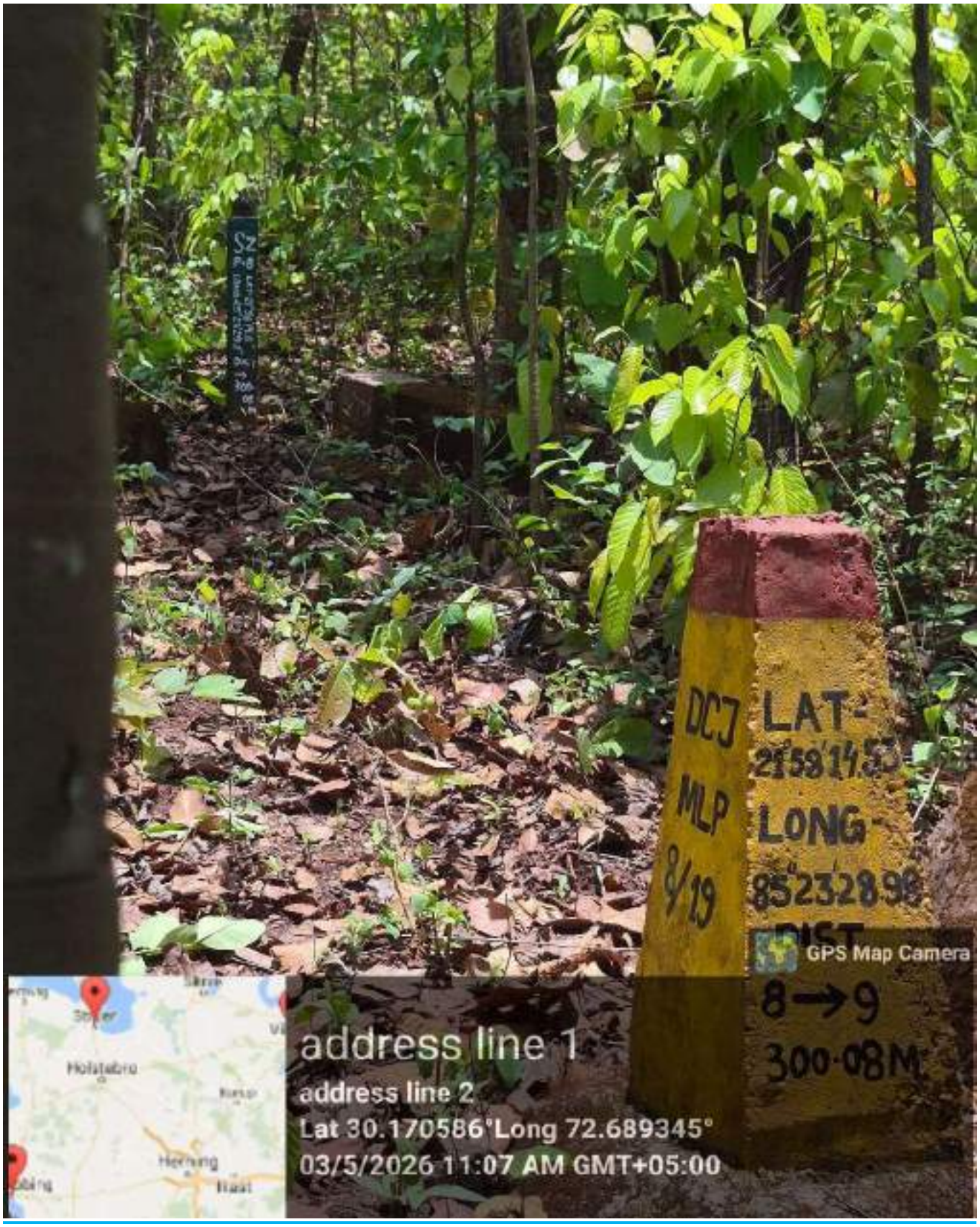


PHOTO COPY OF THE ML BOUNDARY PILLAR DEMARCATED IN DALPAHAR IRON & MANGANESE MINES

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS (WILDLIFE) & CHIEF WILDLIFE WARDEN, ODISHA
Government of Odisha, Forest, Environment & Climate Change Department
PRAKRUTI BHAWAN, PLOT NO.1459, SAHEED NAGAR, BHUBANESWAR- 751007
Phone: 0674-2602250, Website: www.wildlife.odisha.gov.in, Email: pccfwl@odisha.gov.in

Memo No. 3439 / PT1-CWLW-FDWC-FD-0144-2021
Dated, Bhubaneswar the 16th April, 2026

To

The Divisional Forest Officer
Keonjhar Forest Division

Sub: Proposal for the diversion of 79.367 ha. of forest land in favour of Shri Avin Jain (Heir of late Shri DC Jain) for mining of Iron & Manganese Ore in Dalpahar Iron & Manganese Mines in Keonjhar District – Approval of Scheme for creation and maintenance of alternate habitat / home for Avifauna.

