



To

The Divisional Forest Officer  
Keonjhar Forest Division  
Keonjhar, Odisha

GM/OMQ/76/11-G  
6<sup>th</sup> Nov' 2023

**Sub: Proposal for seeking prior approval of the Central Government under Sec-2(ii) of Forest (Conservation) Act-1980 for non-forestry use of 42.608 Ha of forest land within Kalamang West (Northern Part) Iron Ore Mine in Keonjhar & Sundargarh District of Odisha allotted to M/s Tata Steel BSL Limited (now amalgamated into and with M/s Tata Steel Limited).**

Ref: 1. Letter No:8-13/2022-FC, dated 01.09.2023 of MoEF&CC, Govt. of India  
2. EDS dated 30.10.2023 of DFO, Keonjhar raised on Parivesh Portal  
3. Online proposal no: FP/OR/MIN/49169.

Dear Sir,

In reference to the above captioned subject, we are submitting herewith the point wise compliance to the queries raised by MoEF&CC, Govt. of India in its letter under reference for your kind consideration and onward transmission.

- (i) Since many proposals of iron ore mining in this landscape are in the process at Central Govt. level or being proposed for diversion. Therefore, there is a need to analyze the issue at the landscape level in order to conserve the forests & biodiversity. In this regard, detailed consultations with the State Govt. authorities and other stakeholders including mining lessees shall be carried out by the DDGF(C) Bhubaneswar by involving Ministry Officials and WII and report shall be submitted in 45 days.

**Response:** Detailed consultation with the State Govt. Authorities, Ministry Officials, WII and other stakeholders including mining lessees was carried out under the Chairmanship of DDGF(C) Bhubaneswar and PCCF (N), Odisha on 17.10.2023 and as we understand the report has already been submitted by DDGF(C), Bhubaneswar to the MoEF&CC, Govt. of India.

- (ii) Further, considering the present situation of mining in the area and rise in human-elephant conflict the compensation mechanism for the victims by the user agencies needs to be developed.

**Response:** Site Specific Wildlife Conservation Plan to protect and conserve the wildlife of the core area and buffer area has been approved by PCCF(Wildlife) & Chief Wildlife Warden, Odisha. Copy of the same along with approval letter is submitted herewith as **Annexure-I**.

**TATA STEEL LIMITED**

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- (iii) The CSIR-NEERI has given its recommendation on carrying capacity vis-à-vis pollution in these areas and the Suggested Ore Transport Mode (SOTM) in 2014. After lapse of about 9 years, many changes in the landscape and fresh mining in the region, the State Govt. shall examine and report with justification, whether there is a need to re-validate the said study or a need to carry a fresh study in this regard.

**Response:** To be complied by State Govt.

We trust the above complies to the queries raised by your good office towards compliance to MoEF&CC, Govt. of India letter no: 8-13/2022-FC, dated 01.09.2023. We request your good self to kindly do the needful for its onward transmission.

Thanking You,

Yours Faithfully,

**(Atul Kumar Bhatnagar)**  
**General Manager, OMQ**

Encl: As above

Copy to:

1. Principal Chief Conservator of Forests & HoFF, Odisha, Bhubaneswar
2. Regional Chief Conservator of Forests, Rourkela Circle, Rourkela

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**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

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No. 11356 / CWLW-FDWC-FD-0170-2021  
Dated, Bhubaneswar the 30 Oct, 2023

To

The Chief (Kalmong & Gandhalpada Project)  
M/s Tata Steel BSL Ltd. Mines Division  
Joda, Keonjhar

Sub: Approval of Site Specific Wildlife Conservation Plan in respect of Kalmang West (Northern Part) Iron Ore Mines of M/S Tata Steel Ltd. under Bonai & Keonjhar Forest Division in Sundargarh & Keonjhar District

Sir,

I am directed to convey the approval of PCCF (WL) & CWLW, Odisha for the Site Specific Wildlife Conservation Plan at financial outlay of ₹834.168 lakh (Rupees eight crore thirty-four lakh sixteen thousand eight hundred) only as per the details of activities mentioned in Chapter-IV & VI of the Plan in compliance to the condition stipulated in the Environmental Clearance granted by MoEF&CC vide Letter dtd. 18.10.2022.

(i)	In project impact area in Bonai Division:	₹607.200 lakh
(ii)	In project impact area in Keonjhar Division:	₹226.968 lakh
Total:		₹834.168 lakh

A sum of ₹834.168 lakh (Rupees eight crore thirty-four lakh sixteen thousand eight hundred) 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, Bonai/ Keonjhar 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.

Encl: Copy of approved SSWLCP

Yours faithfully

Conservator of Forests (ET)

P.T.O.



Memo. No. 11357 /dt. 30/10/2023

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-0154-2021-20931/FE&CC dt 30.11.2021
2. PCCF (FD & NO, FC Act), O/o PCCF & HoFF, Odisha, Bhubaneswar with reference to FE&CC Deptt. Memo No.20931/FE&CC dt 30.11.2021
3. Regional Chief Conservator of Forests, Rourkela Circle with reference to his office Memo. No.3270 dt. 29.09.2023
4. Divisional Forest Officer, Bonai Division alongwith copy of the approved SSWLCP with reference to Memo. No.3271 dt 29.09.2023 of RCCF, Rourkela Circle
5. Divisional Forest Officer, Keonjhar Division alongwith copy of the approved SSWLCP with reference to Memo. No.3272 dt 29.09.2023 of RCCF, Rourkela Circle

  
Conservator of Forests (ET)



**SITE SPECIFIC  
WILDLIFE CONSERVATION PLAN (SSWLCP)  
OF**

**KALAMANG WEST (NORTHERN PART) IRON ORE MINE  
(MINE LEASE AREA: 92.875 Ha)**

**IN VILLAGE KALAMANG & GHODABUDANI, DISTRICT SUNDERGARH &  
VILLAGE GANDALPADA, DISTRICT KEONJHAR  
OF ODISHA**



**OF M/S. TATA STEEL BSL LTD.  
(NOW AMALGAMATED IN TO AND WITH TATA STEEL LIMITED)**

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**Annexure**

1	ToR (Terms of Reference) issued by State Environment Impact Assessment Authority (SEIAA), Odisha vide ref no. 22/SEIAA dated 15 <sup>th</sup> January 2021	Annexure- I
2	Details of Man-animal Conflict, List of water bodies, Cattle Immunization etc.	Annexure- II (series)
3	List of other Mines in the Impact area	Annexure- III
4	Cost Norm for plantation of Fodder species in Urban Plantation mode	Annexure- IV
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**Maps**

01	Location Map on Topo-sheet showing the Project Area and Impact Area	Plate No. I
02	Location Map showing the distance of the Project Area from National parks, Sanctuaries and elephant/ Tiger reserve	Plate No. II
03	Maps showing Project area, elephant movement area, Man animal conflicts along with the list,	Plate No. III series



## EXECUTIVE SUMMARY

This Site Specific Wild Life Conservation Plan is prepared in compliance of (1)- Item No.2 of condition no. 19(xi), (2)- A. Standard ToR for Mining Projects : condition No.17, 18,19 and (3)- B. Specific ToR condition No.26 (Terms of Reference) issued by State Environment Impact Assessment Authority (SEIAA), Odisha vide ref no. 22/SEIAA dated 15<sup>th</sup> January 2021.

Besides EC has been issued and Standard Condition (VII) stipulates for preparation of this Plan.

- I. The Kalamang West (Northern Part) Iron Ore block of M/s TATA Steel BSL Ltd. (now amalgamated into and with Tata Steel Limited) is located in the village(s) of Ghodabudani & Kalamang under Koira Range of Sundargarh district, and Gandapada village under Barbil Range of Keonjhar district, Odisha. The total leasehold area is over 92.875 Ha. which includes 42.608 ha of Forest land, 30.096 ha of non-forest land and 20.171 ha private land.
- II. Forest clearance under Sec-2(iii) of F.C. Act-1980 has been granted by MoEF & CC vide Letter: File No.8-32/2021-FC dt. 31<sup>st</sup> January, 2022. Application under Sec-2(ii) for forest diversion proposal of entire forest land included within the leasehold area for the purpose of mining and ancillary activities has been recommended by State Govt. to MoEF & CC for Stage-I clearance.
- III. The lease area of Kalamang West (Northern Part) Iron Ore block is located on the Topo Sheet No. F45N5(73 G/5) and bounded by
 

	Latitude (N)	Longitude (E)
North	21° 57' 32.348"	85° 17' 41.646"
East	21° 56' 54.859"	85° 17' 57.532"
South	21° 56' 47.758"	85° 17' 31.002"
West	21° 57' 13.309"	85° 17' 9.020"
- IV. The area is highly undulating and mountainous and the altitudes vary from 690 m to 585 meters above MSL.
- V. The climate is tropical with a very hot summer and moderate to cool winter, the temperature rising up to 47°C. The area is characterized with well defined rainy season. The minimum temperature during winter goes to 7°C.
- VI. The lease area does not form a part of any National Park or Wild life Sanctuary or Critical Wild Life habitat. No protected area is situated in the lease area or within the Zone of Influence.
- VII. The lease area is being surrounded by existing mines and no important wild animals are noticed in the project area.
- VIII. The process of mining will be Opencast Fully Mechanized method with drilling and blasting.

- IX. The Mega wild animals like elephants have been found to be moving in Mendhamurhani PRF, Sidhamath RF, Karampada RF and Karo RF areas.
- X. The threats perceived due to the project operation are
  - Reduction of wildlife habitat
  - Soil erosion
  - Water pollution & water scarcity
  - Physical threats such as fall of animals in the pits, poaching etc.
  - Forest fire
- XI. The present management plan is prepared to minimize the above threats.

**The Mitigation Measures proposed to be taken up is as follows:**

**A. Project Area: Measures to be implemented by Project Proponent:**

The following mitigation measures will be taken by the Project Proponent:

**Bonai Forest Division**

- i. 10 Nos. of Fire Watcher will be engaged for a period of 06 months (January to June) for 05 years.
- ii. Provision of fire blowers and fire fighting monitoring kit to fire fighting squad @10 nos./year with maintenance up to 5 years.
- iii. Awareness Promotion regarding wildlife protection, wildlife conservation, forest protection & forest conservation.
- iv. Provision of installation and maintenance of solar light with early warning system at various locations of elephant movement areas.
- v. Provision of distribution of 50 nos of small paddy reaper machine to the household of surrounding villages of project area for early and easy harvesting of paddy from the field for storage of food materials in order to mitigate the Human-Elephant Conflict.
- vi. Provision of distribution of 500 nos. 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
- vii. Jana Surakhya Gaja Rakhya in five villages= 10 Km (2Km in each), either through VSS/Community/Private Person and its maintenance (90% cost to be borne by User Agency including beneficiaries contribution
- viii. Provision of Rescue Vehicle/RRT vehicle (inbuilt with gps tracker) for implementation in protection/monitoring activities through ground staff in Bonai Division along with anti depredation equipment and
  - (i) remuneration of driver (as per Government approved high skilled labour rate for



- the concerned financial year) and provision of POL, maintenance etc.
- (ii) Provision of 10 nos. of highly skilled squad personnel
  - (iii) Provision of contingencies like uniforms, monitoring kits, life insurance to the squad personnel etc.
  - (iv) Purchase of equipment to support HEC mitigation.

### **Keonjhar Forest Division**

- i. One hired Vehicle along with Driver and POL will be supplied for the anti-poaching –cum- anti-depredation squad.
- ii. Solar fencing will be taken up for Janarakhya and Gaja Surakhya.
- iii. MTS for drone use & its related analysis and documentation at Champua.

### **B. Project Impact Area (Buffer Zone):**

The Impact Area extends over two Forest Divisions, i.e. Bonai Forest Division and Keonjhar Forest Division. The following steps are proposed:

#### **Bonai Forest Division**

##### **1. Protection & Enforcement Activities**

- (a) Establishment of Anti-Poaching Barrack to support protection activities and elephant monitoring activities (including water supply, solar light system, boundary facility etc.) Total Rs.40.00 lakhs.
- (b)(1). Engagement of 10 Squad members for assisting staff in protection, wildlife monitoring and anti-depredation activities (@Rs.345.00 per Man day)- x 10 members x 12 months x 05 years. Rs.63.00 lakhs.
- (b)(2). Hired Vehicle Rs. 31,000/- x 12 months x 05 years = Rs. 18.60 Lakhs
- (b)(3). POL for vehicle Rs. 15000/- x 12 months x 05 years = Rs. 09.00 Lakhs
- (c)(1). Provision of VHF Main station 5 nos. and maintenance up to 05 years. Rs.60.00 lakhs.
- (c)(2). Provision of Walkie-Talkies. Rs.15.00 lakhs.

##### **2. Wildlife Habitat Management:**

- (a) Habitat enrichment with plantation of Bamboo(preferably through bamboo seed balls), 10.00 Ha. Rs.4.40 lakhs
- (b) Provision of creation of new water bodies, 2 nos. Rs.20.00 lakhs.
- (c) Provision of Plantation of fruit bearing and fodder species.(preferably palm species) around water bodies and nearby forest boundaries. Rs.3.00 lakhs.
- (d) Weed eradication. Rs.10.00 lakhs.

- (e) Construction of Check dam along the nallah : Rs. 30.00 lakhs

### **3. Wildlife Monitoring**

- (a) Radio Collaring one elephant Rs.10.00 lakhs.  
 (b) Engagement of two Research Scholars, @ Rs.35000/- per month. Total cost Rs.21.00 lakhs.  
 (c) Engagement of two MTS @ Rs.25000/- per month. Total cost Rs.15.00 lakhs.  
 (d) Other Contingencies: Rs.6.00 lakhs.  
 (e) Procurement of Camera Traps: 25 nos. Rs.10.00 lakhs.

### **4. Human Elephant Conflict Mitigation**

- (a) Deployment of Gaja Saathi on year basis- A participatory approach (10 units of 05 members each @Rs.80,000/unit/year). Rs.40.00 lakhs  
 (b) Signage on both side of track/road/railway  
 (b)(1) Signage with speed limit. Rs.12.00 lakhs.  
 (b)(2) Signage with awareness and warning for wildlife. . Rs.12.00 lakhs.  
 (c) Provision of Elephant Proof Trench, 5RKM. Rs.35.00 lakhs.  
 (d) Capacity Building training for Field Staff on Elephant Human Conflict management at Division Office. Rs.20.00 lakhs.  
 (f) Installation of Solar Street lamp/lights 100 nos. in elephant affected villages and its maintenance. Rs.40.00 lakhs.

### **5. Public Awareness and Livelihood Generation Activity through community mobilization**

- (a) Provision for cattle immunization camps for surrounding fringe villages for mitigation of spreading of diseases etc. Rs.2.00 lakhs.  
 (b) Training and awareness to EDC/VFMC, in Schools, Village level Volunteers for Wild Life Conservation & Protection. Rs.10.00 lakhs.

Total for Bonai forest Division is Rs,506.00 lakhs and 20% of the above cost amounting to Rs.101.20 is also provided to compensate price rise and unforeseen expenditures.

Total cost for Bonai Forest Division is Rs.607.20 lakhs.

### **Keonjhar Forest Division**

1. As a step for habitat improvement, one large Water body will be created, with expenditure of Rs.15.00 lakhs



2. Planting of 5000 nos of Ficus / Fodder Plants in Urban plantation mode. Proposed cost Rs.28.50 lakhs.
3. Wages of Anti-depredation Squad 5 nos for each Division @13,412/- per month for 5 years. Total expenditure proposed Rs.41.565 lakhs.
4. Deployment of 3 nos. of Elephant Trackers – Rs.25.50 lakhs.
5. Deployment of 30 nos. of Gajasathi in 6 villages/VSS. Total cost of Rs.22.575 lakhs.
6. Bulk SMS, Voice Message and early warning System Rs.5.00 lakhs.
7. Procurement of 2 nos. of Portable Cabins : Rs.12.00 lakhs.
8. Distribution of 200 nos. of Grain Bins : cost of Rs.7.00 lakhs.
9. Solar Street Lights along with early warning system in 10 sensitive villages @ 5 per village : Rs.25.00 lakhs.
10. Creation of Awareness in the forest fringe villages will be done and the proposed expenditure is Rs.5.00 lakhs
11. Monitoring & Evaluation will be taken up at regular intervals and the amount proposed is Rs.2.00 lakhs.
12. Total cost for Keonjhar Forest Division Rs.189.14 lakhs, 20 % extra for escalation : Rs.37.828 lakhs.

The total cost of the proposed activities for Keonjhar Forest Division is Rs.226.968 lakhs including 20% escalation cost.

However, the Forest Department is free to utilize the entire amount or a part of it for other suitable areas depending on actual need.

This Plan is prepared for a period of 5 years. Alterations and modifications can be done at any time if required.

## CHAPTER-I

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

### **Brief description of the project**

The Kalamang West (Northern Part) Block Iron Ore Mine is proposed over an area of 92.875 hectares which involves 42.608 Ha of forest land (16.658 ha in Keonjhar Forest Division, District Keonjhar and 25.950 in Bonai Forest Division, District Sundargarh) and 50.267 Ha of non-forest land. The Mining area is situated in three villages namely, village Kalamang & Ghodabudani of Tehsil – Koira, District Sundargarh & village Gandalpada of Tehsil – Barbil, District Keonjhar, State - Odisha.

The Kalamang West (Northern Part) Iron ore block was auctioned by Government of Odisha for grant of mining lease and Bhushan Steel Limited was declared as the 'Preferred bidder'. Accordingly, the Government of Odisha issued a Letter of Intent (LOI) in the name of Bhushan Steel Limited vide Letter No. IV(MISC) SM-53/2017/5285/SM dated 24.06.2017 as per Rule 10(2) of the Mineral Auction Rules 2015 for grant of mining lease for a period of 50 years for Kalamang West (Northern Part) Iron Ore Block in village Kalamang & Ghodabudhani in District Sundargarh and village Gandalpada in District Keonjhar. The LOI was modified by Steel and Mines Department, Government of Odisha vide Letter No. IV(MISC) SM-53/2017/6287/SM dated 27.07.2017, revising the earlier mentioned area of 92.0 ha to 92.875 ha.

Bhushan Steel Limited was acquired by Tata Steel Limited through its wholly owned subsidiary (Bamnipal Steel Limited) pursuant to the Order dated 15.05.2018 issued under IBC Process. The change of name from Bhushan Steel Limited to Tata Steel BSL Limited was noted by the Department of Steel and Mines, Government of Odisha vide letter No. 1409/SM dated 27.02.2019. Further the State Government, vide letter No. 4261/SM dated 27.05.2021, allowed the transfer of LOI issued in favour of Bhushan Steel Limited to Tata Steel BSL Limited under Rule 23A(3) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession



(Amendment) Rules 2021 as well as extended the period of validity of LOI up to 23.06.2022 under the proviso to Rule 10(6) of Mineral Auction Rules 2015.

Now Tata Steel BSL Limited has amalgamated into and with Tata Steel Limited w.e.f 11.11.2021. The Composite Scheme of Amalgamation of Barnipal Steel Limited and Tata Steel BSL Limited into and with Tata Steel Limited was approved and sanctioned by the Hon'ble National Company Law Tribunal, Mumbai bench vide Order dated 29.10.2021. The State Government has also approved the change in name in regard to amalgamation of Barnipal Steel Limited and Tata Steel BSL Limited into and with Tata Steel Limited vide letter No. 541/SM dated 21.01.2022 and vide letter No. 896/SM dated 04.02.2022.

The validity of LOI has now been extended up to 23.12.2022, in favour of M/s Tata Steel Limited, by the State Government vide letter No. 1214/SM dated 11.02.2022 for grant of mining lease for Kalamang West (Northern Part) Iron Ore Block in village Kalamang & Ghodabudhani in District Sundargarh and village Gandalpada in District Keonjhar over 92.875 Ha. Consequent to ensuring compliance to the terms and conditions of Lol, Mining Lease deed was executed and registered for Sundargarh and Keonjhar Districts on 20<sup>th</sup> Dec. 2022. And 21<sup>st</sup> Dec. 2022 respectively.

The aforesaid mine lease area measuring 92.875 ha is for extraction of Iron Ore. The annual excavation is targeted at 2.95 MTPA (RoM) corresponding to 2.84 MTPA saleable iron ore. Open cast mechanized mining method has been proposed. The ROM will be fed to a Crushing/Screening Plant where the lump ore (10 - 40mm) and fines (-10mm) will be segregated in the Crushing / Screening Plant.

**Cost of the Project:**

The estimated cost of the project is Rs.216.20 Crore.

**Location of the Project**

The Project area is located on Topo Sheet No. No. F45N5(73 G/5) with:

**Latitude:** 21° 56' 47.757" - 21° 57' 32.347" N

**Longitude:** 85° 17' 06.658" - 85° 17' 57.531" E

The lease area of Kalamang West (Northern Part) Iron Ore block is further described as follows and bounded by

	Latitude (N)	Longitude (E)
North	21° 57' 32.348"	85° 17' 41.646"
East	21° 56' 54.859"	85° 17' 57.532"
South	21° 56' 47.758"	85° 17' 31.002"
West	21° 57' 13.309"	85° 17' 9.020"

The project area comes partly under Koira Forest Range of Bonai Forest Division and Barbil Forest Range under Keonjhar forest Division.

Both Sundargarh District and Keonjhar District are very rich in Forest as well as wild life. This area is a part of Eastern Ghats and is a continuation of famous Saranda Forest containing diversified Flora & Fauna. Various Wild Life species including Elephants & sloth bears are present in this District.

Both the districts are very rich in mineral deposits such as Iron Ore and Manganese Ore. Besides these Districts are also an Industrial Belt. A number of Industries have come up in these Districts. Presence of Wildlife along with Industries and Mining activities create a conflicting situation.

#### Nature and extent of land required.

##### Existing Land Use:

Revenue & DLC Forest	-	42.608 Ha.
Private (Tenancy) Land	-	20.171 Ha
<u>Government Land</u>	-	<u>30.096 Ha</u>
Total	-	92.875 Ha.

The existing land use can be more specifically described as:

1. Road - 0.726 Ha.
2. Infrastructure - 2.286 Ha.
3. Untouched - 89.863

##### Proposed Land Use plan of Project Area:

The proposed land use during the Mining Plan period will be as follows:

Sl. No.	Purpose of utilization	Area in Ha.
1	Excavation	26.599
2	Overburden Dump	7.971



3	Mineral Storage	17.246
4	Mineral reject stack	3.556
5	Road	4.436
6	Infrastructure	8.887
7	Retaining wall/ Garland Drain	0.34
	Sub Total	69.035
8	Un disturbed	23.84
	Total	92.875

The utilization of Forest land (village wise) will be as follows:

Type of Land use	Forest Area in Ha.			
	Kalamang	Ghodabudhani	Gandhalpada	Total
Area under excavation	0.476	21.716	14.266	36.458
Overburden dump	0.951	0	1.158	2.109
Safety zone of mine boundary	0.477	0.671	1.234	2.382
Mineral Reject Stack	0	0.032	0	0.032
Top soil Stack	0.028	0.2	0	0.228
Green belt in the south beyond the UPL	1.399	0	0	1.399
Total	3.331	22.619	16.658	42.608

**Conditions imposed in FC or EC regarding SSWLCP.**

**Statutory Clearance**

• **Status of Forest Clearance**

Forest diversion proposal under Sec-2(ii) of Forest Conservation Act for the forest land of 42.608 Ha. included within the leasehold area over 92.875 ha for the purpose of mining and ancillary activities has been recommended by State Govt. to MoEF & CC for Stage-I clearance.

- **Status of Environment Clearance:**

- ToR condition**

- (a) ToR (Terms of Reference) was issued by State Environment Impact Assessment Authority (SEIAA), Odisha vide ref no. 22/SEIAA dated 15<sup>th</sup> January 2021. The SSWLCP is being prepared in compliance to the specific condition no. xi and standard condition no. 19 of the said ToR which reads as "A detailed Biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any schedule-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost."

- EC condition**

- (b) The EC has been granted for the project on Dt.18/10/2022 by MoEF & CC, and under "B. Standard Conditions, Section "(VII) Green Belt" point No. (iv) it is stipulated that, "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. and implemented in consultation with the State Forest and Wildlife Department. A copy of the Wildlife Conservation Plan and its implementation status (annual) shall be submitted to the Regional Office of the Ministry."

Hence this Plan is prepared to comply this condition.



## CHAPTER – II

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

### Description of project area and its impact area

#### Project area:

The project area partially covers three villages such as

- (1). Kalmanga, Bonai Forest Division.
- (2). Ghordabudani, Bonai Forest Division
- (3). Gandalpada, Keonjhar Forest Division.

Total no. of Households in these villages is 578 as per 2011 Census Data. A total 71 households/ families (29 in Kalamanga village and 42 in Ghodabudhani village) were identified, which can be termed as land losing households. 54 families are to be displaced for which R & R Scheme has been prepared.

#### Topography and natural drainage:

The project area is with highly rugged terrain, and elongated hills trending ENE-WSW direction, low mounds and narrow valleys. The highest elevation of ridges in the area is 690m. above MSL. The low lying valleys occur at an elevation of around 585m above MSL. Lateritic soil recorded in the ridges and valleys are mainly covered by alluvial soil.

The drainage of the project area takes place through Suna nadi which leads to Karo river flowing from SW to NE at a distance of 3.14 km. Ultimate drainage takes to river Baitarani. Few rain water drainage channels are passing through the lease area

#### Impact Area:

The project area is located at the border of Sundargarh and Keonjhar districts. Therefore the impact area extends over both the districts. Bonai forest division constitutes 57.75% (20705.85 Ha) whereas Keonjhar forest division constitutes 42.25%(15147.57 Ha) of total impact area. The impact area extends over the Forest beats / Ranges.

- Forest Beat: Koira , Malda of Bonai Forest Division and Guali, uliburu, Dubuna, Kendudih of Keonjhar Forest Division.
- Forest Range: Koira of Bonai Forest Division and Barbil of Keonjhar Forest Division.

- Forest Blocks: Parts of the following forest blocks fall within the impact area of 10 km radius:

1. Mendhamaruni RF,
2. Baitarani RF,
3. Sidhamath RF,
4. Lakraghat RF,
5. Karo RF,
6. Toda RF,
7. Uliburu RF etc.

#### Village and Habitation:

There are several villages located within the impact zone. These villages spread in two CD Blocks, Joda CD block in Keonjhar district and Koida CD Block of Sundargarh district.

#### Demographic Pattern:

The demographic pattern of these CD Blocks as per 2011 Census is as follows:

Sl. No.	Particulars	Joda CD Block	Koida CD Block
1	Geographical Area	43,882 Ha.	64,912 Ha
2	No of House Hold	28,356	19,713
3	Total Population	1,25,728	86,818
4	Male Population	64,537	44,024
5	Female Population	61,191	42794
6	Male : Female	1000 : 948	1000 : 972
7	S C Population	11,824 (9.4%)	5,475 (6.3%)
8	S C Male Population	5,967	2,794
9	S C Female Population	5,887	2,681
10	S T Population	75,053 (59.69%)	60,938 (70.19%)
11	S T Male Population	37,613	30,243
12	S T Female Population	37,440	30,695
13	Literates	59,442 (47.28%)	40,467 (46.61%)
14	Total Workers	46,898	33,285
15	Male Workers	33,895	23,021
16	Female Workers	13,039	10,264



17	Cultivators	2,877	5,301
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- **Topography and natural drainage:**

The project area is with highly rugged terrain, and elongated hills trending ENE-WSW direction, low mounds and narrow valleys. The highest elevation of ridges in the area is 690m. above MSL. The low lying valleys occur at an elevation of around 585m above MSL. Lateritic soil recorded in the ridges and valleys are mainly covered by alluvial soil.

#### **Infrastructure Facilities and its impact:**

**Roads:** The area can be approached from Barbil or Koira through NH-215. The National Highway No.215 connecting Panikoili on National Highway No.5 is located at a distance of 1.8 km. NW.

**Railway Line/Siding:** The nearest railway station head is Barbil which is located at a distance of 18 km from the lease area in NE direction.

**Dam:** There is no water reservoir within the impact area.

**Water Way:** The only major water way in this area are Karo river & Suna Nadi. Both these are natural perennial water source.

**Mine Pits:** As there are a number of mines in these areas, there are number of working & non-working pits. There is likelihood of the animals falling in to it. But the present user proposes to surround its own mine pit with Solar Electric fencing along chain mesh provision to prevent entry of all types of wild animals.

**Unguarded dug Wells:** There are no such un-guarded dug wells in the study area. So there is no chance of fall of animals inside the well.

**Mining Projects:** The other important mining projects in the vicinity are Kalta, Tensa, Barsuan in Koira circle and Joda circle in Keonjhar district.

#### **Flora, fauna, forests, other habitats**

##### **Description of Flora & Fauna:**

This is a new mine & yet to be executed. This area does not form a part of any wild life Sanctuary or National Park or critical Wildlife habitat. This area is also surrounded by various mines and mining activities.

The Forest around the lease area & impact zone area are disturbed due to various Mining activities and presence of Wildlife is very sparse. As per the information



collected the following flora & fauna are found in the core and Buffer area of the project.

No endemic species are found either in project area & in the ZOI area.

During the site inspection of the project area as well as the buffer (impact) area detailed study of Flora and fauna has been conducted.

The list of Flora and Fauna so prepared and authenticated by the forest officials is enclosed.

