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

Indira Paryavaran Bhawan,
Aliganj, Jor Bag Road,
New Delhi - 110003.
Dated: 6th August, 2021

To,

The Principal Secretary (Forests),
Government of Odisha,
Bhubaneswar.

Sub: Proposal for non-forestry use of balance forest land of 746.3325 ha including 11.8305 ha for safety zone (excluding 95.60 ha of pre-1980 broken up forest land already diverted and 4.467 ha of forest land being proposed for diversion in separate proposal for mining infrastructure of Daitari ML) within total forest land of 846.3995 ha located within approved Mining lease area of 1018.3085 ha for Iron Ore Mining in Daitari Mining lease in Cuttack Forest Division of Jajpur District and Keonjhar (WL) Division of Keonjhar District, Odisha) M/s OMC Ltd. during Mining lease period as extended under the amended provision MMDR Act.

Sir,

I am directed to refer to this Ministry's letter of even number dated 1.04.2019 **(copy enclosed)** on above mentioned subject and to say that the compliance in response to Ministry's letter dated 1.04.2019 is awaited from the State Government. Further, it is also observed that the State Government has forwarded the proposoal online to MoEF&CC without uploading supporting documents/annexure. For want of supporting documents, it may not be possible for the MoEF&CC to process the case further,

In view of above, the State Government is requested to upload complete supporting information/documents on the PARIVESH portal for further consideration of the proposal in the Ministry.

Sd/-
(Charan Jeet Singh)
Scientist 'D'

Copy to:

1. The Principal Chief Conservator of Forests, Government of Odisha, Bhubaneswar.
2. The Nodal Officer, O/o the PCCF, Government of Government of Odisha, Bhubaneswar.
3. The Regional Officer (Central), Integrated Regional Office, Bhubaneswar
4. Monitoring Cell, FC Division, MoEF&CC
5. Guard File

F. No. 8-28/2015-FC
Government of India
Ministry of Environment, Forests and Climate Change
(FC Division)

Indira Paryavaran Bhawan,
Aliganj, Jor Bag Road,
New Delhi - 110003.
Dated: 1st April, 2019

To,

The Principal Secretary (Forests),
Government of Odisha,
Bhubaneswar.

Sub: Proposal for diversion of balance forest land of 746.3325 ha including 11.8305 ha for safety zone (excluding 95.60 ha of pre-1980 broken up forest land already diverted and 4.467 ha of forest land being proposed for diversion in separate proposal for mining infrastructure of Daitari ML) within total forest land of 846.3995 ha located within approved Mining lease area of 1018.3085 ha for Iron Ore Mining in Daitari Mining lease in Cuttack Forest Division of Jajpur District and Keonjhar (WL) Division of Keonjhar District, Odisha) M/s OMC Ltd. during Mining lease period as extended under the amended provision MMDR Act .

Sir,

I am directed to inform that a meeting on the issue of carrying out study-"*to assess mineable reserve, duration for the extraction from already opened up area (96.50 ha), environmental stability, comparative statement of environmental loss & benefit accrued and possible technological intervention without disturbing the green cover in Daitari Iron Ore Mine Lease for Odisha Mining Corporation Limited, Bhubaneswar, Odisha"as recommended by FAC*, was held on on 06.03.2019 under the chairmanship of Director General of Forests and Special Secretary in the Ministry and a presentation was made by ICFRE, Dehradun on the said study. It was decided in the meeting that the proposal of ICFRE may be accepted on the terms and conditions proposed by ICFRE, and also decided that the total cost of the proposed study shall be borne by the user agency i.e. M/s Odisha Mining Corporation Ltd.