Ref: Memo No. 1053 dated 10.03.2026 of the RCCF, Rourkela Circle addressed to this office with a copy thereof endorsed to you vide Memo No. 1055 of even date.

With reference to the above subject, I am directed to enclose herewith a copy of the scheme for creation and maintenance of alternate habitat/ home for the avifauna, prepared at a total cost of ₹145.920 Lakh (Rupees One Crore Forty-five Lakh Ninety-two Thousand only) in respect of the above project duly approved by PCCF (Wildlife) & CWLW, Odisha.

A copy of the approved scheme may be provided to the user agency for their reference. Accordingly, demand should be raised upon the User Agency to deposit the approved amount in State CAMPA fund in compliance to Condition No. 2(xxxvi) of the Stage-I approval letter granted by MoEF&CC, New Delhi for the proposal.

Additionally, the 5% cost of the approved cost of the scheme shall be contributed by the User Agency to the account of "DFO, Keonjhar Forest Division" for monitoring purpose of the scheme. Demand letter may be placed before the user agency accordingly.

Encl.: Copy of the approved scheme.

Chief Conservator of Forests (Wildlife)

P.T.O.

Memo No. 3430 / Date 16.04.2026

Copy forwarded to the PCCF (FD & NO, FC Act), Odisha, O/o. The PCCF & HoFF, Odisha, Bhubaneswar for kind information and necessary action with reference to Memo No. 1054 dated 10.03.2026 of the RCCF, Rourkela Circle.

Chief Conservator of Forests (Wildlife)

Memo No. 3431 / Date 16.04.2026

Copy along with a copy of the enclosure forwarded to the Regional Chief Conservator of Forests, Rourkela Circle for information and necessary action with reference to his Memo No. 1053 dated 10.03.2026.

Chief Conservator of Forests (Wildlife)

SCHEME FOR CREATION & MAINTENANCE OF ALTERNATE HABITAT/ HOME FOR THE AVIFAUNA, WHOSE NESTING TREES ARE TO BE CLEARED IN DALPAHAR IRON & MANGANESE MINES OF SHRI AVIN JAIN

Compliance with the condition No.2.xxxvi stipulated by MoEF&CC in the **stage I approval order dated 13.02.2026 for diversion of 79.367 ha of forest land, including 2.822 ha abide for safety zone along the mine lease boundary in addition to 10.594 Ha of forest land already diverted within the ML area over 89.961 ha of Dalpahar Iron & Manganese Mines in Baitarani RF (A) under Keonjhar Forest Division of Keonjhar District.**

CREATION & MAINTENANCE OF ALTERNATE HABITAT / HOME FOR AVIFAUNA AFFECTED DUE TO CLEARING OF NESTING TREES

DALPAHAR IRON & MANGANESE MINES OF SHRI AVIN JAIN

---

1. Introduction

The mining lease of Dalpahar Iron & Manganese Mines (Block-A) covering an area of 89.961 ha was originally executed in favour of Late Shri Dharm Chand Jain on 09.06.1986 within Baitarani Reserved Forest-II, under Barbil Tahasil of Keonjhar Forest Division, for a period of 20 years, valid up to 08.06.2006.

Prior to expiry of the lease period, a Renewal of Mining Lease (RML) application was submitted on 01.06.2005 in accordance with the provisions of Rule 24A(1) of the Mineral Concession Rules, 1950, thereby placing the lease under deemed extension.

Subsequently, due to delay in submission of the succession certificate and non-receipt of statutory clearances within the stipulated timeframe, the lease was declared lapsed by the Government of Odisha, Steel & Mines Department vide order dated 01.05.2015. Aggrieved by the said order, a writ petition was filed before the Hon'ble High Court of Odisha.

