ENVIRONMENTAL CLEARANCE

PARIVESH

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

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

To,

The Chief General Manager
Rourkela Steel Plant, Steel Authority of India Limited (SAIL)
Barsua Iron Mines, At/Po Tensa,,Sundargarh,Orissa-770042

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 Ministry vide proposal number IA/OR/MIN/236861/2021 dated 01 Nov 2021. The particulars of the environmental clearance granted to the project are as below.

1.	**EC Identification No.**	**EC22A001OR133056**
2.	**File No.**	J-11015/351/2006-IA-II(M)
3.	**Project Type**	Expansion7
4.	**Category**	A
5.	**Project/Activity including Schedule No.**	1(a) Mining of minerals
6.	**Name of Project**	Amendment in Environmental Clearance of Barsua-Taldih-Kalta Iron Ore Mining (Capacity 8.05 MTPA ROM) and Beneficiation Plant (Capacity 3.5 MTPA) Project of M/s SAIL for change in mining lease area from 2486.383 ha to 2564.323 ha on account of amalgamation of two contiguous mining leases (ML – 130 & ML – 162) without change in production capacity or mining or beneficiation technology under para 7(ii) of EIA Notification 2006.
7.	**Name of Company/Organization**	Rourkela Steel Plant, Steel Authority of India Limited (SAIL)
8.	**Location of Project**	Orissa
9.	**TOR Date**	N/A

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

Date: 25/01/2022

(e-signed)
Pankaj Verma
Scientist E
IA - (Non-Coal Mining sector)

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.

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No. J-11015/351/2006-IA.II(M)
Government of India
Ministry of Environment, Forest and Climate Change
Impact Assessment Division
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2nd Floor, Prithvi Wing,
Indira Paryavaran Bhavan,
Jor Bagh Road, Aliganj,
New Delhi-110 003.

Dated: 25th January, 2022

To,

M/s Steel Authority of India Limited (SAIL)
The Chief General Manager (Mines),
Barsua-Taldih Iron Mines SAIL- Raw Materials Division,
PO- Tensa, Sundargarh, Odisha - 770 042.

Subject:- Proposal for amendment in Environmental Clearance for amalgamation of contiguous mine lease areas comprising of ML – 130 (2486.383ha) and ML – 162 (77.94ha) as total area of 2558.581ha (FC available(2419.871 ha) + non forest land (138.710 ha))without change in production capacity [8.05 MTPA ROM and Beneficiation Plant Capacity 3.5 MTPA] of M/s SAIL for Barsua-Taldih-Kalta Iron Ore Mining Project located at Tantra & Bahamba Villages and Toda R.F, Tahasil Koira under Bonai Subdivision of Sundargarh District, Odisha – Environmental Clearance under para 7(ii) of EIA Notification 2006 regarding.

Sir,

This has reference to the online proposal no. IA/OR/MIN/236861/2021 of M/s SAIL for amendment in Environmental Clearance for amalgamation of contiguous mine lease areas comprising of ML – 130 (2486.383ha) and ML – 162 (77.94ha) as total area of 2558.581ha (FC available(2419.871 ha) + non forest land (138.710 ha))without change in production capacity [8.05 MTPA ROM and Beneficiation Plant Capacity 3.5 MTPA] for Barsua-Taldih-Kalta Iron Ore Mining Project located at Tantra & Bahamba Villages and Toda R.F, Tahasil Koira under Bonai Subdivision of Sundargarh District, Odisha. The mine lease area is located between Latitude 21°49'25.43880" N to 21°59'50.88516" N and Longitude 85°07'43.73832" E to 85°13'53.48136" E. The mine lease area falls under the Survey of India Toposheet No: 73G/1 (F45N1) and falls in Seismic Zone-II. The PP presented the KML file during the presentation to indicate the location of mine lease on Google Earth.