#### Flora of the Project Area

<u>Local Name</u>	<u>Botanical Name</u>	<u>Family Name</u>
<b>TREES</b>		
Achu	<i>Morinda tinctoria</i>	Rubiaceae
Amba (Mango)	<i>Mangifera indica</i>	Anacardiaceae
Amla	<i>Emblica officinalis</i>	Euphorbiaceae
Asan	<i>Terminalia tomentosa</i>	Combretaceae
Bahada	<i>Terminalia bellerica</i>	Combretaceae
Char	<i>Buchnanania lanzan</i>	Anacardiaceae
Dhaman	<i>Grewia tillaefolia</i>	Combretaceae
Dhaura	<i>Anogeissus latifolia</i>	Combretaceae
Dhala siris	<i>Albizia procera</i>	Mimosaceae
Haldu	<i>Adina cordifolia</i>	Rubiaceae
Harida	<i>Terminalia chebula</i>	Combretaceae
Jamun	<i>Syzygium cumini</i>	Myrtaceae
Kaluchia	<i>Diospyros sylvatica</i>	Ebenaceae
Kamalegundi	<i>Mallotus philippinensis</i>	Euphorbiaceae
Kendu	<i>Diospyros melanoxylon</i>	Ebenaceae
Kumbhi	<i>Careya arborea</i>	Myrtaceae
Kusum	<i>Schleichera oleosa</i>	Sapindaceae
Mahul	<i>Madhuca indica</i>	Sapotaceae
Moi	<i>Lannea grandis</i>	Anacardiaceae
Mundi	<i>Mitragyna parviflora</i>	Rubiaceae
Palas	<i>Butea monosperma</i>	Papilionaceae
Rai	<i>Dillenia pentagyna</i>	Dilleniaceae
Rohini/ Som	<i>Soymida febrifuga</i>	Meliaceae
Sal	<i>Shorea robusta</i>	Dipterocarpaceae
Semul	<i>Bombax ceiba</i>	Bombacaceae



<u>Local Name</u>	<u>Botanical Name</u>	<u>Family Name</u>
Sidha	<i>Lagerstroemia parviflora</i>	Lythraceae
Siris/ Tentra	<i>Albizia lebbek</i>	Mimosaceae
Teak	<i>Tectona grandis</i>	Verbenaceae
<b>HERBS/SHRUBS</b>		
Anantamula	<i>Hemidesmus indicus</i>	Asclepiadaceae
Arakha	<i>Calotropis procera</i>	Asclepiadaceae
Baibidanga	<i>Embelia robusta</i>	Myrsinaceae
Basanga	<i>Adhatoda vasica</i>	Acanthaceae
Dhatki	<i>Woodfordia fruticosa</i>	Lythraceae
Kurei	<i>Holarrhena antidysenterica</i>	Apocynaceae
<b>CLIMBERS</b>		
Atundi	<i>Combretum decandrum</i>	Combretaceae
Baidanka	<i>Mucuna monosperma</i>	Papilionaceae
Bichhuati	<i>Urtica dioica</i>	Euphorbiaceae
Muturi	<i>Smylax macrophylla</i>	Liliaceae
Siali	<i>Bauhinia vahlii</i>	Papilionaceae
Satabari	<i>Asparagus racemosus</i>	Liliaceae

**Fauna of the Project Area:**

The fauna found in the project area are as follows:

<u>Local Name</u>	<u>English Name</u>	<u>Zoological Name</u>	<u>Schedule</u>
<b>MAMMALS</b>			
Bilua	Jackal	<i>Canis aureus</i>	I
Heta	Hyena	<i>Hyaena hyaena hyaena</i>	I
Kutura	Barking deer	<i>Muntiacus muntjak</i>	II
Mankad	Monkey	<i>Presbytes entellus</i>	II
Neula	Mongoose	<i>Herpestes edwardsii</i>	II
Saliapatni	Small Indian Civet	<i>Viverricula indica</i>	I
Thekua	Indian Hare	<i>Lepus nigricollis</i>	II
<b>BIRDS</b>			
Bana Kukuda	Jungle fowl	<i>Gallus gallus</i>	II
Gunduri	Grey Partridge	<i>Francolinus pondicerianus</i>	II
Kajalpati	Black Drongo	<i>Dicrurus adsimilis</i>	II



<u>Local Name</u>	<u>English Name</u>	<u>Zoological Name</u>	<u>Schedule</u>
Kapta	Ring Dove	<i>Streptopelia decaocto</i>	II
Kathahana	Goldenbacked Woodpecker	<i>Dinopium benghalense</i>	II
Koel	Cuckoo	<i>Eudynamis Scolopaceus</i>	-
Pecha	Owl	<i>Athere brama brama</i>	II
Kumbhatua	Crow pheasant	<i>Centropus sinensis</i>	II
REPTILES			
Dhamana	Rat snake	<i>Ptyas mucosus</i>	I
Boda	Common Boa	<i>Boa constricta</i>	
Chiti	Common Indian Krait	<i>Bangarus caruleus</i>	II
Naga	Cobra	<i>Naja naja</i>	I
Endua	Garden Lizard	<i>Calotes versicolor</i>	-

**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:

<u>Local Name</u>	<u>Botanical Name</u>	<u>Family Name</u>
TREES		
Achu	<i>Morinda tinctoria</i>	Rubiaceae
Amba (Mango)	<i>Mangifera indica</i>	Anacardiaceae
Amla	<i>Emblica officinalis</i>	Euphorbiaceae
Asan	<i>Terminalia tomentosa</i>	Combretaceae
Bahada	<i>Terminalia belerica</i>	Combretaceae
Bara bakulia	<i>Dalbergia paniculata</i>	Pailanaceae
Baruna	<i>Crateva religiosa</i>	Capparideceae
Bel	<i>Aegle marmelos</i>	Rutaceae
Bhalia	<i>Semecarpus anacardium</i>	Anacardiaceae
Bheru	<i>Chloroxylon swietenia</i>	Meliaceae
Bija/Piasal	<i>Pterocarpus marsupium</i>	Papilionaceae
Chadeigudi	<i>Vitex peduncularis</i>	Verbinaceae
Char	<i>Buchnanania lanzan</i>	Anacardiaceae



<u>Local Name</u>	<u>Botanical Name</u>	<u>Family Name</u>
Chhatian	<i>Alstonia scholaris</i>	Apocynaceae
Chikini/ Kalchua	<i>Glochidion lanceolarium</i>	Euphorbiaceae
Dhaman	<i>Grewia tillaefolia</i>	Combretaceae
Dhaura	<i>Anogeissus latifolia</i>	Combretaceae
Dhala siris	<i>Albizzia procera</i>	Mimosaceae
Gangasiuli	<i>Nyctanthes arbotristis</i>	Oleaceae
Genduli	<i>Sterculia urens</i>	Sterculiaceae
Ghar-Khair	<i>Acacia lenticularis</i>	Mimosaceae
Ghantol	<i>Zizyphus glaberrima</i>	Rhamnaceae
Giringa	<i>Pterospermum heyneanum</i>	Sterculiaceae
Haldu	<i>Adina cordifolia</i>	Rubiaceae
Harida	<i>Terminalia chebula</i>	Combretaceae
Jamun	<i>Syzygium cumini</i>	Myrtaceae
Kaluchia	<i>Diospyros sylvatica</i>	Ebenaceae
Kamalagundi	<i>Mallotus philippinensis</i>	Euphorbiaceae
Kansa	<i>Hymenodictyon excelsum</i>	Rubiaceae
Kantapalas	<i>Cochlospermum gossypium</i>	Bixaceae
Kendu	<i>Diospyrus melanoxylon</i>	Ebenaceae
Khakra	<i>Casearia elliptica</i>	Samydaceae
Kodal	<i>Firmiana colorata</i>	Sterculiaceae
Kumbharchikni	<i>Canthium didymum</i>	Rubiaceae
Kumbhi	<i>Careya arborea</i>	Myrtaceae
Kusum	<i>Schleichera oleosa</i>	Sapindaceae
Mahul	<i>Madhuca indica</i>	Sapotaceae
Mankada Kendu	<i>Diospyros embryopteris</i>	Ebenaceae
Moi	<i>Lannea grandis</i>	Anacardiaceae
Mundi	<i>Mitragyna parviflora</i>	Rubiaceae
Paldhua	<i>Erithrina indica</i>	Papilionaceae
Palas	<i>Butea monosperma</i>	Papilionaceae
Rai	<i>Dillenia pentagyna</i>	Dilleniaceae
Ritha	<i>Sapindus emarginatus</i>	Sapindaceae
Rohini/ Som	<i>Soymida febrifuga</i>	Meliaceae



<u>Local Name</u>	<u>Botanical Name</u>	<u>Family Name</u>
Sal	<i>Shorea robusta</i>	Dipterocarpaceae
Salai	<i>Boswellia serrata</i>	Burseraceae
Semul	<i>Bombax ceiba</i>	Bombacaceae
Sidha	<i>Lagerstroemia parviflora</i>	Lythraceae
Siris/ Tentra	<i>Albizzia lebbek</i>	Mimosaceae
Teak	<i>Tectona grandis</i>	Verbenaceae
Telkuran	<i>Ixora arborea</i>	Rubiaceae
Tinia	<i>Albizzia odoratissima</i>	Mimosaceae
<b>HERBS/SHRUBS</b>		
Anantamula	<i>Hemidesmus indicus</i>	Asclepiadaceae
Arakha	<i>Calotropis procera</i>	Asclepiadaceae
Baibidanga	<i>Embelia robusta</i>	Myrsinaceae
Basanga	<i>Adhatoda vasica</i>	Acanthaceae
Dhatki	<i>Woodfordia fruticosa</i>	Lythraceae
Kurei	<i>Holarrhena antidysenterica</i>	Apocynaceae
<b>CLIMBERS</b>		
Atundi	<i>Combretum decandrum</i>	Combretaceae
Baidanka	<i>Mucuna monosperma</i>	Papilionaceae
Bichhuati	<i>Urtica dioica</i>	Euphorbiaceae
Muturi	<i>Smylax macrophylla</i>	Liliaceae
Siali	<i>Bauhinia vahlii</i>	Papilionaceae
Satabari	<i>Asparagus racemosus</i>	Liliaceae

**Fauna of the Impact Area:**

There are several mining and other projects operating within the impact area. Due to regular disturbance by various mining activities, the wild animals are rarely seen in this area. The common wildlife species which are occasionally seen in this area are:

<u>Local Name</u>	<u>English Name</u>	<u>Zoological Name</u>	<u>Schedule</u>
<b>MAMMALS</b>			
Belera Musa	Giant squirrel	<i>Ratufa bicolor</i>	//
Bhalu	Sloth bear	<i>Melursus ursinus ursinus</i>	/
Barha	Wild Boar	<i>Sus scrofa cristatus</i>	//
Bilua	Jackal	<i>Canis aureus</i>	/



<u>Local Name</u>	<u>English Name</u>	<u>Zoological Name</u>	<u>Schedule</u>
Kalara Patria bagha	Leopard	<i>Panthera pardus</i>	I
Jhinka	Porcupine	<i>Hystrix indica</i>	I
Kutura	Barking deer	<i>Muntiacus muntjak</i>	II
Harina	Spotted deer	<i>Axis axis</i>	II
Mankad	Monkey	<i>Presbytes entellus</i>	II
Neula	Mongoose	<i>Herpestes edwardsii</i>	II
Saliapatni	Small Indian Civet	<i>Viverricula indica</i>	I
Thekua	Indian Hare	<i>Lepus nigricollis</i>	II
Heta Bagha	Striped Hyaena	<i>Hyaena hyaena hyaena</i>	I
Hati	Elephant	<i>Elephas maximus</i>	I
<b>BIRDS</b>			
Bana Kukuda	Jungle fowl	<i>Gallus gallus</i>	II
Gunduri	Grey Partridge	<i>Francolinus pondicerianus</i>	II
Kajalpati	Black Drongo	<i>Dicrurus adsimilis</i>	II
Kapta	Ring Dove	<i>Streptopelia decaocto</i>	II
Koel	Cuckoo	<i>Eudynamis scolopacea</i>	II
Kumbhatua	Crow pheasant	<i>Centropus sinensis</i>	II
Kathahana	Wood pecker	<i>Picus canus</i>	II
Kathahana	Goldenbacked Woodpecker	<i>Dinopium benghalense</i>	II
Sari	Hill Myna	<i>Gracula religiosa</i>	II
Sua	Large Indian Parakeet	<i>Psittacula nipalensis</i>	
<b>REPTILES</b>			
Dharnana	Rat snake	<i>Ptyas mucosus</i>	I
Boda	Common Boa	<i>Boa constricta</i>	
Chiti	Common Indian Krait	<i>Bangarus caruleus</i>	I
Ajagar	Indian python	<i>Python molurus molurus</i>	I
Naga	Cobra	<i>Naja naja</i>	I
Godhi	Monitor Lizard	<i>Varanus bengalensis</i>	I
Endua	Garden Lizard	<i>Calotes versicolor</i>	-

**Movement patterns of the megafauna.**

Small groups of elephants are known to move between Karampada forests of Jharkhand State to Odisha via Kiriburu – Uliburu RF, Sidhamath RF and to Karo RF. This group alternates between Jharkhand-Odisha forests. The movement is not confined to forest areas alone. Stray movement occurs in villages causing house & crop damages of Paddy, Banana plants, Jackfruit, Mangoes. Human death also occurs due to accidental encounter. Malda, Deojhar, Alaghat, Sargigarh, Gonua on Bonai side and Khandabandha and Guruda villages on Kendujhar District are affected by crop depredation. Elephant movement occurs in Teherai and Kundra Nala nearby villages and other plain lands where paddy is adequately available.

Elephant movement is also found occasionally in Mendhamaruni PRF.

**Wildlife corridors.**

Karo- Karampada elephant corridor is located at a distance of about 8.6 kms N from the project area.

**HWC details in the area.**

**Man- animal conflict Data:** (Details collected from DFO's office Bonai and Keonjhar)

Human – Elephant Conflict is on rise in the state and has become one of the major issues in the fight to save Asia's endangered elephants. It is one of main cause of elephant death. Due to loss and fragmentation of elephant habitat/forest, lack of fodder, water and shelter, the elephants are rather turning to crop raiding for sustenance. At times the human habitations are destroyed in the conflict, besides loss of human life.

The elephant population in the district of Sundargarh is rather fluctuating, since elephant movement takes place between Jharkhand and Odisha.



**MAN-ANIMAL CONFLICT INFORMATION****KEONJHAR FOREST DIVISION****Information of Death of Elephants**

Elephant	Range	Location	Cause of Death	
2016-17				
		NIL		
2017-18				
Female-40years	Telkoi	Udayagigi (Munda Sahi )	Due to septicemia	N- 21-18-47 E-85-22-27.44
Female-7years	Keonjhar	Near Village Dumuria Rashi field		N-21-27-27.4 E-85-34-09.0
2018-19				
Male-12 to 14 Years	Champua	Chamakpur KF. 150 meters away from river Baitarani	Due to shock arising from septicemia	N-21-59-45.93 E- 85-28-21.93
Female-30 Years	Keonjhar	Basantpur & Naranpur between Railway Station	Due to Train accident	N- 21-34-39.9 E- 85-38-49.6
Male Calf- 1 Month old	Champua	Mahaparbat DPF, Near village Hatimara Chhak	In-fighting among male & Female elephants	N-21-51-14.6 E-85-25-16.6
2019-20				
Female- 15 to 20 years	Ghatagaon	Near Gayalmunda Village	Inside Barabanka RF	N- 21-27-43.7 E- 85-46-15.1
2 Female & 1 Calf	Ghatagaon	Atei RF	Truck & Bus Accident on 21.08.2019	

**Death of Wild animals**

Year	Name of the animal	No. of Deaths
2019-20	Elephants	6
	Sloth Bear	3
	Wild Boar	5
	Spotted Deer	6
	Barking Deer	2

2020-21 (up to Oct. 20)	<b>Total</b>	<b>22</b>
	Elephants	7
	Sloth Bear	7
	Spotted Deer	4
	Barking Deer	3
	Python	1
	Fox	1
	<b>Total</b>	<b>23</b>

**Human Death due to Wild Animal Attack**

Name of the Range	No. of cases	Compassionate Amount
<b>2015-16 (Human death by Elephants)</b>		
Champua	3 nos	900000
Patna	1 no	300000
Telkoi	1 no	300000
Keonjhar	3 nos	900000
BJP	2 nos	600000
<b>Total</b>	<b>10 nos</b>	<b>3000000</b>
<b>2016-17 (Human death by Elephants)</b>		
Barbil	1 no	300000
BJP	1 no	300000
Ghatagaon	1 no	300000
Keonjhar	1 no	300000
Champua	3 nos	900000
<b>Total</b>	<b>7 nos</b>	<b>2100000</b>
<b>2016-17 (Human death by Wild Bear)</b>		
Patna	1 no	300000
Telkoi	1 no	300000
<b>Total</b>	<b>2 nos</b>	<b>600000</b>
<b>2017-18 (Human death by Elephants)</b>		
Champua	3 nos	900000
BJP	1 no	300000
Ghatagaon	2 nos	NIL
Telkoi	1 no	300000
Keonjhar	1 no	300000
	<b>8 nos</b>	<b>1800000</b>
<b>2017-18 (Human death by Wild Bear)</b>		
BJP	2 nos	600000
<b>2018-19 (Human death by Elephants)</b>		
BJP	1 no	NIL
Champua	3 nos	NIL
Keonjhar	3 nos	400000
Barbil	1 no	400000
	<b>8 nos</b>	<b>800000</b>
<b>2018-19 (Human death by Wild Bear)</b>		
Keonjhar	5nos	1600000



Ghatagaon	1 no	NIL
<b>Total</b>	<b>6 nos</b>	<b>1600000</b>

**Human Deaths due to wild animal attack**

Year	Elephant	Sloth Bear	Wild Boar	Total
2019-20	8	0	1	9
2020-21 (up to Oct.)	1	1	1	3

**Human Injury Due to Wild Animal Attack**

Human Injury by wild animal	Range	Number of cases	Amount Payment
<b>2015-16</b>			
Elephant	BJP	3 nos	10000
Elephant	Champua	1 no	5000
Bear	BJP	6 nos	15000
Bear	Ghatagaon	3 nos	110000
Bear	Patna	8 nos	110000
Bear	Keonjhar	10 nos	133330
Bear	Champua	1 no	100000
<b>2016-17</b>			
Elephant	Champua	1 no	NIL
Elephant	Telkoi	2 nos	10000
Elephant	Keonjhar	1 no	100000
Bear	Patna	5 nos	100000
Bear	BJP	7 nos	10000
Bear	Keonjhar	11 nos	125000
Bear	Ghatagaon	3 nos	180000
Bear	Telkoi	2 nos	10000
<b>2017-18</b>			
Elephant	BJP	1 no	NIL
Elephant	Telkoi	1 no	5000
Elephant	Keonjhar	1 no	NIL
Elephant	Champua	1 no	100000
Bear	Keonjhar	2 nos	NIL
Bear	BJP	5 nos	NIL
Bear	Patna	6 nos	10000
Bear	Keonjhar	1 no	NIL
Bear	Telkoi	2 nos	5000
Bear	Ghatagaon	5 nos	115000
<b>2018-19</b>			
Elephant	Telkoi	3 nos	5000
Elephant	Champua	1 no	NIL
Elephant	BJP	2 nos	NIL

Bear	Keonjhar	6 nos	205000
Bear	Ghatagaon	3 nos	NIL
Bear	Patna	5 nos	15000
Bear	Champua	5 nos	25000
Bear	Barbil	1 no	NIL
Bear	Telkoi	4 nos	NIL
Bear	BJP	1 no	NIL
2019-20			
Elephnat	Ghatagaon	1 no	NIL
Bear	Patna	2 nos	NIL
Bear	Ghatagaon	1 no.	NIL

**Human Injury Due to Wild Animal Attack**

Year	Elephant	Sloth Bear	Wild Boar	Total
2019-20	4	22	0	26
2020-21 (up to Oct.)	4	26	2	32

**House Damage by Elephants**

Range	No. of cases damaged			Amount Sanctioned
	Partly	Fully	Total	
2016-17				
Champua	55	6	61	170000
Barbil	9	0	9	18000
Patna	2	0	2	4000
BJP	15	6	21	90000
Ghatgaon	1	5	6	52000
Keonjhar	3	0	3	6000
Total	85	17	102	340000
2017-18				
Barbil	40	2	42	100000
Champua	87	30	117	474000
Patna	27	11	38	164000
BJP	13	2	15	46000
Total	170	46	216	800000
2018-19				
Champua	41	45	86	532000
Keonjhar	10	1	11	30000
Patna	1	0	1	2000
Telkoi	6	0	6	12000



<b>Total</b>	<b>58</b>	<b>46</b>	<b>104</b>	<b>576000</b>
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House Damage

Year	Number of Houses damaged		
	Partly	Fully	Total No. of cases
2019-20	163	179	342
2020-21 (up to Oct.)	54	24	78

Crop Damage by Elephants

Range	No. of Villages	Type of Crop						Amount Rupees
		Paddy & cereals		Cash crop		Total		
		No. of cases	Area (Ac.)	No. of cases	Area (Ac.)	No. of cases	Area (Ac.)	
2016-17								
Keonjhar	10	82	27.38			82	27.38	273800
Patna	21	63	28.57	6	1.14	69	29.71	299380
Barbil	8	74	26.57	18	6.10	92	32.67	338900
Barbil	5	68	27.17	11	2.09	79	29.26	296780
Barbil	6	68	24.33			68	24.33	243300
Champua	17	103	40.16			103	40.16	401600
Champua	27	90	35.03			90	35.03	350300
Keonjhar	8	20	5.27	5	1.22	25	6.49	67340
Telkoi	11	27	8.34			27	8.34	83400
Patna	5	27	4.11			27	4.11	41100
Patna	12	78	25.80	3	0.46	81	26.26	263520
Ghatgaon	5	21	5.64	5	1.48	26	7.12	74160
BJP	9	51	9.12			51	9.12	91200
Champua	9	73	14.01			73	14.01	140100
Champua	15	92	20.72			92	20.72	207200
Telkoi	18	53	13.91	5	4.32	58	13.91	147740
Keonjhar	8	86	20.91			86	20.91	209100
Champua	13	75	30.67			75	30.67	306700
Telkoi	18	96	16.58			96	16.58	165800
Champua	2	90	15.43			90	15.43	154300
Champua	2	86	13.05			86	13.05	130500
Champua	1	78	15.59			78	15.59	155900
Keonjhar	8	85	23.15			85	23.15	231500
Keonjhar	15	93	20.59			93	20.59	205900
Telkoi	22	74	14.47			74	14.47	144700
BJP	15	62	13.69			62	13.69	136900
Ghatgaon	17	85	18.73			85	18.73	187300
Telkoi	32	95	16.49			95	16.49	164900
Telkoi	11	84	9.56			84	9.56	95600
Ghatgaon	17	79	17.55			79	17.55	175500



Range	No. of Villages	Type of Crop						Amount Rupees
		Paddy & cereals		Cash crop		Total		
		No. of cases	Area (Ac.)	No. of cases	Area (Ac.)	No. of cases	Area (Ac.)	
Patna	1	6	1.24			6	1.24	12400
Keonjhar	14	81	18.24			81	18.24	182400
Telkoi	14	62	9.50			62	9.50	95000
Keonjhar	16	82	18.11			82	18.11	181100
Champua	17	104	24.43			104	24.43	244300
Champua	4	105	24.15			105	24.15	241500
Keonjhar	19	96	22.32			96	22.32	223200
Ghatgaon	8	70	13.8			70	13.8	138000
Keonjhar	8	92	27.15			92	27.15	271500
Keonjhar	22	75	18.09	7	1.36	82	19.44	197160
Ghatgaon	22	81	15.81			81	15.81	158100
Keonjhar	11	61	13.51	3	1.35	64	14.86	137800
Champua	18	79	12.22			79	12.22	122200
Ghatgaon	11	53	10.79			53	10.79	107900
Champua	15	74	26.15			74	26.15	261500
Keonjhar	6	32	11.09	11	2.17	43	13.26	115240
Telkoi	14	49	10.10			49	10.10	101000
BJP		101	29.48			101	29.48	294800
Champua		91	22.76			91	22.76	227600
Champua		50	14.80			50	14.80	148000
Champua		86	28.01			86	28.01	280100
	587	3688	934.34	74	21.69	3762	951.7	9525220
2017-18								
Telkoi	11	55	10.43			55	10.43	104300
Patna	6	55	14.23			55	14.23	142300
Patna	4	49	17.26			49	17.26	172600
Patna	10	60	10.28	2	1.52	62	11.80	121040
Barbil	12	33	19.25	10	2.40	43	21.65	221300
Barbil	15	62	32.22	8	3.77	70	35.99	367440
Champua	15	73	18.42			73	18.42	184200
Champua	2	16	3.47			16	3.47	34700
Telkoi	15	28	3.95	10	3.54	38	7.49	81980
Telkoi	22	63	11.85			63	11.85	118500
Telkoi	13	34	4.47	16	5.61	50	10.08	114720
Telkoi	9	37	7.13			37	7.13	71300
patna	5	40	10.57			40	10.57	105700
keonjhar	15	49	12.20	1	0.24	50	12.44	124880
ghatgaon	11	36	11.56	1	0.12	37	11.68	117040
patna	3	49	9.29			49	9.29	92900
Telkoi	25	68	13.52			68	13.52	135200
Telkoi	28	73	15.03			73	15.03	150300
Champua	6	33	8.80			33	8.80	88000
Champua	9	68	15.94	1	0.20	69	16.14	161800
Champua	9	45	14.49			45	14.49	144900
Champua	12	59	16.60			59	16.60	166000



Range	No. of Villages	Type of Crop						Amount Rupees
		Paddy & cereals		Cash crop		Total		
		No. of cases	Area (Ac.)	No. of cases	Area (Ac.)	No. of cases	Area (Ac.)	
patna	9	65	20.56	10	2.60	75	23.16	236800
keonjhar	11	40	5.56			40	5.56	56500
keonjhar	4	50	13.72			50	13.72	137200
BJP	14	55	13.03	5	1.10	60	14.13	143500
Champua	10	39	13.50			39	13.50	135000
keonjhar	18	58	8.52	2	0.50	60	9.02	91200
BJP	27	66	14.08			66	14.08	149600
BJP	15	60	12.35			60	12.35	123500
Champua	8	15	1.96			15	1.96	19600
Champua	8	33	10.47			33	10.47	104700
Champua	12	62	9.63			62	9.63	96300
Champua	4	57	8.52			57	8.52	85200
Champua	10	54	7.58			54	7.58	75800
Champua	3	35	4.96			35	4.96	49600
Champua	2	3	0.43			3	0.43	4300
Champua	11	100	14.98			100	14.98	149800
Ghatgaon	21	112	35.20	3	1.01	115	36.21	364120
Ghatgaon	38	145	43.55			145	43.55	435500
Champua	12	50	16.00			50	16.00	160000
Champua	17	79	18.79			79	18.79	187900
Champua	24	191	57.58			191	57.58	575800
Telkoi	22	71	13.62			71	13.62	136200
Keonjhar	22	95	31.21	5	0.95	100	32.16	323500
K/P/B/G						129	37.21	375480
Champua						4	0.74	8880
Keonjhar						10	2.61	31100
Keonjhar						29	7.65	76860
Keonjhar						158	52.82	539600
Keonjhar						165	34.09	342700
	579	2618	656.76	74	23.56	3187	815.71	8237340
2018-19								
Telkoi	11	15	3.70	6	1.68	21	5.38	57160.00
Telkoi	6	2	0.32	10	1.83	12	2.15	24800.00
Champua	5	5	0.93	20	4.87	25	5.80	67740.00
Telkoi	2	6	1.57			6	1.57	18600.00
Keonjhar	2	1	0.07	2	0.21	3	0.28	3220.00
Telkoi	4			12	2.02	12	2.02	24240.00
Telkoi	3	1	0.15	7	1.17	8	1.32	15540.00
Ghatgaon	8	3	0.82	11	3.42	14	4.24	49240.00
Patna	2	25	3.95			25	3.95	39500.00
Telkoi	11	26	2.79	20	3.33	46	6.12	67660.00
Keonjhar	20	31	3.84	13	2.16	44	6.00	64320.00
Telkoi	9	21	3.52	1	0.18	22	3.70	37300.00
Patna	3	13	2.11			13	2.11	21100.00
Keonjhar	19	29	6.28	4	1.18	33	7.46	76960.00



Range	No. of Villages	Type of Crop						Amount Rupees
		Paddy & cereals		Cash crop		Total		
		No. of cases	Area (Ac.)	No. of cases	Area (Ac.)	No. of cases	Area (Ac.)	
Keonjhar	8	38	5.58			38	5.58	55800.00
Keonjhar	4	27	4.65			27	4.65	46500.00
Telkoi	2	11	1.82			11	1.82	18200.00
Champua	8	29	9.40	1	0.60	30	10.00	100000.00
Champua		35	4.80			35	4.80	48000.00
Telkoi	1	8	1.05			8	1.05	10500.00
Ghatgaon	6	30	9.63			30	9.63	96300.00
Keonjhar	16	44	9.93			44	9.93	99300.00
Keonjhar	22	56	14.32	1	0.19	57	14.51	145480.00
Keonjhar	12	41	7.18			41	7.18	71800.00
Telkoi	12	28	5.52			28	5.52	55200.00
Patna	8	28	7.75	8	0.98	36	8.73	89260.00
Keonjhar	20	64	15.64			64	15.64	156400.00
Champua	1	27	5.23			27	5.23	52300.00
Telkoi	7	16	4.7			16	4.70	47000.00
Champua	4	37	8.69			37	8.69	86900.00
Keonjhar	17	23	6.02			23	6.02	60200.00
Telkoi	6	23	5.83			23	5.83	58300.00
Champua	8	65	15.52			65	15.52	155200.00
Keonjhar	16	31	9.58			31	9.58	95800.00
Champua	12	48	10.13	3	0.76	51	10.89	108900.00
Keonjhar	14	31	12.16			31	12.16	121600.00
keonjhar	15	56	18.00			56	18	180000.00
keonjhar	20	49	15.04	4	0.4	53	15.44	155200.00
Patna	4	6	0.70			6	0.70	7000.00
Ghatagaon	3	18	4.9			18	4.90	49000.00
Ghatagaon	11	45	13.39			45	13.39	133900.00
keonjhar	18	40	14.38			40	14.38	143800.00
Telkoi	18	42	9.98			42	9.98	99800.00
Telkoi	11	31	5.72			31	5.72	57200.00
Champua	4	59	13.74			59	13.74	137400.00
Telkoi	20	104	26.83			104	26.83	268300.00
Telkoi	15	39	7.96			39	7.96	79600.00
Champua	7					55	13.26	135700.00
Champua	17	85	18.75			85	18.75	187500.00
Telkoi	11	31	5.94			31	5.94	59400.00
Telkoi	22	48	8.82	1	0.16	49	8.98	90100.00
keonjhar	28	43	15.79	2	0.59	45	13.38	164900.00
patna	7	22	4.80			22	4.80	48000.00
patna	7	70	21.43			70	21.43	214300.00
Champua	9	28	6.66			28	6.66	66600.00
Telkoi	24	43	9.30	1	0.57	44	9.87	99840.00
Champua	4	57	13.79			57	13.79	137900.00



Range	No. of Villages	Type of Crop						Amount Rupees
		Paddy & cereals		Cash crop		Total		
		No. of cases	Area (Ac.)	No. of cases	Area (Ac.)	No. of cases	Area (Ac.)	
Champua	14	45	10.64			45	10.64	106400.00
Ghatagaon	6	11	2.95			11	2.95	29500.00
Champua	2	27	6.28			27	6.28	62800.00
Champua	14	67	14.03			67	14.03	140300.00
Champua	2	31	6.83			31	6.83	68300.00
Champua	9	63	13.43			63	13.43	134300.00
Champua	34	78	19.21			78	19.21	192100.00
BJP	19	95	27.52			95	27.52	279640.00
Telkoi	16	39	6.93	2	0.06	41	6.99	70100.00
Champua	14	73	16.11			73	16.11	161100.00
Champua	14	49	11.14			49	11.14	111400.00
patna	6	14	1.43			14	1.43	14340.00
BJP	21	95	26.13			95	26.13	261300.00
BJP	30	94	22.418			94	22.418	225444.00
Keonjhar	22	37	10.98	6	1.4	43	12.38	126600.00
Keonjhar	9	9				47	13.05	135160.00
Ghatagaon	16	98	27.00			98	27.00	270000.00
Ghatagaon	11	32	9.64			32	9.64	96400.00
BJP	19	77	22.542	8	1.38	85	23.926	241978.00
BJP	15	36	9.970	1	0.30	37	10.270	103300.00
BJP	6	35	8.802			35	8.802	88020.00
BJP	24	77	19.71			88	22.67	236220.00
Keonjhar	38	83				83	26.9	289740.00
B.J.P	24	64				64	16.96	170200.00
Telkoi	5	8				8	2.33	27500.00
B.J.P	1	44				44	11.78	117800.00
Telkoi	3	3	0.74	2	0.42	5	1.16	12400.00
Champua	8	27	2.8	7	1.24	34	4.04	42880.00
Patna	2			6	1.34	6	1.34	16060.00
Telkoi	4			6	1.24	6	1.24	14880.00
	992	3245	738.33	165	33.68	3514	856.26	8707922
2019-20								
Telkoi	4			33	4.60	33	4.60	53900
Telkoi	3			4	1.20	4	1.20	14300
Champua	2	1	0.12	2	0.26	3	0.38	4300
Champua	2			3	0.58	3	0.58	6960
Telkoi	5			8	1.90	8	1.90	22500
Barbil	2	2	0.60			2	0.60	6000
Patna	1	2	0.19			2	0.19	1900
	19	5	0.91	50	8.54	55	9.45	109860



Year	No. of victims	Area damaged (Ac.)
2019-20	3540	890.40
2020-21 (up to Oct.)	742	159.49

**BONAI FOREST DIVISION (SUNDARGARH DISTRICT)****BONAI DIVISION**  
**Elephant Census**

Year	No. of elephant found
2010	45
2012	42
2015	65
2017	60

**Death of Elephant last Five Year under Bonai Division**

Year	Range	Date of death	Type of Wild Animal dead	No. of death cases	Reason of death
1	2	3	4	5	6
2018-19	Barsuan	24.12.2018	Elephant Male	1 No.	Circulatory failure by severe dehydration resulting from enteritis
2019-20	NIL	NIL	NIL	NIL	NIL
2020-21	Koira	13.09.2020	Female Elephant	1 No.	Due to hemorrhage shock
	Koira	22.09.2020	Elephant Male	1 No.	Due to Anthrax
	Barsuan	28.02.2020	Elephant Female	1 No.	May be due to Septicemia and Severe degree of dehydration and anemia
	Koira	02.03.2021	Elephant Calf	1 No.	Due to shock leading from blunt injurt to frontal part of the head along with dehydration
2021-22	NIL	NIL	NIL	NIL	NIL
2022-23	NIL	NIL	NIL	NIL	NIL
2023-24	Koira	10.04.2023	Elephant Calf (Male)	1 No.	Natural

**Details of Animal Depredation paid during the year 2018-19 to 2022-23 in****Koira Range**  
**Crop Damage**

Sl. No.	Year	Name of the Division	Name of the Range	No. of Cases	Area Damage in Ac.	Amount sanction	Amount Paid
1	2	3	4	5	6	7	8
1	2018-19	Bonai	Koira	59	22.88	228800	228800
2	2019-20			177	65.51	657300	657300
3	2020-21			-	-	-	-



4	2021-22			243	109.09	1090900	1090900
5	2022-23			134	53.121	531210	531210

**House Damage**

Sl. No.	Year	Name of the Division	Name of the Range	No. of Cases	Partly	Fully	Amount sanction	Amount Paid
1	2018-19	Bonai	Koira	11	5	6	70000	70000
2	2019-20			75	42	33	414000	414000
3	2020-21			50	32	18	244000	244000
4	2021-22			85	34	51	578000	578000
5	2022-23			69	36	33	402000	402000