Pursuant to the directions of the Hon'ble High Court and subsequent hearings, the Government of Odisha vide order dated 06.09.2019 held that the mining lease had not lapsed. Accordingly, the validity of the lease was extended up to 08.06.2036 in favour of Shri Avin Jain, Power of Attorney holder of Smt. Sobha Jain (wife of Late Shri Dharm Chand Jain), in accordance with the provisions of the MMDR (Amendment) Act, 2015, as communicated vide letter dated 28.04.2022.

Consequent upon this, the Supplementary Lease Deed for Block-A over 89.961 ha was executed by the State Government of Odisha on 27.04.2023 in favour of Shri Avin Jain.

The entire mining lease area lies within Baitarani Reserved Forest-A. The mine falls under Survey of India Topo sheet No. F45N5 (73G/5) and is geographically bounded by latitudes 21°58'4.701" N to 21°58'42.918" N and longitudes 85°23'26.729" E to 85°23'59.175" E.

Presently, a proposal for diversion of 79.367 ha of forest land, including 2.822 ha earmarked as safety zone, in addition to 10.594 ha of forest land already diverted, has been submitted under Section 2(ii) of the

Forest (Conservation) Act, 1980. The MoEF&CC, Government of India has accorded in-principle (Stage-I) approval, subject to fulfillment of stipulated conditions, vide Letter No. F.No. 8-31/215/FC (E-91138) dated 13.02.2026.

2. ***LOCATION OF THE PROJECT AREA***

The project area is located within Baitarani Reserved Forest-A, under Keonjhar Forest Division, near Bichhakundi village, Barbil Tahasil, Keonjhar District, Odisha.

The precise location details of the project area are provided below:

Parameter	Description
Coordinates	Latitude: 21° 58' 4.701"N to 21° 58' 42.918"N Longitude: 85° 23' 26.729"E to 85° 23' 59.175"E
Toposheets	F45N5 (73G/5)
Elevation above MSL	The lease area exhibits undulating terrain with steep relief. The general hill trend is NNE–SSW. Elevation ranges from 553 m RL to 723 m RL. No perennial nala exists within the lease area. Sona Nadi, flowing northwards, is located approximately 1 km west of the lease area.
Present Land Use	Opencast mine
Villages within ML Area	No village; the area forms part of Baitarani RF-A

The mining lease is accessible from Joda (via Bichakundi) at a distance of 5 km, and from Jurudi (via Khandbandha) at a distance of 8 km. The lease area is approximately 295 km by road from Bhubaneswar Airport.

Distance from Major Transport Infrastructure

Modes of Transportation & Location	**Direction**	**Distance on Road**	**Aerial Distance**
NH-520,Joda	North-East	9 km	7 km
Jurudi Railway Station	South-East	10 km	3 km
Banspani Railway station	North-East	6.5 km	3.3 km
Tonto airstrip	North-West	15 km	7.5 km

3. TYPES OF LAND

The lease area is characterized by a lateritic surface overlain by a thin soil cover ranging from 0.5 m to 4.0 m in thickness. The soil colour varies from yellowish brown to reddish brown and grey.

Due to prolonged mining activities and associated deforestation, soil erosion has occurred along slopes, with soil primarily retained in areas having vegetation cover. The soil/alluvium is predominantly silty to clayey, containing pebbles and cobbles of chert, jasper, banded hematite jasper (BHJ) and hematite Iron Ore.

4. FORESTS OF THE IMPACT AREA

The entire mining lease area forms part of the Baitarani – A Reserved Forest. Mining operations have resulted in increased anthropogenic pressures, including population influx, vehicular movement, noise pollution, and air and water pollution.

These factors have adversely impacted the avian habitat in both the core and surrounding areas. The removal of nesting trees for mining and allied activities has led to loss of nesting sites, resulting in a noticeable decline in avifaunal population, not only within the core mining zone but also in the adjacent forested landscape.

Several Forest Blocks in Keonjhar Division are located within the Impact Area, such as:

Sl. No.	Name of the Forest Block	Location
1	Baitarani -B Reserved Forest	3.8 Km NE
2	Baitarani -A Reserved Forest	Entire Lease Are
3	Siddhamath Reserved Forest	1.8 Km W
4	Chamakpur Reserved Forest	5.7 Km E

5. AVIFAUNA IN THE CORE AND BUFFER ZONE

During the Environmental Impact Assessment (EIA) study and preparation of the Site-Specific Wildlife Conservation Plan, the following avifaunal species were recorded within the core zone of the project area:

A. Avifauna Recorded in Core Zone

Sl. No.	Local name	English name	Zoological name	Schedule as per Wildlife Protection Act, 1972.
1	Bana Kukuda	*Red jungle fowl*	*Gallus gallus*	II
2	Baga	*Cattle egret*	Bubulcus obis	II