2. The Project Proponent initially made an online application for Terms of Reference vide IA/OR/MIN/192496/2021 dated 03.04.2021. The proposal was considered in the 31st EAC meeting held during 9th -15th June, 2021. After detailed deliberations made by the Project Proponent, the Committee noted that the PP amalgamated the contiguous Mining Leases viz ML – 130 (2486.383ha) and ML – 162 (77.94ha) covering total area of 2564.323ha on 02.12.2020 and PP did not obtained amendment in EC after amalgamation of mining leases. Therefore, the Committee returned the proposal in present form and is of

the view that the PP first should obtain necessary amendment in EC for amalgamation of mining leases and then should apply for Terms of Reference. Then, the PP applied online for amendment in EC vide IA/OR/MIN/216764/2021 dated 26.06.2021 under para 7(ii) of the provisions of the EIA Notification, 2006 for the project mentioned above. The proposal was considered in the 33rd EAC Meeting held during 13th to 16th July 2021 wherein the Committee observed that as per EIA Notification 2006 there will be due diligence necessary including preparation of EIA and public consultation and the application shall be appraised accordingly for grant of environmental clearance under para 7(ii) of EIA Notification 2006. Therefore, the Committee deferred the proposal for want of additional information. PP submitted the information vide Lr Ref. No: CGM/BIM-TIM/123 dated 18.08.2021. Then, again the proposal was considered in the 36th EAC meeting held during 31st August and 1st September, 2021. Based on the documents submitted and presentation made by the Project Proponent and the Consultant, the Committee noted that the proposal is for amalgamation of two leases for which already EC has been granted and project also includes beneficiation plant which comes under the category 2(b) Mineral beneficiation as per the Schedule of the EIA Notification, 2006 as amended time to time. PP in the instant proposal has submitted Form-II for category 1(a) Mining of minerals only. The Committee therefore returned the proposal in present form and was of the view that PP should submit the complete application for the both the category 1(a) Mining of minerals & 2(b) Mineral beneficiation along with the requisite information.

3. Now, the Project Proponent submitted a fresh application for amendment in EC vide IA/OR/MIN/236861/2021 dated 01.11.2021 under para 7(ii) of the provisions of the EIA Notification, 2006 along with the information sought in the 36th EAC meeting held during 31st August and 1st September, 2021. The proposed project activity is listed at schedule no. 1(a) Mining of Minerals and 2(b) Mineral beneficiation under Category "A" of the schedule of the EIA Notification, 2006 and appraised at the Central level.

4. The Project Proponent submitted that Environmental Clearances obtained in the following chronological order: -

I. Initially, Integrated Environmental Clearance obtained vide letter No. J11015/351/2006-IA.II(M) dated 29.10.2010 for Barsua-Taldih-Kalta Iron Ore Mining (ML-130), Beneficiation and Pelletisation plant project of M/s Steel Authority of India Limited for an annual production capacity of 8.05 million tonnes of iron ore by the opencast mechanized method along with setting up of a beneficiation plant of 4.25 million TPA (in additional to existing plant of 2.5 million TPA) and setting up of a pelletisation plant of 2.0 million TPA capacity involving total mine lease area of 2486.391 ha.

II. Amendment in Environmental Clearance obtained vide F.No.J-11015/351/ 2006-IA.II(M) (pt.) dated 30.03.2016 for the following:-

   i. Temporary permission to change iron ore production (ROM) from three blocks viz. Barsua, Talidh and Kalta in ML-130 lease from 2.5, 4.25 and 1.3 million TPA to 3.5, 2.05 and 2.5 million TPA respectively, keeping the total iron ore

(ROM) production restricted to 8.05 million TPA as specified in the earlier environment Clearance.

ii. Permission to operate existing beneficiation plant at the rate 4.5 million TPA instead of 2.5 million TPA.

iii. Permission for road transportation of part of iron ore (ROM) from Talidh block to the Barsua Valley (about 11kms.) and to the Barsua beneficiation plant for a period of five years till facilities viz. crushing plant, LDBC are erected and commissioned for the Taldih block.

iv. 'To replace outside mine lease area' with 'ML-162 lease and acquired area' in environmental clearance, in order to utilize the infrastructure facilities for processing of iron ore produced from ML-130 lease.

v. To modify the total lease area of ML-130 lease from 2486.391 to 2486.383 ha as per the joint survey committee report (DGPS survey report) of Govt. of Odisha and the lease deed executed by and between the Govt. of Odisha and SAIL on 13th November, 2014.

