स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
रॉ मेटेरियल्स डिवीज़न
RAW MATERIALS DIVISION

Ref.No. SAIL/RMD/BOM/2020/E&L/ 2805

Date: 29.05.2020

To

Member Secretary
IA-Division (Non-coal Mining sector)
Ministry of Environment, Forest and Climate Change,
A-106, Agni Block, 1st Floor, Indira Paryavaran Bhawan,
Jorbagh Road, New Delhi-110003

Sub: Bolani Iron Ore Mine along with Beneficiation and Pellet Plant of M/s Steel Authority of India Limited, located at Village Bolani, Tehsil- Barbil, District Keonjhar, Odisha (5.1 Sq. Mile Mining Lease) – **Amendment in Environmental Clearance granted** vide letter (No. J-11015/418/2008-IA.II (M) dated 21st December, 2012 for Change in change in product mix by including excavation and despatch of iron ore fines from existing Fines Dumps up to 3.0 MTPA (from present 0.5 MTPA) and Modification of Mining parameters including updating of reserves and waste generation keeping total production within approved EC capacity of 12 MTPA under Para 7(ii) of EIA Notification 2006.

Ref.: Minutes of 14th EAC (Non-Coal Mining) Meeting held during 26-27, February, 2020 **(Agenda 2.4)**

Sir,

Inviting your kind attention to the subject & reference cited above, it is to state that the proposal for amendment of Environmental Clearance of Bolani Ores Mines (5.10 Sq Mile ML) of SAIL for change in product mix by including excavation and despatch of iron ore fines from existing Fines Dumps maximum up to 3.0 MTPA (from present 0.5 MTPA) and Modification of Mining parameters including updating of reserves and waste generation keeping total production within approved EC capacity of 12 MTPA under Para 7(ii) of EIA Notification 2006 was considered by EAC in its 14th meeting held during 26-27, February 2020 (**Agenda No. 2.4**) and sought additional information in respect of the proposal. The pointwise clarification / information desired by the EAC is enclosed herewith for your kind perusal.

During above EAC meeting, honorable committee members suggested for a site visit by EAC members and MOEF&CC, GoI, New-Delhi to understand the proposed logistic arrangement for selling of fines as the present proposal involves despatch dump fines by rail or road or both rail & road . Accordingly, as desired by EAC, the desired information has been reviewed by SAIL and its consultant MECON with the help of internal arrangement and technical information related to dump stabilization studies, Transport scenario, Traffic density & road carrying capacity, Excavation plan, Mass balance & quantitative dispatch scenario for lump/fines and Impact on pollution load (increase/decrease) due to proposed excavation & dispatch plan have been reassessed. All information is properly delineated in the attached report.

Contd. p/2

In the present lock down situation across the country, to take preventive measures to prevent spread of COVID – 19, we would like to request the committee to reconsider the proposed visit plan to mines at this juncture.

It may be appreciated that Bolani Ores Mines of SAIL is located in the tribal dominated area in Keonjhar District of Odisha and is playing major role in improving the socio-economic development of the area. The proposed excavation and despatch of the fines from old fines dumps will not only help in effective utilization of the low grade resources but also help in elimination of environmental hazards associated with storage of the fines.

In view of the above, the desired information sought by EAC is herewith submitted for your kind perusal. We earnestly request you to consider the proposal for early grant of amendment of the Environment Clearance of the above referred project so that we will be in a position to supplement the iron ore requirement of the country.

With regards,

Yours faithfully,

29/5/2020

(Arun Kumar Mishra)
Chief General Manager (Mines)
Bolani Ores Mines, RMD, M/s SAIL

अरुण कुमार मिश्रा / Arun Kumar Mishra
मुख्य महाप्रबंधक (खान) / Chief General Manager (Mines)
सेल – आर एम डी – बोलानी–अयस्क खदान
SAIL-RMD-Bolani Ores Mines
बोलानी-758 037, क्योंझर, ओड़ीसा
Bolani-758 037, Keonjhar, Odisha

Encl.: Report containing additional details sought by the Hon'ble EAC (Non-Coal Mining), MoEF &CC, GoI, New- Delhi

ADDITIONAL DETAILS SOUGHT by EAC for

Amendment in Environmental Clearance due to Changes in Project Configuration of 5.1 Square Miles Mining Lease of Bolani Ores Mines of SAIL