3	Gunduri	*Patridge*	*Perdix Perdix*	II
4	Kapta	*Collared dove*	*Streptopelia decaocto*	II
5	Koel	Assian Cuckoo	*Eudynamus scolopaceus*	II
6	Kumbhatua	*Crow Pheasant*	*Centropus sinensis*	II
7	Machharanka	*Little Kingfisher*	*Alcedo pusilla*	II
8	Kanti Baga	*Pond Heron*	*Ardeola grayii*	II
9	Baga	*Little egret*	*Egretta garzetta*	II

Avifauna Recorded in Buffer Zone (10 km Radius)

Besides, the birds observed in the buffer zone of 10 km radius from the periphery of the project Area are given below:

Sl. No.	Local name / English name	Zoological name	Schedule as per Wildlife Protection Act, 1972.
1	Bana myna/ Ghunkalika	*Acridotheres ginginianus*	II
2	Bana kukuda (Red Jungle fowl)	*Gallus gallus*	II
3	Black Headed oriole	*Oriolus xanthornus*	II
4	Black Ibis	*Pseudibispapillosa*	II
5	Blue Hill Rock pegion	*Columba rupestris*	II
6	Cattle egret	*Bubulcus ibis*	II
7	Chestnut Headed Bee-eater	*Merops leschenaultia*	II
8	Common bustard quail	*Turnixsuscitator*	II
9	Common crow	*Corvus corax*	II
10	Common myna/ Bani	*Acridotheres tristis*	II
11	Crow Pheasant	*Centropus sinensis*	II
12	Cuckoo	*Cuculus spp.*	II
13	Doves	*Streptopelia spp*	II
14	Drongo (Black)	*Dicrurusmacrocercus*	II

15	Grey jungle fowl	*Gallus sonneratü*	II
16	House Sparrow	*Passer domesticus*	II
17	House swift	*Apus affinis*	II
18	Indian Roller	*Coracias benghalensis*	II
19	Jungle Babbler	*Argya striata*	II
20	Jungle Bush quail	*Perdicula asiatica*	II
21	Koel (Assian)	*Eudynamysscolopaceus*	II
22	Lesser golden backed woodpecker	*Dinopium benghalensis*	II
23	Little Egret	*Egretta garzetta*	II
24	Indian Robbin	*Copsychusfulicatus*	II
25	Painted spur fowl	*Galloperdixlunulata*	II
26	Pariah kite	*Milvus migrans*	II
27	Parrot	*Psittaculaeupatria*	II
28	Peacock/ Peafowl	*Pavo cristatus*	I
29	*Pied myna*	*Gracupica contra*	II
30	Indian Pond heron	*Ardeola grayii*	II
31	Purple sunbird	*Cinnyris asiaticus*	II
32	Quaker babbler	*Alcippe poioicephala*	II
33	Red vent Bulbul	*Pycnonotus cafer*	II
34	Rose Ringed Parakeet	*Psittaculakrameri*	II
35	Shikra/ Baja pakshi	*Accipiter badius*	I
36	Small Indian Cormorant	*Microcarboniger*	II
37	Spotted Babbler	*Pellorneum ruficeps*	II
38	Spotted Dove	*Spilopelia chinensis*	II
39	Spotted owlet	*Athene brama*	II
40	Common Tailor Bird	*Orthotomussutorius*	II

41	Rufous Treepie	*Dendrocittavagabaunda*	II
42	Wagtail	*Motacilla spp*	II
43	Weaver Bird	*Ploceus philippinus*	II
44	White cheeked Bulbul	*Pycnonotus leucotis*	II
45	Woolly necked stork	*Ciconia episcopus*	II
46	Yellow legged green pigeon	*Treron phoenicoptera*	II
47	Common lora	*Aegithina tiphia*	II
48	Jungle Crow	*Corvus macrorhynchos*	II
49	Partridge	*Francolinus pictus*	II
50	Pied crested Cuckoo	*Clamatorjacobinus*	II
51	Red Jungle Fowl	*Gallus gallus*	II
52	Shrikes	*Lanius Spp.*	II
53	Small Green Bee-eater	*Merops orientails*	II
54	White throted Kingfisher	*Halcyon smyrrensis*	II
55	White Breasted water hen	Amauronis phoenicurus	II
56	Yellow Cheeked Tit	Machlophus spilonotus	II

6. ***TYPES OF NESTS BUILT BY BIRDS***

A bird nest is a structure or site used by birds for egg laying, incubation, and rearing of nestlings. Nest construction may be undertaken by a pair or by multiple individuals in species exhibiting cooperative breeding behavior. Nests range from simple ground scrapes to complex hanging or domed structures, serving to protect eggs and chicks from climatic extremes and predators.