**Human Kill**

Sl. No.	Year	Name of the Division	Name of the Range	No. of Cases	Amount sanction	Amount Paid
1	2018-19	Bonai	Koira	1	400000	400000
2	2019-20			1	400000	400000
3	2020-21			1	400000	400000
4	2021-22			4	1600000	1600000
5	2022-23			2	800000	800000

**Cattle Kill**

- Nil -

**Human Injury**

- Nil -

**Details of Animal Depredation paid during the year 2018-19 to 2022-23 in****Barsuan Range****Crop Damage**

Sl. No.	Year	Name of the Division	Name of the Range	No. of Cases	Area Damage in Ac.	Amount sanction	Amount Paid
1	2	3	4	5	6	7	8
1	2018-19	Bonai	Barsuan	39	11.98	119800	119800
2	2019-20			73	27.93	280700	280700
3	2020-21			10	3.60	36000	36000
4	2021-22			96	43.321	398000	398000
5	2022-23			139	51.094	555192	555192



**House Damage**

Sl. No.	Year	Name of the Division	Name of the Range	No. of Cases	Partly	Fully	Amount sanction	Amount Paid
1	2018-19	Bonai	Barsuan	-	-	-	-	-
2	2019-20			7	3	4	46000	46000
3	2020-21			7	2	5	54000	54000
4	2021-22			21	13	8	106000	106000
5	2022-23			33	13	20	226000	226000

**Human Kill**

Sl. No.	Year	Forest Division	Name of the Range	No. of Cases	Amount sanction	Amount Paid
1	2018-19	Bonai	Barsuan	-	-	-
2	2019-20			-	-	-
3	2020-21			-	-	-
4	2021-22			3	1200000	1200000
5	2022-23			3	1200000	1200000

**Cattle Kill**

- Nil -

**Human Injury**

- Nil -

**Other projects or their impact area vis a vis impact area of the project proposed**

There are several other mining projects around this project. The surrounding mining leases are shown in table below

Sl. No	LEASE NAME WITH LESSEE	AREA (Ha.)
1	Ghoraburhani-Sagasahi iron ore block (AMNS India)	139.165
2	Sagasahi iron mines (National Enterprises)	41.844
3	Kalmang mn. mines (Rungta Mines Ltd.)	218.530
4	Malda mn. mines block-1 (TISCO)	681.564
5	Sanindpur iron & bx. mines (Rungta Sons)	147.100
6	Oraghat iron & mn. mines (SA Halim)	25.847
7	Oraghat iron ore mines (Rungta Sons)	82.966
8	Sanindpur iron & mn. (National Enterprises)	70.917
9	Malda mn. mines block-2 (TISCO)	37.405
10	Patabeda iron ore mines (MGM Minerals)	28.397
11	Patabeda iron ore mines (MG Mohanty)	14.000



12	Patabeda iron-mn. mines (MG Mohanty)	19.425
13	Gonua iron & manganese mines (P K Alhuwalia)	86.886
14	Ganua iron & mn. mine (KC Pradhan)	12.560
15	Ganua iron & mn mines (Zenith Mining)	129.179
16	Ganua iron & mn mines (KJS Alluwallia)	23.166
17	Ganua iron & mn. mines (P. Mohanty)	13.796
18	Malda mn. mines block-5 (TISCO)	55.220
19	Ganua iron_mn mines (MG Mohanty)	83.151
20	Dalita iron & mn. mines(BC Dogra)	22.165
21	Dubuna iron & mn. mines (Neelanchal Ispat Nigam Limited)	868.816
22	Patamunda mn. mine (Orissa Manganese & Mineral)	807.306
23	Malda mn. mines block-3 (TISCO)	46.137
24	Sanpatholi mn. mines (Orissa Manganese & Mineral)	23.290
25	Patamunda mn. mine (Sun Alloys & Minerals Ltd.)	81.197
26	Tehari-Sonua iron mn. mines (Tarani Minerals)	29.076
27	Bhanjapali, Koira & Teherai manganese mines (RS Sindhu)	65.710
28	Bhanja kusum mn. mines (Orissa Manganese & Mineral)	8.498
29	Teherai iron-mn. mines (BICO)	116.572
30	Kanther-Koira iron-mn. mines (BS Mishra)	13.270
31	Kanther Koida mn. mines (Rungta Mines Ltd.)	73.653
32	KJST iron-mn-bux (S.N.Mohanty)	333.063
33	Tentulidihi mn. mines (Orissa Manganese & Mineral)	35.610
34	Bhanjapali iron mines (JN Patnaik)	18.000
35	Toda iron ore mines (SAIL)	3.340
35	Bhanjapali iron ore mines (OMC Ltd.)	141.235
36	Koida iron mines (ESSEL)	90.143
37	Nuagaon iron & mn. mines (SD Sharma)	12.922
38	Orahuri mn. mines (Orissa Manganese & Mineral)	51.476
39	Nuagaon mn. mines (Tarani Minerals)	7.850
40	Narayanaposi iron-mn. mines (AMTC)	349.254
41	Kasira iron ore mines (OMC Ltd.)	418.335
42	Nadidihi iron & mn. mines (Feegrade)	121.405
43	Nadidihi iron-mn. mines (BICO)	73.855
44	Nuagaon iron & mn. mines (S.N.Mohanty)	29.297
45	Bandhal mn. mines (Kanakdhara)	28.021
46	Kamando mn. mines (UC Mishra)	60.700
47	Kusumdihi-Kamanda mn.&bx (Rungta Sons)	43.067
48	Kusumdihi mn. mines (Orissa Manganese & Mineral)	31.549
49	Kusumdihi mn. & bx. mines (BICO)	52.176
50	Kusumdihi mn. mines (Kavita Agarwal)	47.486
51	Barsuan-Kalta iron ore mines (SAIL)	2486.382
52	TISCO-Khandbandh iron mine	978.000
53	R P Sao, Chormalda mn mine	141.122
54	Rungta_Katasahi_mn_mine	196.860
55	SN Paul Katasai mn mime	9.700
56	KJS Alluwallia, Nuagaon iron	767.284
57	R.P. Sao & Sons, Guali iron mines	365.026



58	KJS Alluwalia Panduliposi-Kendudihi iron & mn	40.470
59	KC Pradhan-Paradeipur iron mine	12.600
60	OMC_Parlipada mn	104.860
61	TISCO Tiring pahar mn mines	169.000
62	Shri Metaliks Ltd. Khandband iron mine	35.774
63	R B Das Kundrupani iron & mn	10.255
64	OMC_Tiringpahar iron & mn	79.300
65	OMC_Khandband iron ore mine	366.311
66	Rungta, Siljoda mn mine	715.369
67	Serajudin_Guruda mn mine	40.064
68	S N Dasmohapatra Katasahi mn mine	36.474
69	omdc_bhadrasahi iron & mn	998.700
70	FACOR Katashi block-a manganese mine	8.936
71	FACOR Katasahi block-b manganese mine	4.560
	<b>TOTAL</b>	<b>13582.640</b>

**Villages within the Impact Area**

<b>Name of the Village</b>		
<b>Koira Range</b>		
Moldiya	Kadadiha	Kalmang
unjaghara	Balajuri	Malda
Dalmakudar	Kantarkala	Kakarpani
Jhirpani	Dhubulaberha	Mutukudar
Majuranachana	Sagarhabhanga	Deogarh
Kalta	Teherai	Kenaveta
Torha	Belkudar	Girhol
Kolaparha	Bhaliadihi	Pataberha
Kusumdihi	Chandiposi	Sunaposi
Roladihi	Sargigarh	Ganua
Rengalbeda	Bad Indpur	Mandajoda
Nadikashira	San Indpur	Dalita
Kasira	Pureibahal	Sankadalia
Bhanjapali	Jalipada	Amliam
Koira	Gopisahi	Patmunda
Harishchandrapur	Alaghat	Biradihi
Orahari	Ghorhaburhani	Khajurdihi
Nuagaon	Segasahi	
<b>Barsuan Range</b>		
Anandapur	Rangua	Kamando
Kula		

Total Mining projects within a radius of 10 Kms is (13582.64 Ha. + 92.875 Ha.=) 13675.515 Ha. The average radius of these projects is 6.5964 Km. Therefore the overall impact area is with a radius of 16.5964 Kms.



## **CHAPTER – III**

*Probable Impacts of the Project on Flora and Fauna- Under this likely impacts of project and ancillary activities on flora and fauna and on movement of mega fauna shall be discussed.*

### **Impact of Project:**

The mining process adopted in the present case is open cast fully mechanized mining method with deployment of mechanized shovel and high capacity dumpers of matching size. Drilling and blasting activities as per the requirement will also be taken up by deployment of proper machineries. Excavation of Ore & Waste will be done using combination of shovel dumper system and the Ore will be mechanically crushed to the desired size. During the initial period, the transportation of ore will be through the road using high capacity trucks to the destination/ Railway siding. However, at the latter stage the Iron ore fines will be transported through the slurry pipeline and the CLO will continue to be transported through the road to the railway siding.

### **General Impact on Environment**

**Impact on Soil:** - The mining activity will involve removal of all the forest cover, top Soil due to digging of large pits. Major part of the forest land will come under the mining pit setting aside the safety zone. The topographical features of the lease area put it in high soil erosion prone area. Therefore large scale soil erosion is bound to take place which may cause formation of Gullies and Ravines leading to further destruction of adjoining forest as well as wildlife habitat. The running of heavy machinery will lead to soil compaction which will have tilling effect on the normal morphology and the micro flora & fauna residing within sub soil. Denudation of soil & its green cover will also reduce the biotic material from the soil. More over the area being bereft of its natural green cover, there is possible chances of either being infested with weeds or become barren. The moisture content of the soil will reduce in the top soil & sub soil.

**Impact on Vegetation:** - Due to mining activity over the lease area, the biotic pressure which was exerted over the Forest area now being leased-out, will be shifted to the surrounding areas. Collection of fuel wood, small timber and other NTFP by the local people will also be shifted to the surrounding area which will create additional pressure on the surrounding Forest area. Grazing pressure of the local Cattle will also be shifted to these Forest. Therefore the wildlife habitat in these Forest areas is likely



to be disturbed. With the de-forestation there is every likely hood of increased incidents of man animal conflict.

**Impact on water regime:** - Large quantities of water produced in the process of mining which are highly polluted will be released in to the natural drainage system, thereby contaminating natural water sources. The slurry generated in the mining process will also be pumped out in to the natural drainage system making the natural water source unfit for consumption by animals as well as human beings. Besides large amount of Garbage will be generated in the mining area and will contaminate the water. The contaminated water will create health problems within the Zone of Influence as well as beyond. As the entire water requirement for mines would be from bore holes, this would adversely affect the ground water table which would not only affect the quality & health of forest but also would minimize the potable drinking water to the population.

**Impact on Air:** - The mining process, Ore Crushing & Screening, transportation, and plying of large number of heavy vehicles may spread large quantities of dust in the surrounding area. There will be heavy air pollution in and around the lease area creating various problems for the animals and the fringe village dwellers living around the mines area.

**Air Pollution:**

The Impact on Ambient air quality will be estimated by using the Air Dispersion Model for prediction of Ground level concentration from mining activities and crusher area are computed by using appropriate methods as prescribed by MoEF & OSPCB at the time of EIA/EMP preparation.

**Water Pollution:**

The adverse impact on nearby water body due to mining is envisaged because of contamination silt carry-over along with run-off water. However, the same will be kept under control within the SPCB prescribed norms by taking the suitable control measures like; de-silting checks/check weirs, settling pits and gully plugs besides well managing the mine waste dumps with adequate sloping followed by application of coir-geo textiles, plantation, mixed grass application, toe wall etc.

Besides the above, the Oil & Grease and silt carry-over is envisaged with the work-shop service centre water. However, the same will be well separated, collected, stored and disposed properly to the authorized re-processers. The treated water will be utilized for adjacent plantation purpose as it is very negligible in quantity.



Sewage generation due to domestic / site-specific Camps is envisaged, it will result in carryover of organic pollutants. However, the same will be brought within the norms by treating at Sewage treatment plants / Soak pits.

**Degradation Anticipated:**

Due to diversion of forest area to the extent of 42.608 ha, the biotic pressure which was exerted on this area will be further diverted to the impact zone causing degradation of the forest cover within the impact zone. Decrease in wildlife habitat to the extent is anticipated.

Since this new mining lease area is surrounded by working mines, the wildlife habitat of the area has already been disturbed and that it can be presumed that, the wild animals of the area have migrated to the nearby forest areas which are not disturbed by mining. Though elephants have been seen occasionally visiting existing forest areas in and around the mine area.

Change of land use pattern within the mining area may permanently make the area unsuitable for animal habitat unless properly reclaimed.

**Impact on movement of mega fauna**

**Fall of animals in the Mine Pits**

The mine pits are dug with very steep slopes with 10 metres bench height with vertical slope (the overall slope being 45°). Usually no physical barrier is provided around the mine pits. Any accidental fall of the animals in those pits may be fatal for the animals.

**Poaching**

The poachers may also drive the animals and lead them in to the mine pits using the same as animal trap.

## CHAPTER –IV

*Mitigation Measures Required- In this mitigation measures required need to be detailed to counter the adverse impacts of the project along with its financial implication.*



## CHAPTER –IV

*Mitigation Measures Required- In this mitigation measures required need to be detailed to counter the adverse impacts of the project along with its financial implication.*

### A. 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 the project's core area will aim for maintenance of habitat for smaller animals that used to live and share habitat with Project area. The management of Zol 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:*

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.

To conserve a viable population of Wildlife in general and the Pachyderm in particular in their natural habitat.

To conserve the natural biodiversity, aesthetic and geo-morphological value of the area through appropriate management of site, habitat and landscape.

To reduce the dependency of local people on the forest resources of the Zol through culturally, socially, economically acceptable and ecologically sustainable and viable alternatives by undertaking eco-development programmes.

To reduce man-animal conflict by ensuring contiguity of habitat in the buffer zone by improving forest cover in long term basis.

## **B. STRATEGIES TO MITIGATE AND MINIMIZE ADVERSE IMPACTS:**

### **1) Strategies for Core Zone:**

#### **1.1) Fire Watchers**

Fire is one major threat to wild life habitat in the area. 05 nos. of villagers preferably youth will be engaged selected from local villages on the suggestion of VSS for a period of 6 months (January to June) annually. They will be termed as Fire Watchers. It will be better that the fire watchers should either be linked earlier with poaching / illegal collection of forest produce with working knowledge of forest tracts, path and routes followed by villagers as well as wildlife, willingness to work in forest, ability to move on foot /cycle. Fire watchers should be well trained by the local forest Staff the way how to douse fire (ground fire, crown fire

etc.) using bunch of green branches of locally available plants. They should





possess the local Fire Brigade station telephone number and in case of exigencies when the occurrence of fire goes beyond their control can call the fire brigade Executives to lit off the fire before it aggravates. They will also be supplied Fire Blowers to cut weeds, heap them and practise Control Burning'.

#### **Provision of Fire fighting equipment:**

In order to mitigate immediate impact of fire hazards around the core zone and its fringe areas, it is proposed to have sufficient no. of fire fighting kits (fire blowers, safety equipment, helmet, fire beater, fire scrapper, gloves, fire proof shoes, medicines, ORS packets etc.) with the fire fighting squads.

### **I.3) Awareness Promotion**

(i) The User Agency will create awareness among the Plant Executive/staff/workers and villagers of adjoining areas regarding wildlife protection, wildlife conservation, forest protection & forest conservation sensitize them to maintain the proper balance of biodiversity in the surrounding areas.

(ii) Plant Executive/staff/workers should aware about cleanness of the project premises. They will also be aware to protect any type of wildlife including snakes if noticed in the project area. In such an event instead of killing it being afraid, they should intimate the nearest Forest staff or snake charmer available in every Division Office now-a-days for rescue of the wildlife and safe release in the nearby forest. They should also be aware not to domesticate any wildlife as it goes against the Wildlife (Protection) Act, 1972.

(iii) The Drivers of heave earth moving vehicles will be told to keep the noise levels to the barest minimum, take all precaution against fire, damage to trees etc. Drivers will be told to control speed so as not to run over slow-moving wildlife like snakes, lizards, mongoose, civets etc. Behavioural change will be expected from each worker on the above points and use of garbage bins. Any sick and injured animal will have to be rescued and given first aid and water. Such animal is to be subsequently handed over to the nearest forest official and released after healing the wound. No worker shall get involved in crime against animals & forests.

(iv) There should be enough provision and facility for creating awareness through media, announcements, awareness meetings, brochures, documents etc. in the

surrounding fringe villages towards community mobilisation for protection of wildlife and forest.

#### **1.4) Provision of Solar street light with early warning system:**

It was evident that in the fringe villages, 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 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 solar street light with early warning system (having solar panel, blinker light, siren, GSM operated sim-cards & its controller etc.), 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 and around of fringe villages of the project area considering the elephant movement.

#### **1.5) Provision of distribution of small paddy reaper machine**

It is proposed to distribute of small paddy reaper machine to the household of surrounding villages of project area for early and easy harvesting of paddy from the field for storage of food materials in order to mitigate the Human-Elephant Conflict

#### **1.6) 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 such 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.

#### **1.7) Jana Surakhya Gaja Rakhya:**

In order to mitigate Human Elephant Conflict in surrounding villages of the project area such as Kulla, Kamanda, Bhutuda, Kemsila, Tensa, Dengula, Jaldihi, Segsahi, Teherai, Badindupur, Gonua, Nadidhi, Kalta, Kadaliala, Rengalbeda, MaldaBasti, Sargigarh, Topadihi, Jhirpani, Patmunda, Panposia, Kadodihi, Kantarkoida, San indupuretc., it is proposed to implement Solar Fencing as a barrier through Jana SurakhyaGajaRakhya scheme by community/vss/private persons through PPP mode (90% cost to be borne by user agency including beneficiaries contribution). As these fringe villages are situated in a contiguous manner to forest areas such as Toda RF, Karo RF, Kathmal RF, Mendhamaruni RF, Bhabanipahar RF, Khajurdihi RF, Sarkunda RF, Sarkunda PRF, Khajurdihi PRF, Bhabnipahar PRF, Kathmal PRF, Mendhamaruni PRF, Gonua PRF, Toda DPF, Ranisal DPFetc. there is always a high chance of regular elephant movement to above said fringe villages which ultimately leads to Human Elephant Conflict. In this context, it has been proposed to implement Solar Fencing in the above proposed fringe villages However the exact location of construction should be decided at the suitable site condition as concerned with local staffs and villagers with their need of the hour.

#### **1.8) Provision of Rescue Vehicle/RRT vehicle (inbuilt with gps tracker) for implementation in protection/monitoring activities through ground staff in Bonai Division:**

Most of the times the ground staff and para squad members are facing trouble with immediate reach to the sensitive points, where any rescue of the wildlife or

any human being required due to several situations. To minimize the time lapses, it is proposed to implement a Rescue Vehicle with adequate facility of following amenities/facilities so that any medical requirement could be availed within a short lapse of time. The Rescue Vehicle proposed may be of TATA XENON YODHA (4WD) /FORCE MOTOR/ MAHINDRA along with following facilities should be provided and the entire setup should be stationed at Divisional Level and whenever required it should move to the desired place with the team. The proposal should also include bearing the cost of POL & maintenance for 05 years and 10 nos. of anti-depredation squad unit at highly skilled labour rate as per approved rate for the particular year basis and contingencies like uniforms, monitoring kits, life insurance to the squad personnel etc.

SL No	Name of the Item	Quantity (In Nos.)
1	Wire Cutter	10
2	Tent-Quechua/Coleman/Wild craft	10
3	WINCH-For Dragging Vehicle	03
4	LIGHT-Fenix Light	10
6	Screw Carabiner	05
8	Ketch Pole	10
9	Polycarbonate Helmet With Visor	10
11	Sample Collection Box	05
12	Walkie-Talkie	10
14	Sleeping Bag	10
15	Extension Cord	05
16	Head Light	10
17	Hammer	05
18	Metal Detector	05
19	Stretcher-2(1-Rigid,1-Collapsible-)	03
20	Crate With Blind And Fibre Wheel	05
21	Thick Rubber Gloves	10
22	Snake Rescue Kit Bag	05
23	Ankle Boot	10
24	Rope	05



25	Water Sprinkler	05
26	Snake Catcher	05
27	Refrigerator Portable	01
28	Portable Generator	01
29	Halogen Light With Stand	03

## **II) Strategies to mitigate and minimize the adverse impact so observed in the Zone of Influence (ZoI):**

### **FOR BONAI DIVISION**

#### **Protection & Enforcement Activities**

**II.1) Establishment of Anti-Poaching Barrack to support protection activities and elephant monitoring activities (including water supply, solar light system, boundary facility etc.):**

In suitable location at border area of Karo RF and Toda RF in a parallel way to Rourkela Division, one anti poaching barrack need to be constructed, which will be a 2 storied structure. In the ground storey vehicle of the squad can be stationed but the staffs will remain in the 2nd storey to locate the movement of elephants and fire hazard during fire season. Also, this unit will provide accommodation to the anti-depredation squad or fire squad in need of the hour. This will also help in monitoring the protection activities by proper coordination amongst staffs of Koira Range of Bonai Forest Division at the sensitive areas which will be also useful during inter divisional coordination with Rourkela Division.

#### **II.2) 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 job of 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 spoor, 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.

### **II.3) Improvement of Communication Network:**

The most difficult part of the surrounding zone of this project area is to establish a proper communication network amongst the staffs and other local inhabitants in most of times. To address any issues related to wildlife and forest matters we have to depend on our communication network on a prior basis for which the system of communication has to be improved. In this context, 05 VHF Main Station is to be established at strategic location of Range Headquarters so that the overall monitoring could be controlled in a continuous manner. Apart from this, necessary walkie-talkies must be provided to ground staffs to coordinate among themselves properly in and around the forest areas.



## **Wildlife Habitat Management**

### **II.4) Habitat enrichment with plantation of Bamboo (preferably through bamboo seed balls):**

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 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 Toda RF, Karo RF, Kathmal RF, Mendhamaruni RF, Bhabanipahar RF, Khajurdihi RF, Sarkunda RF, Sarkunda PRF, Khajurdihi PRF, Bhabnipahar PRF, Kathmal PRF, Mendhamaruni PRF, Gonua PRF, Toda DPF, Ranisal DPF etc. areas.

### **II.5) Creation of Water Bodies and plantation of fruit bearing & fodder species (preferably Palm species) around water bodies and nearby forest boundaries:**

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 02 nos. of artificial water hole of size (60 m × 40 m × 5 m). It is

also proposed to plant fruit bearing & fodder species (preferably palm species) around those water bodies with subsequent maintenance.

#### **II.6) Weed eradication:**

The most competition faced by the forest growth is towards heavy weed growth inside the forest areas. Care should be taken towards removal of such weeds (*Lantana*, *Eupatorium* etc.) where heavy infestation is going on. Continuous removal through manually or by Root-Stock Method is going to create a better environment to grow the trees inside forest. The proposed areas of Toda RF, Karo RF, Kathmal RF, Mendhamaruni RF, Bhabanipahar RF, Khajurdihi RF, Sarkunda RF, Sarkunda PRF, Khajurdihi PRF, Bhabnipahar PRF, Kathmal PRF, Mendhamaruni PRF, Gonua PRF, Toda DPF, Ranisal DPF could be included as per site suitability condition through Range Officer and team.

#### **II.7) 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 2 nos. of RCC check dam in Koira Range and Barsuan 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.



## **Wildlife Monitoring**

### **II.8) Provision of Radio Collaring of one elephant:**

It is proposed to have radio collared to one Elephant for record, document and monitor the distribution pattern, movement pattern, analysis of behaviour, association index with forest and other species etc. In addition to that it is also proposed to have two nos. of Research Scholar @ Rs.35000/- per month and two nos. of MTS @ Rs.25000/- at Division level for monitoring, listing, mapping, documenting and preparing the database of the radio collared elephant along with study of other forest flora as well as fauna of Bonai Forest Division.

### **II.9) Procurement of Camera Trap:**

It is proposed to establish the trap cameras at sensitive locations of Toda RF, Karo RF, Kathmal RF, Mendhamaruni RF, Bhabanipahar RF, Khajurdihi RF, Sarkunda RF, Sarkunda PRF, Khajurdihi PRF, Bhabnipahar PRF, Kathmal PRF, Mendhamaruni PRF, Gonua PRF, Toda DPF, Ranisal DPF in order to monitor the wildlife movement and their behavioural aspects towards the climate change on a regular basis. This will provide a foundation to observe their need and demand from the nature.

## **Human Elephant Conflict Mitigation**

### **II.10) 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/year to keep a watch on elephant movement and take appropriate steps to resolve Human- Wildlife Conflict

**II.11) 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.

**II.12) Trench Fencing:**

In order to mitigate Human Elephant Conflict in surrounding villages of the project area such as Kulla, Kamanda, Bhutuda, Kemsila, Tensa, Dengula, Jaldihi, Segsahi, Teherai, Badindupur,





Gonua, Nadidhi, Kalta, Kadalía, Rengalbeda, MaldaBasti, Sargigarh, Topadihi, Jhirpani, Patmunda, Panposia, Kadodihi, Kantarkoida, San indupuretc., it is proposed to excavate Elephant Proof Trench as a barrier. As these fringe villages are situated in a contiguous manner to forest areas such as Toda RF, Karo RF, Kathmal RF, Mendhamaruni RF, Bhabanipahar RF, Khajurdihi RF, Sarkunda RF, Sarkunda PRF, Khajurdihi PRF, Bhabnipahar PRF, Kathmal PRF, Mendhamaruni PRF, Gonua PRF, Toda DPF, Ranisal DPF etc. there is always a high chance of regular elephant movement to above said fringe villages which ultimately leads to Human Elephant Conflict. In this context, it has been proposed to excavate elephant proof trench over 05 RKM of size 3m top, 1m bottom and 2.5m depth and heap the dug-up earth at the fringe areas. A mixture of grass seeds, leguminous species should be sown over the dug-up earth. However the exact location of construction should be decided at the suitable site condition as concerned with local staffs and villagers with their need of the hour.

#### **II.13)Capacity Building training for Field Staff on Human Elephant Conflict management at Division Office:**

The filed staffs are the real grass root level workers who are always facing the challenges and different level of circumstances during Human Elephant Conflict. They are always in a touch with the local affected villagers and simultaneously leading the team towards solving the issues. In order to provide a high level of motivation and confidence, it is proposed to provide sufficient amount of capacity building training to the suitable candidates form the conflict areas. Sharing the experiences along with different level of discussions will also provide a better

solution towards mitigating these issues and subsequently these staffs will also be motivated towards delivering their duty.

**II.14) Installation of Solar Street lamp/light 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 high mask solar street lights, 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

**Public Awareness and Livelihood Generation Activity through community mobilization**

**II.15) Health Monitoring of Wildlife/Immunization of cattle**

There are many villages / habitations either inside the forests or very close to forests. Their cattle are used to graze in the forests and probable carrier of contagious diseases (viral, fungal). Their immunization will go a long way in preventing spread of disease to wild animals mostly herbivorous. It is proposed to



conduct house to house cattle/ goat immunization program for these villages in consultation with Animal Husbandry Department every year for 05 years. The continuous immunization program will also regulate the health status of wildlife and their ecosystem which subsequently provide their better span of life

**II.16) Training and awareness to EDC/VFMC, in Schools, Village level Volunteers for Wild Life Conservation & Protection**

There is a urgent need to select village level volunteers through EDC/VFMC towards providing 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 awareness could 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.

## **KEONJHAR FOREST DIVISION**

### **Measures to be Implemented by the User Agency**

#### **1) Provision of Hired Vehicle and POL for Keonjhar Forest Division:**

The user agency will bear the cost of hired vehicle (Rs.31,000/- per month) for deployment of Anti-poaching Squad in Keonjhar Forest Division. (Rs.31,000/- + Rs.15,000/-) x 12 month x 5 years = Total cost for 5 years = Rs.18.60 lakhs.

#### **2) POL**

POL(Rs.15,000/- per month) for deployment of Anti-poaching Squad in Keonjhar Forest Division will be provided by the User Agency. Total cost Rs.15000/- x 12 x 5 = Rs.9.00 lakhs.

#### **3) Jana Rakhya – Gaja Surakhya**

Solar fencing may be taken up (2 Km in one village) either in 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.

#### **4) Drone Utilization:**

MTS for drone use and its related analysis and documentation at Champua.

#### **5) Fitting of optimizer:**

Fitting of optimizer / modernization in O/o RCCF, Rourkela for better record management and file flow.

### **Strategies to mitigate and minimize the adverse impact so observed in Keonjhar Forest Division**

#### **Habitat Improvement**

It is proposed to improve the wild life habitat within the Impact Zone with the following activities.

##### **i. Creation of Water body :-**

In order to contain the wild animals in a safe habitat, it is proposed to make provision for availability of water during summer season. It is proposed to create one water body of size 60 m x 40 m x 3 m at a strategic locations in Uliburu RF at a cost of Rs.15.00 lakhs.

##### **ii. Planting of Fodder Species :-**

5000 numbers of Ficus/Fodder plants specially Siali (Bauhinia) will be



planted in Urban Plantation mode to provide fodder for the elephants @5.70 lakhs/1000. An amount of Rs.28.50 lakhs is provided for the same. (The cost norm of Urban plantation is enclosed).

iii. Provision of Salt Licks :-

It is proposed to prepare 10 nos. of Salt Licks for the wild animals @25000/- . Total cost rs.2.50 lakhs

. Wildlife Protection:

iv. Anti-poaching-cum-Anti-depredation Squad:

In order to augment the present anti-poaching mechanism it is proposed to form an anti-poaching-cum- anti-depredation squad with 5 persons. This squad will act as Strike Units to curb poaching of wild animals and attend to all animal depredation cases. The project proponent will provide a hired vehicle along with POL. The other requirements will be as follows:

	<u>Particulars</u>	<u>Amount</u>
1	Wages of squad members – @13,412.00 / month, 13412 x 5 x 12 months = Rs.8,04,720/-	8,04,720/-
2	Hire charges of vehicles @31,000/- per month – Rs.3,72,000/- to be borne by user agency.	User Agency
3	POL for vehicles/ boats/ trawlers@15,000/- per month. Per year = Rs.1,80,000/- . to be borne by user agency	User Agency
4	Recharging of Mobile sets – 500x12x1	6,000/-
5	Contingency per year	20,580/-
	<b>COST PER YEAR</b>	<b>8,31,300/-</b>
	<b>TOTAL COST FOR 5 years- Rs.8,31,300/- x 5</b>	<b>41,56,500/-</b>

v. Deployment of Elephant Trackers:

It is proposed to deploy 3 persons in the villages (where frequent movement of elephants is noticed), to keep track of the elephants. The wage rate is Rs.13,412/- per month. Total cost 3 x Rs.13,412 x 12 x 5years = Rs. 24,14,160/- . An amount of Rs.1,35,840/- is provided for uniforms and equipments. Total Rs.25.50 lakhs.

vi. Provision of Gajasathi:

Gajasathi will deployed @ 5 Gajasathi per village/VSS in 6 villages 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	3500/-
	b.	Cap	1 no.	@50/-	per village	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.75,250/- x 6 nos. x 5 years = Rs.22,57,500/-

vii. Bulk SMS, Voice Message and Early Warning System :-

An amount of Rs.5.00 lakhs is proposed for these activities.

viii. Portable Cabin:-

Two numbers of portable Cabins will be procured for the protection staff for tracking and monitoring of elephant movement along the SH and NH. The proposed cost is @6.00 lakhs each and total cost rs.12.00 lakhs.

ix. Distribution of Grain Bins :-

200 nos. of Grain Bins will be distributed in the area to protect the harvested crop from elephants. The proposed cost is @3500/- and total cost Rs.7.00 lakhs.

x. Providing Solar Street Light along with early warning system :-

It is proposed to fix Solar Street Lights in 10 villages of the impact area of the project. It will have a deterrent effect on mega animals / other wild animals and prevent entry to habitation. A sum of Rs.15.00 lakh is proposed for solar light arrangement (10 villages @ 5 nos. each, cost @Rs.30,000/- each)

Early Warning system provides warning about presence of wild animals in nearby raising alarm. It will alert villagers and keep them in house and not to come out of houses to prevent man-wildlife face to face conflict and



prevent human kill and injury. For 10 villages a sum of Rs.10.00 lakh is provided @ Re.1.00 lakh per village.

Solar Street lights will be provided in the elephant sensitive zones/villages to create psychological barrier for the wild animals. The following villages are tentatively selected for providing solar street lights.