STEEL AUTHORITY OF INDIA LIMITED
RAW M ATERIALS DIVISION
INDUSTRY HOUSE, 5TH FLOOR
10, CAM AC STREET
KOLKATA – 700017
Project Proponent

MECON LIMITED
(A Govt. of India Enterprise)
Vivekananda Path
PO. Doranda
Dist– Ranchi,Jharkhand-834002
Certification :NABET/EIA/1619/RA0068
Environmental Consultant

ADDITIONAL DETAILS SOUGHT BY EAC (Non-Coal Mining)

The proposal for Amendment of Environmental Clearance approval letter No. J-11015/418/2008-IA.II(M)dated 21st December, 2012 and amendment dated 17.02.2014 for change in product mix by including excavation and dispatch of accumulated iron ore fines from old Fine Dumps to the tune of 3.0 MTPA, keeping total production within approved EC capacity of 12 MTPA and changes in scope of work pertaining to change in mineable reserve position after detailed exploration of ML area, ensuing increase in estimation of OB/waste quantity and change in mining parameters etc. under Para 7(ii) of EIA Notification was considered in the 14th meeting of the Expert Appraisal Committee (EAC) for Environmental Appraisal of Non-Coal Mining Projects held on 26th February, 2020 (**Agenda 2.4**) in the Ministry of Environment, Forest & Climate Change, Indira Paryavaran Bhawan, New Delhi.

After detailed deliberation, the EAC deferred the project and sought the following additional information:

a) PP need to conduct the dump stabilization studies
b) Transport scenario to be properly calculated and resubmitted
c) Traffic density and road carrying capacity to be calculated
d) Excavation plan to be properly delineated
e) Mass balance to be prepared and quantitative dispatch scenario for lump, fines to be submitted
f) Impact on pollution load (increase/decrease) due to proposed excavation & dispatch plan needs to be submitted.

Point wise reply to above details are given in the following paragraphs-

a) Point 1- PP need to conduct the dump stabilization studies.

Bolani Ores Mines comprises of two adjacent mining leases; 5.1 Sq. Mile Mining Lease (over an area of 1321.45 ha for iron ore) and 6.9 Sq. Mile Mining Lease (over an area of 1586.36 ha for Manganese ore) and has been working for production and despatch of iron ore since 1960. The low grade iron ore fines generated from the 5.1 Sq. Miles Mining Lease (ML) till mid-eighties (before installation & commissioning of fines washing plant and poor off-take of fines) was stacked near the railway siding coming inside both 5.1 Sq. Miles ML and 6.9 Sq. Miles ML. Since installation of fines washing plant / beneficiation plant at Bolani, generated low grade fines are being washed and being dispatched to Steel plants.

There are five old iron ore fines dumps containing about 7.073 million tonnes and lying unutilized since long. To eliminate environmental hazards associated with the storage of fines as well as for effective utilization through beneficiation & pelletisation, Ministry of Mines, Govt. of India vide order dated 16.09.2019 allowed sale of the low grade iron ore fines lying at captive mines of SAIL. In this regard, the old iron ore fines dumps at Bolani Ores Mines have been jointly inspected and surveyed the quantities stacked in each of the fines dumps by officials from Dept. of Mines & Geology, Govt. of Odisha, Indian Bureau of Mines, Bhubaneswar & SAIL during February, 2020. The details of these iron ore fines dumps at the Bolani Ores Mines are given in the following tables.

Table 1 - Iron Ore Quantities stacked in Dumps at Bolani Ores Mines

Sl. No	Dump	Quantity In fines dump (in million tonnes)		
		5.10 sq. mile ML	6.90 sq. mile ML	Total
1	Dump 1	1.197	3.066	4.263
2	Dump 2	0.898	1.057	1.955
3	Dump 3 (Near DH–5)	0.556	-	0.556
4	Dump 4 (Near MRS)	0.212	-	0.212
5	Dump 5 (Near MRS)	0.087	-	0.087
	Total	**2.950**	**4.123**	**7.073**

Table 2 - Size of Dumps at Bolani Ores Mines

Sl.	Dump	5.10 sq. mile ML			6.90 sq. mile ML		
		Bottom Area (m^2)	Max. Height (m)	Avg. Height (m)	Bottom Area (m^2)	Max. Height (m)	Avg. Height (m)
1	Dump 1	24965	35	25	82765	35	34.6
2	Dump 2	19904	28	28	27779	28	28
3	Dump 3	26328	25	17.5	-	-	-
4	Dump 4	4196	14	13.2	-	-	-
5	Dump 5	16123	10	8.2	-	-	-

It can be observed from the above tables that all these dumps are very low height ranging from 10 m to 35 m occupying over areas ranging from 0.4 h to 10.7 ha. A map showing plans and sections of the iron ore fines dumps at Bolani Ores Mines is enclosed at **Annexure – 1**.