As documented in the "Book of Indian Birds" by Dr. Salim Ali, Indian birds construct the following ten major types of nests:

1. Simple scrapes
2. Twig nests
3. Nests in tree holes
4. Nests in excavated tunnels in earth banks
5. Pendant nests
6. Nests built entirely of mud
7. Domed or bell-shaped nests

8. Cup-shaped nests made of grass
9. Woven oblong purse nests
10. Nests in leaves stitched together

7. CREATION OF AN ALTERNATE HABITAT.

In view of the removal of a substantial number of trees within the mining lease area for execution of mining and allied operations, it has been considered necessary to provide alternate artificial nesting habitats for the avifauna inhabiting the area. The loss of matured trees has resulted in the reduction of natural nesting sites, thereby necessitating suitable mitigation measures.

Accordingly, it is proposed to design, fabricate, and install artificial nests of various types, including twig nests, cavity (hole) nests, cup-shaped nests, bell-shaped nests, and woven oblong nests, to facilitate breeding and roosting of different bird species. These nests shall be prepared exclusively from eco-friendly and natural materials such as grasses, climbers, bamboo, wooden planks, and other locally available biodegradable materials, ensuring compatibility with the surrounding forest ecosystem.

The artificial nests shall be installed at appropriate locations and suitable heights on standing trees and other secure structures within the forest area and safety zone, taking into consideration species-specific nesting preferences. The design, shape, size, and materials proposed for construction of the artificial nests are detailed in the subsequent sections.

7. A. Cup/Saucer shaped nest:

This type of artificial nest shall be fabricated from natural twigs and small climbers by trained local artisans. Wherever required, limited use of suitable adhesives may be undertaken solely for structural stability. In such cases, loose twigs shall be placed inside the nest cavity to ensure that nesting birds are not exposed to any possible contamination.

The proposed nests shall be of 6" to 12" diameter, which is considered ideal for accommodating small to medium-sized avifaunal species. The average cost of preparation of this type of nest is estimated at Rs. 200/- per unit.

These nests shall be installed on tree branches, house parapets, or similar secure locations within the project and surrounding forest area. The fixing/placement cost is estimated at Rs. 20/- per nest, thereby fixing the total average cost at Rs. 220/- per nest.

Considering natural wear and exposure to climatic conditions, these nests are proposed to be replaced on an annual basis.

7. B. Woven nests:

In order to enhance and support the population of weaver birds, particularly in urbanized and semi-urban localities within and around the project influence area, it is proposed to prepare and install woven-type artificial nests.

The proposed woven nests shall be fabricated from bamboo, following the design indicated below. These nests shall be hung from tree-top branches, building structures, or electric transmission poles, as appropriate. The average size of each woven nest shall be 10 inches in diameter and 20 inches in length, with an entrance opening of 8" × 9", which is considered suitable for weaver birds. The dimensions may be modified, if required, based on close field observations and nesting behavior of the species.

The average cost, inclusive of fabrication, fixing, and fixing materials, is estimated at Rs. 100/- per nest.

In addition to the above, half-opened box-shaped nests prepared from bamboo strips covered with palm leaves, as well as earthen pots with suitable openings, are also proposed to be installed to further improve avifaunal habitat conditions. These nests may be fixed on tree trunks or branches, with or without camouflage, depending upon site-specific requirements.

The average size of the bamboo box (lower part) shall be 12" × 12" × 10", while the earthen pots shall be approximately 12" to 15" in diameter with a height of 12". The average fabrication cost for these nests is estimated at Rs. 250/- per unit, and the fixing cost including fixing materials is estimated at Rs. 50/- per unit. Accordingly, the total average cost per nest is Rs. 300/-.

Considering natural wear and exposure to climatic conditions, these nests are proposed to be replaced on an annual basis.

The fabrication of the above nests shall be undertaken by local bamboo artisans and traditional earthen pot makers, following a short on-site demonstration, thereby encouraging community participation and use of indigenous skills

7. C. Nest Box:

A nest box is a man-made enclosure specifically designed and installed to provide safe nesting or roosting space for wildlife. Nest boxes are most commonly used for avian species, in which case they are also referred to as bird boxes or birdhouses. However, certain small mammalian species may also utilize such structures for shelter and breeding.