2. A copy of the minutes and the study proposal of ICFRE is enclosed.

3. The State Government is requested to take action accordingly under intimation to this Ministry.

Yours faithfully,

Encl. As above

(Sandeep Sharma) 1.4.19
Assistant Inspector General of Forests (FC)

Copy to:

1. The Principal Chief Conservator of Forests, Government of Odisha, Bhubaneswar.
2. The Nodal Officer, O/o the PCCF, Government of Odisha, Bhubaneswar.
3. The Addl. PCCF (Central) (FCA), Regional Office, Bhubaneswar.
4. Shri Sudhir Kumar, ADG (EM), The Indian Council of Forestry Research and Education (ICFRE), Dehradun
5. PPS to DGF&SS/ PS to IGF (FC)
6. Monitoring Cell, FC Division, MoEF&CC
7. Guard File

1.4.15
(Sandeep Sharma)
Assistant Inspector General of Forests (FC)

Minutes of the discussion held on 06.03.2019 at 02.30 P.M under the chairmanship of Director General of Forests and Special Secretary (FC) in Indira Paryavaran Bhawan in connection with the study "To assess mineable reserve, duration for the extraction from already opened up area (96.50 ha), environmental stability, comparative statement of environmental loss & benefit accrued and possible technological intervention without disturbing the green cover in Daitari Iron Ore Mine Lease for Odisha Mining Corporatin Limited, Bhubaneswar, Odisha", to be carried out by the ICFRE, Dehradun .

1. At the outset, Inspector General of Forests (FC) requested participants to make a brief introduction.

2. Dr. V. Jeeva Scientist 'F'. Indian Council of Forestry Research and Education made a presentation on the following:

   (i) Brief of Daitri Mine.
   (ii) Components of the proposed study, which are:
   a. Component-I: Study area delineation and preparation of thematic maps (ICFRE & WII).
   b. Component-II: Assessment feasibility of mineable iron ore reserve and time duration of its extraction from already opened up area (96.50 ha) (ICFRE).
   c. Component-III: Environmental stability in the area, if expansion of mining activity is allowed beyond already broken up area.
   d. Component-IV: Assessment of environmental losses/ benefits (both tangible and intangible) in monetary terms, if expansion is allowed beyond already opened up area (Terrestrial forest/faunal and avi, aquatic biodiversity and socio-economic –ICFRE& WII)
   e. Component-V: Exploration of possibility of specific technical interventions for iron ore extraction without disturbing green cover (ICFRE).
   (iii) **Time Schedule:** The time schedule for the study would be two years from the date of award of the study and release of Ist instalment. The Schedule of payment as proposed by ICFRE, Dehradun is as follows:

S.N.	Activities	% of payment
1.	On acceptance of Work Order	50%
2.	On completion of field work and submission of	25%
3.	On completion and Submission of Final report	20%
4.	Acceptance of final report	5%

   (iv) **Cost of the Study**: The estimted cost for the proposed study is Rs.327.93 lakhs. Breakup of the cost as given by ICFRE at **Annexure- I**.

3. **Decision taken in the meeting:** After detailed delabration, it has been decided to accept the proposal of ICFRE for carrying out study, *to assess mineable reserve, duration for the extraction from already opened up area (96.50 ha), environmental stability, comparative statement of environmental loss & benefit accrued and possible technological intervention without disturbing the green cover in Daitari Iron Ore Mine Lease for Odisha Mining Corporatin Limited, Bhubaneswar, Odisha*, on the terms and conditons of ICFRE,Dehradun as stated in para (2) above.
4. The total cost of the study shall be borne by the user agency i.e. M/s. Odisha Mining Corporation.
5. List of participants are given in **Annexure-II.**
6. Meeting ended with thanks to Chair.