The amendment for point no. (i) to (iii) will be only for 5 years.

III. Again, the Environmental Clearance amended vide F.No. J-11015/351/2006- IA.II (M) dated 03.07.2020 with corrigendum dated 13.07.2020 for change in excavation & dispatch pattern with provisions for excavation & dispatch of tailings from Tailing Pond of Barsua and subgrade dump fines iron ore fines for selling in open market keeping the total production within 8.05 MTPA under para 7(ii) of EIA Notification, 2006. Further, validity of redistribution of production as per the EC amendment dated 30.03.2016 were further extended by two more years i.e., till 31.03.2023.

IV. Further, EC has been amended vide F.No. J-11015/351/2006- IA.II (M) dated 17.03.2021 for re-distribution of iron ore production from Kalta Block and Taldih Block keeping the total production within the EC Capacity of 8.05 MTPA (Barsua: 3.5 MTPA, Taldih : 1.35 MTPA and Kalta : 3.20 MTPA).

5. The Project Proponent submitted that the Barsua Iron Mine (Southern part) and Kalta Iron Mine (Northern part) are in operation since 1960 and 1966 respectively. The Taldih Iron Mine (Middle part) has started production in the year 2016. There were two contiguous mining leases namely ML – 130 (main iron ore mining lease) and ML – 162 (for infrastructure) under the Barsua – Taldih – Kalta Iron Mines. The Mining Lease for ML- 130 (2486.383 ha) was granted on 06.01.1960 for a period of 30 years and subsequently renewed & lease deed for the 2nd renewal period executed on 13.11.2014 having validity up to 05.01.2030. The associated infrastructure facilities of Barsua Iron Mine are located in another adjoining mining lease viz ML – 162 (77.94 ha), which was granted on 29.04.1960 and subsequently renewed as well as extended the lease period up to 28.04.2030 and supplementary lease deed was executed on 24.09.2016. PP submitted that the Govt. of Odisha vide proceeding No.IV(B)SM-03/2020/10418/SM, Bhubaneswar, dated 02.12.2020 amalgamated the contiguous Mining Leases viz ML–130 (2486.383 ha) and ML–162 (77.94 ha) covering total area of 2564.323 ha. PP also submitted the amalgamated lease deed executed on 30.03.2021 over an area of 2564.323 ha and validity period of the

amalgamated mining lease to be co-terminus with the lease whose period will expire first i.e., 05.01.2030.

6. The Project Proponent submitted the Modification of Mining Plan along with Progressive Mine Closure Plan approved by Indian Bureau of Mines, Bhubaneswar vide letter No. MP/A/39-ORI/BHU/2020-21 dated 01.04.2021 for the amalgamated lease area of ML-130 & ML-162 over an area of 2564.323ha with 16 MTPA expansion capacity from Barsua-Taldih-Kalta Iron mines for the period 2021-22 to 2024-25.