<u>Barbil Range</u>	<u>Champua Range</u>
Kendudihi	Palasa (Ka)
Kendudihi (Nuasahi)	Guruda
Sankarpur	Basantapur
Kanarda	Pidhapokhari
Nuagaon	Khandabandh
Rugudihi	

xi. Creation of awareness :-

Awareness programs will be organised in the villages as well as Schools. The user agency will contribute Rs.5.0 lakhs @ Rs.1,00,000 .00 per year for undertaking such activities.

xii. Monitoring and Evaluation

The implementation of this plan will have to be closely monitored and evaluated during 4<sup>th</sup> year through independent person/agency. An amount of Rs.2.00 lakh is provided for the purpose.

**Discretion of Forest Department**

Although the above proposals are submitted for the mitigation of various threats to Wildlife and its habitat, the Forest Department is free to make alteration of the proposal or to divert the proposed activities to any other suitable locations.

**Undertaking:**

The project proponent undertakes to bear the cost of price escalation and/or differential wages in case of price rise or wage hike.

## **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



**CHAPTER –VI**

- A.** Total financial implication of Management Intervention and cash flow statement for 05 years (year wise) is given here. Also monitoring, evaluation and interim review provision shall be mentioned.

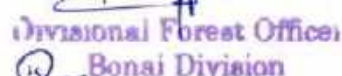
**Table 6.1: Financial provision of works borne by Use Agency/  
Project Proponent  
BONAI FOREST DIVISION**

To be borne by User Agency			
Sl. No.	Management Interventions	Area in ha./Unit in no./RKM	Total Amount (Rs. in Lac.)
1	10 Nos. of Fire Watcher will be engaged for a period of 06 months (January to June) for 05 years	10 Nos.	To be Borne by User Agency
2	Provision of fire blowers and fire fighting monitoring kit to fire fighting squad @10 nos./year with maintenance up to 5 years	50 Nos.	
3	Awareness Promotion regarding wildlife protection, wildlife conservation, forest protection & forest conservation	60 Nos.	
4	Provision of installation and maintenance of solar street light with early warning system at various locations of elephant movement areas.	25 Nos.	
5	Provision of distribution of small paddy reaper machine to the household of surrounding villages of project area for early and easy harvesting of paddy from the field for storage of food materials in order to mitigate the Human-Elephant Conflict	50 Nos.	
6	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	500 Nos.	
7	Jana Surakhya Gaja Rakhya in five villages= 10 Km (2Km in each), either through VSS/Community/Private Person and its maintenance (90% cost to be borne by User Agency including beneficiaries contribution)	10 Km	
8	Provision of Rescue Vehicle/RRT vehicle (inbuilt with gps tracker) for implementaion in protection/monitoring activities hthrough ground staff in Bonai Division along with anti depredation equipment and (i) remuneration of driver (as per Government approved high skilled labour rate for the concerned financial year) and provision of POL, maintenance etc. (ii) Provision of 10 nos. of highly skilled squad personnel (iii) Provision of contingencies like uniforms, monitoring kits, life/health insurance to the squad personnel etc. (iv) Purchase of equipment to support HEC mitigation	01 No.	

*Approved*

  
Principal Chief Conservator of Forests  
(Wildlife) & Chief Wildlife Warden  
Odisha, Bhubaneswar

61

  
Divisional Forest Officer  
Bonai Division

**Table 6.2: Financial provision of works in Zone of Influence****To be 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.)
<b>1</b>	<b>Protection &amp; Enforcement Activities</b>			
	(a) Establishment of Anti-Poaching Barrack to support protection activities and elephant monitoring activities (including water supply, solar light system, boundary facility etc.)	1 No.	40.00	40.00
	(b)(1) Engagement of 10 Squad members for assisting staff in protection, wildlife monitoring and anti-depredation activities (@Rs.345.00 per Manday)- x 10 members x 12 months x 05 years	10 Nos.	63.00	63.00
	(b)(2) Hired Vehicle Rs. 31,000/- x 12 months x 05 years = Rs. 18.60 Lakhs	01 No	18.60	18.60
	(b)(3) POL for vehicle Rs. 15000/- x 12 months x 05 years = Rs. 09.00 Lakhs	LS	9.00	9.00
	(c)(1) Provision of VHF Main station and maintenance upto 05 years	5 Nos.	12.00	60.00
	(c)(2) Provision of Walkie-Talkies	50 Nos.	0.30	15.00
<b>2</b>	<b>Wildlife Habitat Management</b>			
	(a) Habitat enrichment with plantation of Bamboo(preferably through bamboo seed balls)	10 ha.	0.44	4.40
	(b).1. Provision of creation of new water bodies	02 Nos.	10.00	20.00
	(b).2. Provision of Plantation of fruit bearing and fodder species.(preferably palm species) around water bodies and nearby forest boundaries.	LS	3.00	3.00
	(c) Weed eradication	10 ha.	1.00	10.00
	(d) Construction of Check dam along the nallah	02 Nos.	15.00	30.00
<b>3</b>	<b>Wildlife Monitoring</b>			
	(a).1. Provision of Radio Collaring of one elephant	01 No.	10.00	10.00
	(a).2. Engagement of two Research Scholar @Rs.35000/- /month to record, document, and monitor radio collared elephant along with other wildlife of the Division.	LS	0.35	21.00
	(a).3. Engament of two MTS @Rs.25000/ month to prepare, list, map and maintain the database of wild flora and fauna including	LS	0.25	15.00



	Radio Collared elephant of the Division.			
	(a).4. Other Contingencies	LS	6.00	6.00
	(b) Procurement of Camera Trap	25 Nos.	0.40	10.00
<b>4</b>	<b>Human Elephant Conflict Mitigation</b>			
	(a) Deployment of Gaja Saathi on year basis- A participatory approach (10 units of 05 members each@Rs.80000/unit/year)	10 Nos.	8.00	40.00
	(b) Signage on both side of track/road/railway			
	(b)(1) Signage with speed limit	40 Nos.	0.30	12.00
	(b)(2) Signage with awareness and warning for wildlife	40 Nos.	0.30	12.00
	(c) Provision of Elephant Proof Trench	5 RKM	7.00	35.00
	(d) Capacity Building training for Field Staff on Elephant Human Conflict management at Division Office	10 Nos.	2.00	20.00
	(e) Installation of Solar Street lamp/light in elephant affected villages and its maintenance	100 Nos.	0.40	40.00
<b>5</b>	<b>Public Awareness and Livelihood Generation Activity through community mobilization</b>			
	(a) Provision for cattle immunization camps for surrounding fringe villages for mitigation of spreading of diseases etc.	10 Nos.	0.20	2.00
	(b) Training and awareness to EDC/VFMC, in Schools, Village level Volunteers for Wild Life Conservation & Protection	LS	10.00	10.00
	<b>Total</b>			<b>506.00</b>
	<b>20% Escalation</b>			<b>101.20</b>
	<b>Grand Total</b>			<b>607.20</b>

Countersigned

Regional Chief Conservator of Forests  
Rourkela Circle, Rourkela

Divisional Forest Officer  
Bonai Division

**BONAI FOREST DIVISION**

<b>To be Implemented by Forest Department with the Funds deposited by User Agency</b>									
Sl. No.	Management Interventions	Area in ha./Unit in no./RKM	Unit cost (RS. in Lac.)	Total Amount (Rs. in Lac.)	Year wise Financial Target (Rs. In Lac.)				
					1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> year	5 <sup>th</sup> year
1	<b>Protection &amp; Enforcement Activities</b>								
	(a) Establishment of Anti-Poaching Barrack to support protection activities and elephant monitoring activities (including water supply, solar light system, boundary facility etc.)	1 No.	40.00	40.00	40.00	-	-	-	-
	(b)(1) Engagement of 10 Squad members for assisting staff in protection, wildlife monitoring and anti-depredation activities (@Rs.345.00 per Manday)- x 10 members x 12 months x 05 years	10 Nos.	63.00	63.00	12.60	12.60	12.60	12.60	12.60
	(b)(2) Hired Vehicle Rs. 31,000/- x 12 months x 05 years = Rs. 18.60 Lakhs	01 No	18.60	18.60	3.72	3.72	3.72	3.72	3.72
	(b)(3) POL for vehicle Rs. 15000/- x 12 months x 05 years = Rs. 09.00 Lakhs	LS	9.00	9.00	1.80	1.80	1.80	1.80	1.80
	(c)(1) Provision of VHF Main station and maintenance upto 05 years	5 Nos.	12.00	60.00	60.00	-	-	-	-
	(c)(2) Provision of Walkie-Talkies	50 Nos.	0.30	15.00	5.00	5.00	5.00	-	-
2	<b>Wildlife Habitat Management</b>								
	(a) Habitat enrichment with plantation of Bamboo(preferably through bamboo seed balls)	10 ha.	0.44	4.40	4.40	-	-	-	-
	(b).1. Provision of creation of new water bodies	02 Nos.	10.00	20.00	10.00	10.00	-	-	-
	(b).2. Provision of Plantation of fruit	LS	3.00	3.00	1.10	1.25	0.25	0.20	0.20





	(d) Capacity Building training for Field Staff on Elephant Human Conflict management at Division Office	10 Nos.	2.00	20.00	4.00	4.00	4.00	4.00	4.00
	(e) Installation of Solar Street lamp/light in elephant affected villages and its maintenance	100 Nos.	0.40	40.00	20.00	20.00	-	-	-
<b>5</b>	<b>Public Awareness and Livelihood Generation Activity through community mobilization</b>								
	(a) Provision for cattle immunization camps for surrounding fringe villages for mitigation of spreading of diseases etc.	10 Nos.	0.20	2.00	0.40	0.40	0.40	0.40	0.40
	(b) Training and awareness to EDC/VFMC, in Schools, Village level Volunteers for Wild Life Conservation & Protection	LS	10.00	10.00	2.00	2.00	2.00	2.00	2.00
	<b>Total</b>			<b>506.00</b>	<b>251.42</b>	<b>112.17</b>	<b>56.17</b>	<b>43.12</b>	<b>43.12</b>
	<b>20% Escalation</b>			101.20	50.28	22.43	11.23	8.62	8.62
	<b>Grand Total</b>			<b>607.20</b>	<b>301.70</b>	<b>134.60</b>	<b>67.40</b>	<b>51.74</b>	<b>51.74</b>

Countersigned

29/11/19

Regional Chief Conservator of Forests  
Rourkela Circle, Rourkela

  
Divisional Forest Officer  
Bonai Division



**KEONJHAR FOREST DIVISION****A. To be borne by the User Agency/Project Proponent**

Sl. No.	Proposed Interventions	Specification	Amount (Rs. in Lac.)
1	Hire charges of Vehicle for the Anti-poaching-cum-anti-depredation Squad @rs.31,000/- per month.. Rs.18.60 lakhs for 5 years.	One vehicle	To be Borne by User Agency
2	POL for the hired vehicle @Rs.15,000/- per month. Total for 5 years= Rs.9.00 lakhs.	POL	
3	Jana Rakhya – Gaja Surakhya Solar fencing may be taken up (2 Km in one village) either in community mode or VSS mode or private farmers land as per Socio – economic – politico dynamics of the village. Subsidy component to be borne by beneficiaries (Private + Public).		
4	MTS for drone use & its related analysis and documentation at Champua		
5	Fitting of optimizer / modernization in O/o RCCF, Rourkela for better record management and file flow.		

Approve

21/08/23  
Divisional Forest Officer,  
Keonjhar Division

Principal Chief Conservator of Forests  
(Wildlife) & Chief Wildlife Warden  
Odisha, Bhubaneswar

**B. To be Implemented by KEONJHAR FOREST DIVISION with  
the funds deposited by the User Agency**

Sl. No.	Particulars	Estimated cost (In lakhs)
1.	Creation and maintenance of One Water body (60m x 40 m x 3 m)	15.000
2.	Planting of 5000 nos of Ficus species & Tala and other Fodder Plants specially Bauhinia spp. (Siali) etc. in Urban plantation mode @5.70 lakhs/1000	28.500
3.	Anti-poaching-cum-Anti-depredation Squad 5 persons for 5 years @13412/- and incidentals (Vehicle, Driver and POL to be provided by the user agency)	41.565
4.	Deployment of 3 nos. of Elephant Trackers @13,412/- 13,412 x3x12x5 = Rs.24,14,160/- Equipments: Rs.1,35,840/- (Total= Rs.25,50,000/-)	25.500
5.	Deployment of Gajasathi @5 persons per village/VSS in 6 villages (Total 30 persons) @ Rs.75250/- /village/year. Total Cost for 5 years:- Rs.75250/- x 6 nos. x 5 years = Rs.22,57,500/-	22.575
6	Bulk SMS, Voice Message and early warning System	5.000
7	Procurement of 2 nos. of Portable Cabins for monitoring elephant movement along SH and NH @6.00 lakh each	12.00
8	Distribution of 200 nos. of Grain Bins @3500/- each	7.000
9	Providing Street Solar Light along with early warning System (SIM Based) in elephant Sensitive villages.	25.00
10	Creation of awareness	5.00
11	Monitoring and Evaluation	2.00
	<b>TOTAL</b>	<b>189.14</b>
	20 % extra for escalation	37.828
	<b>G. TOTAL</b>	<b>226.968</b>

  
Divisional Forest Officer,  
Keonjhar Division



**YEARWISE REQUIREMENT OF FUNDS**  
**FOR THE ACTIVITIES WITHIN THE IMPACT ZONE**

**KEONJHAR FOREST DIVISION**

Sl. No.	Activity	Requirement of Funds in lakhs					Total
		1 <sup>st</sup> yr	2 <sup>nd</sup> yr	3 <sup>rd</sup> yr	4 <sup>th</sup> yr	5 <sup>th</sup> yr	
1	Creation and maintenance of Water body	15.000	0	0	0	0	15.000
2	Planting of 5000 nos. of Ficus / Fodder plants in Urban plantation mode	0.58060	1.47615	11.22225	8.3049	6.9161	28.500
3	Anti-poaching-cum-Anti-depredation Squad 10 persons for 5 years @13412/- and incidentals.	8.313	8.313	8.313	8.313	8.313	41.565
4	Deployment of Elephant Trackers – 3 nos	5.100	5.100	5.100	5.100	5.100	25.500
5	Deployment of Gajasathi @5 persons per village/VSS in 6 villages (Total 30 persons) @ Rs.75250/- /village/year. Total Cost for 5 years:- Rs.75250/- x 6 nos. x 5 years = Rs.22,57,500/-	4.515	4.515	4.515	4.515	4.515	22.575
6	Bulk SMS, Voice Message and Early Warning system	1.00	1.00	1.00	1.00	1.00	5.000
7	Procurement of 2 nos. of Portable Cabins for monitoring elephant movement along SH and NH @6.00 lakh each	12.00	0	0	0	0	12.00

8	Distribution of 200 nos of Grain Bins @3500/- each	7.00	0	0	0	0	0	7.000
9	Providing Street Solar Light along with early warning System (SIM Based) in elephant Sensitive villages.	25.00	0	0	0	0	0	25.00
10	Creation of awareness	1.00	1.00	1.00	1.00	1.00	1.00	5.00
11	Monitoring and Evaluation	0	0	0	0	2.00	0	2.00
	<b>Total</b>	<b>89.5086</b>	<b>21.40415</b>	<b>31.15025</b>	<b>30.2329</b>	<b>26.8441</b>	<b>189.14</b>	
	Cost escalation 20%	17.90172	4.28083	6.23005	6.04658	5.36882	37.828	
	<b>Grand Total</b>	<b>107.41032</b>	<b>25.68498</b>	<b>37.3803</b>	<b>36.27948</b>	<b>32.2129</b>	<b>226.968</b>	

  
 21/08/17  
 Divisional Forest Officer,  
 Keonjhar Division



**ABSTRACT OF REQUIREMENT OF FUNDS**  
**FOR EXECUTION BY FOREST DEPARTMENT**

Particulars	Bonai Forest Division	Keonjhar Forest Division	Total
Total	506.00	189.14	695.14
20% Cost escalation	101.20	37.828	139.028
Grand Total	607.20	226.968	834.168

The cost estimate of this plan is therefore Rs.607.20 lakhs for Bonai Forest Division and Rs. 226.968 Lakhs for Keonjhar Forest Divisions.

The amount will be deposited with the D.F.O/ Forest Department for taking up different activities within the Zone of Influence.

**Plan Period:**

This plan is proposed for a period of 5 years. However, if necessary, interim revision of this plan can be taken up depending on the actual requirement.

Approved

The plan period is five years and will be revisited by the concerned DFOs at least one year before expiry of its implementation. The user agency will bear the cost of such plan upon its approval.

Principal Chief Conservator of Forests  
(Wildlife) & Chief Wildlife Warden  
Odisha, Bhubaneswar

**PROCEEDINGS OF THE MEETING OF STATE LEVEL EXPERT APPRAISAL  
COMMITTEE, ODISHA HELD ON 13<sup>th</sup> NOVEMBER, 2020**

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The SEAC met on 13<sup>th</sup> November, 2020 at 11:00 AM through video conferencing in Google Meet under the Chairmanship of Sri. B. P Singh. The following members were present in the meeting.

1. Sri. B. P. Singh	-	Chairman
2. Prof (Dr.) H. B. Sahu	-	Member
3. Dr. D. Swain	-	Member
4. Prof. (Dr.) P.K. Mohanty	-	Member
5. Sri. J. K. Mahapatra	-	Member
6. Sri. K. R. Acharya	-	Member
7. Prof.(Dr.) B.K. Satpathy	-	Member
8. Dr. Sailabala Padhi	-	Member
9. Dr. K.C.S Panigrahi	-	Member

The agenda-wise proceedings and recommendations of the committee are detailed below.



## **ITEM NO. 02**

**PROPOSAL OF ENVIRONMENTAL CLEARANCE OF KALAMANG WEST (NORTHERN PART) IRON ORE MINES FOR MINING OF IRON ORE WITH PRODUCTION CAPACITY OF 2.95 MTPA (ROM) AT VILLAGE- KALAMANG & GHODABUDANI DISTRICT- SUNDERGARH & VILLAGE - GANDALPADA, DISTRICT - KEONJHAR, ODISHA (MLA: 92.875 HA) OF M/S TATA STEEL BSL LTD. - TOR**

1. The proposal was considered by the committee to determine the "Terms of Reference (ToR)" for undertaking detailed EIA study for the purpose of obtaining environmental clearance in accordance with the provisions of the EIA Notification, 2006 and amendment thereafter.
2. As per EIA Notification dated 14.09.06 and its subsequent amendments S.O.141 (E) on dated 15.1.2016, the project falls under, Category "B1".
3. The Kalamang West (Northern Part) Block Iron Ore Mine of M/s TATA Steel BSL Ltd. is proposed over an area of 92.875 hectares (ha) which involves 42.608 ha of forest land (16.658 ha in Keonjhar Forest Division, District Keonjhar and 25.950 ha in Bonai Forest Division, District Sundargarh) and 50.267 ha of non-forest land. The Mining area is situated in three villages namely, village Kalamang & Ghodabudani of Tehsil – Koira, District Sundargarh & village Gandalpada of Tehsil - Barbil, District Keonjhar State Odisha.
4. The Government of Odisha had issued Letter of Intent (LoI) vide Govt. letter No. IV(MISC) SM-53/2017/5285/SM dt.24.06.2017 as per Rule 10(2) was again modified by Steel and Mines Department, Government of Odisha vide letter no. IV(MISC) SM-53/2017/6287/SM dt.27.07.2017 revising the earlier mentioned area of 92.0 ha to 92.875 ha for grant of Mining Lease for Kalamang West (Northern Part) Iron Ore Block in village Kalamang & Ghodabudhani in District Sundargarh and village Gandalpada in District Keonjhar is in the name of M/s Bhushan Steel Ltd. The change of name from Bhushan Steel Limited to TATA STEEL BSL Limited was approved by the Department of Steel and Mines vide letter No. 1409/SM/dated 27.02.2019 for grant of a Mining Lease. Now, M/s Tata Steel BSL Ltd. has requested to 'The Additional Chief Secretary' of Department of Steel and Mines, Govt. of Odisha for extension of validity of LOI vide letter no TSBSL/CS/2020/101 dated 05.03.2020.
5. **Location & Connectivity** : Kalamang West (Northern Part) Block Iron Ore Mine of M/s Tata Steel BSL Limited having lease area 92.875 hectares is situated in three villages namely Kalamang & Ghodabudani of Sundargarh District & village Gandalpada of Keonjhar Districts, of State Odisha. The geo-coordinates is Latitude: 21° 56' 47.757"- 21° 57' 32.347" N Longitude: 85° 17' 06.658" - 85° 17' 57.531" E. The mine is well connected

by NH-215, which is about 1.80 km in NW. Nearest Railway Station is Barbil which is about 17.86 Km in NNE direction. Rourkela Airport at 59 Km NW, Jharsuguda Airport 128 km W and Biju Patnaik International Airport, Bhubaneswar is about 196 Km in SSE direction from the project site.

6. **Environmental Sensitivity:** The mine lease area consist of 42.608 ha of forest land (16.658 ha in Keonjhar Forest Division, District Keonjhar and 25.950 ha in Bonai Forest Division, District Sundargarh). There is no National Park, wildlife sanctuary, biosphere reserve within 15 km radius of the Mine. However, Karo Karampada Elephant corridor is located at about 8.6 km N of the lease area. There is no perennial surface water body in the applied mine lease area.
7. **Method of Mining:** Opencast Fully Mechanized Mining method has been proposed. It is proposed to commence mining operation from north eastern part of the lease. In the plan period of about 2.95 MTPA, has been proposed for production. As the mining activities in the lease area is to be commenced, activities connected with development of the mine such as scrapping of weathered zones, cutting of trees/bushes, making of access roads, infrastructure development etc will be given prime preference. After the development of an access road to the targeted area a box cut will be opened and thereafter, it will be expanded both laterally and depth-ward to fulfill the required production target.
8. The aforesaid mine lease area measuring 92.875 ha is for extraction of Iron Ore. The annual excavation is targeted at 2.95 MTPA (RoM) Iron Ore with total maximum excavation of 3.92 MTPA. The ROM will be fed to a mobile crushing/ screening plant of 1000 TPH capacity. The lump ore and fines will be segregated in the Crushing /Screening plant.
9. **Drilling & Blasting:** Drilling will be carried out using 110-150 mm dia. Drill with 3.0-4.0m burden & 3.5-4.5 m spacing based on the geological rock characteristics. Taking into account the disposition of the ore body, it has been estimated that about 80 % (approx.) of planned quantity will require drilling & blasting.
10. **Loading & transportation:** Blasted material will be loaded with hydraulic excavators of bucket capacity of 2.5 to 4.0 cum into 35/50 ton capacity dumpers and will be transported to a proposed crushing & screening plant for production of lump & fines. Dumpers of 15/25T capacity would be utilized for shifting of crushed ore to the stack-yard. Marketable ore will be dispatched by road through trucks of different capacities and rail. Waste generated will be transported to proposed waste dump.
11. **Nature of Waste:** The iron ore deposits of the area are associated with BHJ, Laterite, lateritic soil and shale. These will be generated from the lease area as waste with iron ore. No top-soil will be generated in the ensuing plan period.
12. **Dumping Site:** A quantity of 141,10,154 m<sup>3</sup> waste will be generated during the conceptual plan period. 14,58,980 m<sup>3</sup> waste will be generated in the ensuing plan period out of which 8,55,122 m<sup>3</sup> of waste is proposed to be stored on the earmarked 3 dumps and the rest 1,12,241 m<sup>3</sup> will be utilized for making of roads and other related construction activities. Rest quantity of generated waste of vol. 4,91,557 m<sup>3</sup> will be utilized in the proposed backfilling.
13. **Rehabilitation & Resettlement:** The mine lease area comprise of 20.580 Ha private land. Few habitations of Ghodabudhani village are located in the lease area. Rehabilitation & resettlement of all the PAFs will be carried out as per the State R&R Policy.



14. **Green Belt:** Plantation will be carried out in 7.5 m wide safety barrier zone, backfilled area, inactive dump slopes, etc. At conceptual stage, almost entire mine lease area will be reclaimed by plantation.
15. **Water Requirement :** The estimated water requirement for domestic and mining purposes including plantation is to the tune of 65 m<sup>3</sup>/day and 170 m<sup>3</sup>/day respectively. The Peak total water requirement at mine for domestic and industrial use will be 235 m<sup>3</sup>/day. The availability of water for drinking and domestic purposes will be made from bore wells and that for mining use will be from sources like Mine pit (When available) / perennial stream / river.
16. **Power Requirement:** The fully mechanized mining will be done in a 3 shifts of 8 hours each. The mining equipment will be operated by diesel. The use of electricity will be for lighting/illumination purposes in mining operations and will be obtained from Odisha State Electricity Board (OSEB). The electricity/DG power will be provided at the office, camp and mines. Power requirement - 1800-2000 KW ; Source of power Odisha State Electricity Board, DG sets - 850 KVA X 3 nos. or 2250 KVA.
17. **Employment Potential:** The project will generate direct to the tune of about 428 persons as well as indirect employment opportunities for the nearby villages.
18. The cost of the project is Rs.216.20 Crores.
19. The Environment consultant **M/s Visiontek Consultancy Services Pvt. Ltd. – Bhubaneswar** along with the proponent made a presentation on the proposal before the Committee.

Considering the information / documents furnished by the proponent and presentation made by the consultant **M/s Visiontek Consultancy Services Pvt. Ltd. – Bhubaneswar**, the SEAC prescribed the following specific ToRs in addition to standard ToRs along with specific conditions as recommended by CSIR-NEERI on carrying capacity study as per **Annexure -B** for conducting detailed EIA study.

- (i) Quality and quantity of low-grade ore generation and its usage and declaration.
- (ii) Details on Rehabilitation & Resettlement plan for 2 villages.
- (iii) Private Land acquisition status.
- (iv) Copy of forest clearance status.
- (v) 2-3 roads will be de-routed, details to be submitted.
- (vi) Permission copy for usage of water from Sona nadi.
- (vii) Traffic study, slope study, socio economic study to be conducted in comprehensive manner.
- (viii) Waste generation and management.
- (ix) Material Balance chart.
- (x) Copy of Forest Diversion proposal.
- (xi) Site specific conservation plan.
- (xii) Re-plantation of trees, uprooted in mining area in safety zone.
- (xiii) Public Hearing to be conducted in both the Districts of Keonjhar and Sundergarh.
- (xiv) Water Balance with water harvesting details be submitted.
- (xv) Traffic Density should to be undertaken by a domain expert inside the mine lease area at intersection with the haulage road and at intersection points of haulage road with

NH/SH/Public roads and mitigation measures for decongestion, if any by a domain expert.

- (xvi) Slope study for mine and OB/waste to be undertaken by an Institute of repute.
- (xvii) Socio-economic study to be undertaken by an Institute of repute
- (xviii) Baseline Data study – Three-dimensional simulation study (predictive study) to be undertaken compressive with this proposed mine, any other proposed mines & the existing other operating mines.
- (xix) OB/waste management & “zero discharge” management to be submitted.
- (xx) Details of retaining wall, garland drain and settling pond to be submitted along with de-silting Management and SOP for desilting perpetually if any from any waterbody/agricultural land.
- (xxi) Identification of occupational health hazards and perennial measure for mitigation of the same through domain health expert.



**TERMS OF REFERENCE (ToR) FOR CONDUCTING ENVIRONMENT IMPACT ASSESSMENT STUDY AND INFORMATION TO BE INCLUDED IN EIA/EMP REPORT FOR KALAMANG WEST (NORTHERN PART) IRON ORE MINES FOR MINING OF IRON ORE WITH PRODUCTION CAPACITY OF 2.95 MTPA (ROM) AT VILLAGE- KALAMANG & GHODABUDANI DISTRICT- SUNDERGARH & VILLAGE - GANDALPADA, DISTRICT - KEONJHAR, ODISHA (MLA: 92.875 HA) OF M/S TATA STEEL BSL LTD. - TOR**

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**A. STANDARD TOR FOR MINING PROJECT**

1. The Environmental Clearance will not be operational till such time the Project Proponent complies with all the statutory requirements and judgment of Hon'ble Supreme Court dated the 2nd August 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors..
2. Department of Mining & Geology, State Government shall ensure that mining operation shall not commence till the entire compensation levied, 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 the 2nd August 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors.
3. Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
4. A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
5. All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
6. All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
7. Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.
8. Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
9. It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental



issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the proposed safeguard measures in each case should also be provided.

10. The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
11. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
12. Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
13. A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.
14. Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.
15. Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
16. The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
17. A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.
18. Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.
19. A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan alongwith budgetary provisions for their conservation should be

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prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

20. Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered.
21. Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects failing under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).
22. R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs/STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine (lease) area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.
23. One season (non-monsoon) [i.e. March - May (Summer Season); October - December (post monsoon season) ; December - February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM<sub>10</sub>, particularly for free silica, should be given.
24. Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
25. The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.
26. Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
27. Description of water conservation measures proposed to be adopted in the Project should

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be given. Details of rainwater harvesting proposed in the Project, if any, should be provided,

28. Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.
29. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter- alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.
30. Details of any stream, seasonal or otherwise, passing through the tease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be.
31. Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and BGL. A schematic diagram may also be provided for the same.
32. A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.
33. Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.
34. Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
35. Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.
36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.

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38. Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
39. Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.
40. Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
41. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
42. The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
43. A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
44. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
45. The activities and budget earmarked for Corporate Environmental Responsibility (CER) shall be as per MoEF&CC, Govt. of India O.M No 22-65/2017-IA. II (M) dated 01.05.2018 and the action plan on the activities proposed under CER shall be submitted at the time of appraisal of the project included in the EIA/EMP Report.
46. The Action Plan on the compliance of the recommendations of the CAG as per MoEF&CC, Govt. of India Circular No. J-11013/71/2016-IA.I (M), dated 25.10.2017 needs to be submitted at the time of appraisal of the project and included in the EIA/EMP Report.
47. Compliance of the MoEF&CC, Govt. of India Office Memorandum No. F: 3-50/2017-IA.III (Pt.), dated 30.05.2018 on the judgement of Hon'ble Supreme Court, dated the 2nd August, 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India needs to be submitted and included in the EIA/EMP Report.

**B. Specific TOR : Recommendation of CSIR-NEERI Report on "Carrying Capacity Study for Environmentally Sustainable Iron and Manganese Ore Mining Activity in Keonjhar, Sundargarh and Mayurbhanj districts of Odisha State"**

1. Department of Steel & Mines, Govt. of Odisha should prepare 5 years regional plan for annual iron ore requirement from the state, which in turn shall be met from different mines/zones (e.g. Joda, Koira.) in the state. Accordingly, sustainable annual production (SAP) for each zone/mine may be followed adopting necessary environmental protection measures.
2. The expansion or opening of new manganese ore mines may be considered only when the actual production of about 80% is achieved. Further, the mines that have not produced Mn ore for last two years and have no commitment in the current year as well: EC capacity in such cases may be reviewed. The Department of Steel & Mines, Govt. of Odisha shall submit the Annual Report on this issue to the MoEF&CC for further necessary action.
3. Analysis of baseline environmental quality data for the year 2014 and 2016 indicates that existing mining activities appear to have little / no potential impact on environmental quality,

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except on air environment, which was mainly due to re-suspension of road dust. Therefore, all the working mines can continue to operate with strict compliance to monitoring of environmental quality parameters as per EC and CTE/CTO conditions of the respective mine, and implementation of suggested measures for control of road dust and air pollution. Odisha State Pollution Control Board has to ensure the compliance of CTE/CTO. Regional office of the MoEF&CC, Bhubaneswar shall monitor the compliance of the EC conditions. Regional office of the Indian Bureau of Mines (IBM) shall monitor the compliance of mining plan and progressive mine closure plan. Any violation by mine lease holder may invite actions per the provisions of applicable acts.

4. Considering the existing environmental quality, EC capacity, production rate, iron ore resources availability and transport infrastructure availability, the share of Joda and Koira sector works out to be 70% and 30% respectively for the existing scenario for the year 2015-16. However, for additional EC capacity, it can be 50:50 subject to commensurate infrastructure improvement (viz. SOTM, pollution free road transport, enhancement of rail network etc.) in the respective regions.
5. Continuous monitoring of different environmental quality parameters as per EC and CTE/CTO conditions with respect to air, noise, water (surface and ground water) and soil quality in each region shall be done. The environmental quality parameters should not indicate any adverse impact on the environment. Monitoring within the mines should be done by individual mine lease holders, whereas outside the mine lease area, monitoring should be done by the Govt, of Odisha through various concerned departments/ authorized agencies. Various monitoring/ studies should be conducted through national reputed institutes, NABET/ MoEF&CC accredited laboratories/organizations. The reports submitted by individual mine lease holders and study reports prepared by other concerned departments/agency for each of the regions should be evaluated and examined by SPCB/ MoEF&CC.
6. Construction of cement concrete road from mine entrance and exit to the main road with proper drainage system and green belt development along the roads and also construction of road minimum 300 m inside the mine should be done. This should be done within one year for existing mines and new mine should have since beginning. The concerned departments should extend full support; wherever the land does not belong to the respective mine lease holders. The Department of Steel & Mines, Govt, of Odisha should ensure the compliance and should not issue the Mining Permits, if mine lease holder has not constructed proper cement concrete road as suggested above.
7. In view of high dust pollution and noise generation due to road transport, it is proposed to regulate/guide the movement of iron and manganese ore material based on the EC capacity of the mines. Accordingly, ore transport mode has been suggested, as given below in Table.