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Annexure-I

Cost Estimates

S. No.	Budget Head	Amount (Rs. Lakh)		
		ICFRE	WII	Grand Total
1	Cost of man-days of officials deployed	22.50	-	22.50
2	Cost of physical inputs/services/ utilities/ consumables/ raw materials (including engagement of project staff and semi-skilled person, office expenses, Inception meeting and report writing etc.)	41.20	108.98	150.18
	Cost of project manpower (PA- 02 @Rs 45000/per month); PF- 03 @Rs 32000/-per month; LA- 01 @Rs 32000/- per month; FA- 05@Rs 10000/- per months)	31.20	61.32	-
	Equipment and capital (Camera Traps, Digital cameras and accessories, GPS, Binoculars, Soil moisture meter)	10.00 (Lump-Sum)	15.80	-
	Operational (Digital remote sensing date, base camp establishment @Rs 10000/- per month; chemical and other labs materials; field gears)		15.26	-
	Consumables (hiring of field vehicles per month; POL , Final report publication; other consumables like stationary, Fax, Telephone, emails etc.)		16.60	-
3	External payment envisaged e.g. to outside Sub-consultants and Domain Experts	30.00	-	30.00
4	Travel Expenses (TA/DA)	26.00	6.00	32.00
5	Contingencies	5.00	-	5.00
6	Sub Total expenses = sum of (1 to 5)	124.70	114.98	239.68
7	Intellectual fee @ of 33% of above (1 to 5)	41.15	-	41.15
	Institutional charges @15%	-	17.25	17.25
8	Total cost (excluding GST)	165.85	132.23	298.08
GST @18%		29.85	-	29.85
GRAND TOTAL		**195.70**	**132.23**	**327.93**

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Annexure-II

List of Participants :

i. Shri Siddhanta Das, DGF&SS, MoEF&CC, New Delhi.

ii. Shri A.K. Mohanty, IGF(FC), MoEF&CC, New Delhi.

iii. Dr.S.A. Hussain, Scientist G, Wildlife Institute of India, Dehradun.

iv. Dr.K. Ramesh, Scientist E, Wildlife Institute of India, Dehradun.

v. Shri Sudhir Kumar, ADG (EM), The Indian Council of Forestry Research and Education (ICFRE), Dehradun

vi. Dr.V. Jeeva, Scientist F, The Indian Council of Forestry Research and Education (ICFRE), Dehradun

vii. Shri Sandeep Sharma, AIG (FC), MoEF&CC, New Delhi .

viii. Shri Rajesh Kumar, TO (FC), MoEF&CC, New Delhi

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DRAFT PROPOSAL FOR THE STUDY

To assess mineable reserve, duration for the extraction from already opened up area (96.50 ha), environmental stability , comparative statement of environmental loss &benefit accrued and possible technological intervention without disturbing the green cover in Daitari Iron Ore Mine Lease for Odisha Mining Corporation Limited, Bhubaneswar, Odisha

1. Preamble

Daitari iron ore mining lease (DIOL) of Odisha Mining Corporation (OMC) is spread over an area of 1018.3085 ha and located in village Talpada, Rebana Reserve Forest & Daitari Protected Forest (between latitudes 21005'33.1"N" & 21007'08.8"N and longitudes 85046'01.9"E & 85049'17.0"E) in Harichandanpur tehsil, Keonjhar & Jajpur districts of Odisha and is covered by Survey of India toposheet no. 73 G/16. Daitari iron ore mine is in operation since 1966. The OMC has proposed to expand the mine lease area and applied for diversion of balance forest area of 746.3325 ha for mining activity.

2. Brief description of the mine lease

Daitari Iron Ore Mine lease (DIOL) was originally granted over an area of 7 sq miles in Talpada (Daitari) for iron ore mining in favour of Orissa Mining Corporation (OMC) by the erstwhile Mining and Geology Department of Government of Orissa in 16.03.1965. Initially, DIOL deed for total area of 1812.99 ha was executed on 27.01.1966 for a period of 30 years. Further renewed for a period of 20 years w.e.f 27.01.1996 to 26.01.2016 and subsequently extended up to 21.03.2020 under the amended provisions of MMDR Act, 1957. Later it was again proposed by OMC to retain 1018.3085 ha and surrender the remaining area (794.6815 ha) to the state government. Precise area plan for the balance retained area of 1018.3085 ha was approved by the Directorate of Mines, Odisha vide letter no. No. M IV (B)-59/04-12897/DM dated 23/02/2013.