7. The Project Proponent submitted that out of 2564.323 ha, 2425.613 ha is Forest Land (Toda R.F.) and 138.710 ha is Non-Forest Land. PP submitted that 5.742 ha of Forest Land, which was part of ML – 130, is under occupation of the local Schedule Tribe & Other Traditional Forest Dwellers in Village Tantra. Their individual rights have been recognized by granting pattas under Forest Right Act., 2006. PP obtained Stage-II Forest Clearance vide MoEF F.No.8-90/1996-FC (pt), dated 06.03.2013 for diversion of forest land over 2341.931ha (2248.252ha for mining and allied activities and 93.679ha for safety zone) under ML – 130 of Barsua-Taldih-Kalta in favour of M/s SAIL. Then, PP obtained Stage-II Forest Clearance vide MoEF F.No.8-18/2014-FC dated 23.10.2017 for diversion of 77.94 ha of forest land including 2.562ha of safety zone area for development of mining infrastructure in Toda RF in ML–162 lease of M/s SAIL. Further, PP submitted that Stage – II Forest Clearance over 2419.871 ha obtained covering under the amalgamated lease.

8. The Project Proponent submitted the baseline environmental data carried out during March – May, 2021 covering Micro-meteorology (1 location close to ML Area), Ambient Air Quality (8 locations incl. 1 Core Zone village), Work Zone Air Quality (12 locations), Ambient Noise Levels (10 locations), Work Zone Noise Levels (12 locations), Water Quality (8 surface water locations & 8 ground water locations), Traffic Density and People's opinion regarding the project. PP submitted that the predominant wind direction blowing from South-West (prevailing for ~24.8% of the time) and South-East ((prevailing for ~11.9% of the time) and predominant wind speeds were mostly in the range of 0.44 – 2.0 m/s. PP reported that the results of monitoring of ambient quality indicated that air quality is well within the norms of NAAQS 2009 at all the eight monitoring locations for all parameters (PM10, PM2.5, SO2, NO2, CO, NH3, O3, Pb, As and Ni). PP also reported that the ambient noise levels at all the 9 (nine) residential locations and 1 (one) industrial area is well within the norms of CPCB. PP submitted that the ground water quality meets the prescribed norms except some values of Manganese in GW4 (Sarkunda Village) & GW6 (Barsua township). PP submitted that the Traffic volume survey was recorded hourly continuously for 7 days at 4 (four) locations from 16th March to 22nd March 2021. At present the traffic volumes at TDS1, TDS2, TDS3 and TDS4 are within the respective Recommended Design Service Volumes. PP submitted that an opinion poll was carried out during June, 2021 to get an idea about local people's perception regarding Barsua-Taldih-Kalta Mines of SAIL. 74.5% of respondents have identified creation of employment opportunity as the main advantage. Around 81.8% of the respondents feel improvement in peripheral development activities and about 25.5 % of the respondents are apprehensive about health problems due to environmental pollution. During the survey local people pointed out that in view of the prevailing Covid19 pandemic students are forced to attend classes online. Due to poor internet connectivity in the region children

are unable to attend such on-line classes properly. Local people expect that the PP should arrange to improve internet connectivity in the region. Further, PP reported that there is no change in production as well as mode of evacuation & dispatch from Barsua – Taldih – Kalta Mines under the present proposal and there is no possibility of rise in pollution load.

9. The Project Proponent submitted the Consent to Operate issued by the Odisha State Pollution Control Board vide Consent Order No: 14129/IND-I-CON-1 (A) dated 17.09.2021 for production of 8.05 MTPA (ROM) [(i) Barsua – 3.5 MTPA iron ore including excavation and dispatch of tailings maximum up to – 1.0 MTPA from the tailing pond at Barsua, (ii) Kalta – 3.2 MTPA iron ore including excavation and dispatch of subgrade iron ore fines maximum up to 0.5 MTPA from fines stocks and (iii) Taldih – 1.35 MTPA iron ore including excavation and dispatch of subgrade iron ore fines maximum up to 0.5 MTPA from fines stocks] and operation of mobile crushing and screening plant of capacity 4x300 TPH and operation of mobile screening plant of capacity 4x300 TPH for the period up to 31.03.2022. PP submitted the Certified EC Compliance report issued by the Integrated Regional Office (IRO), Bhubaneswar vide Lr No. 101-257/21/EPE/1353 dated 29.10.2021. Site visit was carried out by IRO, Bhubaneswar on 22nd & 23rd October, 2021.