The iron ore fines dump are very old and stable for more than 3 decades. In order to stabilize the fine dumps and control of erosion, the following measures have been undertaken under the guidance and association with of IIT Kharagpur:

- Planation with grasses / vetiver over these dumps.
- Terracing, grass seeding and application of coir matting over steep dump slopes
- Retailing walls and garland drains with settling pits to control the surface runoff

Photographs showing the dump stabilization measures at fines dumps of Bolani Ores Mines are given below:

Retaining Wall at Dump - 1

Retaining wall at Dump – 2


Retaining wall with garland drains & settling pit at Dump – 3 near DH - 5

All the aforementioned measures and lying unutilized since more than three decades, the iron ore fines dumps are stable and intact. Under the instant proposal, it has been proposed to excavate the iron ore fines from the top of the dumps by deploying small capacity excavators and dumpers / trippers combination maintaining proper height & width of benches without involving drilling and blasting for selling in open market or dispatch to external pellet conversion agents. Further, it has been planned to excavate the fines up to 3 MTPA and liquidate the entire old fines dump at the earliest.

It can be observed from the above photographs and filed positions that the iron ore fines dumps at Bolani Ores Mines have been stable over more than three decades and no sign of slope failure has been observed till date. Hence, keeping in view of the stable dumps having low height ranges from 10 m to 35 m, excavation of fines from the top slicing method with proper benching by deploying small capacity excavators and trippers can be done safely without any slope failure issues. During the process of excavation, due care will be taken towards abatement of environmental conditions and ensure safety in working.

b) <u>Point 2- Transport scenario to be properly calculated and resubmitted</u>

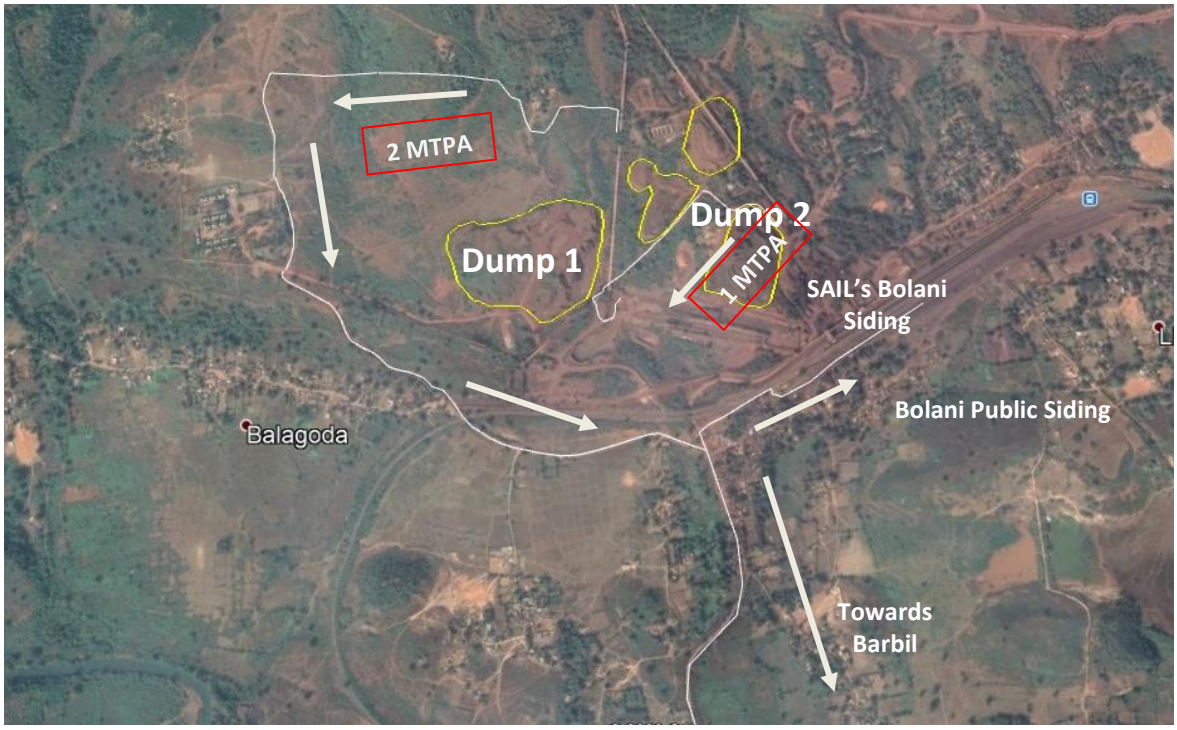
In the present proposal, it has been proposed that 3 MTPA fines will be excavated from the old fines dumps and dispatched for selling in open market or pellet conversion. 1 MTPA of the excavated fines will be transported through SAIL's own roads to the existing mechanized loading facilities at nearby SAIL's Bolani Railway Siding for final dispatch by rail. The rest 2 MTPA will be dispatched by 18 t tipper trucks up to Public Sidings at Bolani / Barbil and thereafter by rail or directly by road as decided by the successful buyers / pellet conversion agencies. The following roads will be used for transport of excavated fines from the Fines Dumps:

- SAIL's own internal road from fines dump to SAIL's Bolani Rly Siding
- Public Road from Bolani-Barbil PWD Road up to W.Hutting Chowk
- Public Road to Bolani Public Siding
- Public Road from Bolani to Barbil Rly. Siding & beyond

Road from Bolani – Barbil PWD Road up to W.Hutting Chowk

Public Road from Bolani to Barbil Rly. Siding & beyond

The proposed ore transport routes from the fines dumps to SAIL's Bolani Siding and Bolani Public Siding as well as route to Barbil are shown in the following Figure.



Proposed plan of Transportation of fines from dumps

It has been planned to transport the excavated fines from the dumps for about 309 days in a year and 12 hours per day. The expected traffic scenario over the proposed ore transport roads for transport of the excavated fines under the present proposal are given in the following tables.

Table 3 - Expected Traffic Over internal road leading to SAIL's Bolani Siding

Transportation of fines from Fines Dumps to SAIL's Bolani Siding	:	1.0 million tonnes per annum
No. of working days per annum	:	309 days
No. of working hours per day	:	12 hrs
Length of transport road from Dumps to SAIL's Bolani Railway Sidings	:	about 0.8 km
Quantity of fines transportation per day	:	About 3250 TPD
Capacity of trucks to be deployed for transportation of excavated dump fines	:	18 t
No. of truck trips per day	:	180 per day (one way) 360 per day (both ways)
Hourly traffic per hour	:	30 per hour (both ways)

Table 4 – Expected Traffic Over Bolani-Barbil PWD Road up to W.Hutting Chowk

Transportation of fines from dumps over the road	:	2.0 million tonnes per annum
No. of working days per annum	:	309 days
No. of working hours per day	:	12 hrs.
Length of transport PWD Road upto W Hutting Chowk	:	1.5 km
Type of Road	:	Two lane block topped
Quantity of fines transportation per day	:	About 6,500 TPD
Capacity of trucks to be deployed for transportation of excavated fines	:	18 t
No. of truck trips per day	:	360 per day (one way) 720 per day (both ways)
Hourly traffic per hour	:	60 per hour (both ways)

Table 5 – Expected Traffic Over Road from W Huttng Chowk to Bolani Public Siding

Maximum expected transportation of fines to Bolani Public Siding	:	1.0 million tonnes per annum
No. of working days per annum	:	309 days
No. of working hours per day	:	12 hrs.
Type of Road	:	Intermediate lane
Length of transport road from Bolani-Barbil Road near W.Huttings to Bolani Public Siding	:	1.0 km
Quantity of dump excavation & transportation per day	:	About 3250 TPD
Capacity of trucks to be deployed	:	18 t
No. of truck trips per day	:	180 per day (one way) 360 per day (both ways)
Hourly traffic per hour	:	30 per hour (both ways)

Table 6 – Expected Traffic Over Bolani - Barbil Road up to Barbil Rly Siding or beyond