2.1 Background for the study

The approved mining lease area is 1018.3085 ha that consists of a total forest area of 846.3995 ha of which forest area of 533.659 ha is located in Keonjhar wild life (WL) Division and 193.266 ha in Cuttack Forest Division (i.e.n a total of 726.925ha) having legal status of reserved forest & Gramya Jungle and Demarcated Protected Forest (DPF) respectively. Of the total forest area, an area of 95.60 ha has ready been diverted in 2005, while 4.467 ha for DIOL mining infrastructure is being processed for diversion separately. The balance forest area of 746.3325 ha has been presently proposed for diversion for expansion of mining activity. Density of vegetation reported in the forest area proposed for diversion is 0.8-1.0 (Eco-class-I in Keonjhar WLD) and 0.6 (Eco class-I in Cuttack FD). A total of 1,65,869 trees in Keonjhar WLD and 70,607 trees and 35,838 poles in Cuttack FD , thus a total of 272404 trees are assessed to be used under this mining project. The area does not involve any notified Eco sensitive zone/National Park/ Wildlife Sanctuary. However, this area was supporting Royal Bengal Tiger. Recently National Tiger Conservation Authority has proposed a tiger corridor interlinking Simlipal Tiger Reserve and Satkosia Tiger Reserve in Odisha for long term Tiger/wildlife conservation. The area proposed for forest diversion falls

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within the proposed tiger corridor. And, an area of 28.67 ha of Gramya Jungle within the lease hold area found to be podu/jhoom/shifting cultivation ravaged which is as per Forest (Conservation) Act 1980 is a violation and is under investigation in KWLD.

The Department of Environment, Forests and Climate Change, State Government of Odisha vide letter no. 10F (Cons.) 210/2015, 16637/F/E, Bhubaneswar dated 19.09.2015 submitted a proposal for obtaining prior approval from the Central Government. The said proposal was placed before Forest Advisory Committee (FAC) meetings held on 12.07.2016, 20.07.2017 and 26.06.2018. Detail deliberation and discussion was held with the representative of APCCF, Regional Office Bhubaneswar and the user agency during the FAC meeting on 26.07.2018. Subsequently , considering the fact that the proposed diversion is situated in the virgin, very dense, nearly undisturbed pristine forest having immense biodiversity value that serve as a crucial tiger corridor interlinking Simlipal Tiger Reserve and Satakosia Tiger Reserve, which is very near to the proposed diversion boundary and also a prized habitat for Elephants & many other important wildlife species; in addition, as per Decision Support System (DSS) of MoEF&CC the Daitari mine is the lone mine situated on hill top and is aerially 5 km (approx.) apart/away from the Chromite mine cluster situated in the valley; and approximately 2.7 lakh trees from KWLD and CFD are assessed to be used for mining project FAC recommended the MoEF&CC to conduct a study through ICFRE with following objectives:

3. OBJECTIVES

To ascertain -

1. The feasibility of the fact that how much quantity of ore material can be extracted from already opened up area without further expansion of the existing mining area (i.e. 95.60 ha).
2. The time duration for which the extraction of material can be done from already opened up area.
3. Environmental stability in the area, if expansion of mining activity is allowed beyond already broken up area.
4. Comparative statement of environmental loss *vis a vs* benefit (comparison in monetary terms including both tangible and intangible benefits/loss) which will be accrued/lost if the area is allowed for mining.
5. The possibility of specific technological interventions for ore extraction without disturbing the green cover of the area.