**Table : EC Capacity based Suggested Ore Transport Mode (SOTM)**

Code	EC	Suggested Ore Transport Mode
SOTM 1	> 5 MTPA	100% by private railway siding or conveyor belt up to public railway siding or pipeline for captive mines and 70% for non-captive mines
SOTM 2	Between 3 and <5 MTPA	Minimum 70% by public railway siding, through conveyor belt and maximum 30% by road - direct to destination or other public railway siding or above option

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Code	EC	Suggested Ore Transport Mode
SOTM 3	Between 1 and < 3 MTPA	Minimum 70% by public railway siding and maximum 30% by road - direct to destination or by other public railway siding or above options
SOTM 4	<1 MTPA	100 % by 10/17 Ton Trucks or above options

It is mentioned by State Govt, of Odisha that currently about 45% of the iron ore is despatched using rail network and progressively it will be increased to about 60% by rail/slurry over a period of 5 years, taking into account time required to set up more railway sidings.

In view of present ore transport practices and practical limitations, all the existing mines should ensure adoption of SOTM within next 5 years. New mines or mines seeking expansion should incorporate provision of SOTM in the beginning itself, and should have system in place within next 5 years. However, the State Govt, of Odisha shall ensure dust free roads in mining areas wherever the road transportation of mineral is involved. The road shoulders shall be paved with fence besides compliance with IRC guidelines. All the roads should have proper drainage system and apart from paving of entire carriage width the remaining right of way should have native plantation (dust capturing species). Further, regular maintenance should also be ensured by the Govt. of Odisha.

Transportation of iron & manganese ore through river (jetty) to nearest Sea port (Sea cargo option) may be explored or connecting Sea ports with Railway network from the mines to be improved further so that burden on existing road and rail network and also pollution thereof can be minimized. Progress on development of dust free roads, implementation of SOTM, increased use of existing rail network, development of additional railway network/conveyor belt/ pipelines etc. shall be submitted periodically to MoEF&CC and SEIAA, Odisha.

Responsibility: Department of Steel & Mines, Govt. of Odisha; Time Period: 5 Years for developing railway/ conveyor belt facilities

8. Development of parking plazas for trucks with proper basic amenities/ facilities should be done inside mine. This should be done within one year for existing mines and new mines should have since beginning. Small capacity mines (in terms of lease area or production) not having enough space within the mine lease areas should develop parking plaza at a common place within the region with requisite facilities. Responsibility: Individual Mine Lease Holders; Time Period: 1 Year
9. Construction of NH 215 as minimum 4 lane road with proper drainage system and plantation and subsequent regular maintenance of the road as per IRC guidelines. Construction of other mineral carrying roads with proper width and drainage system along with road side plantation to be carried out. Responsibility: Department of Steel & Mines with PWD / NHAI Time Period: 2 Years.
10. Regular vacuum cleaning of all mineral carrying roads aiming at "Zero Dust Resuspension" may be considered. Responsibility: PWD / NHAI/ Mine Lease Holders; Time Period: 3 months for existing roads.
11. Expansion of existing mines and new mines should be considered after conducting recent EIA Study as per the provisions of EIA Notification 2006, as amended time to time<sup>1)</sup> with proper justification on demand scenario for iron ore requirement and availability of pollution free transport network in the region. Responsibility: IBM, Department of Steel & Mines and MoEF&CC, New Delhi.

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12. **Mine-wise Allocation of Annual Production:** In case the total requirement of iron ore exceeds the suggested limit for that year, permission for annual production by an individual mine may be decided depending on approved EC capacity (for total actual dispatch) and actual production rate of individual mine during last year or any other criteria set by the State Govt., i.e. Dept. of Steel & Mines. Department of Steel and Mines in consultation with Indian Bureau of Mines-RO should prepare in advance mine-wise annual production scenario as suggested in Table, so that demand for iron ore can be anticipated, and actual production/dispatch does not exceed the suggested annual production.

**Table: Allocation of Production to Different Mines for 5 Years  
(as per approved Mining Plan)**

Mine Lease	EC Capacity (MTPA)	Suggested Annual Production (MT)				
		2016-17 Yr 1	2017- 18 Yr 2	2018-19 Yr 3	2019-20 Yr 4	2020-21 Yr 5
Mine 1	X1					
Mine 2	X2					
Mine 3	X3					
Mine n	Xn					
Total	160 +	105	129	153	177	201
Next year allocation = Average of EC Capacity and Last year production						

13. **Expansion of Existing Mines having Validity up to 2020:** In view of implementation of MMDR Act 2015, wherein many non-captive mines are expected to be closed by March 2020, total iron ore production scenario has been. It is expected that the non-captive mines having validity till 2020 shall try to maximize their production (limited to EC capacity) in the remaining period. Further, depending upon availability of iron ore resources, these mines may also seek expansion of EC capacity. It may be noted here that total EC capacity of existing 25 working mines having validity upto 2020 is about 85 MTPA, whereas actual production from these mines has been only 44.677 MT (52.6%) during 2015-16 and 57.07 MT (67.1%) during 2016-17. Also, it is expected that these mines would not even be able to achieve ore production as per existing EC capacity till March 2020. Therefore, these existing mines should go for production to the fullest extent to meet the requisite demand from the State. However, where EC limit is exhausted, application for expansion may be considered. Further, the EC process (i.e. Grant of TOR, Baseline data collection, Mining plan/ scheme approval, Public hearing, preparation of EIA/EMP Report, Appraisal by the EAC and grant of EC) takes about one year time. Under such circumstances, it is suggested that further applications for grant of TOR or grant of EC for expansion of production capacity of the mine should be considered for those existing mines, which have exhausted their capacity subject to consideration of all environmental aspects. Responsibility: Department of Steel & Mines and MoEF&CC, New Delhi.
14. **Sustained Iron Ore Production beyond 2020:** Considering the implementation of MMDR Act 2015, total production of iron ore in Odisha State is anticipated to be about 111 MT during 2016-17 (actual production was - 102.663 MT), 136 MT during 2017-18, 146 MT during 2018-19 and 146 MT during 2019-20. Then there will be substantial drop in total production (to the tune of 73 MT during 2020-21 onwards) due to closure of mines, which are valid up to 2020. Therefore, in order to maintain operation/sustained growth of downstream industries, iron ore mining in the region needs to be continued at a sustainable



rate. The State Govt. through Department of Steel and Mines should initiate appropriate action to ensure continued availability of iron ore from the region, as per suggested sustainable annual production

15. **Reserves Estimation**-Mining Plan and Exploration; Appropriate actions (geo- technical investigation for qualitative and quantitative resource estimation & other preparations for auction of mines), may be initiated taken into account the existing working mines, and the mines which were operational at some point of time (but closed presently due to various reasons). The total iron ore reserves/ resources available within the total lease area of each mine should be estimated by State Govt./NMET/ GSI (or any other approved agency) with respect to: (i) Total lease area of mine (surface), (ii) Maximum depth to which resources could be available, (iii) Resources below the ground water table (if intersected), (iv) Reserves are to be estimated as per UNFC code with respect to quantity and quality (% Fe content), (v) Maximum mining rate and area for auction (after 2020) will be calculated based on total resources available and proposed life of mine leading to closure of mine in a stipulated time period. Responsibility: Department of Steel & Mines, IBM and GSI; Time frame: 1 year for the mines to be auctioned for next 2 years. The above mentioned organizations shall ensure the compliance with respect to timelines for implementations.
16. Depending upon availability of extractable iron ore resources within a mine, mining below the ground water table may be permitted after conducting necessary geological and hydro-geological study by GSI and requisite approval from the CGWB/CGWA (Central Ground Water Board/Authority). This can be explored at least in few mines on trial/pilot basis. Further, within a mine, it will be desirable to operate one pit at a time, and next pit should be opened after extracting maximum possible resources from the first pit, so that the exhausted pit can be used for back filling/ storing of low grade iron ore. However, depending upon the quantity and/or quality of iron/ manganese ore, other mine pits in the same mine lease may also be opened for sustainable scientific mining, as per approved mining plan/scheme of mining by IBM. The Department of Steel & Mines, Govt. of Odisha should initiate the pilot project so that minerals are fully utilized.
17. **Commercial Utilization of Low Grade Ore:** R&D studies towards utilization of low-grade iron ore should be conducted through research/academic institutes like IMMT, Bhubaneswar, NML, Jamshedpur, and concerned metallurgical departments in IITs, NITs etc., targeting full utilization of low-grade iron ore (Fe content upto 45% by 2020 and upto 40% by 2025). In fact, life cycle assessment of whole process including environmental considerations should be done for techno-economic and environmental viability. R&D studies on utilization of mine wastewater having high concentration of Fe content for different commercial applications in industries such as cosmetics, pharmaceutical, paint industry should also be explored. Responsibility: IBM, Dept, of Steel & Mines, Individual Mine Lease Holders.
18. The mining activity in Joda-Koira sector is expected to continue for another 100 years, therefore, it will be desirable to develop proper rail network in the region. Rail transport shall not only be pollution free mode but also will be much economical option for iron ore transport. The rail network and/or conveyor belt system upto public railway siding needs to be created. The total length of the conveyor belt system/ rail network to be developed from mines to nearest railway sidings by 11 mines in Joda region is estimated to be about 64 km. Similarly, in Koira region, total length of rail network/ conveyor system for 8 mines (under SOTM 1 & 2) is estimated to be around 95 km. Further, it is suggested to develop a rail network connecting Banspani (Joda region) and Roxy railway sidings in Koira region.

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Responsibility: Dept, of Steel & Mines, Govt, of Odisha and Concerned Mines along with Indian Railways. Time Period: Maximum 7 years (by 2025). The Department of Steel & Mines, Govt, of Odisha should follow-up with the concerned Departments and railways so that proposed proper rail network is in place by 2025.

19. State Govt, of Odisha shall make all efforts to ensure exhausting all the iron & manganese ore resources in the existing working mines and from disturbed mining leases/zones in Joda and Koira region. The criteria suggested shall be applicable while suggesting appropriate lease area and sustainable mining rate. Responsibility: Dept, of Steel & Mines, Govt, of Odisha.
20. Large and medium mine leases contribute to better implementation of reclamation and rehabilitation plans to sustain the ecology for scientific and sustainable mining. The small leases do not possess scientific capability of environmentally sustainable mining. Therefore, new mine leases having more than 50 ha area should be encouraged, as far as possible. This will ensure inter-generational resource availability to some extent. Responsibility: Dept, of Steel & Mines, Govt, of Odisha.
21. **Mining Operations/Process Related:** (i) Appropriate mining process and machinery (viz. right capacity, fuel efficient) should be selected to carry out various mining operations that generate minimal dust/air pollution, noise, wastewater and solid waste, e.g. drills should either be operated with dust extractors or equipped with water injection system, (ii) After commencement of mining operation, a study should be conducted to assess and Quantify emission load generation (in terms of air pollution, noise, waste water and solid waste) from each of the mining activity (Including transportation) on annual basis. Efforts should be made to further eliminate/ minimize generation of air pollution/dust, noise, wastewater, solid waste generation in successive years through use of better technology. This shall be ensured by the respective mine lease holders, (iii) Various machineries/equipment selected (viz. dumpers, excavators, crushers, screen plants etc.) and transport means should have optimum fuel/power consumption, and their fuel/power consumption should be recorded on monthly basis. Further, inspection and maintenance of all the machineries/ equipment/ transport vehicles should be followed as per manufacturer's instructions/ recommended time schedule and record should be maintained by the respective mine lease holders, (iv) Digital processing of the entire lease area using remote sensing technique should be carried out regularly once in 3 years for monitoring land use pattern and mining activity taken place. Further, the extent of pit area excavated should also be demarcated based on remote sensing analysis. This should be done by ORSAC (Odisha Space Applications Centre, Bhubaneswar) or an agency of national repute or if done by a private agency, the report shall be vetted/ authenticated by ORSAC, Bhubaneswar. Expenses towards the same shall be borne by the respective mine lease holders. Responsibility: Individual Mine Lease Holders.
22. **Air Environment Related:** (i) Fugitive dust emissions from all the sources should be controlled regularly on daily basis. Water spraying arrangement on haul roads, loading and unloading and at other transfer points should be provided and properly maintained. Further, it will be desirable to use water fogging system to minimize water consumption. It should be ensured that the ambient air quality parameters conform to the norms prescribed by the GPCB in this regard, (ii) The core zone of mining activity should be monitored on daily basis. Minimum four ambient air quality monitoring stations should be established in the core zone for SPM, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub> and CO monitoring. Location of air quality monitoring stations should be decided based on the meteorological data,

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topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board (based on Emission Load Assessment Study). The number of monitoring locations may be more for larger capacity mines and working in larger area. Out of four stations, one should be online monitoring station in the mines having more than 3 MTPA EC Capacity, (iii) Monitoring in buffer zone should be carried out by SPCB or through NABET accredited agency. In addition, air quality parameters (SPM, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub> and CO) shall be regularly monitored at locations of nearest human habitation including schools and other public amenities located nearest to source of the dust generation as applicable. Further, 11 continuous air quality monitoring systems may be installed in Joda and Koira regions and one in Baripada/ Rairangpur region, (iv) Emissions from vehicles as well as heavy machinery should be kept under control and regularly monitored. Measures should be taken for regular maintenance of vehicles used in mining operations and in transportation of mineral, (v) The vehicles shall be covered with a tarpaulin and should not be overloaded. Further, possibility of 3 using closed container trucks should be explored for direct to destination movement of iron ore. Air quality monitoring at one location should also be carried out along the transport route within the mine (periodically, near truck entry and exit gate). Responsibility: Individual Mine Lease Holders and SPCB.

23. **Noise and Vibration Related:** (i) Blasting operation should be carried out only during daytime. Controlled blasting such as Nonel, should be practiced. The mitigation measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented, (ii) Appropriate measures (detailed in Section 5.4) should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs/muffs, (iii) Noise levels should be monitored regularly (on weekly basis) near the major sources of noise generation within the core zone. Further, date, time and distance of measurement should also be indicated with the noise levels in the report. The data should be used to map the noise generation from different activities and efforts should be made to maintain the noise levels with the acceptable limits of CPCB (CPCB, 2000) (iv) Similarly, vibration at various sensitive locations should be monitored atleast once in month, and mapped for any significant changes due to successive mining operations. Responsibility: Individual Mine Lease Holders.
24. **Water/Wastewater Related :** (i) In general, the mining operations should be restricted to above ground water table and it should not intersect groundwater table. However, if enough resources are estimated below the ground water table, the same may be explored after conducting detailed geological studies by GSI and hydro- geological studies by CGWB or NIH or institute of national repute, and ensuring that no damage to the land stability/ water aquifer system shall happen. The details/ outcome of such study may be reflected/incorporated in the EIA/EMP report of the mine appropriately, (ii) Natural watercourse and/or water resources should not be obstructed due to any mining operations. Regular monitoring of the flow rate of the springs and perennial nallas should be carried out and records should be maintained. Further, regular monitoring of water quality of nallas and river passing thorough the mine lease area (upstream and downstream locations) should be carried out on monthly basis, (iii) Regular monitoring of ground water level and its quality should be carried out within the mine lease area by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring should be carried out on monthly basis, (iv) In order to



optimize water requirement, suitable conservation measures to augment ground water resources in the area should be undertaken in consultation with Central Ground Water Board (CGWB). (v) Suitable rainwater harvesting measures on long term basis should be planned and implemented in consultation with CGWB, to recharge the ground water source. Further, CGWB can prepare a comprehensive plan for the whole region, (vi) Appropriate mitigation measures (viz. ETP, STP, garland drains, retaining walls, collection of runoff etc.) should be taken to prevent pollution of nearby river/other water bodies. Water quality monitoring study should be conducted by State Pollution Control Board to ensure quality of surface and ground water sources on regular basis. The study can be conducted through NABL/ NABET approved water testing laboratory. However, the report should be vetted by SPCB. (vii) Industrial wastewater (workshop and wastewater from the mine) should be properly collected, treated in ETP so as to conform to the discharge standards applicable, (viii) Oil and grease trap should be installed before discharge of workshop effluents. Further, sewage treatment plant should be installed for the employees/colony, wherever applicable, (ix) Mine lease holder should ensure that no silt originating due to mining activity is transported in the surface water course or any other water body. Appropriate measures for prevention and control of soil erosion and management of silt should be undertaken. Quantity of silt/soil generated should be measured on regular basis for its better utilization, (x) Erosion from dumps site should be protected by providing geo-textile matting or other suitable material, and thick plantation of native trees and shrubs should be carried out at the dump slopes. Further, dumps should be protected by retaining walls. (xi) Trenches / garland drain should be constructed at the foot of dumps to arrest silt from being carried to water bodies. Adequate number of check dams should be constructed across seasonal/perennial nallas (if any) flowing through the mine lease areas and silt be arrested. De-silting at regular intervals should be carried out and quantity should be recorded for its better utilization, after proper soil quality analysis, (xii) The water so collected in the reservoir within the mine should be utilized for the sprinkling on hauls roads, green belt development etc. (xiii) There should be zero waste water discharge from the mine. Based on actual water withdrawal and consumption/ utilization in different activities, water balance diagram should be prepared on monthly basis, and efforts should be made to optimize consumption of water per ton of ore production in successive years. Responsibility: Individual Mine Lease Holders, SPCB and CGWB.

25. **Land/ Soil/ Overburden Related** : (i) The top soil should temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long (not more than 3 years or as per provisions mentioned in the mine plan/ scheme). The topsoil should be used for land reclamation and plantation appropriately, (ii) Fodder plots should be developed in the non-mineralised area in lieu of use of grazing land, if any. (iii) Over burden/ low grade ore should be stacked at earmarked dump site(s) only and should not be kept active for long period. The dump height should be decided on case to case basis, depending on the size of mine and quantity of waste material generated. However, slope stability study should be conducted for larger heights, as per IBM approved mine plan and DGMS guidelines. The OB dump should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles should be undertaken for stabilization of the dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Proper records should be maintained regarding species, their growth, area coverage etc, (iv) Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from mine operation, soil, OB and mineral dumps. The water so collected can be utilized for



watering the mine area, roads, green belt development etc. The drains should be regularly de-silted, particularly after monsoon and should be maintained properly. Appropriate documents should be maintained. Garland drain of appropriate size, gradient and length should be constructed for mine pit, soil. OB and mineral dumps and sump capacity should be designed with appropriate safety margin based on long term rainfall data. Sump capacity should be provided for adequate retention period to allow proper settling of silt material. Sedimentation pits should be constructed at the corners of the garland drains and de-silted at regular intervals, (v) Backfilling should be done as per approved mining plan/scheme. There should be no OB dumps outside the mine lease area. The backfilled area should be afforested, aiming to restore the normal ground level. Monitoring and management of rehabilitated areas should continue till the vegetation is established and becomes self-generating, (vi) Hazardous waste such as, waste oil, lubricants, resin, and coal tar etc. should be disposed off as per provisions of Hazardous Waste Management Rules, 2016, as amended from time to time. Responsibility: Individual Mine Lease Holders.

26. **Ecology/Biodiversity (Flora-Fauna) Related:** (i) As per the Red List of IUCN (International Union for Conservation of Nature), six floral species and 21 faunal species have been reported to be under threatened, vulnerable & endangered category. Protection of these floral and faunal species should be taken by the State Forest & Wildlife Department on priority, particularly in the mining zones, if any, (ii) The mines falling within 5-10 km of the Karo- Karampada Elephant corridor buffer need to take precautionary measures during mining activities. The forest and existing elephant corridor routes are to be protected and conserved. Improvement of habitat by providing food, water and space for the elephants is required to be ensured to avoid Man- Elephant conflicts. Though as per the records of State Forest Department, movement of elephants in the Karo-Karampada elephant corridor within 10 km distance from the mines in Joda and Koira is not observed, the Forest Department shall further record and ensure that elephant's movement is not affected due to mining activities, (iii) All precautionary measures should be taken during mining operation for conservation and protection of endangered fauna namely elephant, sloth bear etc. spotted in the study area. Action plan for conservation of flora and fauna should be prepared and implemented in consultation with the State Forest and Wildlife Department within the mine lease area, whereas outside the mine lease area, the same should be maintained by State Forest Department, (iv) Afforestation is to be done by using local and mixed species saplings within and outside the mining lease area. The reclamation and afforestation is to be done in such a manner like exploring the growth of fruit bearing trees which will attract the fauna and thus maintaining the biodiversity of the area. As afforestation done so far is very less, forest department needs to identify adequate land and do afforestation by involving local people in a time bound manner, (v) Green belt development carried out by mines should be monitored regularly in every season and parameters like area under vegetation/plantation, type of plantation, type of tree species /grass species/scrubs etc., distance between the plants and survival rate should be recorded, (vi) Green belt is an important sink of air pollutants including noise. Development of green cover in mining area will not only help reducing air and noise pollution but also will improve the ecological conditions and prevent soil erosion to a greater extent. Further, selection of tree species for green belt should constitute dust removal/dust capturing plants since plants can act as efficient biological filters removing significant amounts of particulate pollution. Thus, the identified native trees in the mine area may be encouraged for plantation. Tree species having small leaf area, dense hair on leaf surface (rough surface), deep channels on leaves should be included for plantation,



(vii) Vetiver plantation on inactive dumps may be encouraged as the grass species has high strength of anchoring besides medicinal value, (viii) Details of compensatory afforestation done should be recorded and documented by respective forest divisions, and State Forest Department should present mine-wise annual status, along with expenditure details, (ix) Similarly, Wildlife Department is also required to record and document annual status of wildlife in the region and should identify the need for wildlife management on regional level, (x) Maintenance of the ecology of the region is prime responsibility of the State Forest and Wildlife Department. They need to periodically review the status and identify the need for further improvement in the region. The required expenditure may be met from the funds already collected in the form of compensatory afforestation and wildlife management. Further, additional fund, if required can be sought from DMF. Responsibility: Individual Mine Lease Holders and State Forest & Wildlife Department.

27. **Socio-Economic Related:** (i) Public interaction should be done on regular basis and social welfare activities should be done to meet the requirements of the local communities. Further, basic amenities and infrastructure facilities like education, medical, roads, safe drinking water, sanitation, employment, skill development, training institute etc. should be developed to alleviate the quality of life of the people of the region, (ii) Land outtees and land losers/affected people, if any, should be compensated and rehabilitated as per the national/state policy on Resettlement and Rehabilitation, (iii) The socioeconomic development in the region should be focused and aligned with the guidelines/initiatives of Govt. of India/ NITI Aayog / Hon'ble Prime Minister's Vision centring around prosperity, equality, justice, cleanliness, transparency, employment, respect to women, hope etc. This can be achieved by providing adequate and quality facilities for education, medical and developing skills in the people of the region. District administration in association with mine lease holders should plan for "*Samagra Vikas*" of these blocks well as other blocks of the district. While planning for different schemes in the region, the activities should be prioritized as per Pradhan Mantri Khanij Kshetra Kalyan Yojna (PMKKKY), notified by Ministry of Mines, Govt. of India, vide letter no. 16/7/2017-M.VI (Part), dated September 16, 2015. Responsibility: District Administration and Individual Mine Lease Holders.
28. **Road Transport Related:** (i) All the mine lease holders should follow the suggested ore transport mode (SOTM) based on its EC capacity within next 5 years, (ii) The mine lease holders should ensure construction of cement road of appropriate width from and to the entry and exit gate of the miner as suggested in Chapter 10. Further, maintenance of all the roads should be carried out as per the requirement to ensure dust free road transport, (iii) Transportation of ore should be done by covering the trucks with tarpaulin or other suitable mechanism so that no spillage of ore/dust takes place. Further, air quality in terms of dust, PM<sub>10</sub> should be monitored near the roads towards entry & exit gate on regular basis, and be maintained within the acceptable limits. Responsibility: Individual Mine Lease Holders and Dept. of Steel & Mines.
29. **Occupational Health Related:** (i) 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 periodically, (ii) Occupational health surveillance program for all the employees/workers (including casual workers) should be undertaken periodically (on annual basis) to observe any changes due to exposure to dust, and corrective measures should be taken immediately, if needed, (iii) Occupational health and safety measures related awareness programs including identification of work related health



hazard, training on malaria eradication, HIV and health effects on exposure to mineral dust etc., should be carried out for all the workers on regular basis. A full time qualified doctor should be engaged for the purpose. Periodic monitoring (on 6 monthly basis) for exposure to respirable minerals dust on the workers should be conducted, and record should be maintained including health record of all the workers. Review of impact of various health measures undertaken (at an interval of 3 years or less) should be conducted followed by follow-up of actions, wherever required. Occupational health centre should be established near mine site itself. Responsibility: Individual Mine Lease Holders and District Administration (District Medical Officer),

30. **Reporting of Environmental Sustainability Achievement:** All the mines should prepare annual environmental sustainability report (ESR), highlighting the efforts made towards environmental protection with respect to different environmental components vis-a-vis production performance of the mine on monthly basis. The data collected as per EC and CTE/CTO conditions should be utilized to prepare the annual sustainability report. The mines performing high with effective environmental safeguards may be suitably recognized/rewarded. "Star Rating Format" formulated by the Ministry of Mines along with environmental sustainability report may be used,
31. **Environmental Monitoring Requirements at Regional Level:** Apart from strict compliance and monitoring by individual mine lease holder, there is a need for simultaneous monitoring in each of the regions by competent expert agencies under the guidance/ supervision of concerned regulatory agency. Details of the studies required to be done on regular basis (continuously for 5 years) through responsible agency (organization of national/state repute) and time frame are suggested in Table.

**Table: Suggested Environmental Monitoring Requirements and Action Plans at**

Sl. No.	Study component / Action Plan	Responsibility	Monitoring and Reporting Time Frame (Approx.)
1.	Environmental Quality Monitoring with respect to Air, Water, Noise and Soil Quality in each region (Joda, Koira and Baripada/Rairangpur) as per specified frequency shall be done by a third party (preferably Govt.) and/or laboratory approved/ recognized by NABET/ CPCB/ SPCB/ MoEF&CC. All the water bodies (rivers, nallas, ponds etc.) shall be monitored. National/State level research/ academic institutes may be involved initially for couple of years to streamline the activity. The report shall be brought out annually by June each year. The study shall be conducted in consultation with MoEF&CC-RO.	SPCB	Continuous Annually

Sl. No.	Study component / Action Plan	Responsibility	Monitoring and Reporting Time Frame (Approx.)
	Installation of online ambient air quality monitor for PM <sub>10</sub> , PMP.S, SO <sub>x</sub> and NO <sub>x</sub> within the mine having more than 3 MTPA EC Capacity	Respective Mine Lease Holders	Continuous Annually
	Installation of online ambient air quality monitor for PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>x</sub> and NO <sub>x</sub> in the Joda and Koira Region (total 11 locations).	SPCB	Continuous Annually
2.	Status of flora and fauna in each of the regions shall be assessed on annual basis. Changes, if any, taking place in the region shall be brought out clearly. The study shall be conducted in consultation with State Forest and Wildlife Department.	State Forest & Wildlife Dept.	Annually in mining zone and once in 3 years in the region
3.	Socio-economic study incorporating developments taking place in each of the region, CSR initiatives made by the mining companies shall be conducted on annual basis. Further, micro level developmental needs shall be clearly brought out in the report for each region. The study shall be conducted in consultation with district administration.	Respective District Administration	Annually
4.	A detailed hydro-geological study in each of the regions shall be conducted in an integrated manner in consultation with Regional Director, Central Ground Water Board. Accordingly, all project proponents shall implement suitable conservation measures to augment ground water resources in the area.	SPCB	Once in 2 years
5.	The State Govt. shall ensure construction and maintenance of dust free common roads/ appropriate rail network for transport of ore from mines to the consumer end.	Dept. of Steel & Mines	12 months for road network and 5-7 years for rail network
6.	Construction and maintenance of dust free roads from respective mine to the main road	Respective Mine Lease Holders	Continuous 6 months
7.	Traffic/road inspection study addressing the condition of	Dept. of Steel & Mines	Continuous 6 months

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Sl. No.	Study component / Action Plan	Responsibility	Monitoring and Reporting Time Frame (Approx.)
	traffic/roads leading to different mines and connecting to different railway sidings shall be undertaken on annual basis. Further, detailed traffic study shall be undertaken on every 5 yearly basis to ensure adequacy of road/rail infrastructure in each of the regions. The study can be undertaken through national/ state level research/ academic institute (such as CSIR-CRRI, New Delhi).		
8.	Assessment of land use/ land cover changes in each of the regions, with particular focus on mining areas, afforestation activities, variation in flow path of various water bodies etc. using remote sensing data	ORSAC	Annually
9.	R&D Studies for utilization of low-grade iron ore	Dept. of Steel & Mines through R&D / Academic Institutes	Upto 45% by 2020 and upto 40% by 2025

The data so generated for the region should be made available on the website of Department of Steel & Mines and also at MoEF&CC website, so that it can be effectively utilized by Individual Mine Lease Holders for preparing EIA/ EMP reports. This will meet the requirement for separate one season baseline environmental quality data collection by the individual proponents, if the mine proposed is in the same study region. Further, MoEF&CC through EAC1 can also utilize the data base available in evaluating the proposals for expansion of existing mines or new mines while granting ToR or EC to the mine, taking an holistic view of the region. State Govt, of Odisha should bring out an integrated environmental sustainability report for each of the regions (mainly for Joda and Koia region) incorporating ESR of individual mines and data collected in the region through various agencies, once in 5 years, to plan level of scientific and sustainable mining for the next 5 years.

32. Institutional Mechanism for Implementation of Environmentally Sustainable Mining: The present study is not a one-time study, but a process to ensure environmentally sustainable mining activities in the region on long term basis. Looking into the large-scale mining activities and long term perspective for mining vis-a-vis environmentally sustainable mining and upliftment of people of the region, there is a need to create an agency, who will integrate all the aspects relating to sustainable mining in the region on long term basis. It could be a SPV of Govt, of Odisha or a cell within the overall control and supervision of Dept. of Steel & Mines, with members from

IBM, GSI, OSPCB, MoEF&CC-RO and other concerned Departments and Mine Owners (EZMA), District Administration. It is found that the strong database available for the region needs to be taken into account to map and establish environmental quality of the region on daily, monthly, seasonal and annual basis. Further, the efforts and initiatives of the mines

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towards environmental protection as well as upliftment of the people of the region are required to be integrated, and a systematic plan at the block/regional level needs to be framed for the overall benefit of the local society, region, district, state and the country as a whole. It will be desirable to have proper environmental quality data management and analysis by NEERI or any other agency for next 5 years (six monthly compliance reports followed by field verification) ensuring sustainable mining practices in the region leading to an overall development of the region. District Mineral Funds should be utilized appropriately for various developmental activities/needs of the region. Further, an environmental sustainability report incorporating environmental status of region coupled with social upliftment may be brought out by SPCB or any other authorized agency on annual basis. This report can be used for supporting the regional EIA study, and also need for environmental quality monitoring by individual mine seeking environmental clearance for new mine/ expansion of mine, including public hearing. Since, outcome of the above study reports shall be in the overall interest of all the stakeholders (including local population) of the region, further planning for the region shall warrant cooperation and assistance of all the stakeholders (mine operators, industries, transporters, State & Central Government Offices, MoEF&CC, CPCB, SPCB, Dept. of Steel & Mines, IBM, IMD, NGOs and local people) in sharing the relevant data/information/ reports/documents etc. to continuously improve upon the environmentally sustainable development plan for economic growth in mining sector as well as for improvement in quality of life of the people of the region.

**C. Besides the above, the below mentioned general points are also to be followed:-**

- a) All documents to be properly referenced with index and continuous page numbering.
- b) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.
- c) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.
- d) Where the documents provided are in a language other than English, an English translation should be provided.
- e) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.
- f) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006- IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.
- g) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.
- h) As per the circular no. J-11011/618/2010-IA.II (I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of

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Ministry of Environment, Forest and Climate Change, as may be applicable.