Expected transportation of fines to Barbil Public Siding or further by road	:	1.0 million tonnes per annum
No. of working days per annum	:	309 days
No. of working hours per day	:	12 hrs.
Type of Road	:	Two lane block topped
Length of transport road from Bolani-Barbil Road near W.Huttings to Barbil Rly Siding	:	8 km
Quantity of dump excavation & transportation per day	:	About 3250 TPD
Capacity of trucks to be deployed for transportation of dump fines	:	18 t
No. of truck trips per day	:	180 per day (one way) 360 per day (both ways)
Hourly traffic per hour	:	30 per hour (both ways)

c) <u>Point 3- Traffic density and road carrying capacity to be calculated</u>

The major impact on public transport infrastructure is from the proposed dispatch of 2 MTPA from the Dumps to Public Sidings at Bolani or Barbil. The fines from the dumps to the tune of 2 MTPA will be despatched in 18 t capacity tipper trucks upto Public Sidings at Bolani or Barbil and thereafter by rail or directly road beyond Barbil as per the suitability of the successful bidders/buyer or pellet conversion agents. The existing traffic levels, carrying capacity of the roads and expected increase from the proposed transport of fines over the public roads are as follows:

Bolani – Barbil Road (Two Lane Black Topped Road)

As per IRC:64 "Guidelines for Capacity of Roads in Rural Areas", the recommended design service volume for two lane roads on plain terrain with low curvature (<51°/km) is 15000 Passenger Car Units (PCUs) per day and the reduction factor for 3.5 m wide lane and shoulder width of 1.2 m is 0.92. The Bolani – Barbil Road can be classified under this category. Accordingly, the recommended design service volume comes down to 13800 PCUs/day. The present average traffic on the Bolani – Barbil Road is 5290 PCUs/day with max of 7425 PCUs/day. Even considering the maximum existing traffic, the road has additional capacity of 6375 PCUs/day i.e. 2125 trucks/day can ply on the road. Therefore even assuming entire 2 MTPA is transported to Barbil (i.e. worst scenario), the expected increase in traffic will be 720 trucks per day i.e. 2160 PCUs per day. Therefore, the road will be able to handle the additional truck traffic to & from Bolani.

Even in the worst scenario, the transport of fines from Bolani will take place over 12 hours during day time, the capacity of the road may be reduced to 6900 PCUs over 12 hours. The traffic as measured over 0600 – 1800 hrs varied from 1762 to 4549 PCUs (Average ~2985 PCUs). The resultant traffic on the Bolani-Barbil Road due additional load from transport 2 MTPA fines will thus increase to ~6710 PCUs maximum over 12 hours which is still within the recommended design service volume. Therefore, the road will be able to handle the additional truck traffic to & from Bolani.

Public Road from W Hutting to Bolani Public Siding (Intermediate Lane)

The road going to Bolani Public Siding is an Intermediate Lane Road. Accordingly, as per IRC:64, the recommended design service is 5520 PCUs/day. The traffic on this road varies from 769 to 3735 (average: 1886) PCUs/day. Even in the worst scenario, the transport of fines from Bolani will take place only over 12 hours during day time, the capacity of the road may be reduced to 2760 PCUs over 12 hours.

The approach road to Bolani Public Siding is a short stretch of intermediate lane road which is used by private operators to approach Bolani Public Siding as and when required. It is expected that maximum about 1 MTPA may be transported from the Bolani Public Siding, which is expected to increase 180 trucks per day i.e. 1080 PCUs per day. The traffic as measured over 0600 – 1800 hrs varied from 591 to 1453 PCUs (Average ~783 PCUs). The resultant maximum traffic will be 2533 PCUs during 0600 – 1800 hrs which is still within the recommended design service volume. Therefore, the road will be able to handle the additional truck traffic to & from Bolani.

d) <u>Point 4- Excavation plan to be properly delineated.</u>

Bolani 5.1 Sq. Mile ML of Bolani Ores Mines is spread over an area of 1321.45 ha. The Mining Lease comprises of F, G, D, Panposh and B & C mining blocks along with Ore Processing plants, material despatch facilities (loading plant along with railway siding) and other ancillary infrastructures existing within SAIL's adjoining Bolani 6.9 Sq. Mile ML. MoEFCC granted environmental clearance for 5.1 Sq. Miles ML of Bolani Ores Mines vide their letter no. J-11015/418/2008-IA.II(M) dated 21st December, 2012 for annual production capacity of production of 12 MTPA (which includes excavation of 0.5 MTPA fines from fines dump) along with setting up of beneficiation plant of 12 MTPA capacity and a palletisation plant of 4 MTPA capacity.