4. STUDY AREA

The proposed forest area for diversion (746.3325 ha) in the mine lease area (1018.3085 ha) of Daitari Iron Ore that falls under Cuttack Forest Division (CFD) of Jaipur District and Keonjhar (Wildlife) Division (KWD) , Keonjhar District, Odisha. The proposed forest area for diversion is dominated by Sal and riverine forests with semi- evergreen, moist and dry deciduous vegetation representing diverse flora and fauna. Further, the MLA is located within Simlipal Tiger Reserve - Satakosia Tiger Reserve corridor connecting two potential habitats for tiger, elephant and other wildlife's. In addition Similipal-Hadgarh-Kuldhiha corridor is considered to be the most potential route for elephant and tiger. Considering the

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important wild life habitat and the corridor ICFRE established networking with Wildlife Institute of India (WII) Dehra Dun for a holistic approach of the study.

5. APPROACH & METHODOLOGY

Considering the scope given by Forest Advisory Committee (FAC) also as outlined in the letter vide no F.No 8-28/205-FC dated 28 September, 2018 received from Assistant Inspector General of Forest (FC) following are the five major component outlined for the study. The approach and the methodology presented under the respective components are tentative and will be finalized based on the data availability in the field.

5.1 Component-I: Study area delineation and preparation of thematic maps (ICFRE & WII)

The mine lease area of Daitari Iron shape files, topographical maps (Land Use and Land Cover, Forest Cover, Forest Type, Protected area, biodiversity, geological, toposheet, and drainage) will be procured from the respective authentic agency such as DIOL of OMC, National Remote Sensing Centre (NRSC), Indian Space Research Organization (ISRO), Forest Survey of India, Survey of India Geological survey of India and State Forest Department. The classified maps procured will be processed for developing various thematic maps using Remote Sensing (RS), Geographical Information system (GIS). In addition Global Positioning System (GPS) and topographical maps will be used for ground truth verification and develop maps for the respective study components.

5.2 Component-II: Assessment feasibility of mineable iron ore reserve and time duration of its extraction from already opened up area (96.50 ha) (ICFRE)

Initially the Daitari Iron Ore Mining lease area was executed in 1812.99 ha (27.01.1966) for a period of 30 years. Later OMC retained 1018.3085 ha and surrendered the remaining area of 794.6815ha to the state government for which Final Mine Closure Plan (FMCP) was prepared and approved by IBM vide letter no 314(3)/201-MCCM(CZ)/FMCP-6/453 dated 15.03.2013. and certificate was issued by the regional Controller of Mines, Bhubaneswar vide letter no FMCP/FM/05-ORI/BHU-2012-13 dated 25.06.2013 and precise area plan for the area 1018.3085ha was approved by the Directorate of mines, Odisha vide letter no MIV(B)-59/04-12897/DM dated 23/02/2013.

The assessment of mineable reserve from the already opened are will be assessed using the documents such as the Mining plan (MCR, 1960) approved by IBM, scheme of mining, progressive Mine Closure Plan (PMCP) for the period of 2003-2008 for an area of 190.20 ha approved by IBM,2003 dated 11.07.2006 . Geological reserve as per Geological Survey of India (GSI); iron ore reserves (proved, probable) exploration by Odisha Mining Corporation Limited (OMC) and IBM will be procured. Year wise Iron ore production from 1993 to till date from OMC, domestic & export market; possibilities of export, import Vs Indigenous production demand and supply gap will be estimated. Further based on the mine lease area broken up, geological plan, surface plan and conceptual plan using suitable methods of

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assessment, ICFRE will explore the possible mineable iron ore reserve available and time duration for extraction

5.3 Component-III: Env ironmental stability in the area, if expansion of mining activity is allowed beyond already broken up area

The stability of slopes in open pit mines and Overburden Dump area is an issue of great concern in terms of environmental stability. Relevant geological and geomorphic conditions of the mined out and the surrounding areas, slope properties of soil/rock , surface / groundwater condition etc , will be examined from the geological reports for the mined out area and proposed area to assess the environmental stability. In addition the optimal staged excavation adopted and time sequence, the design parameters followed for excavation or embankment and adaptive management in practice both in pit area and OB dump will be also be assessed for the existing environmental stability to recommend further if expansion is allowed beyond already broken area.