- i) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area,(ii) geological maps and sections and (iii) Sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

**D. The prescribed TOR would be valid for a period of four years for submission of the EIA/EMP report.**

## COST NORM FOR URBAN PLANTATION FOR 1000 SAPLINGS

(Tail seedling plantation of One year Six months old)

(Labour cost @ 333/- 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
<b>PREVIOUS YEAR (ADVANCE WORK) NURSERY RAISING</b>						
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	9490.50	1568	11058.50
	<b>TOTAL</b>		<b>28.5</b>	<b>9490.50</b>	<b>1568</b>	<b>11058.50</b>
2	Monitoring & Supervision charge 5% of the total cost					553
	<b>GRAND TOTAL</b>		<b>28.5</b>	<b>9491</b>	<b>1568</b>	<b>11612</b>
<b>0<sup>TH</sup> YEAR OPERATION</b>						
1	Nursery Cost (1 Yr 6 months old seedlings) part @ Rs.37.97 per seedling (Rs.27.02 to be released) for 1100 seedlings (1000+100)	April-Mar	71	23643	4474	28117
	<b>TOTAL</b>		<b>71</b>	<b>23643</b>	<b>4474</b>	<b>28117</b>
2	Monitoring & Supervision charge 5% of the total cost					1406
	<b>GRAND TOTAL</b>		<b>71</b>	<b>23643</b>	<b>4474</b>	<b>29523</b>
<b>1<sup>ST</sup> YEAR OPERATION</b>						
1	Nursery cost (1 year & 6 months old seedling) balance @ Rs.27.02 for 1100 seedling	April-June	14.5	4828.50	362	5190.50
2	Alignment & stacking at 4M spacing including clearance sites in avenue & 2.5m X 2.5m in case of block plantation	April-May	15	4995	0	4995
3	Excavation of pits- 45vmx45cmx45cm in hard soil with vertical cut edges to make an uniform cube & heaping the excavated soil out side the pits	May-June	52	17316	0	17316
4	Refilling of pits with excavated soil after breaking the clods completely	June	8	2664	0	2664
5	Carriage and transport of saplings from Nursery site to plantation site over an average	July	0	0	6600	6600







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 per 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	1332	0	1332
4	(a) Cost of FYM 0.25 cft per plant @ Rs.15 per cft for 25 cft for 100 plants (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 (e) Cost of chemical fertilizer (Urea/Dap/NPK etc.)		0	0	375	375
			0	0	80	80
			0	0	120	120
			0	0	500	500
				0	1200	1200
5	1 <sup>st</sup> weeding around the plant to a radius of 30 cm & application of fertilizer	August	20	6660	0	6660
6	Soil working around 0.5MT radius & application of fertilizer, Moisture conservation & mulching	August-Sept	24	7992	0	7992
7	2 <sup>nd</sup> Weeding around the plant to radius of 0.5 MT.	Oct-Nov	16	5328	0	5328
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	61938	0	61938
10	Contingency Expenditure		0	0	1380	1380
	<b>TOTAL</b>		<b>250</b>	<b>83250</b>	<b>74939</b>	<b>158189</b>
11	Monitoring & Supervision Charge 5% of the total cost					7909
	<b>Grand Total</b>		<b>250</b>	<b>83250</b>	<b>74939</b>	<b>166098</b>



*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						
3 <sup>RD</sup> YEAR MAINTENANCE						
1	Weeding, Soil working & Manuring	Sept-Oct	20	6660	0	6660
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	61938	0	61938
	Total		206	68598	1200	69798
4	Monitoring & Supervision charge 5% of the total coost					3490
	Grand Total		206	68598	1200	73288
*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						
4 <sup>TH</sup> YEAR MAINTENANCE						
1	Watch & ward for 12 months from April to March. 365 Days	April-Mar	186	61938	0	61938
	Total		186	61938	0	61938
2	Monitoring & Supervision charge 5% of the total coost					3097
	Grand Total		186	61938	0	65035

#### ABSTRACT

Sl	Year of Operation	No of persons	Labour	Material	Monitoring & Supervision	Total
1	PREVIOUS YEAR (ADVANCE WORK) NURSERY RAISING	28.5	9491	1568	553	11612
2	0 <sup>TH</sup> YEAR OPERATION	71	23643	4474	1406	29523
3	1 <sup>ST</sup> YEAR OPERATION	331.5	110390	103367	10688	224445
4	2 <sup>ND</sup> YEAR OPERATION	250	83250	74939	7909	166098
5	3 <sup>RD</sup> YEAR MAINTENANCE	206	68598	1200	3490	73288
6	4 <sup>TH</sup> YEAR MAINTENANCE	186	61938	0	3097	65035
	TOTAL	1073	357310	185548	27143	57001

Sl no	Variable	Period	Range in Impact Area	Numbers	Most prone villages	SSWLCIP intervention suggested
1	Human Death	2009-10 to 2022-23	Barbil Champua	3 2	Khandabandha	1.Early warning system (Bulk messages and Miking) 2.Solar Street lights (nos)
2	Elephant Death	2009-10 to 2022-23	Barbil Champua	1 1		1.Elephant trackers 2.Cattle immunisation
3	Crop Damage	2014-15 to 2020-2021	Barbil Champua	46 14	Kohlapanduli, Badajal, Gandalpada, Kanarda Basantpur	Overlapping with Human Death, Elephant Death and House Damaged
4	House Damage	2014-15 to 2020-2021	Barbil Champua	22 12	Kendudihi, Dhanurjaypur, Kanarda, Nuagaon, Kendudihi Palsa (KA), GURUDA, BASANTAPUR, Pidhapokhari	1.Grain bin (400 nos) 2.Hand search torch lights (40 Nos)
5	WaterbodiesConstructed	2012-13 to 2022-2023	Barbil Champua			3 waterbodies excluding impact area
6	Habitat improvement					1.Ficus plantation (1000 Nos) 2.Fruit bearing trees along 10 streams(10*100=1000)

Solar Lights:-

Range	Village	Nos
Barbil	Kendudihi, Sankarpur, Kanarda, Nuagaon, Rugudi	10
Champua	Palsa (Ka), Guruda, Basantapur, Pidhapokhari, Khandabandha	10
Total :-		20

  
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	nos
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#### Hand Search Lights:-

Range	Village	Nos
Barbil	Badajal, Gandalpada, Kanarda, Lasarda	AS per list of the Range Officer 12
Champua	Basantapur	55 in no. of
Total :-		

#### Grain Bins:-

Range	Village	Nos
Barbil	Churmalda, Gamalei, Kohlapanduli, Badajal, Kanarda, Lasarda	700
Champua	Basantapur, Kajjoda	300
Total :-		1000 nos.

#### Elephants Trackers:-

Range	Village	Nos
Barbil	Kendudihi, Rugudi, Raida	2
Champua	Khandabandha	1
Total:-		3 Nos



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**Salt Licks :-**

In last 10 year, out of 65 death of elephants , 20 are due to various diseases. During 2021-2022, there were 13 death of elephants out of which 9 are due to various diseases. Moreover during regular elephant dung test it is revealed that there is huge load of Strongyloides/worm. It is one of the reason for reduction of immunity . Hence experts from Centre for Wildlife Health, OUAT, Bhubaneswar advised to create more salt licks to reduce worm load and increase immunity. As it is very difficult to do deworming of wild elephants. Salt lick is effective and most practical option. Hence on 10 salt licks are suggested in each forest blocks in Kalmaning Tata. ( As per list Attached ) .

**Salt Lick:-**

Range	Forest Block	No of Salt Lick
Barbil	Karo RF	3
	Sidhamatha RF	5
Champua	Baitarani A RF	2
Total :-		10 nos

**Cattle immunisation**

Since last 10 years, 20 Elephant deaths out of 65 were due to diseases especially due to Clostridium, HS & Anthrax. It has increased since last 2 years. Hence, extensive Cattle immunisation in forest fringe villages for HS, Anthrax & FMD is required regularly. Hence provision for Cattle immunisation is made in Site Specific Wildlife Conservation Plan.



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# **ELEPHANT DEATH & HUMAN DEATH REPORT IN IMPACT AREA ( KALAMANGA TATA)**

**FROM 2009-10 TO 2022-2023**

<b>RANGE</b>	<b>SECTION</b>	<b>Beat</b>	<b>ELEPHANT S DEATH</b>	<b>VILLAGE NAME</b>	<b>HUMAN DEATH</b>	<b>VILLAGE NAME</b>
BARBIL	BARBIL	KIRIBURU				
BARBIL	BARBIL	HARMATHA				
BARBIL	GUALI	KENDUDIHI			1	Karo RF near Kendudihi village
BARBIL	GUALI	BHADRASAI				
BARBIL	GUALI	RAIDA			1	Bhuyan Roida
BARBIL	GUALI	RUGUDIHI	1	Near Churmalda	1	Kollaharodkala
BARBIL	BARBIL	BARBIL				
BARBIL	GUALI	JHARGAON				
CHAMPUPA	JODA	KHANDABANDHA	1	Near Churmalda	2	Khandabandha -2
CHAMPUPA	JODA	JODA				
CHAMPUPA	BAMEBARI	DUBUNA				
<b>TOTAL :- (2009-10 TO 2022-2023 )</b>			<b>2 NOS</b>		<b>05 NOS</b>	

  
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# CAUSE OF ELEPHANT DEATH IN IMPACT AREA

Sl No.	Year & date	Sex	Name of the Range	Village	Forest	Cause of death
5	13.07.10	Elephant (calf)	Barbil	Chormalda Village	Sidhamath R.F.	Due to shock starvation and dehydration of the baby elephant.
	03.07.2020	Male Baby elephant (Age about 3 to 4 Years)	Barbil	Near Chormalda Village	Sidhamath RF	Due to respiratory failure

  
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**HOUSE DAMAGED IN IMPACT AREA ( KALMANG TATA  
FROM 2014-2015 TO 2020-2021 )**

Range	Beat	Village name	COUNT
Barbil	Rugudi	Gadadharpur (Badjal)	2
Barbil	Kendudihi	Kendudihi	4
Barbil	Harmatha	Dhanurjayspur(Harmat ha)	2
Barbil	Harmatha	Kanarda	2
Barbil	Kenduduihi	Nuagaon	2
Barbil	Kendudihi	Kendudihi (Nuasahi)	2
Barbil	Bhadrasahi	Tanto (Munda Sahi)	1
Barbil	Rugudi	'Sankarpur	2
Barbil	Rugudi	Ramchandrapur	2
Barbil	Rugudi	Rugudi	2
Barbil	Rugudi	Revenshapur(ka)	1
Champua	Khandabandh	Palasa( Ka )	3
Champua	Dubuna	Guruda	2
Champua	Dabuna	Basantpur	2
Champua	Dabuna	Pidhapokhari	3
Champua	Khandabandha	Khandabandha	2
<b>TOTAL :-</b>			<b>34 NOS</b>

**CROP DAMAGED IN IMPACT AREA ( TATA KALMANG )  
FROM 2014-15 TO 2020-2021**

Range	Beat	Village Name	COUNT
Champua	Dubuna	Basantpur	13
Champua	Dubuna	Kaijoda	1
Barbil	Kiriburu	Kohlapanduli	5
Barbil	Harmath	Dhanurjaypur	1
Barbil	Rugudi	Badajal	8
Barbil	Rugudi	Charmalda	2
Barbil	Rugudi	Gandalpada	8
Barbil	Rugudi	Rugudi	2
Barbil	Kendudihi	Ponduliposhi	1
Barbil	Harmath	Gamalei	5
Barbil	Harmath	Kanarda	7
Barbil	Harmath	Badajal	4
Barbil	Harmath	Lasarda	3
<b>TOTAL :-</b>			<b>60 NOS</b>



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SALT LICK IN IMPACT AREA		
RANGE	FOREST BLOCK IN IMPACT AREA	NO OF SALT LICK
BARBIL	KARO RF	3
	SIDHAMATHA RF	5
CHAMPUA	BAITARANI A RF	2
TOTAL :-		10 NOS

  
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# WATERBODIES IN IMPACT AREA FROM 2011-12 TO 2022-2023 ( KALMANG JSW)

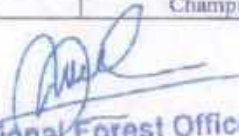
Year	Name of the Scheme	Name of Site	Name of Block	Name of Range	Section	Beat	No of Water Bodies Created	SL_NO	LATITUDE			LONGITUDE		
									DD	MM	SS	DD	MM	SS
2011-12	State Plan	Karo Rf	Joda	Barbil	Barbil	Kiriburu	1	1	22	3	51.8	85	17	13
2012-13	State Plan	Haramatha - Karo-Karampada EC	Joda	Barbil	Barbil	Kiriburu	1	2	22	3	8.6	85	16	41.6
2013-14	State Plan	Haramatha - Karo-Karampada EC	Joda	Barbil	Barbil	Kiriburu	1	3	22	2	57	85	16	35.1
2014-15	State Plan	Karo RF near Kolhapanduli - Karo-Karampada EC	Joda	Barbil	Barbil	Kiriburu	1	5	22	2	7.1	85	15	58.7
2015-16	State Plan	Karo - Karampada EC at Karo RF	Joda	Barbil	Barbil	Harmath	1	6	22	2	27.5	85	17	33.6
2015-16	CAMPA APO 2014-15 (PCCFWL)	Karo RF	Joda	Barbil	Guali	Kandudihi	1	7	21	59	49	85	15	12
2017-18	CAMPA APO 2016-17 (PCCFWL)	Sidhamath R.F	Joda	Barbil	Guali	Rugudi	1	8	21	58	0.2	85	20	11.4
TOTAL :-									07 NOS					

  
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 Keonjhar Division



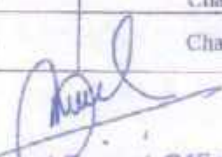
## CATTLE IMMUNISATION IN IMPACT AREA ( KALMANG TATA )

Sl No.	Name of the Forest Division	Name of the village	Name of the CD Block	Name of the Forest Range
1	Keonjhar (T)	jamadalaka	Champua	Champua
2	Keonjhar (T)	Anandapur panchapokharia	Champua	Champua
3	Keonjhar (T)	Asuria	Champua	Champua
4	Keonjhar (T)	Badadhanurjayapur	Champua	Champua
5	Keonjhar (T)	Badapada	Champua	Champua
6	Keonjhar (T)	Badkalimati	Champua	Champua
7	Keonjhar (T)	Baikunthapur	Champua	Champua
8	Keonjhar (T)	Bala	Champua	Champua
9	Keonjhar (T)	Balabhadrapur alias andhurikhuman	Champua	Champua
10	Keonjhar (T)	Balada	Champua	Champua
11	Keonjhar (T)	Baibandha	Champua	Champua
12	Keonjhar (T)	Balipasi	Champua	Champua
13	Keonjhar (T)	Banakati	Champua	Champua
14	Keonjhar (T)	Barakhandia	Champua	Champua
15	Keonjhar (T)	Bardhana	Champua	Champua
16	Keonjhar (T)	Baria	Champua	Champua
17	Keonjhar (T)	Basantapur	Champua	Champua
18	Keonjhar (T)	Basira	Champua	Champua
19	Keonjhar (T)	Basudevpur	Champua	Champua
20	Keonjhar (T)	Baushapani Unit No.05	Champua	Champua
21	Keonjhar (T)	Bhanda	Champua	Champua
22	Keonjhar (T)	Bhimapur	Champua	Champua
23	Keonjhar (T)	Bholabeda	Champua	Champua
24	Keonjhar (T)	Bichakhandi Unit No.04	Champua	Champua
25	Keonjhar (T)	Champadihi	Champua	Champua
26	Keonjhar (T)	Chingudipasi	Champua	Champua
27	Keonjhar (T)	Dabuna	Champua	Champua
28	Keonjhar (T)	Daduan	Champua	Champua
29	Keonjhar (T)	Dehuripasi Alias Suyabaha	Champua	Champua
30	Keonjhar (T)	Deojhar	Champua	Champua
31	Keonjhar (T)	Dhanurjayapur	Champua	Champua
32	Keonjhar (T)	Dhatika	Champua	Champua
33	Keonjhar (T)	Dolita	Champua	Champua
34	Keonjhar (T)	Gambharia	Champua	Champua
35	Keonjhar (T)	Gandabarei	Champua	Champua
36	Keonjhar (T)	Ghantgedia	Champua	Champua
37	Keonjhar (T)	Ghantupashi	Champua	Champua
38	Keonjhar (T)	Girdhripur	Champua	Champua
39	Keonjhar (T)	Godatopa	Champua	Champua
40	Keonjhar (T)	Gugudari	Champua	Champua
41	Keonjhar (T)	Gumura	Champua	Champua
42	Keonjhar (T)	Handibhanga	Champua	Champua
43	Keonjhar (T)	Haridajodi	Champua	Champua
44	Keonjhar (T)	Indraprastha	Champua	Champua
45	Keonjhar (T)	Jajapasi	Champua	Champua
46	Keonjhar (T)	Jalahari	Champus	Champua
47	Keonjhar (T)	Jalapapasi	Champua	Champua
48	Keonjhar (T)	Jalli	Champua	Champua
49	Keonjhar (T)	Jamirata	Champua	Champua
50	Keonjhar (T)	Jamupani	Champua	Champua
51	Keonjhar (T)	Jayantapur	Champua	Champua
52	Keonjhar (T)	Joda Unit No.02	Joda	Champua
53	Keonjhar (T)	Jyotipur	Champua	Champua
54	Keonjhar (T)	Kaijoda	Champua	Champua
55	Keonjhar (T)	Kainta	Champua	Champua

  
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 Keonjhar Division



Sl No.	Name of the Forest Division	Name of the village	Name of the CD Block	Name of the Forest Range
56	Keonjhar (T)	Kaliapal	Champua	Champua
57	Keonjhar (T)	Kalikaprasada	Champua	Champua
58	Keonjhar (T)	Kamalapur	Champua	Champua
59	Keonjhar (T)	Kamanda(kha)	Champua	Champua
60	Keonjhar (T)	Kamarjoda Unit No.03	Champua	Champua
61	Keonjhar (T)	Kanakana	Champua	Champua
62	Keonjhar (T)	Kanchanpur	Champua	Champua
63	Keonjhar (T)	Kanchindumuria	Champua	Champua
64	Keonjhar (T)	Kandara	Champua	Champua
65	Keonjhar (T)	Karanjia	Champua	Champua
66	Keonjhar (T)	Kashipala	Champua	Champua
67	Keonjhar (T)	Kasia	Champua	Champua
68	Keonjhar (T)	Katalapasi	Champua	Champua
69	Keonjhar (T)	Kendua	Champua	Champua
70	Keonjhar (T)	Khandabandha	Champua	Champua
71	Keonjhar (T)	Khuntapada	Champua	Champua
72	Keonjhar (T)	Khuntapani Unit No.06	Champua	Champua
73	Keonjhar (T)	Kodagadia	Champua	Champua
74	Keonjhar (T)	Kolhadihi	Champua	Champua
75	Keonjhar (T)	Krushnapur	Champua	Champua
76	Keonjhar (T)	Kutupali	Champua	Champua
77	Keonjhar (T)	Laxmipasi	Champua	Champua
78	Keonjhar (T)	Lunagadia	Champua	Champua
79	Keonjhar (T)	Madhupur	Champua	Champua
80	Keonjhar (T)	Mahadebanasa	Champua	Champua
81	Keonjhar (T)	Maheshpur	Champua	Champua
82	Keonjhar (T)	Makundapur	Champua	Champua
83	Keonjhar (T)	Manada	Champua	Champua
84	Keonjhar (T)	Mangalpur	Champua	Champua
85	Keonjhar (T)	Maudi	Champua	Champua
86	Keonjhar (T)	Mirigasinga	Champua	Champua
87	Keonjhar (T)	Mohadevpur	Champua	Champua
88	Keonjhar (T)	Murusuan	Champua	Champua
89	Keonjhar (T)	Mutuda	Champua	Champua
90	Keonjhar (T)	Malda	Champua	Champua
91	Keonjhar (T)	Naibaga	Champua	Champua
92	Keonjhar (T)	Nandapur.99	Champua	Champua
93	Keonjhar (T)	Narayanpat	Champua	Champua
94	Keonjhar (T)	Naupani	Champua	Champua
95	Keonjhar (T)	Nayagada	Champua	Champua
96	Keonjhar (T)	Neundi	Champua	Champua
97	Keonjhar (T)	Nischintapur	Champua	Champua
98	Keonjhar (T)	Nishagadia	Champua	Champua
99	Keonjhar (T)	Padua	Champua	Champua
100	Keonjhar (T)	Panpos	Champua	Champua
101	Keonjhar (T)	Parbatipur	Champua	Champua
102	Keonjhar (T)	Parudipasi	Champua	Champua
103	Keonjhar (T)	Patabila	Champua	Champua
104	Keonjhar (T)	Patala	Champua	Champua
105	Keonjhar (T)	Patuakudar	Champua	Champua
106	Keonjhar (T)	Pidhapokhari	Champua	Champua
107	Keonjhar (T)	Podesimula	Champua	Champua
108	Keonjhar (T)	Purunadihi	Champua	Champua
109	Keonjhar (T)	Radhikadeipur	Champua	Champua
110	Keonjhar (T)	Rajabasa	Champua	Champua
111	Keonjhar (T)	Rajia	Champua	Champua
112	Keonjhar (T)	Ramachandrapur	Champua	Champua
113	Keonjhar (T)	Ramachandrapur alias Balabhadrapur	Champua	Champua

  
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 Keonjhar Division



Sl No.	Name of the Forest Division	Name of the village	Name of the CD Block	Name of the Forest Range
114	Keonjhar (T)	Ramala Unit No.06	Champua	Champua
115	Keonjhar (T)	Ramchandrapur(Kha)	Champua	Champua
116	Keonjhar (T)	Ratanapur	Champua	Champua
117	Keonjhar (T)	Sadangi	Champua	Champua
118	Keonjhar (T)	Sanhundala	Champua	Champua
119	Keonjhar (T)	Saradhupanka	Champua	Champua
120	Keonjhar (T)	Sasanga	Champua	Champua
121	Keonjhar (T)	Shirikuan	Champua	Champua
122	Keonjhar (T)	Silipunj	Champua	Champua
123	Keonjhar (T)	Solagura	Champua	Champua
124	Keonjhar (T)	Sridharpur	Champua	Champua
125	Keonjhar (T)	Sunapashi	Champua	Champua
126	Keonjhar (T)	Taduabahal	Champua	Champua
127	Keonjhar (T)	Tangarabantala	Champua	Champua
128	Keonjhar (T)	Tangarapada	Champua	Champua
129	Keonjhar (T)	Tangarnali	Champua	Champua
130	Keonjhar (T)	Tolakbahal	Champua	Champua
131	Keonjhar (T)	Trilochampur	Champua	Champua
132	Keonjhar (T)	Unchabali	Champua	Champua
133	Keonjhar (T)	Kandara	Joda	Barbil
134	Keonjhar (T)	Bileipada	Joda	Barbil
135	Keonjhar (T)	Birkala	Joda	Barbil
136	Keonjhar (T)	Gobindapur	Joda	Barbil
137	Keonjhar (T)	Kandara	Joda	Barbil
138	Keonjhar (T)	Barhundala	Joda	Barbil
139	Keonjhar (T)	Bileipada	Joda	Barbil
140	Keonjhar (T)	Dampur	Joda	Barbil
141	Keonjhar (T)	Jugudidar	Joda	Barbil
142	Keonjhar (T)	Kandara	Joda	Barbil
143	Keonjhar (T)	Sialijoda	Joda	Barbil
144	Keonjhar (T)	Balagoda	Joda	Barbil
145	Keonjhar (T)	Bolani	Joda	Barbil
146	Keonjhar (T)	Dhanurjoypur	Joda	Barbil
147	Keonjhar (T)	Gadadharpur	Joda	Barbil
148	Keonjhar (T)	Kanarda	Joda	Barbil
149	Keonjhar (T)	Kendudihi alias paredipada	Joda	Barbil
150	Keonjhar (T)	Kolhapandol	Joda	Barbil
151	Keonjhar (T)	Limitur	Joda	Barbil
152	Keonjhar (T)	Madkamibeda Unit No.11	Joda	Barbil
153	Keonjhar (T)	Baneikala Unit No.01	Joda	Barbil
154	Keonjhar (T)	Bhuyanraida	Joda	Barbil
155	Keonjhar (T)	Choramalada	Joda	Barbil
156	Keonjhar (T)	Gadadharpur/Lasarda	Joda	Barbil
157	Keonjhar (T)	Gamulai	Joda	Barbil
158	Keonjhar (T)	Kanduripani	Joda	Barbil
159	Keonjhar (T)	Kanrda	Joda	Barbil
160	Keonjhar (T)	Katesahi	Joda	Barbil
161	Keonjhar (T)	Kolhabarpada	Joda	Barbil
162	Keonjhar (T)	Kolharaida	Joda	Barbil
163	Keonjhar (T)	Kolharudukela	Joda	Barbil
164	Keonjhar (T)	Pandulipasi	Joda	Barbil
165	Keonjhar (T)	Rugudidihi	Joda	Barbil
166	Keonjhar (T)	Tanto	Joda	Barbil
167	Keonjhar (T)	Tapadihi	Joda	Barbil
168	Keonjhar (T)	Vuyarudukela	Joda	Barbil
169	Keonjhar (T)	LOTAPANI	Joda	Barbil
170	Keonjhar (T)	Baneikala Unit No.01	Joda	Barbil
171	Keonjhar (T)	DALAKI	Joda	Barbil
172	Keonjhar (T)	Balita	Joda	Barbil

  
 Divisional Forest Officer  
 Keonjhar Division


Sl No.	Name of the Forest Division	Name of the village	Name of the CD Block	Name of the Forest Range
173	Keonjhar (T)	Lahanda	Joda	Barbil
174	Keonjhar (T)	Thakurani	Joda	Barbil
175	Keonjhar (T)	RAIKA	Joda	Barbil
176	Keonjhar (T)	SADINGAU	Joda	Barbil
177	Keonjhar (T)	Serenda	Joda	Barbil
178	Keonjhar (T)	SUYABAHAL	Joda	Barbil
179	Keonjhar (T)	BELAKUNDI	Joda	Barbil
180	Keonjhar (T)	Hayarpur	Joda	Barbil
181	Keonjhar (T)	Limitur	Joda	Barbil
182	Keonjhar (T)	Ulliburu	Joda	Barbil
183	Keonjhar (T)	Madkambeda Unit No.11	Joda	Barbil
184	Keonjhar (T)	NALDA	Joda	Barbil
185	Keonjhar (T)	SANTABAHALA UNIT NO.09	Joda	Barbil

  
 Divisional Forest Officer  
 Keonjhar Division



OTHER MINING IN IMPACT AREA ( KALMANG TATA)	
SL_NO	NAME OF MINES
0	OMM_SANPATHOLI MN
1	OMM_ORAHURI MN
2	NATIONAL ENTERPRISES_SANINDPUR IR&MN
3	SN MOHANTY_NUAGAON IRON&MN
4	TISCO_MALDA B5
5	TISCO_MALDA B3
6	OMM_KUSUMADIHI MN
7	ESSEL_KOIDA IRON
8	SN MOHANTY_KIST IRON-MN-BUX
9	SN MOHANTY_GANUA IRON-MN
10	OMM_BHANJA KUSUM MN
11	TISCO_MALDA B1
12	TISCO_MALDA B2
13	RUNGTA ORAGHAT IRON MINE
14	RUNGTA SANINDPUR IRON MINE
15	JN PATNAIK-BHANJAPALI
16	KANAKADHARA MINING & MINERAL Ltd. BANDHAL MN MINE
17	MG MOHANTY GANUA IRON & MN MINE (82)
18	SUN ALLOYS & MINERAL Ltd. PATAMUNDA MN MINE
19	ORISSA MANGANESE & MIN, Ltd.-PATAMUNDAMN MINE
20	RUNGTA-BONAI INDUSTRIAL CO-NADIDIHI IRON & MN
21	RUNGTA FEEGRADE-NADIDIHI IRON & MN
22	RUNGTA-BONAI INDU-KUSUMDIHI-KAMANDO BAUXITE & MN
23	RUNGTA- SONS PVT. LTD. KANTHER-KOIRA MN
24	RUNGTA MINES LTD. KOLMONG MN
25	RUNGTA-BONAI-INDUS. CO TEHERAI IRON & MN
26	P.K. AHLUWALIA GANUA IRON & MN MINE-23.3
27	KAVITA AGARWAL KUSUMDIHI MN MINE
28	BC DOGRA GANUA
29	NE-ADAGHAT
30	NE_SAGASAH
31	MATADIN SARADA KHAJURDIHI
32	BS_MISRA_KANTHER_KOIRA
33	SA_HALIM_ORAGHAT
34	SAIL_ML_130
35	AMTC_NARAYANAPOSI
36	BC DOGRA_DALITA
37	TARANI MINERALS_NUAGAON
38	UC MISHRA_KAMANDO
39	OMC_BHANJAPALI_KOIRA
40	SD SARMA_NUAGAON
41	RS SINDHU_BHANJAPALI
42	SK PAUL_TAHARI
43	TARANI MINERALS_TAHARI
44	PAWAN KUMAR AHLUWALIA IRON & MN GANUA-86
45	ZENITH IRON & MN MINE GONUA
46	RUNGTA-BONAI INDUSTRIAL CO-KUSUMDIHI MN & BAUXITE
47	OMC_KOIRA_KASIRA

6.OTHER MINING IN KALMANG TATA

  
 Divisional Forest Officer  
 Keonjhar Division



SL_NO	NAME OF MINES
48	MG MOHANTY IRON & MN MINE PATABEDA-19
49	MG MOHANTY PATABEDA IRON MINE-28
50	MG MOHANTY PATABEDA IRON MINE-14
51	KC PRADHAN GANUA IRON & MN MINE
52	NEELANCHAL ISPAT NIGAM LIMITED KOIDA
53	MATADIN SHARDA DALITA MN MINE
54	MATADIN SHARDA MANDAJODA MN MINE ML-56
55	TISCO-KHANDBANDH IRON MINE
56	R.P. SAO & SONS GUALI IRON MINES
57	TISCO TIRING PAHAR MN MINES
58	DHARAMCHAND JAIN SIDHAMATH IRON & MN
59	KJS ALLUWALIA PANDULIPOSI-KENDUDIHI IRO*
60	KJS A LLUWALIA NUAGAON IRON
61	KC PRADHAN-PARADEIPUR IRON MINE
62	R B DAS KUNDRUPANI IRON & MN
63	SN PAUL KATASAI MN MINE
64	R P SAO CHORMALDA MN MINE
65	OMC_SGBK_KOIDA
66	OMC_TIRINGPAHAR
67	OMC_KHANDBAND
68	RUNGTA_KATASAHU_MN_MINE
69	RUNGTA SILJODA MN MINE
70	SERAJUDIN_GURUDA
71	S N DASMOHAPATRA KATASAHU MN MINE
72	OMC_PARLIPADA
73	OMDC_BHADRASAHU
74	DEEPAK STEEL KHANDBANDH IRON ORE MINE
75	FACOR KATASHI BLOCK-A MANGANESE MINE
76	FACOR KATASAHU BLOCK-B MANGANESE MINE
77	DC-JAIN-DALITA-IRON-ORE-MINE-BLOCK-A
78	DC-JAIN-DALITA-IRON-ORE-MINE-BLOCK-B3
79	DC-JAIN-DALITA-IRON-ORE-MINE-BLOCK-C
80	SHRI METALIKS Ltd. KHANDBAND IRON MINE
81	RBT LTD. KATASAHU & RUDUKELA MN MINE