The Bolani Ores Mines is open cast fully mechanized mines and fall under Category-A (Fully Mechanized category) as per the IBM guidelines. Mining is being done by conventional opencast mining method with shovel dumper combination as per the calendar plan of excavation as approved in the Review of Mining Plan.

In compliance to directions of Ministry of Mines, GoI for effective use of these low grade mineral, Bolani Ores Mines has planned for eexcavation of fines from old Fines Dumps maximum up to 3.0 MTPA and dispatch through rail / road or road & rail combination for selling in open market / dispatch to external pellet conversion agents keeping total production within the approved EC limit of 12.0 MTPA. The planned and IBM approved excavation plan during 2020-21 to 2024 -25 from 5.1 Sq. Miles Mining Lease of Bolani Ores Mines is given in the following table.

Table 7- Approved Excavation Plan of Bolani Ores Mines (5.1 Sq. Miles Lease)

Year	ROM (million tonne)			Excavation of fines from old Fines Dump (max.) (million tonnes)	Total excavation (ROM + Fines) (million tonnes)	Overburden (million m^3)
	Ore	Sub-grade	Total ROM			
2020 - 21	6.49	2.43	8.92	3.0	11.92	1.80
2021 - 22	8.95	3.02	11.97	-	11.97	1.04
2022 - 23	11.83	0.13	11.96	-	11.96	0.76
2023 - 24	9.95	2.04	11.99	-	11.99	0.80
2024 - 25	9.15	2.78	11.93	-	11.93	0.88

It is submitted that it has been planned to excavate and dispatch the about 3 MTPA fines stacked in the 5.1 Sq. Mile lease during 2020-21. However, in case the planned 3 MTPA iron ore fines from the Fines Dump will not be excavated completely / partially due to certain unavoidable reasons, the remaining left out iron ore fines from Fines Dumps in the 5.1 Sq. Miles Lease will be excavated and dispatched during subsequent years keeping the total iron ore production i.e. ROM from mines & fines from the Fine Dumps within the EC capacity of 12 MTPA.

e) <u>Point 5- Mass balance to be prepared and quantitative despatch scenario for lump, fines to be submitted:-</u>

Mass balance for quantitative despatch scenario for lump, fines from in suite reserves and fines from fines dumps before and after the present proposal shall be as follows-

Table 8 – Comparative Mass balance as per Original EC Configuration and proposed excavation & dispatch of fines

Attribute	As per Original EC	As per Present Proposal	Remarks
Lease Area	1321.45 ha	1321.45 ha	No Change
Production Capacity	12 MTPA (including 0.5 excavation from fines dumps)	12 MTPA (including excavation of fines from fines dumps maximum up to 3 MTPA)	No Change in total iron ore production but change in product mix
Excavation of fines from fines dumps	0.5 MTPA	3 MTPA	Increase by 2.5 MTPA till liquidation of fines
Method of Mining	Conventional Open Cast Mining by Shovel-Dumper Combination and including drilling & blasting for ROM. Only excavation without drilling & blasting for fines from the Fines Dumps.	Conventional Open Cast Mining by Shovel-Dumper Combination and including drilling & blasting for ROM. Only excavation without drilling & blasting for fines from the Fines Dumps.	No Change
OB Generation	1.12 Mm^3/Year	0.84 Mm^3/Year	Reduction by up to 25% till liquidation of fines
Production	Processed Ore : Iron Ore Lumps + Fines ~10 MTPA (Lump proportion: ~ 30%)	Processed Ore : Iron Ore Lumps + Fines ~ 7.5 MTPA (Lump proportion: ~ 30%) & low grade fines: 3 MTPA (max.)	Change in product mix till liquidation of fines from the Fines Dumps.
Explosives Consumption	1500 ton/yr	1200 ton/yr	Up to ~25% reduction till liquidation of fines
Make-up water requirement for ore beneficiation	8000 m^3/day	6000 m^3/day	
Area covered by exposed Fines dumps in 5.1 Sq. Miles Lease	9.15 ha	-	After liquidation of fines, reduction in generation of dust and surface runoff
Mode of material dispatch of ore	100 % by rail	Processed lumps + fines by rail. 1 MTPA excavated fines by rail & 2 MTPA by road, rail and road & rail.	Increase in road dispatch by up to 2 MTPA max till liquidation of fines.
PM_{10} Pollution Load	20.02	19.57	Decrease
# Less water consumption by beneficiation plant which will process less amount of ore. It is to be noted that proposed 4 MTPA Pelletisation Plant is still under planning stage.			

f) Point 6- Impact on pollution load (increase/decrease) due to proposed excavation & dispatch plan needs to be submitted.