10. The Project Proponent submitted the past production details for the period 1993- 94 to 2018-19 duly authenticated by Deputy Director of Mines, Koira vide Lr. No. 6522/Mines dated 13.12.2019. PP reported that subsequent to the judgment of Apex Court dated 02.08.2017, the Government of Odisha has issued demand notice to Barsua Kalta Mines for payment of compensation towards excess production on or before 31st December, 2017 against EC/CTO capacity. Dy. Director of Mines (DDM), Koira vide letter dated 02.09.2017 issued a demand notice for payment of Rs. 66,89,42,779.5 /- in respect of Barsua / Kalta Iron Mines to recover price of mineral produced without/beyond EC alone under Section 21 (5) of MMDR Act, 1957. The said amount was deposited on 29.12.2017 under protest. Further, letter No.5962/Mines dtd, 24.10.2017 of DDM, Koira has directed to pay compensation of Rs.90,19,71,684.40 /- for mining in excess of the permissible limit under the Consent to Operate. Against the above stated demands, SAIL had filed a Writ Petition bearing WP (C) No- 24282/2017 in High Court of Odisha, Cuttack. The matter was heard and Hon'ble High Court had passed the stay order on 04.04.2018 & matter is sub-judice. PP also submitted the affidavit dated 20.04.2020 that Barsua-Taldih-Kalta Iron Ore Mine (ML-130, Mining Lease: 2486.383 Ha) of SAIL shall comply with all the statutory requirement & judgment of Hon'ble Supreme Court dated 2nd August 2017 in writ Petition (civil) No. 114 of 2014 in the matter of common cause versus Union of India & Ors subject to the result of the pending writ petitions before Hon'ble High Court of Odisha and further appeals thereto if need arises. PP submitted an undertaking in a non-judicial stamp paper of Rs 20 bearing 10AA 450732 dated 01.12.2021 that Department of Steel and Mines, Govt. of Odisha vide proceeding No. IV (B) SM-03/2020/10418/SM, Bhubaneswar, Dtd. 02.12.2020 amalgamated the contiguous mining leases viz (ML-130 2485.383 ha) and ML -162 (77.94 ha) covering a total area of 2564.323ha having validity up to 05.01.2030. The lease deed of the amalgamated lease was executed on 30.03.2021. PP also confirmed that mining was never done in the ML-162 lease, pre and post, its amalgamation with the ML-130 lease.

11. Observation and Recommendation of the Committee:

The proposal for amendment in Environmental Clearance was considered in the 42nd EAC (Non-Coal Mining) meeting held during 30th November – 3rd December, 2021. After detailed deliberations made by the Project Proponent and the Consultant, the Committee **recommended** the proposal of M/s SAIL for amendment in Environmental Clearance for amalgamation of contiguous mine lease areas comprising of ML – 130 (2486.383ha) and ML – 162 (77.94ha) as total area of 2558.581ha (FC available(2419.871 ha) + non forest land (138.710 ha))without change in production capacity [8.05 MTPA ROM and Beneficiation Plant Capacity 3.5 MTPA] for Barsua-Taldih-Kalta Iron Ore Mining Project located at Tantra & Bahamba Villages and Toda R.F, Tahasil Koira under Bonai Subdivision of Sundargarh District, Odisha along with the following additional specific conditions for this project.

12. The matter has been examined in the Ministry in accordance with the Environmental Impact Assessment Notification, 2006 and further amendments thereto and the undersigned is directed to say that the Ministry of Environment, Forest & Climate Change after accepting the recommendation of EAC during its 42nd EAC (Non-Coal Mining) meeting held during 30th November – 3rd December, 2021, hereby accords the amendment in Environmental Clearance for amalgamation of contiguous mine lease areas comprising of ML – 130 (2486.383ha) and ML – 162 (77.94ha) as total area of 2558.581ha (FC available(2419.871 ha) + non forest land (138.710 ha))without change in production capacity [8.05 MTPA ROM and Beneficiation Plant Capacity 3.5 MTPA] for Barsua-Taldih-Kalta Iron Ore Mining Project located at Tantra & Bahamba Villages and Toda R.F, Tahasil Koira under Bonai Subdivision of Sundargarh District, Odisha along with the following additional specific conditions.