  
 Divisional Forest Officer  
 Keonjhar Division





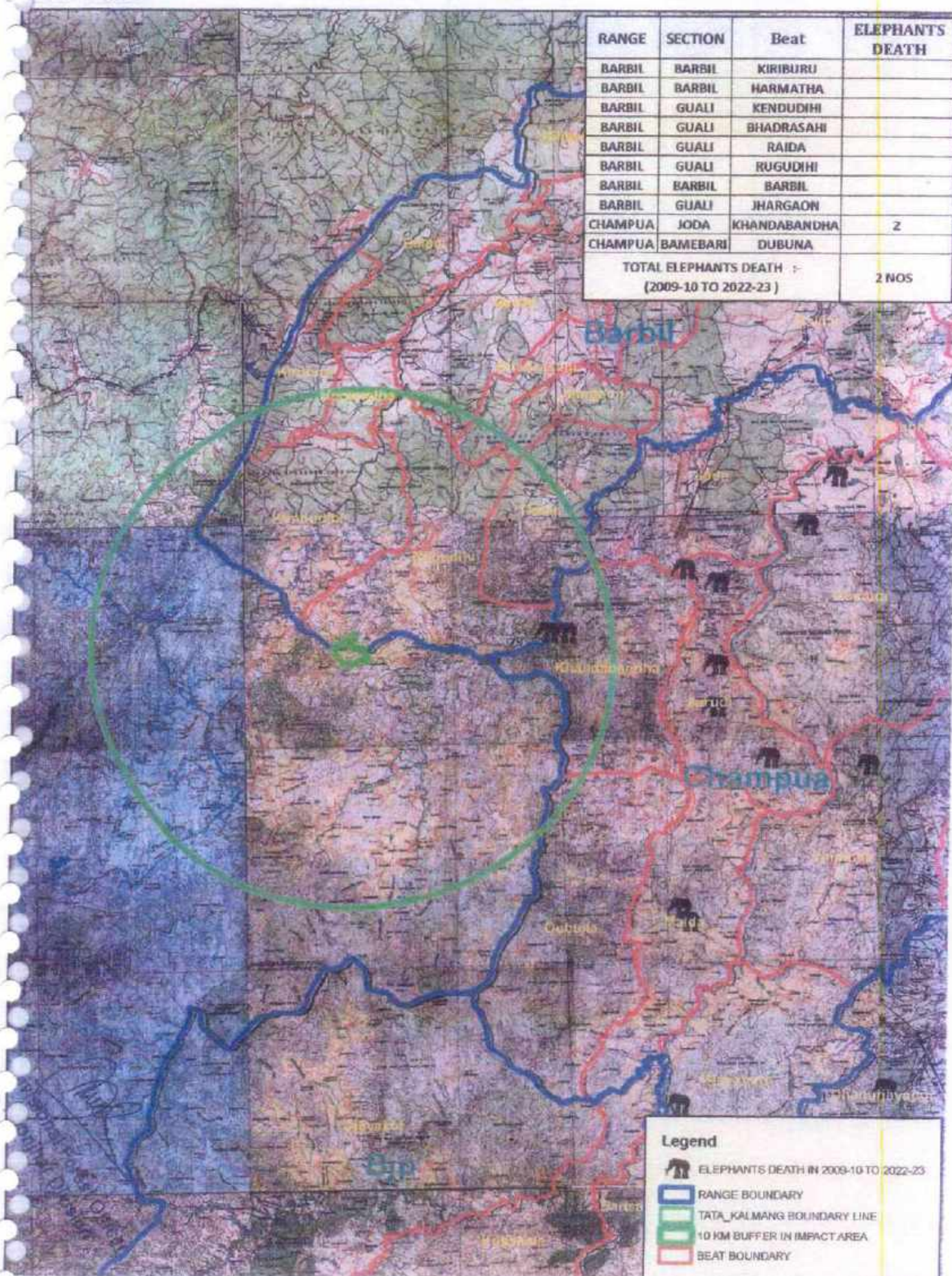




SCALE :- 1 : 185000

# ELEPHANTS DEATH IN IMPACT AREA ( KALMANG TATA )

RANGE	SECTION	Beat	ELEPHANTS DEATH
BARBIL	BARBIL	KIRIBURU	
BARBIL	BARBIL	HARMATHA	
BARBIL	GUALI	KENDUDIHI	
BARBIL	GUALI	BHADRASAH	
BARBIL	GUALI	RAIDA	
BARBIL	GUALI	RUGUDIHI	
BARBIL	BARBIL	BARBIL	
BARBIL	GUALI	JHARGAON	
CHAMPUA	JODA	KHANDABANDHA	2
CHAMPUA	BAMEBARI	DUBUNA	
TOTAL ELEPHANTS DEATH :- (2009-10 TO 2022-23 )			2 NOS



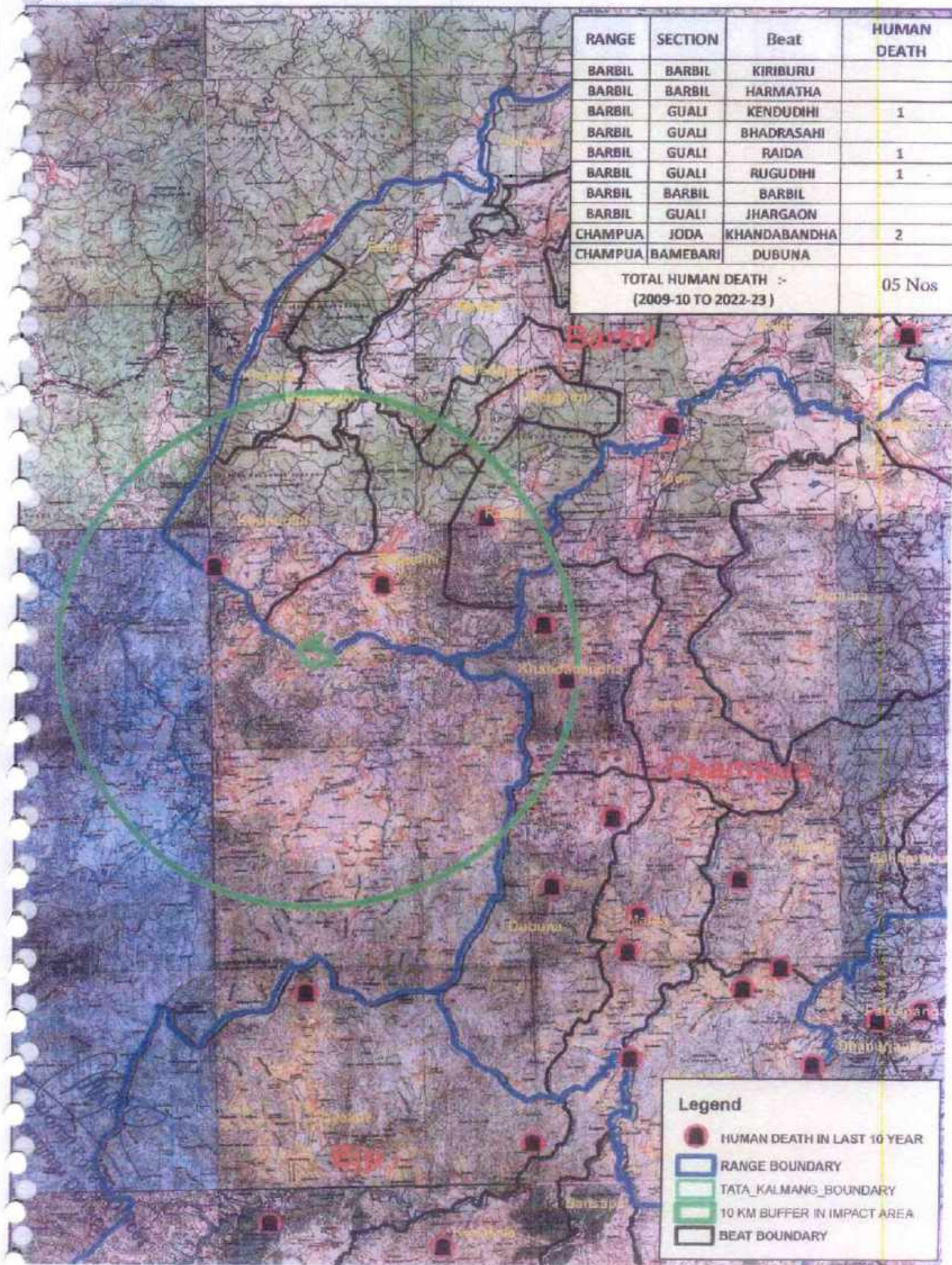




SCALE :- 1 : 185000

# HUMAN DEATH IN IMPACT AREA( KALMANG TATA)

RANGE	SECTION	Beat	HUMAN DEATH
BARBIL	BARBIL	KIRIBURU	
BARBIL	BARBIL	HARMATHA	
BARBIL	GUALI	KENDUDIHI	1
BARBIL	GUALI	BHADRASAH	
BARBIL	GUALI	RAIDA	1
BARBIL	GUALI	RUGUDIHI	1
BARBIL	BARBIL	BARBIL	
BARBIL	GUALI	JHARGAON	
CHAMPUA	JODA	KHANDABANDHA	2
CHAMPUA	BAMEBARI	DUBUNA	
TOTAL HUMAN DEATH :- (2009-10 TO 2022-23 )			05 Nos



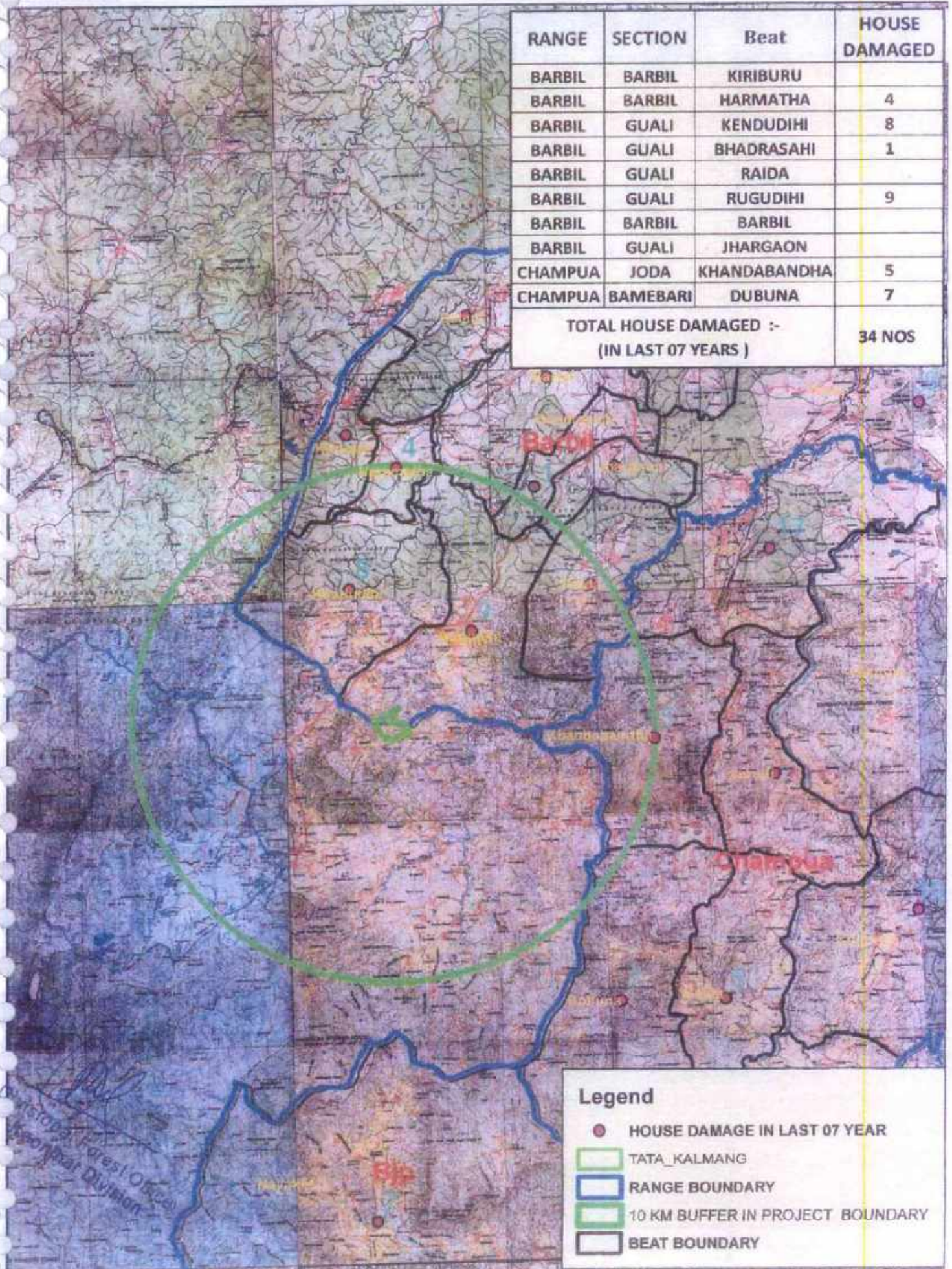




# HOUSE DAMAGED IN IMPACT AREA( KALMANG TATA )

SCALE : 1 : 185000

RANGE	SECTION	Beat	HOUSE DAMAGED
BARBIL	BARBIL	KIRIBURU	
BARBIL	BARBIL	HARMATHA	4
BARBIL	GUALI	KENDUDIHI	8
BARBIL	GUALI	BHADRASAHU	1
BARBIL	GUALI	RAIDA	
BARBIL	GUALI	RUGUDIHI	9
BARBIL	BARBIL	BARBIL	
BARBIL	GUALI	JHARGAON	
CHAMPUA	JODA	KHANDABANDHA	5
CHAMPUA	BAMEBARI	DUBUNA	7
TOTAL HOUSE DAMAGED :- ( IN LAST 07 YEARS )			34 NOS



## Legend

- HOUSE DAMAGE IN LAST 07 YEAR
- TATA\_KALMANG
- RANGE BOUNDARY
- 10 KM BUFFER IN PROJECT BOUNDARY
- BEAT BOUNDARY

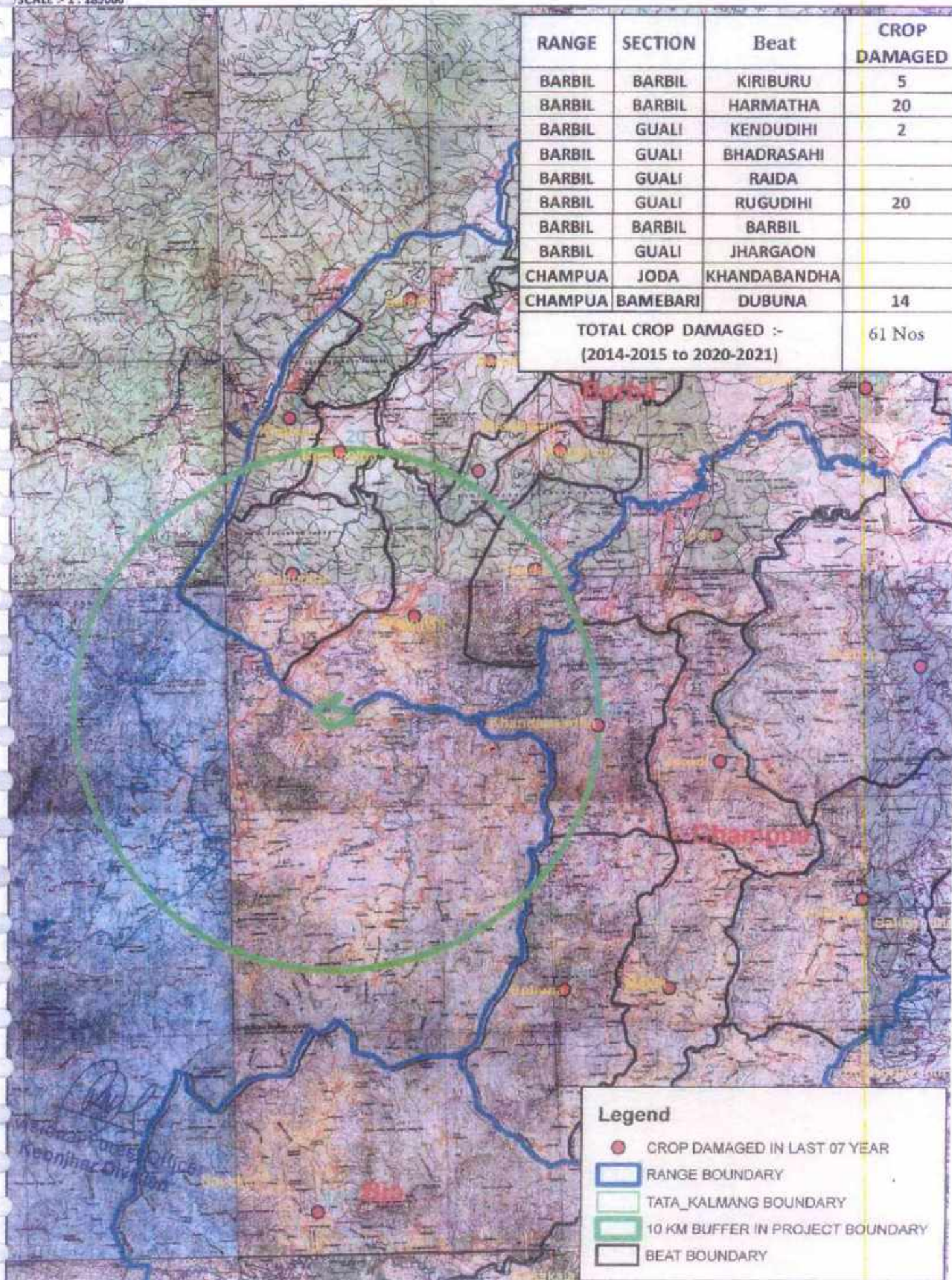




# CROP DAMAGED IN IMPACT AREA ( TATA KALMANG )

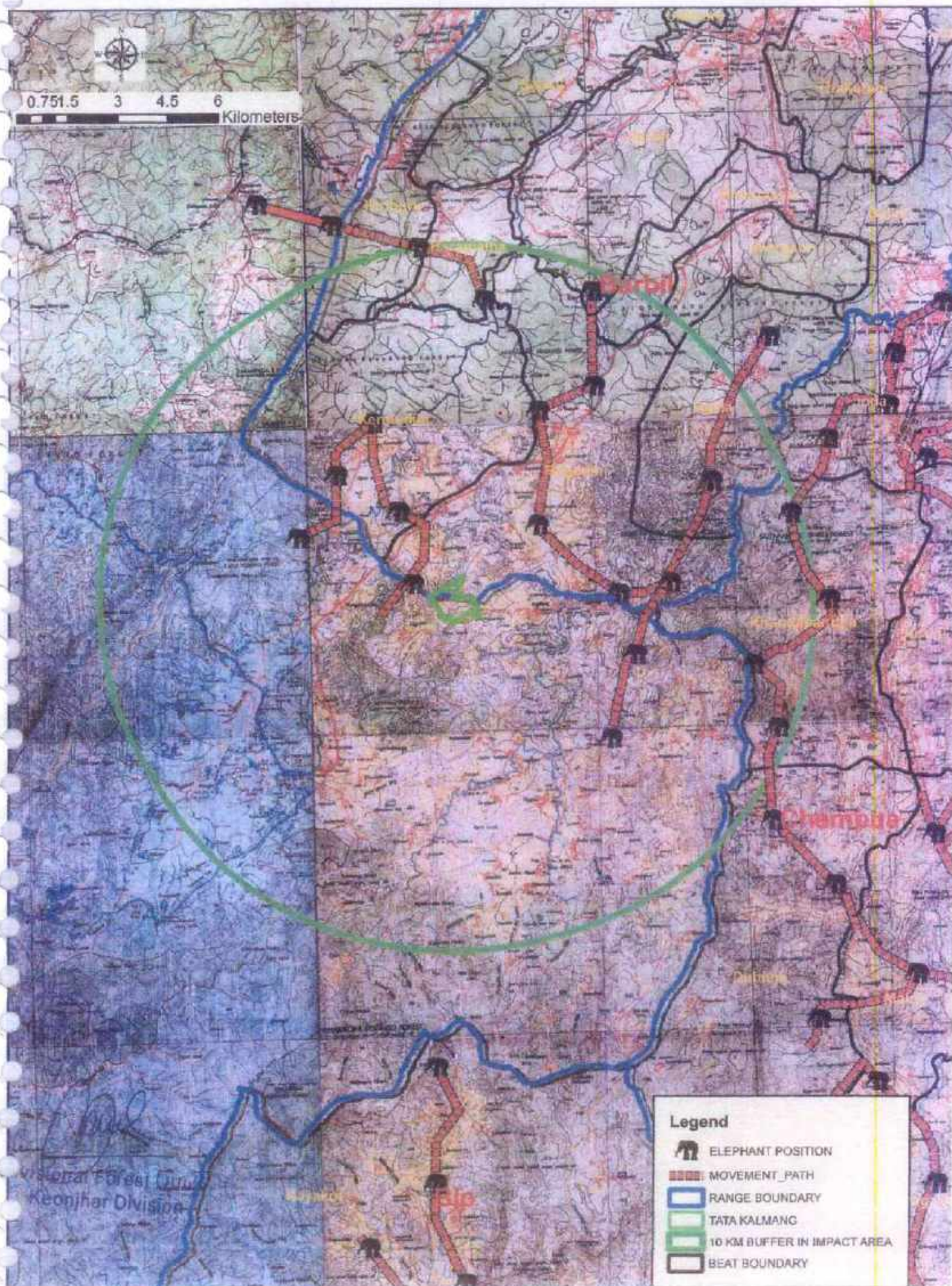
SCALE - 1 : 185000

RANGE	SECTION	Beat	CROP DAMAGED
BARBIL	BARBIL	KIRIBURU	5
BARBIL	BARBIL	HARMATHA	20
BARBIL	GUALI	KENDUDIHI	2
BARBIL	GUALI	BHADRASAH	
BARBIL	GUALI	RAIDA	
BARBIL	GUALI	RUGUDIHI	20
BARBIL	BARBIL	BARBIL	
BARBIL	GUALI	JHARGAON	
CHAMPUA	JODA	KHANDABANDHA	
CHAMPUA	BAMEBARI	DUBUNA	14
TOTAL CROP DAMAGED :- (2014-2015 to 2020-2021)			61 Nos





# ELEPHANT MOVEMENT MAP IN IMPACT AREA( KALMANG TATA)







# FOREST BLOCK & WATERBODIES IN IMPACT AREA( KALMANG TATA)



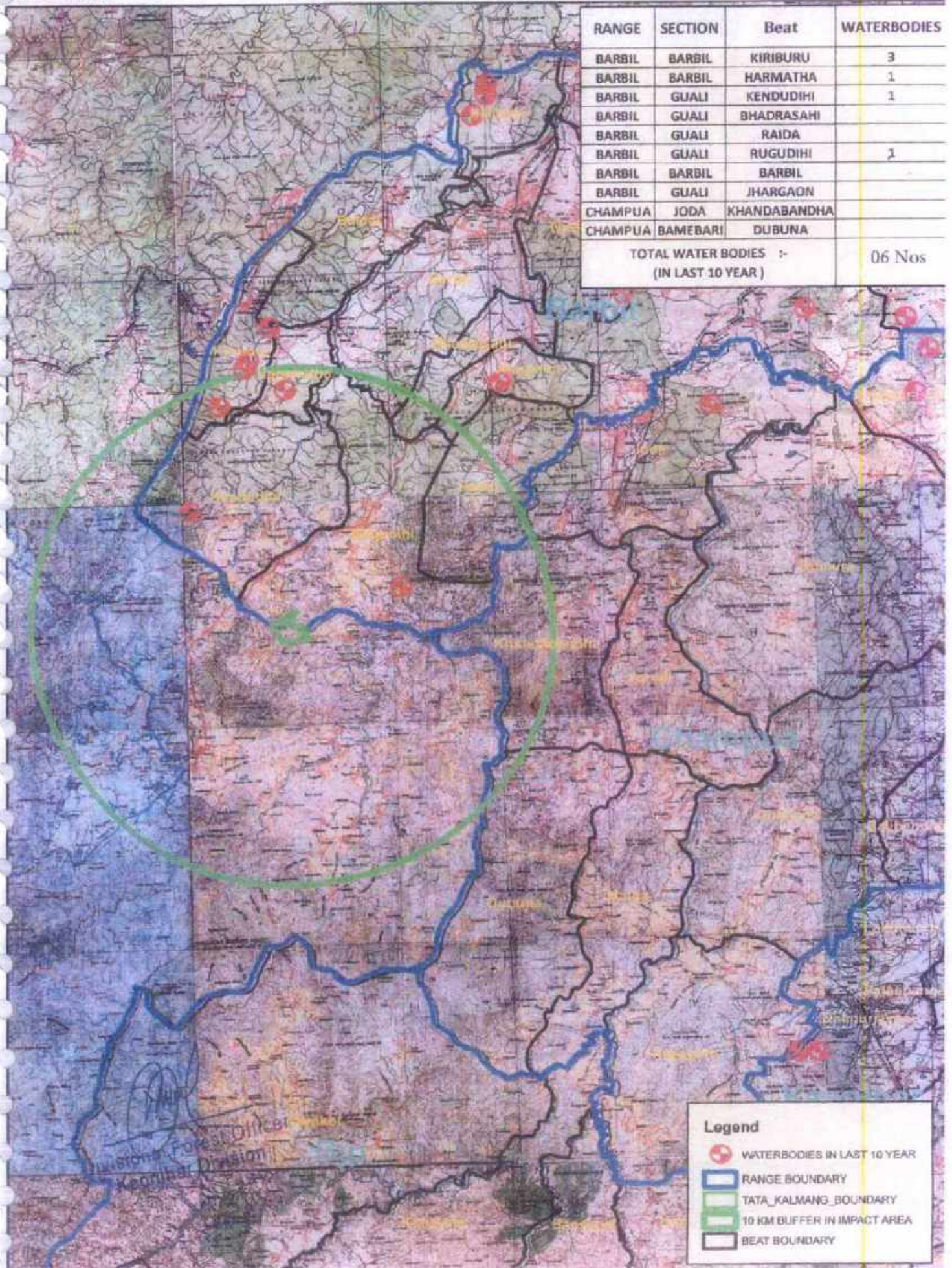









# WATERBODIES IN IMPACT AREA ( KALMANG TATA )

SCALE :- 1 : 185000

RANGE	SECTION	Beat	WATERBODIES
BARBIL	BARBIL	KIRIBURU	3
BARBIL	BARBIL	HARMATHA	1
BARBIL	GUALI	KENDUDIHI	1
BARBIL	GUALI	BHADRASAH	
BARBIL	GUALI	RAIDA	
BARBIL	GUALI	RUGUDIHI	1
BARBIL	BARBIL	BARBIL	
BARBIL	GUALI	JHARGAON	
CHAMPUA	JODA	KHANDABANDHA	
CHAMPUA	BAMEBARI	DUBUNA	
TOTAL WATER BODIES :- (IN LAST 10 YEAR )			06 Nos



## Legend

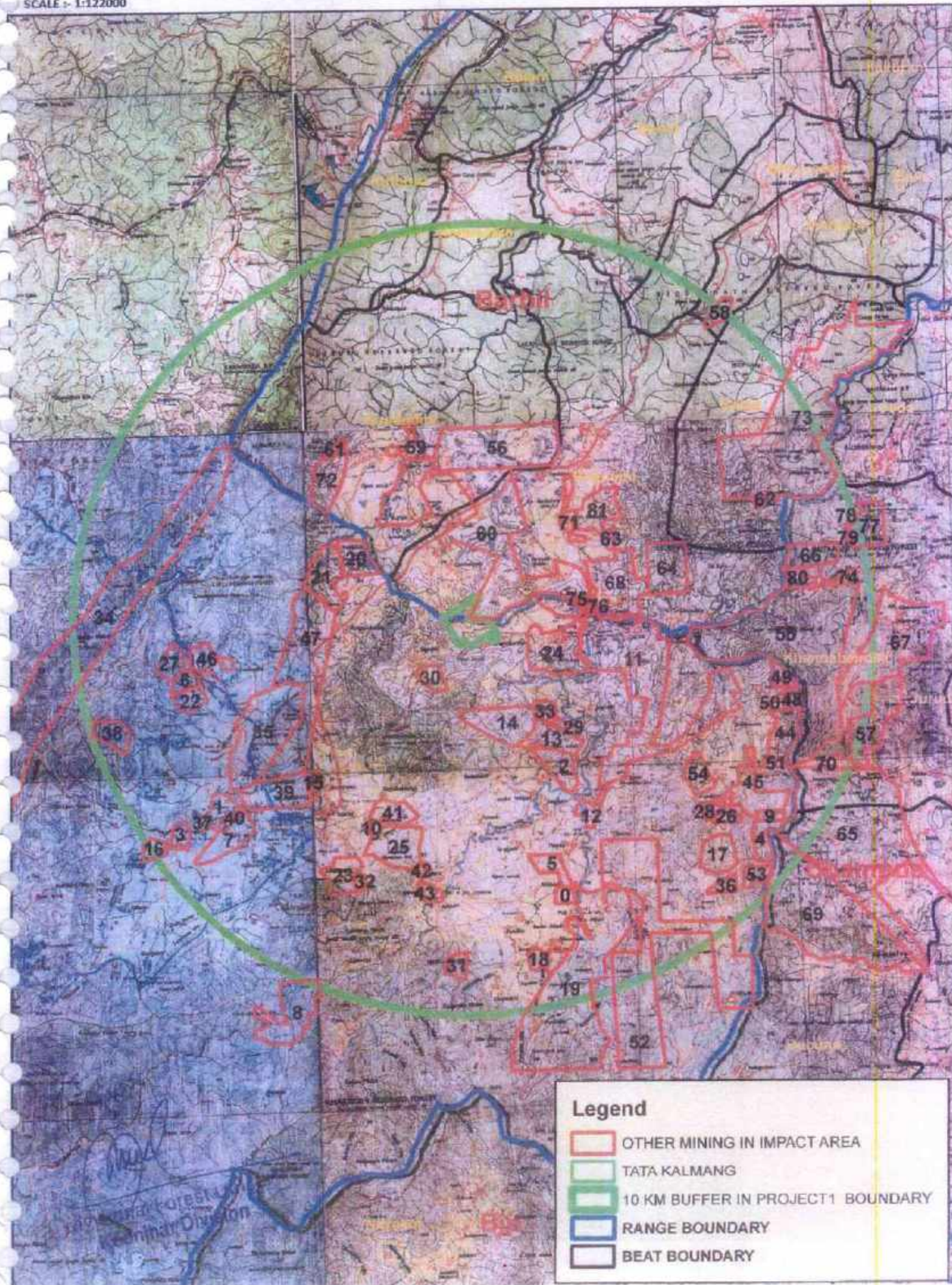
-  WATERBODIES IN LAST 10 YEAR
-  RANGE BOUNDARY
-  TATA\_KALMANG\_BOUNDARY
-  10 KM BUFFER IN IMPACT AREA
-  BEAT BOUNDARY