Impact prediction has been carried out for the following two scenarios

1. Configuration as per existing EC i.e. Mining of 12 MTPA of ore from pit area and transport via conveyor/rail.
2. Future scenario i.e. mining of 9.0 MTPA of ore from pit area and excavation of 3.0 MTPA of fines from the old fines dumps and transport via road/rail.

Table 9 – Input Data

Parameter	Unit	Quantity at present	Quantity in future after proposed changes till liquidation of fines
Annual Production (Mining)	MTPA	12	9 ROM + 3 fines from old fines dumps
Transport of fines from Dumps	MTPA	-	3.0 (via Road/Rail)
ROM/Waste Ratio (Avg. : 2020-21 to 2024 -25)	t/m^3	10.73	10.73
OB generation	Mm^3/Yr	1.12	0.84
Operating Hrs	hrs/Day	24	24 (Mining) 12 (for fines transport minimum)
Days of Operation	Days/Yr	309	309
Lease Area	km2	13.2145	13.2145
Loader volume	m3	8	8
Dumper Capacity	T	100	100
Truck Capacity (For fines transport)	T	-	18
Avg Speed of Dumper	Km/hr	15	15
Waste Moisture	%	15	15
Waste Silt Content	%	5	5
Waste Drop Height	m	2	2
Ore Moisture	%	10	10
Ore Silt Content	%	3	3
Ore Drop Height	m	2	2
Haul Road Moisture Content	%	20	20
Haul Road Silt Content	%	15	15
Mean wind Speed	m/s	2	2

After the proposed changes, in addition to mining of 9.0 MTPA of ore (existing 12 MTPA), fines from dumps shall be excavated and material will be transported by road/railways at the rate of 3.0 MTPA maximum. Total iron ore production shall remain 12.0 MTPA as per EC. The estimated PM10 pollution load from all the activities Bolani 5.1 Sq. Miles Mining operations before and after the proposed changes are as follows.

Table 7 – PM Emission Load from various Mining Activities

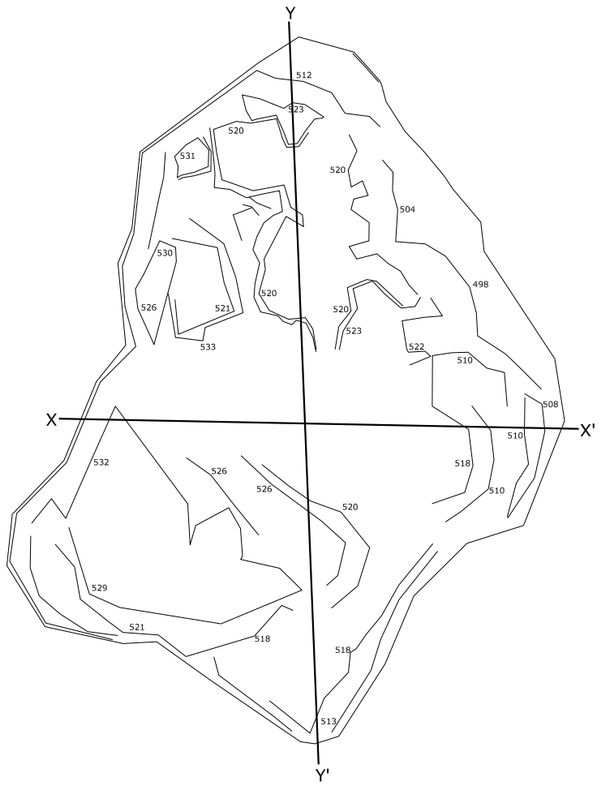
Sl. No.	Area/Activity	Emission rates (g/s)	
		(Existing)	(After Proposed changes)
1	Bolani 5.1 Mine including Emissions from Pits, OB Dumps and material handling	2.75	2.45
2	Emissions from haul roads during material transportation in and around mine pit	17.27	16.22
3	Excavation and Dispatch of fines form fines dumps (@3 MTPA)	-	0.91
	Total	**20.02**	**19.57**
	Net Change	**-0.44 g/s (-2.22%)**	

An overall decrease in PM pollution load is anticipated due to present proposal. On liquidation of fines form the old fines dumps, the environmental hazards associated with the iron ore fines dumps is likely to be eliminated.