The installation of nest boxes or roosting boxes is a widely accepted conservation practice and is often undertaken as a habitat enhancement and mitigation measure to compensate for the loss of natural nesting sites. Strategic placement of these structures assists in maintaining and stabilizing populations of specific species within a given area by providing secure locations for nesting, breeding, and roosting.

These nest boxes shall be fabricated from low-cost softwood by skilled carpenters. The ideal dimensions of each nest box shall be 25 cm × 25 cm × 40 cm. The entrance opening shall be circular in shape, having a diameter ranging from 10 cm to 15 cm, and shall be positioned at a height of 15 cm from the base of the box.

The top of the nest box shall be either heap-roofed or provided with a slightly slanting roof. In case of a slanting roof, the slope shall be oriented towards the rear side and not towards the front opening, so as to prevent entry of rainwater. The bottom plank shall be provided with small drainage holes to allow easy discharge of rainwater and moisture accumulation.

These nest boxes may be fixed on standing trees, side walls, or abandoned structures, as appropriate. In addition to birds, these structures may also be utilized by squirrels, rodents, and small reptiles, thereby contributing to overall faunal habitat enhancement.

The average cost, inclusive of fabrication and fixing, is estimated at Rs. 600/- per unit.

Considering natural wear and exposure to climatic conditions, these nests are proposed to be replaced on an annual basis.

7. D. Bell-Shaped Nests

The bell-shaped nests shall be conical in form, with base diameters ranging from 12 inches to 18 inches. The height of the nest shall be equal to or up to 1.2 times the diameter of the base, depending on design requirements.

These nests shall be suspended or hung, as shown in the approved design. The bell-shaped nests shall be prepared from eco-friendly and natural materials such as bamboo, pliable climbers, and grasses including "Kaincha" and "Munja", ensuring suitability for avifaunal use and compatibility with the surrounding environment.

The average cost for fabrication and fixing of each bell-shaped nest is estimated at Rs. 260/- per unit.

Considering natural wear and exposure to climatic conditions, these nests are proposed to be replaced on an annual basis.

8. BIRD BATH:

In order to enhance habitat quality for avifauna and other small fauna, it is proposed to install 50 nos. bird baths as permanent water sources within the Keonjhar Forest Division. The provision of these bird baths shall help mitigate seasonal water scarcity, particularly during dry and summer periods, and shall support the hydration, thermoregulation (cooling), and grooming requirements of avian species.

The bird baths shall be strategically located in suitable forest patches, safety zones, and other undisturbed areas, ensuring easy accessibility for birds while minimizing disturbance. The proposed measure is expected to contribute positively to avian survival, habitat utilization, and overall ecological stability within the project influence area.

- **Dimensions:**

Each bird bath shall measure 5 ft × 5 ft × 0.5 ft and shall be elevated on pillars or any suitable raised platform. The structure shall be provided with gently sloped edges, along with placed rocks, to facilitate easy perching, safe access, and exit for birds.

- **Materials:**

The bird baths shall be constructed using reinforced cement concrete (RCC) to ensure structural stability and long-term durability. Stones and branches shall be incorporated within and around the structure

to enhance accessibility and make the baths more bird-friendly and natural in appearance.

- **Disinfection and Maintenance:**

Regular maintenance and disinfection shall be undertaken to maintain water quality and prevent disease transmission. Potassium permanganate ($K.MnO_4$) shall be used in controlled quantities for periodic disinfection of the water.

These bird bath installations shall function as reliable and hygienic permanent water sources for a variety of avian species and shall also indirectly support other small fauna, thereby contributing to overall biodiversity enhancement and habitat improvement within the project influence area.

9. *TARGET AND PHASING OF NEST FIXING*

The forest land proposed for diversion under the project measures 79.367 ha; however, the entire mining lease area, covering 89.961 ha, lies within Reserved Forest land. In order to compensate for the loss of natural nesting habitats due to tree felling and mining operations, it is proposed to undertake a phased installation of artificial nests made from eco-friendly and natural materials across the mining lease area.

Under this scheme, it is proposed to fix 10 (ten) artificial nests per hectare per year, comprising different types of nests suitable for various avifaunal species. Accordingly, a total of 9,000 (nine thousand) artificial nests shall be installed over a period of ten (10) years within the Reserved Forest area of the mining lease.