# OTHER MINING IN IMPACT AREA ( KALMANG TATA)

SCALE :- 1:122000

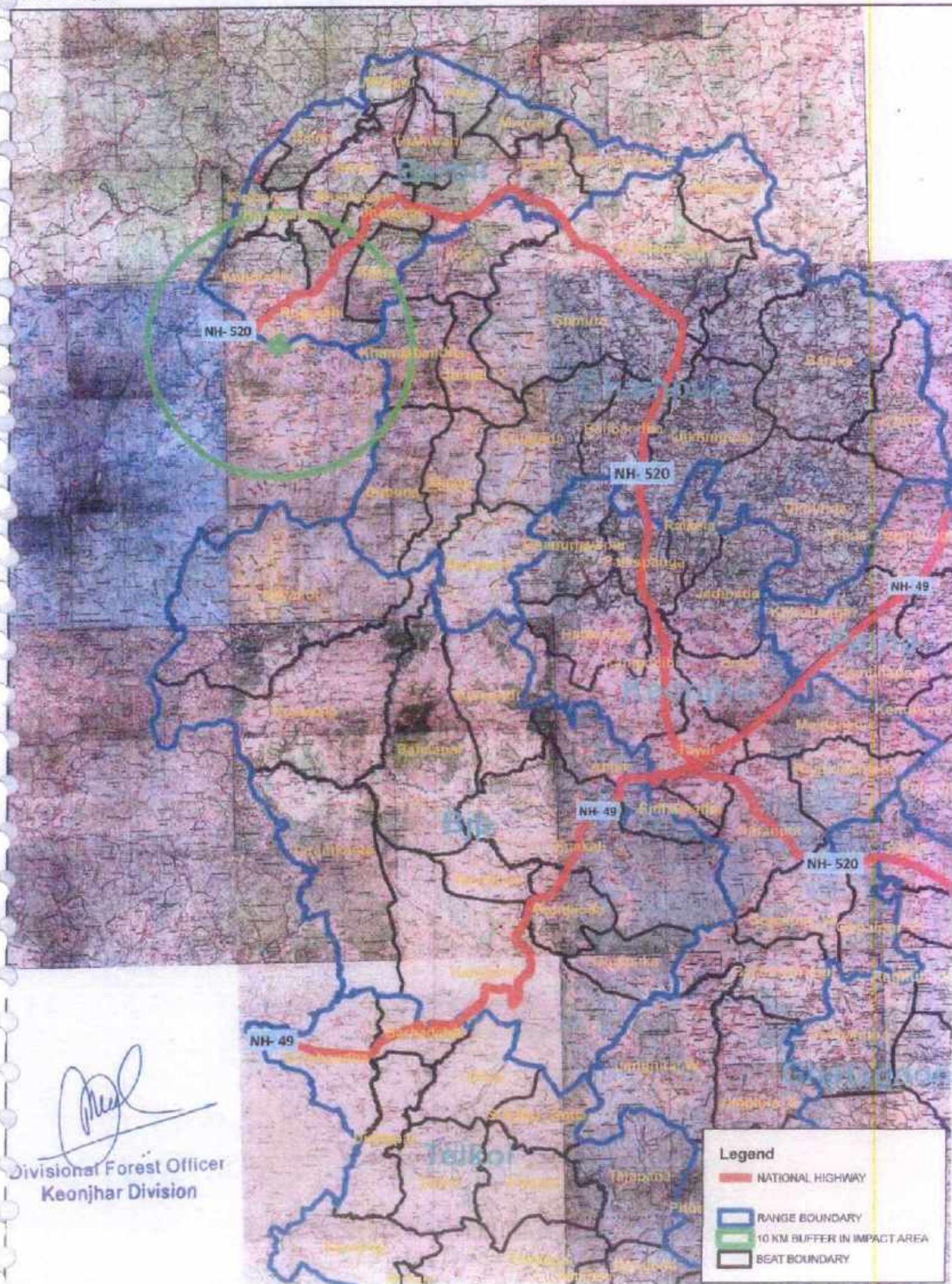






SCALE: 1:366,000

# NATIONAL HIGHWAY IN IMPACT AREA ( KALMANG TATA )







# DRAINAGE PATTERN IN IMPACT AREA (TATA KALMANG )

SCALE :- 1 : 185000







# WATCH TOWER POSITION IN IMPACT AREA( KALMANG TATA)

SCALE :- 1 : 185000

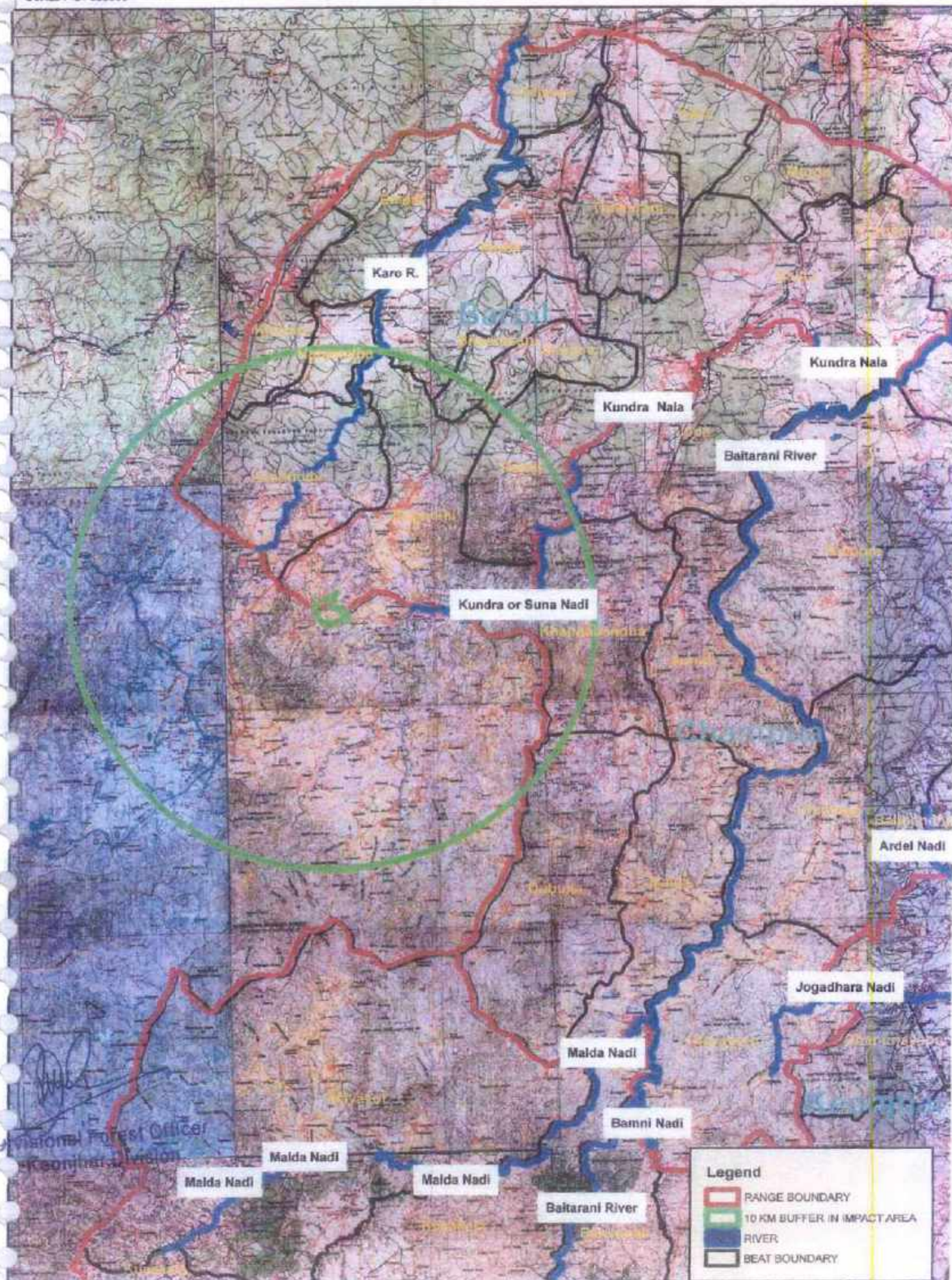






SCALE - 1 : 185000

# RIVER IN IMPACT AREA ( TATA KALMANG)

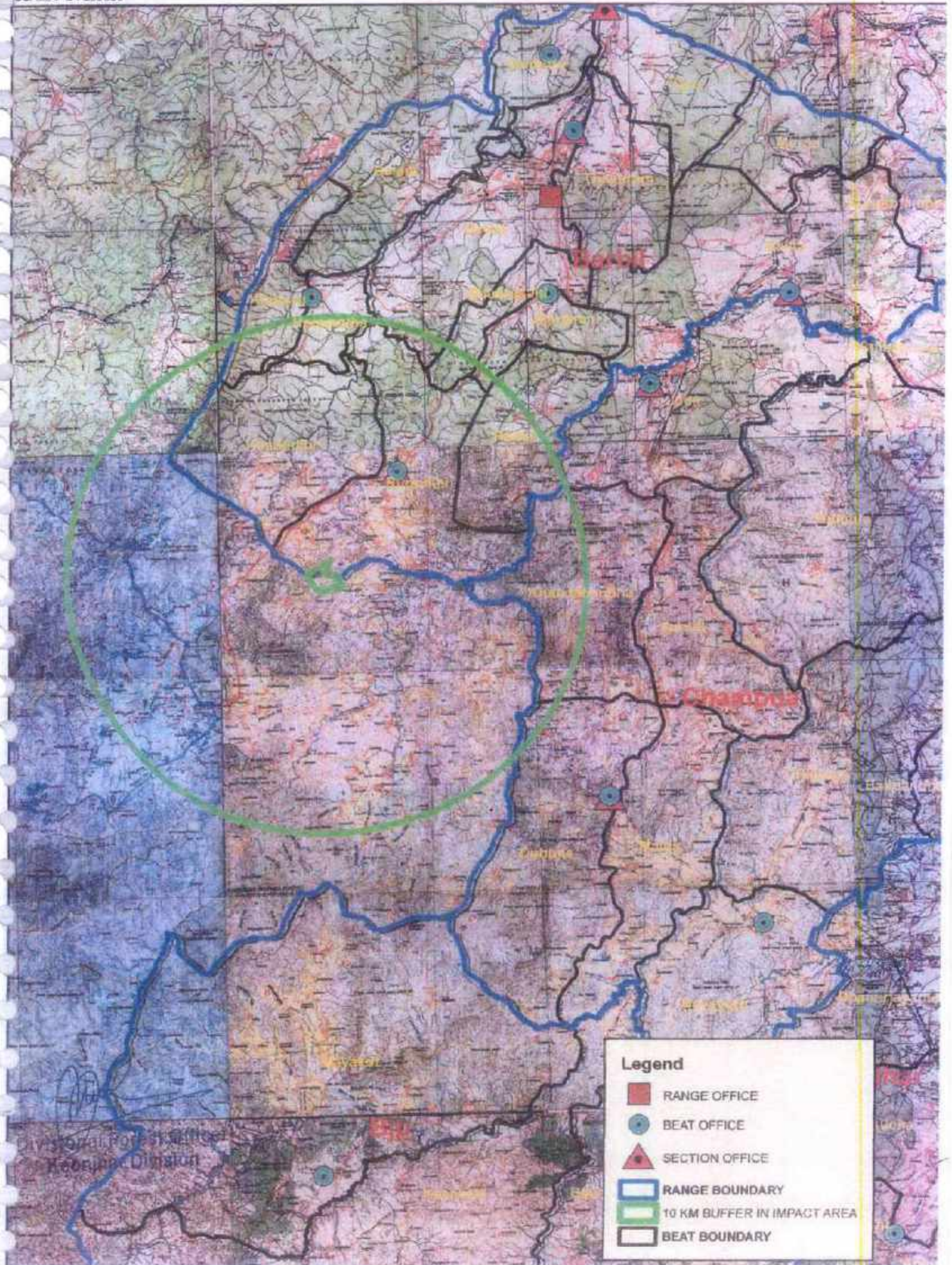






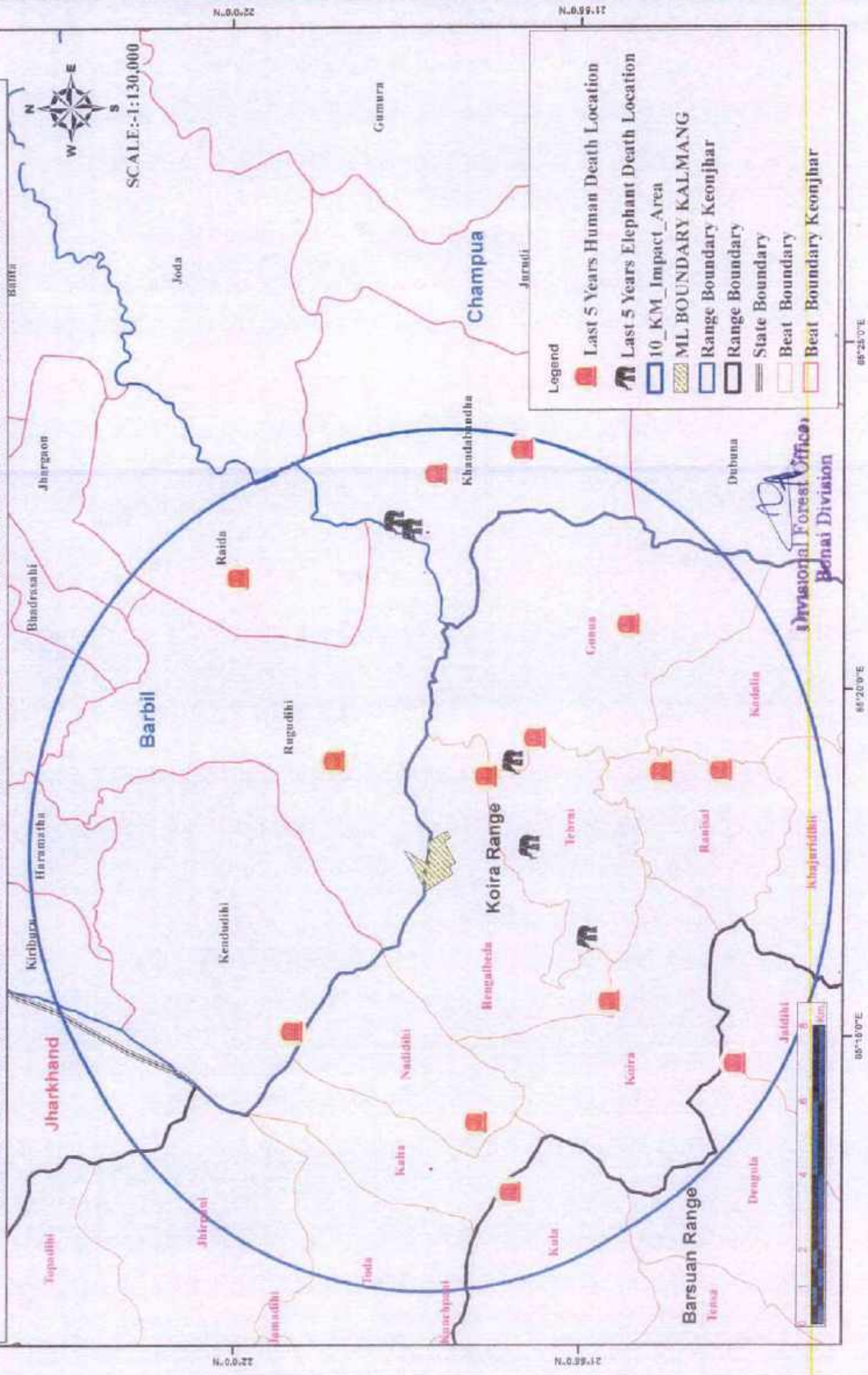
# OFFICE POSITION OF RANGE , SECTION & BEAT IN IMPACT AREA

SCALE :- 1 : 185000





# COMPOSITE MAP SHOWING HUMAN AND ELEPHANT DEATH OF LAST FIVE YEARS WITHIN 10 KM IMPACT AREA OF KALMANG WEST (NORTHERN PART) IRON ORE BLOCK M/S TATA STEEL BSL LTD UNDER BONAI & KEONJHAR FOREST DIVISION





N.O.59-12





ENVIRONMENTAL  
CLEARANCE

## PARIVESH

(Pro-Active and Responsive Facilitation by Interactive,  
and Virtuous Environmental Single-Window Hub)

**Government of India**  
**Ministry of Environment, Forest and Climate Change**  
**(Issued by the State Environment Impact Assessment**  
**Authority(SEIAA), Orissa)**

To,

The Sr. Manager  
 Tata Steel Limited, Meramandali  
 Registered Office  
 Bombay House,  
 24 Homi Mody Street,  
 Mumbai- 400001,  
 Site: www.tatasteel.com Address for communication:  
 M/s Tata Steel Ltd Meramandali  
 At- Narendrapur, P.O.- Kusupanga, Via- Meramandali, Dist.-Dhenkanal,  
 Odisha  
 759121 -759121

**Subject:** Grant of Environmental Clearance (EC) to the proposed Project Activity  
 under the provision of EIA Notification 2006-regarding

Sir/Madam,

This is in reference to your application for Environmental Clearance (EC)  
 in respect of project submitted to the SEIAA vide proposal number  
 SIA/OR/MIN/55807/2020 dated 08 Jun 2022. The particulars of the environmental  
 clearance granted to the project are as below.

- |   |  |
|---|--|
| 1. EC Identification No.                      | EC22B001OR117596   |
| 2. File No.                                   | 55807/89-MINB1/06-2022   |
| 3. Project Type                               | New  |
| 4. Category                                   | B1   |
| 5. Project/Activity including<br>Schedule No. | 1(a) Mining of minerals  |
| 6. Name of Project                            | Kalamang West (Northern Part) Block<br>Iron Ore Mines of Tata Steel BSL Limited. |
| 7. Name of Company/Organization               | Tata Steel Limited, Meramandali  |
| 8. Location of Project                        | Orissa   |
| 9. TOR Date                                   | 15 Jan 2021  |

The project details along with terms and conditions are appended herewith from page  
 no 2 onwards.

Date: 18/10/2022

(e-signed)  
**Dr. K. Murugesan, IFS**  
 Member Secretary  
 SEIAA - (Orissa)

*Note: A valid environmental clearance shall be one that has EC identification  
 number & E-Sign generated from PARIVESH. Please quote identification  
 number in all future correspondence.*

*This is a computer generated cover page.*





**SEIAA File No. 55807/89-MINB1/06-2022**

**Subject: Proposal for Mining of Iron Ore with production Capacity of 2.95 MTPA (RoM) from Kalamang West (Northern Part) Iron Ore Mines at Village- Kalamang & Ghodabudani, District- Sundergarh & Village - Gandalpada, District - Keonjhar, Odisha(MLA: 92.875 ha) by M/s Tata Steel Limited -Environmental Clearance reg.**

This has reference to your online proposal No. SIA/OR/MIN/55807/2020 dated 08.06.2022, submitted to SEIAA, Odisha for grant of Environmental Clearance(EC) for Mining of Iron Ore with production Capacity of 2.95 MTPA (RoM) from Kalamang West (Northern Part) Iron Ore Mines at Village- Kalamang & Ghodabudani, District- Sundergarh & Village - Gandalpada, District - Keonjhar, Odisha(MLA: 92.875 ha) in terms of the provisions of the Environment Impact Assessment(EIA) Notification, 2006 under the Environment(Protection) Act,1986.

**2. Proposal in Brief:**

Proposal No.	SIA/OR/MIN/55807/2020
File No.	55807/89-MINB1/06-2022
Project Type	Fresh EC
Category	BI
Project/Activity including Schedule No.	I(a) Mining of minerals
Name of the Project	Proposal for grant of EC for Mining of Iron Ore with production Capacity of 2.95 MTPA (RoM) From Kalamang West (Northern Part) Iron Ore Mines at Village- Kalamang&Ghodabudani District- Sundergarh & Village - Gandalpada, District - Keonjhar, Odisha(MLA: 92.875 ha)
Name of the company/Organization	M/s Tata Steel Limited
Location of Project	Odisha
ToR Date	15.01.2021

- This is a proposal for EC for mining of iron ore from Kalamang West (Northern Part) Iron Ore Mines with Production Capacity of 2.95 MTPA (ROM) over M.L. area of 92.875 Ha at Village- Kalamang & Ghodabudani of District- Sundergarh& Village Gandalpada of District- Keonjhar by M/s Tata Steel Limited filed by Sri Santosh Kumar Pattajoshi, Sr.Manager.
- The Kalamang West (Northern Part) Block Iron Ore Mine is proposed over an area of 92.875 hectares (ha) which involves 42.608 ha of forest land (16.658 ha in Keonjhar Forest Division, District Keonjhar and 25.950 ha in Bonai Forest Division, District Sundargarh) and 50.267 ha of non-forest land. The Mining area is situated in three villages namely,

*keed*  
*18/10/2022*





# STATE ENVIRONMENT IMPACT ASSESSMENT AUTHORITY, ODISHA

5RF-2/1, Unit-IX, Bhubaneswar-751022, Tel: 0674-3510075, Email: seiaaorissa@gmail.com

statutory body constituted by Ministry of Environment, Forest & Climate Change under Environment (Protection) Act, 1986)

- village-Kalamang & Ghodabudani of Tahasil – Koira, District Sundargarh & village Gandalpada of Tehsil - Barbil, District Keonjhar State Odisha.
5. TOR was issued by SEIAA vide letter reference No.22/SEIAA dated 15.01.2021 to the project for undertaking detailed EIA studies.
  6. The Government of Odisha had issued Letter of Intent (LoI) vide Govt. letter No. IV(MISC) SM-53/2017/5285/SM dt.24.06.2017 as per Rule 10(2) was again modified by Steel and Mines Department, Government of Odisha vide letter no. IV(MISC) SM-53/2017/6287/SM dt.27.07.2017 revising the earlier mentioned area of 92.0 ha to 92.875 ha for grant of Mining Lease for Kalamang West (Northern Part) Iron Ore Block in village Kalamang & Ghodabudhani in District Sundargarh and village Gandalpada in District Keonjhar is in the name of M/s Bhushan Steel Ltd. The change of name from Bhushan Steel Limited to TATA STEEL BSL Limited was approved by the Department of Steel and Mines vide letter No. 1409/SM/dated 27.02.2019 for grant of a Mining Lease. Now, M/s Tata Steel BSL Ltd. has requested to 'The Additional Chief Secretary' of Department of Steel and Mines, Govt. of Odisha for extension of validity of LOI vide letter no TSBSL/CS/2020/101 dated 05.03.2020. The LOI has been issued for a period of 50 years.
  7. **Location & Environmental Sensitivity** : The geo-coordinates of the mine lease area is Latitude: 21°56'47.757"N to 21°57'32.347"N and Longitude: 85°17'06.658" E to 85°17'57.531" E. The mine is well connected by NH-215, which is about 1.80 km in NW. Nearest Railway Station is Barbil which is about 17.86 Km in NNE direction. Rourkela Airport at 59 Km NW, Jharsuguda Airport 128 km W and Biju Patnaik International Airport, Bhubaneswar is about 196 Km in SSE direction from the project site. The project proponent has submitted that there is no National Park, wildlife sanctuary, biosphere reserve within 15 km radius of the Mine. However, Karo Karampada Elephant corridor is located at about 8.6 km N of the lease area. There is no perennial surface water body in the applied mine lease area.
  8. A total 42.608 ha. of forest land has been reported to be involved in the project. Approval under Section 2(iii) of the Forest (Conservation) Act, 1980 for diversion of 42.608 ha of forest land for non-forestry purposes has been obtained vide MoEF&CC letter No. 8-32/2021-FC dtd. 31.01.2022. Approval under section 2 (ii) has been recommended by GoO to MoEF&CC vide letter no: FE-DIV-FLD-0048-2022-10644/FE&CC dated 17/06/2022.
  9. Site Specific Wildlife conservation plan for schedule-I species has been submitted to the Divisional Forest Officer of Bonai Forest Division & Keonjhar Forest Division vide ref. no. JCO/13/133/118 dtd. 7th June 2022.
  10. Public Hearing for this project was conducted in two districts i.e Sundergarh and Keonjhar. In respect of Keonjhar district, PH was conducted on 09.03.2022 at 11.00 A.M at Village Gandalpada (GP-Guali) P.S- Rugudihi, Hata No. 48, Plot No. 194 & for Sundergarh district, PH was conducted on 10.11.2021 at 10:30 A.M at Football Play Ground of Kalamang village under Koira Block. The major issues raised in the public hearing were provision of employment to local people, education, medical facilities, infrastructural development and welfare activities, road maintenance, tree plantation etc. Action plan for fulfilling the PH commitments has been made.

*ke*  
18/10/22





**STATE ENVIRONMENT IMPACT ASSESSMENT AUTHORITY, ODISHA**

5RF-2/1, Unit-IX, Bhubaneswar-751022, Tel: 0674-3510075, Email: seiaaorissa@gmail.com

statutory body constituted by Ministry of Environment, Forest & Climate Change under Environment (Protection) Act, 1986

11. Baseline monitoring studies has been carried out for the period December 2019 to February 2020 (Winter Season).
12. **Reserves** - Total geological reserves reported in the mine lease area is 929,73,749T (92.97 MT) with 718,86,002 T (71.88 MT) mineable reserve. The mine capacity will be 2.95 MTPA Iron Ore (ROM) corresponding to the production of 2.84 MTPA Saleable Iron Ore with a total Max excavation of 4.54 MTPA. In the lease area, iron ore (ROM) grade varies from 45% to 65% Fe. Iron ore of > 55% Fe is considered as marketable grade. The reserve in between 45-55% Fe has been taken as sub-grade ore (Mineral rejects).
13. **Method of Mining**: Opencast Fully Mechanized Mining method has been proposed. It is proposed to commence mining operation from north eastern part of the lease. In the plan period of about 2.95 MTPA, has been proposed for production. As the mining activities in the lease area is to be commenced, activities connected with development of the mine such as scrapping of weathered zones, cutting of trees/bushes, making of access roads, infrastructure development etc will be given prime preference. After the development of an access road to the targeted area a box cut will be opened and thereafter, it will be expanded both laterally and depth-ward to fulfill the required production target. Life of mine is 25 years.
14. **Production Details**: The annual excavation is targeted at 2.95 MTPA (RoM) Iron Ore with total maximum excavation of 3.92 MTPA. The ROM will be fed to a mobile crushing/screening plant of 1000 TPH capacity. The lump ore and fines will be segregated in the Crushing /Screening plant.
15. **Drilling & Blasting**: Drilling will be carried out using 110-150 mm dia. Drill with 3.0-4.0m burden & 3.5-4.5 m spacing based on the geological rock characteristics. Taking into account the disposition of the ore body, it has been estimated that about 80 % (approx.) of planned quantity will require drilling & blasting.
16. **Transportation**: Transportation of iron ore has been proposed through 5 railway sidings such as Barbil Rail siding, Nayagarh Rail siding, Jururi Rail siding, Banspani Rail siding & Barsua Rail siding.
17. **Waste Generation & Management**: A total volume of 14,58,980 m<sup>3</sup> insitu waste is to be generated from the lease area. For the purpose a volume 1,12,241 m<sup>3</sup> waste generated in the 1<sup>st</sup> year from the lease area will be used and rest waste of volume 3,30,412 m<sup>3</sup> will be accommodated on the proposed dumps. Dump-A and B have been proposed in the NE side and SE side of the lease area over an area of 0.967 Ha. & 1.826 Ha. respectively. Similarly, the in situ waste to be generated in the 2nd year is 3,87,513 m<sup>3</sup>, out of which of 1,84,267 m<sup>3</sup> will be used for backfilling of the exhausted portion and rest quantity of waste of volume 2,03,246 m<sup>3</sup> shall be accommodated over the proposed dump-A and C. Dump C will be located at the northern part of the Dump-B. In the third year a vol of 1,00,524 m<sup>3</sup> waste will be utilized for backfilling and the rest of 1,37,257 m<sup>3</sup> waste will be dumped on Dump C. The total waste to be generated in the fourth year and fifth year of volume 1,70,254 m<sup>3</sup> and 2,20,779 m<sup>3</sup> respectively will be used for backfilling of the exhausted areas.

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18. **Rehabilitation & Resettlement:** The project proponent has submitted that the mine lease area comprises of 20.580 Ha private land. Few habitations of Ghodabudhani village are located in the lease area. The project involves 71 affected families and 54 numbers of displaced families involves. All the affected families shall receive R & R compensation based on their entitlements as prescribed under the Orissa R&R Policy, 2006 and subsequent biennial revisions communicated by Govt. from time to time as well as the best practices recommended by the LARR Act, 2013. Funds allocated for R&R Rs. 39.07 crores.
19. **Green Belt:** Plantation will be carried out in 7.5 m wide safety barrier zone, backfilled area, inactive dump slopes, etc. At conceptual stage, almost 4.17ha. will be under plantation.
20. **Rainwater Harvesting Details:** Rain water harvesting measures will be done by construction of trenched along the green belt, roads and through recharge pits which accounts to a recharge of around 21700 KL /year. Total rainwater harvesting potential in the project area is around 302471.1 KL /year or 0.302471 MCM.
21. **Water Requirement:** The total water requirement is about 235 KLD (For Drinking & Domestic Uses - 65 KLD and for Mining Operations, dust suppression and Plantation - 170 KLD). For Ground water abstraction of 65KLD, application has been submitted vide no. 21-4/3864/OR/MIN/2022 dtd. 28.06.2022. For Surface water withdrawal of 170 KLD from Suna River, application has been submitted vide no. 2021012241000218 dtd. 01.03.2021.
22. **Power Requirement:** Power utilization for this project is 1,800 – 2,000 KW. 3 DG sets of 850 KVA will be used for emergency backup. Power permission will be obtained from Odisha State Electricity Board (OSEB) after EC.
23. **Employment Potential:** The project will generate direct to the tune of about 428 persons as well as indirect employment opportunities for the nearby villages.
24. Total cost of the project is Rs. 216.20 crores. Budgetary allocation towards EMP: Capital cost is Rs. 9.96 Crores & Recurring cost is Rs. 0.865 crores. Budget for PH commitments is Rs. 9.93 crores.
25. The Environment Consultant M/s Visiontek Consultancy Services Pvt. Ltd. Bhubaneswar along with the proponent made a detailed presentation on the proposal before the SEAC on 08.07.2022.
26. The project proponent furnished additional information / documents on the project to SEAC on 22.08.2022.
27. The SEAC have appraised the proposal in its meeting dated 02.09.2022 and have recommended for grant of Environmental Clearance for the project, stipulating various conditions.
28. The matter was further examined in the State Environment Impact Assessment Authority (SEIAA), Odisha in its 93rd meeting held on 15.10.2022 in accordance with the EIA Notification, 2006 and further amendments thereto.

  
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29. As per the recommendations of the SEAC, Environmental Clearance (EC) is granted under the provisions of EIA Notification No. S.O. 1533 (E) dated the 14<sup>th</sup> September, 2006 of the Government of India in the erstwhile Ministry of Environment and Forests, as amended from time to time for "Mining of Iron Ore with production Capacity of 2.95 MTPA (RoM) from Kalamang West (Northern Part) Iron Ore Mines at Village- Kalamang & Ghodabudani, District- Sundergarh & Village-Gandalpada, District-Keonjhar, Odisha(MLA: 92.875 ha)" with the following stipulations, environmental conditions and safeguards.

**Stipulations:**

**A. Specific conditions:**

- (i) The proponent shall implement the Pollution Control Measures and safeguards as proposed in the Environment Management Plan (EMP) of EIA report.
- (ii) The public road passing through the mining lease shall be given access to the public after lease execution in consultation with the villagers.
- (iii) As submitted by project proponent vide letter no.GM/OMQ/70/11-G/FY'23 dated 17.10.2022, an amount of Rs.140 Lakhs shall be spent towards implementation for surface water run-off management, installation of STP & ETP in three years time period.

**B. Standard Conditions -**

**1. 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, if applicable to 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.

  
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- (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 29<sup>th</sup> 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/ Tahasildar'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](http://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/SELAA, 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.
- (I) 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<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, CO and SO<sub>2</sub> etc. as per the methodology mentioned in NAAQS Notification No. B-29016/20/90/PCI/I, 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

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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<sub>10</sub> and PM<sub>2.5</sub> 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.

**(II) 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 wall 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

  
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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 supernatant 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.
- (III) **Noise and vibration monitoring and prevention**
- (i) The peak particle velocity at 500m distance or within the nearest habitation, whichever is

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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.
- (IV) **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 of 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.
- (V) **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

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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.

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**(VI) Transportation**

- (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 equipment 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.

**(VII) Green Belt**

- (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

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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 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.

**(VIII) 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-

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**STATE ENVIRONMENT IMPACT ASSESSMENT AUTHORITY, ODISHA**

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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.
- (IX) Corporate Environment Responsibility (CER)**
  - (i) The activities and budget earmarked for Corporate Environmental Responsibility (CER) as per Ministry's O.M No 22-65/2017-IA. II (M) dated 01.05.2018 or as proposed by

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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.

**(X) 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 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.
- (iv) 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.
- (v) 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.
- (vi) 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) The project proponent shall augment infrastructure on drinking water, health care and education in nearby villages as per time bound action plan submitted.
- (viii) The project proponent shall obtain permission from DGMS under 106(2b) to carry out blasting operation within the lease area.
- (ix) Fe grade - 55 and +45 to be attempted to use by blending with higher grade.
- (x) It shall be mandatory for the project management to submit six (06) monthly compliance reports on post environmental monitoring in respect of the stipulated terms and conditions in this Environmental Clearance to the State Environment Impact Assessment Authority (SEIAA), Odisha, SPCB & Regional Office of the Ministry of Environment & Forest, Odisha in hard and soft copies on 1<sup>st</sup> June and 1<sup>st</sup> December of each calendar year. The proponent shall also upload the compliance report including results of monitored data, as applicable in the website of the Ministry for monitoring of EC Conditions.
- (xi) The environmental statement for each financial year ending 31<sup>st</sup> March in Form-V as is

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18/10/2022





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mandated to be submitted by the project proponent to the Odisha State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of EC conditions and shall also be sent to the respective to the MoEF&CC & its concerned Regional Office, Central Pollution Control Board and State Pollution Control Board.

- (xii) The proponent shall submit/upload six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MoEF&CC, Govt. of India, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; SPM, RSPM, SO<sub>2</sub>, NO<sub>x</sub> (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the project shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.
- (xiii) 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.
- (xiv) The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules made there under and also any other orders passed by the Hon'ble Supreme Court of India/ High Court and any other Court of Law relating to the subject matter.
- (xv) 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.
- (xvi) 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**

**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.






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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, Chandrasekharapur, Bhubaneswar for information.
5. **Member Secretary**, CGWA, 18/11, Jamnagar House, ManSingh Road, New Delhi-110011 for information.
6. **Collector, District Magistrate**, Sundargarh, for kind information and necessary action.
7. **Collector, District Magistrate**, Keonjhar, for kind information and necessary action.
8. **Secretary**, SEAC, Paribesh Bhawan, A/118, Nilakantha Nagar, Unit-VIII, Bhubaneswar for kind information.
9. Guard file for record/Website/Parivesh Portal.

  
18/10/22

**Member Secretary**

**Signature Not Verified**

Digitally signed by D. K.

Murugesan, IFS

Member Secretary

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