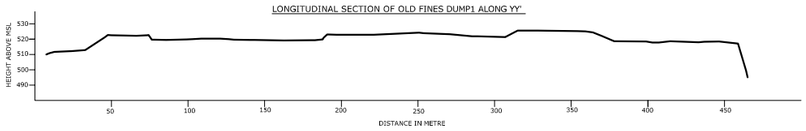
****

ANNEXURE-1

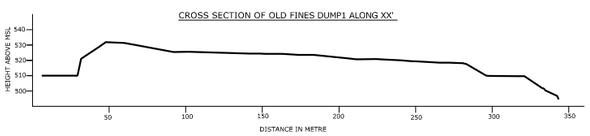
OLD FINES DUMP 1



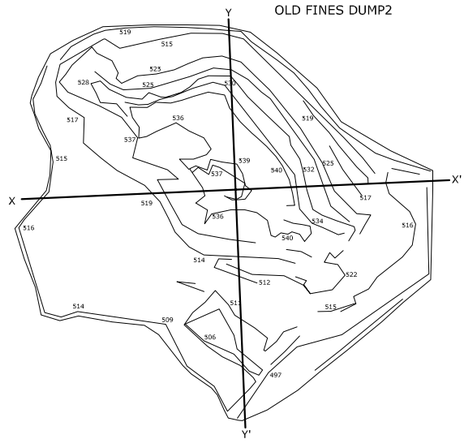
LONGITUDINAL SECTION OF OLD FINES DUMP1 ALONG YY'



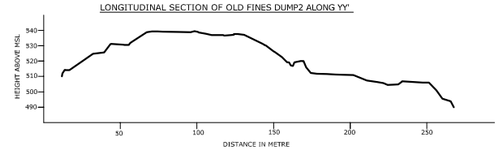
CROSS SECTION OF OLD FINES DUMP1 ALONG XX'



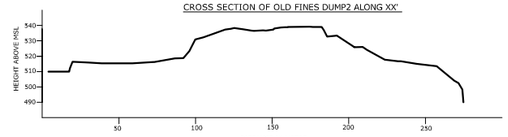
OLD FINES DUMP2



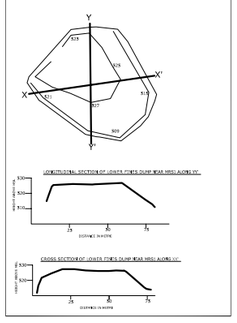
LONGITUDINAL SECTION OF OLD FINES DUMP2 ALONG YY'



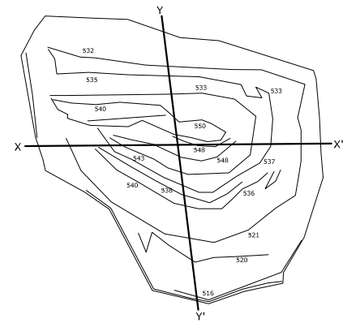
CROSS SECTION OF OLD FINES DUMP2 ALONG XX'



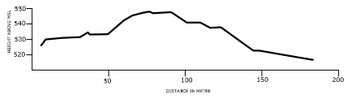
DUMP-5 (NEAR MRS)



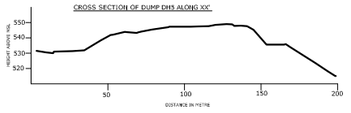
DUMP-3 (NEAR DH-5)



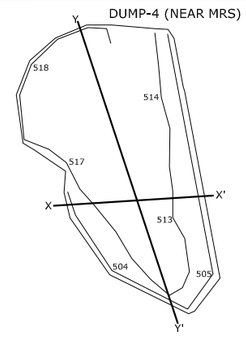
LONGITUDINAL SECTION OF DUMP DH5 ALONG YY'

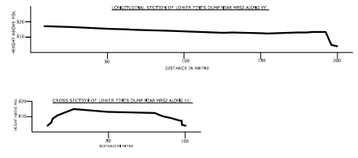


CROSS SECTION OF DUMP DH5 ALONG XX'



DUMP-4 (NEAR MRS)





स्टील अथारिटी आफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LTD.

RAW MATERIALS DIVISION

BOLANI ORES MINES, BOLANI

PLAN,LONGITUDINAL AND CROSS SECTION OF FINES DUMPS

PLANNING AND DEVELOPMENT WING, ROURKELA

SCALE 1 : 4000