The type-wise proportion of artificial nests proposed to be installed under the scheme is provided in the table below.

Type of Artificial Nest	% of Nest	No. to be Fixed	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	Total
Cup /saucer shape	35	3150	315	315	315	315	315	315	315	315	315	315	3150
Woven nest	30	2700	270	270	270	270	270	270	270	270	270	270	2700
Nest Box	25	2250	225	225	225	225	225	225	225	225	225	225	2250
Bell shaped Nest	10	900	90	90	90	90	90	90	90	90	90	90	900
Total	100	9000	900	900	900	900	900	900	900	900	900	900	9000

10. BIRD CONSERVATION AWARENESS CAMPAIGNS IN PERIPHERAL VILLAGES

Birds play a vital role in maintaining ecological balance through functions such as pollination, seed dispersal, pest control, and food-chain regulation. Despite their ecological importance, many bird species face increasing threats due to habitat loss, human interference, and lack of awareness.

To address these challenges, Bird Conservation Awareness Campaigns are proposed as a key component of this scheme. A minimum of five (5) awareness programmes per year shall be organized among school students and local communities residing within and around the forest area. These campaigns shall be conducted through community events, interactive sessions, nature-based activities, and educational programmes, with the objective of sensitizing the public towards the importance of bird conservation.

Implementation of these awareness campaigns in the peripheral villages is expected to enhance environmental understanding, inspire community participation, and contribute significantly to the long-term protection and conservation of avifaunal populations in the project influence area.

11. ESTABLISHMENT OF A BIRD CONSERVATION AREA

In order to mitigate the impacts of habitat alteration arising from mining and allied activities, a suitable forest land measuring 20.00 ha, falling within the Zone of Influence (ZOI) in Baitarani Reserved Forest, has been identified for development as a Bird Conservation Area.

The geographical coordinates of the identified area are as follows:

Latitude:22°03'15.86"N
Longitude: 85°25'49.85" E

This designated conservation zone shall serve as a safe refuge for avifauna displaced or otherwise affected by the project, providing suitable conditions for feeding, nesting, roosting, and breeding.

In addition to its ecological significance, the Bird Conservation Area is expected to deliver community benefits by functioning as a nature retreat, offering opportunities for environmental appreciation and passive recreation. The initiative also holds potential for nature-based and eco-tourism development, thereby contributing to local livelihood opportunities.

12. HABITAT ENHANCEMENT WITHIN THE BIRD CONSERVATION AREA

Within the identified Bird Conservation Area, habitat enhancement measures shall be undertaken to improve suitability for avifauna.

This shall include sowing of native wild grain species to ensure availability of food for seed-eating birds. Appropriate grain species shall be selected, the site prepared, and seeds sown during suitable seasons. Regular monitoring and maintenance shall be undertaken to ensure successful germination and growth.

Further, plantation of Ficus species and other native fruit-bearing plants preferred by birds shall be carried out to provide long-term food resources, nesting sites, and perching habitat. Healthy saplings shall be planted in properly prepared pits at suitable spacing, preferably during the monsoon season. Post-plantation maintenance shall include watering, protection from disturbances, weeding, and periodic monitoring of survival and growth.

Priority shall be accorded to native species to enhance local biodiversity and maximize ecological benefits to resident and migratory bird populations.

13. ENGAGEMENT OF PARTNER NGO FOR BIRD CONSERVATION AWARENESS

To ensure effective implementation of bird conservation and awareness initiatives, a partner Non-Governmental Organization (NGO) shall be engaged by the Divisional Forest Officer (DFO), with expenditure met from the approved scheme cost.

The selected NGO shall conduct activities such as bird walks, conservation awareness programmes, educational outreach, and community engagement initiatives. Bird conservation awareness is particularly critical in the project area, as it is a tribal-dominated region where traditional practices may inadvertently impact avifaunal populations.

These programmes shall aim to educate local communities and children, foster environmental responsibility, promote respect for wildlife, and encourage sustainable coexistence with avian biodiversity, thereby contributing to a healthier and more balanced ecosystem.

14. FORMATION OF BIRD LOVERS SOCIETY IN KEONJHAR FOREST DIVISION

To strengthen community involvement and ensure sustained conservation efforts, a Bird Lovers Society shall be formed within the Keonjhar Forest Division.