5.4 Component-IV: Assessment of environmental losses/ benefits (both tangible and intangible) in monetary terms, if expansion is allowed beyond already opened up area (Terrestrial forest/faunal, aquatic biodiversity and socio-economic – ICFRE& WII)

The main approach of estimating or assessing the environmental losses /benefits in terms of open cast mining in the Daitari Iron Ore Mining lease area for Odisha Mining Corporation (OMC) would involve (1) estimating the change in the value of the resource as an asset due to the mining activities; (2) other consequences such as displacement of local communities and related impacts will be quantified in addition to health impacts. Generally, environmental impacts are often dislocated in time and space, making cause and effect difficult to establish due to scarcity of reliable data. In order to properly identify the impacts for valuation, following broad approach will be adopted:

1. The resources have been removed or affected by the operation of the mine and proposed to be removed or affected if expansion is allowed?
2. The value of the resources removed or destroyed by the operation of the mine and proposed to be removed or affected if expansion is allowed?
3. What livelihood changes that have occurred in the past and proposed as a result of the location of the mine in the past
4. The value of Wild life habitats loss due to mining and
5. What are the cost and benefits of these changes?

The three major resources that are directly or indirectly affected by mining activities would be considered for the study such as, 1. Land, 2. Forests and 3. Water resources.

The task of the analysis of individual impacts of mining on these resources will be disaggregated into individual components. Subsequently, the variety of attributes under environmental good or service will be calculated for Total Economic Value (TEV) as some of

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these attributes are concrete and easily measurable such as timber, while others are more difficult to quantify due to the unavailability of market values. The total economic value however is the sum of all the components that consists of (i) direct use values; (ii) indirect use values; and (iii) non-use values. The valuation technique applied depends on the category of value attached to the particular resource which is affected by the mining activity. The various techniques to assess the environmental loss / benefit and cost for quantification will be:

Benefit /loss costs	Valuation techniques /sources
Benefits	
1. Taxes and royalties	Annual payments
2. Employment	Salaries & wages
3. Compensation	Replacement& relocation cost
4. Other social benefits	Other payments
5. Revenue	Social development cost
On site loss /cost	
1. Agri/horti- crop value /if any	Opportunity cost
2. Timber value	Opportunity cost/direct cost
3. Loss of tree /shrub- carbon sequestration	Indirect cost
4. Loss of vegetation –soil erosion /sedimentation /water	Indirect cost Indirect cost
5. Loss of NTFPs	Indirect cost/ market /benefit transfer
6. Loss of habitat – flagship wild life species	Habitat management replacement cost
7. Loss of house	Replacement/relocation cost
Off site loss /cost	
1. Health effects	Cost of health effect
2. Reduced water quality /availability	Replacement /mitigation costs
3. Reduced Air quality	Mitigation costs
4. Soil health	Mitigation /replacement costs
5. Biodiversity management cost	Mitigation /replacement costs
6. Compensatory afforestation cost	Mitigation /afforestation costs
The attributes and methods proposed are tentative , based on the ground truth and availability of the data suitable attributes and techniques will be employed	

5.4.1 TERRESTRIAL FOREST AND AQUATIC BIODIVERSITY

5.4.1.1 Terrestrial forest floral variables (ICFRE)

Primary baseline data on terrestrial floral-diversity will be collected through sample survey in the study area covering three seasons (pre monsoon, monsoon and post monsoon). Quadrate nested method will be used for vegetation sampling for tree, shrub and understory flora. The phyto-sociological data for trees and shrubs will be collected from random quadrates of 10 m x 10 m and 5 m x 5 m size. Random quadrates of 1 m x 1 m size will be laid for the study of herb component. During the field survey, number of plants of different species in each

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quadrate will be identified and counted. Based on the quadrate data, frequency, density and cover (basal area) of each species will be calculated (Misra, 1968). The importance value index (IVI) for three types of plant habits (tree, shrub and herb) will be determined by summing up the relative density, relative frequency and relative dominance values. To assess diversity of floral elements and numerical structure of the plant community in the study sites, Shannon-Wiener index (H') and Buza and Gibson's evenness index (E) will be computed. With the vegetation surveyed rare, endangered and threatened category species (RET) will be identified referring to the Red Data Book of Botanical Survey of India, IUCN Red data list and other available literatures on flora and herbarium pertaining to the rare/ endangered species of study area. The economic and endemic flora, if any will also be identified and listed.