A. <u>Additional Specific Conditions</u>

i. No mining activities will be allowed in the part of forest land involved in the lease area i.e. 5.742 ha for which the forest clearance is not available.

ii. The Project Proponent shall ensure the livelihood and food security of the forest dwelling Scheduled Tribes and other traditional forest dwellers and take adequate measures for protection of 5.742 ha of Forest Land (Part of ML-130).

iii. The Project Proponent shall adhere to the 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".

iv. All other terms and conditions mentioned in the EC letter dated 29.10.2010, 30.03.2016, 03.07.2020 and 17.03.2021 shall remain the same.

B. 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, 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 & 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
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.

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 Re-suspension" 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) 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.

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	2017-18	2018-19	2019-20	2020-21
		Yr 1	Yr 2	Yr 3	Yr 4	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. 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 CPCB 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, PM10, PM2.5, SO_2, NO_x and CO monitoring. Location of air quality monitoring stations should be decided based on the meteorological data, 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, PM10, PM2.5, SO_2, NO_x 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 Joida 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 outees and land losers/affected people, if any, should be compensated and rehabilitated as per the national/state policy on Resettlement

and Rehabilitation. (iii) The socio-economic 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 mine, 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, PM10 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-à-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 Regional Level.

Sr. 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
	Installation of online ambient air quality monitor for PM10, PM2.5, SOx and NOx within the mine having more than 3 MTPA EC Capacity	Respective Mine Lease Holders	Continuous Annually
	Installation of online ambient air quality monitor for PM10, PM2.5, SOx and NOx 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	Respective District Administratio n	Annually

	conducted in consultation with district administration.		
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 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).	Dept. of Steel & Mines	Continuous 6 months
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 EAC) 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-à-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 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.

13. This issues with the approval of the Competent Authority.

Yours faithfully,

Pankaj Verma

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Copy to:

1). **The Secretary,** Ministry of Mines, Government of India Shastri Bhawan, New Delhi.

2). **The Chief Secretary,** Government of Odisha, Secretariat, Bhubaneswar.
3). **The Secretary,** Department of Environment, Government of Odisha, Secretariat, Bhubaneswar.
4). **The Secretary,** Department of Mines and Geology, Government of Odisha, Secretariat, Bhubaneswar.
5). **The Secretary,** Department of Forests, Government of Odisha, Secretariat, Bhubaneswar.
6). **The Secretary,** Department of Steel and Mines, Government of Odisha, Secretariat, Bhubaneswar.
7). **The Member Secretary,** Odisha Pollution Control Board, Parivesh Bhawan, A/118 Nilakantha Nagar, Unit-VIII, Bhubaneswar-751012.
8). **The Additional Principal Chief Conservator of Forests,** Ministry of Environment, Forest and Climate Change, Regional Office (EZ), A/3, Chandrasekharpur, Bhubaneswar-751023.
9). **The Chief Wildlife Warden,** Prakurti Bhawan, 5th floor, BDA Apartment, Nilakanthanagar, Nayapalli, Bhubaneswar-751012, Odisha.
10). **The Chairman,** Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi–110032.
11). **The Controller General,** Indian Bureau of Mines, Indira Bhavan, Civil Lines, Nagpur-440001.
12). **The Member Secretary,** Central Ground Water Board, Ministry of Agriculture and Irrigation, 12/1 Jam Nagar House, Shahjahan road, New Delhi 110011.
13). **The District Collector,** Sundargarh District, Govt. of Odisha.
14). **Guard File.**
15). **PARIVESH Portal.**

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