This society shall serve as a participatory platform for local residents, bird enthusiasts, students, and other stakeholders to collectively engage in bird-related activities, share knowledge, assist in conservation efforts, and support implementation of this scheme. The society is expected to play a key role in ensuring long-term stewardship and continuity of bird conservation initiatives.

15. EXECUTION OF THE SCHEME

For implementation of the proposed scheme, the User Agency, Shri Avin Jain, shall deposit the total approved financial outlay into the Odisha CAMPA Fund, as per applicable guidelines and approvals. All activities under the scheme shall be executed through the Forest Department in accordance with approved plans and financial norms.

16. MONITORING AND EVALUATION

Effective implementation of this scheme requires technical skill, sustained effort, and regular oversight. Continuous monitoring of artificial nests, bird baths, habitat enhancement measures, and awareness activities shall be undertaken to assess effectiveness and ecological outcomes.

Monitoring shall be carried out periodically by field-level staff, with regular review by senior officers at the Division and Circle levels. Monitoring outcomes shall guide maintenance, replacement, and adaptive management actions wherever required.

The 5% of the total plan cost over and above i.e. **Rs 7.296 or Rs.7.30 Lakh will be contributed by the User Agency to "The DFO, Keonjhar Division" for monitoring of above Avifauna Scheme.**

17. PLAN PERIOD

The scheme is proposed to be implemented over a ten-year period, from 2026-27 to 2035-36. A mid-term review shall be conducted after five years, if required, to assess performance, incorporate improvements, and ensure alignment with conservation objectives.

Divisional Forest Officer,
Keonjhar Division

18. FINANCIAL FORECAST

Sl. No.	Particulars of Works	1st Year (Lakh)	2nd Year (Lakh)	3rd Year (Lakh)	4th Year (Lakh)	5th Year (Lakh)	6th Year (Lakh)	7th Year (Lakh)	8th Year (Lakh)	9th Year (Lakh)	10th Year (Lakh)	Total (Lakh)
1	Bird conservation awareness campaign of 5 nos per year at the peripheral villages	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	5.000
2	Artificial bird nesting structures will be installed by fixing nests of various sizes and types at varying heights throughout the project site to promote bird habitation and conservation. A total of 900 bird nests per year will be installed at a unit cost of Rs.345/- each during the 10-year plan period, amounting to 9,000 bird nests in total.	3.105	3.105	3.105	3.105	3.105	3.105	3.105	3.105	3.105	3.105	31.050
3	Creation of Birdbath size 5ft x5ft x 0.5ft reinforced elevated concrete structure with sloppy edges, 50 Nos @0.20 lakh each. With maintenance and filling with disinfectant (potassium permanganate) for 09 year @0.20 lakh/year	10.000	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	11.800
4	a) Wild fruit-bearing trees and wild grain plantations (Ficus, Papaya, Jamun, Guava, Jackfruit, Ziziphus, Mango, Millet, Mustard, Paddy, Sunflower) over	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	25.000

	20.00 ha in Baitarani RF.											
	b). Engagement Of Watcher.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	10.000
	c) Fencing of the identified site with Bamboo Twigs and Thorn Fencing over 1.80 RKM as per one-time cost Norm pay Matrix for the year 2025-26 [1,21,512/250x1800]=Rs 874886.4 or say 8,75,000.00	8.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.750
5	Formation of Bird Lovers Society in Keonjhar Forest Division	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	10.000
6	Engagement of Partner NGO by DFO Keonjhar to undertake awareness and maintenance activities.	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	20.000
7	**Total**	**28.855**	**10.305**	**10.305**	**10.305**	**10.305**	**10.305**	**10.305**	**10.305**	**10.305**	**10.305**	**121.600**
8	20% Escalation Cost	5.771	2.061	2.061	2.061	2.061	2.061	2.061	2.061	2.061	2.061	24.320
9	**Grand Total**	**34.626**	**12.366**	**12.366**	**12.366**	**12.366**	**12.366**	**12.366**	**12.366**	**12.366**	**12.366**	**145.920**

(Rupees one crore forty-five lakh ninety-two thousand) only

N.B.- The 5% of the plan cost over and above i.e. **Rs 7.296 or Rs 7.30 Lakh** will be contributed by the User Agency to "The DFO, Keonjhar Division" for monitoring of above Avifauna Scheme.

09/03/26

Divisional Forest Officer
Keonjhar Division

Approved

Principal Chief Conservator of Forests
(Wildlife) & Chief Wildlife Warden
Odisha, Bhubaneswar