The environmental services provided by the resources removed (number of trees and poles estimated or as proposed) to make the mining activities such as carbon sequestration (regulating service) will be considered based on available/suitable methods. As the vegetation cover contributes to carbon sink.

6.4.1.2 Water related variables (ICFRE)

The environmental services provided by the resources removed (vegetation) to make the mining activities will result in sedimentation and reduction in water supply (regulating service) as the vegetation cover contributes to minimize the sedimentation apart from the rainfall and topography as a natural process. Those variables will be considered to estimate cost of loss. Based on the data to be generated suitable methods will be employed.

5.4.2 Terrestrial faunal and related variables (WII)

The study will be focused on the impact of mining on wildlife habitat within Similipal – Satkosia corridor forests; delineate the impact zone of proposed Daitari mine expansion area and estimate environmental losses in terms of environmental services provided by the resources removed to make way for mining activities such as wild life habitat.

5.4.2.1 Faunal Assessment

- Mammalian species occupancy and their distribution will be assessed using sign survey and encounter rates by line transect method (Buckland et al., 1993).
- Herpetofauna enumeration will be done using Visual Encounter Survey (VES) during transect walk ((1890), Daniel (2002), Daniels (2005), Das (2003) and Whitaker and Captain (2004).
- The sampling of terrestrial avifauna will be done using point count method (Metcalfe, 2007).
- Butterfly sampling will be done along the transect line, which is the most common method used for assessing butterfly abundance in monitoring programs (Newman et al., 2003; Ellis and Waterton, 2004; Thomas, 2005).

- Information about the diversity and relative abundance of fish species will be estimated using different fishing nets (gill and cast net). Faunal occupancies in different habitat and land use will be determined in both qualitative and quantitative terms (indices and densities).

5.4.2.2 Floral Assessment- For vegetation sampling, quadrates method will be used (Golodets et al., 2012).

5.4.2.3 Assessment of losses to wildlife habitat

A cost-benefit analysis of allowing mining of iron ore if expansion is allowed beyond already opened area i.e., the tiger corridor linking Similipal Tiger Reserve and Satkosia Tiger Reserve will be conducted. The costs of loss due to mining will include, among others, the loss of key regulating services obtained from the forest.

- The functional and monetary value of non-timber forest products (NTFPs).
- The functional and monetary value of habitat for wild life
- The recreational value of both Similipal Tiger Reserve and Satkosia Tiger Reserve will be estimated using the Contingent Valuation method. (Detailed Proposal from WII Dehradun is given in Annexure-II)

5.5 Component-V Exploration of possibility of specific technical interventions for iron ore extraction without disturbing green cover (ICFRE).

Review of literature on available methodologies and techniques for iron ore mining without disturbing green cover in forested areas will be explored for identification of suitable technical interventions specific to the Daitari Iron Ore Mine lease area. The existing mining methods and techniques in practice will also be examined to identify gaps and for suitable refinement.

5.6 DETAILS OF DATA/ INPUTS REQUIRED

Following details will be required and need to be provided to the ICFRE:

1. GIS based temporal and spatial study area map with all the facilities/infrastructure including the boundary, dump management and reclamation activities undertaken along with GPS location.
2. Mining area / land use detail, boundary map, diagrams, surface map, etc including GPS locations.
3. Mining Plan/Scheme/Mine closure plan for the broken up area and proposed new area of mining.
4. EIA and EMP reports for the broken up area and proposed new area.
5. Consent to operate.
6. Copy of EC/FC clearances and their compliance reports for the broken and new area proposed.
7. Cases of violation, if any and action taken thereof.

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8. Monitoring mechanism, periodical recorded/modelled data for various environmental parameters if any.
9. Production detail since the inception to till date.
10. Demand predicted and supplied by Daitari Iron Ore Mine till data.
11. Imports from within state ; outside and international if any
12. Any other documents relevant to the mine, as required for the purpose.

5.7 COST ESTIMATES

S. No.	Budget Head	Amount (Rs. Lakh)		
		ICFRE	WII	Grand Total
1	Cost of man-days of officials deployed	22.50	-	22.50
2	Cost of physical inputs/services/ utilities/ consumables/ raw materials (including engagement of project staff and semi-skilled person, office expenses, Inception meeting and report writing etc.)	41.20	108.98	150.18
	Cost of project manpower (PA- 02 @Rs 45000/per month); PF- 03 @Rs 32000/-per month; LA- 01 @Rs 32000/- per month; FA-05@Rs 10000/- per months)	31.20	61.32	-
	Equipment and capital (Camera Traps, Digital cameras and accessories, GPS, Binoculars, Soil moisture meter)	10.00 (Lump-Sum)	15.80	-
	Operational (Digital remote sensing date, base camp establishment @Rs 10000/- per month; chemical and other labs materials; field gears)		15.26	-
	Consumables (hiring of field vehicles per month; POL , Final report publication; other consumables like stationary, Fax, Telephone, emails etc.)		16.60	-
3	External payment envisaged e.g. to outside Sub-consultants and Domain Experts	30.00	-	30.00
4	Travel Expenses (TA/DA)	26.00	6.00	32.00
5	Contingencies	5.00	-	5.00
6	Sub Total expenses = sum of (1 to 5)	124.70	114.98	239.68
7	Intellectual fee @ of 33% of above (1 to 5)	41.15	-	41.15
	Institutional charges @15%	-	17.25	17.25
8	Total cost (excluding GST)	165.85	132.23	298.08
GST @18%		29.85	-	29.85
GRAND TOTAL		195.70	132.23	327.93

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5.8 SCHEDULE OF PAYMENT

SN.	Activities	% of payment
1.	On acceptance of Work Order	50%
2.	On completion of field work and submission of draft report	25%
3.	On completion and Submission of Final report	20%
4.	Acceptance of final report	5%

5.9 TIME SCHEDULE

The time schedule for completing the task will be twenty four (24) months from the receipt of I[st] instalment and also subject to the field conditions and requirement of data from Project Proponent. The **tentative schedule** of activities will be as under:

SN.	Particulars	Duration							
		Year-I				Year-II			
		Q-I	Q-II	Q-III	Q-IV	Q-I	Q-II	Q-III	Q-IV
1.	Selection of project staff and establishment of field station								
2.	Desk Review of available data and reports, project inception meeting								
3.	Procurement of GIS based maps from respective institutions for developing thematic maps								
4.	Field data collection, analysis and interpretation of results								
5.	Residual field data collection, analysis, interpretation of results and compilation of results								
6.	Preparation and submission of draft report								
7.	Submission of final report after incorporation of comments/observations, if any, from project proponent								
The proposed schedule of activities is tentative and may be revised depending on receipt of required data/reports from IBM, OMCL and actual field conditions etc									

5.10 LOGISTIC ARRANGEMENT

Local logistic, boarding, lodging and local transport to the study area during field visit and meeting etc to be provided by OMCL. Further, the services of local staff may also be provided during field visits, if required.

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5.11 EXPECTED OUTPUTS/DELIVERABLES

A comprehensive report (both hard and soft copy) including mineable iron ore reserve and time duration of its extraction from already opened up area (96.50 ha), environmental stability and statement of both tangible and intangible environmental losses/benefits in monetary terms, if expansion is allowed beyond already opened up area Daitari Iron Ore Mines of M/s OMCL, Odisha area.

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