स्टील अथॉरिटी ऑफ इंडिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
राउरकेला इस्पात संयंत्र
ROURKELA STEEL PLANT
बोलानी अयस्क खदान
BOLANI ORES MINES

Letter No. : CGM/ESL/1480 Date : 26/09/24

To

The Member Secretary,
State Pollution Control Board,
Paribesh Bhawan, A/118, Nilkantha Nagar, Unit – VIII,
Bhubaneshwar – 751 012, Odisha

Sub: Submission of Environmental Statements of both 5.10 sq. miles ML & 6.90 sq. miles ML of Bolani Ores Mines for the year 2023-24

Sir,

Please find enclosed herewith the Annual Environmental Statements of Bolani Iron Ore Mines (5.10 sq. miles ML) & Bolani Manganese & Iron Ore Mines (6.90 sq. miles ML) of Bolani Ores Mines, RSP-SAIL for the period of Apr'23 to Mar'24, duly filled in Form-V as per the prescribed format of SPCB, Odisha. The report also contains the updated status of environmental monitoring reports pertaining to the above period.

Thanking you,

Yours Faithfully,

26/09/24

Chief General Manager (Mines)
Bolani Ores Mines,RSP-SAIL

जयदेव चट्टोपाध्याय/Joydev Chattopadhyay
मुख्य महाप्रबंधक (खान) / Chief General Manager (Mines)
सेल-आर.एस.पी-बोलानी अयस्क खदान
SAIL-RSP-Bolani Ores Mines
बोलानी-758037, क्योंझर, ओडीसा
Bolani-758 037, Keonjhar, Odisha

30/9/24

Encls. : As Above

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(1) Regional Officer, State Pollution Control Board, Keonjhar

ENVIRONMENTAL STATEMENT
Year: 2023-24
Bolani Iron Ore Mines
(5.10 Sq. Miles ML)
BOLANI ORES MINES

STEEL AUTHORITY OF INDIA LIMITED
ROURKELA STEEL PLANT
BOLANI ORES MINES (BOM)
KHEONJHAR (DIST.)
ODISHA – 758037

FORM – V

Environmental Statement for the financial year ending 31st March 2024

PART – A

(i)	**Name and address of the owner/occupier of the industry operation or process.**	:	Bolani Iron Ore Mines (5.10 sq. miles ML) Bolani Ores Mines P.O- Bolani, Dist. : Keonjhar Pin- 758037, Odisha	
	Occupier	:	Bolani Ores Mines, RSP-SAIL	
	Agent	:	Shri Joydev Chattopadhyay Chief General Manager(Mines), BOM	
	Nominated Owner	:	Shri Atanu Bhowmick, Director I/c Rourkela Steel Plant	
(ii)	**Industry category Primary - (STC code) Secondary - (SIC Code)**	:	Open Cast Iron Ore Mine	
(iii)	**Production capacity**	:	Permitted capacity	: 12 MTPA
			Total ROM	: 7709258 T
			CLO	: 2671950 T
			Fines	: 4988068 T
			Total Finished product	: 7660018 T
(iv)	**Year of establishment**	:	1960	
(v)	**Date of the last environmental statement submitted**	:	28.07.2023	

PART – B

Water and Raw Material Consumption

(1) Water consumption m^3/day

Process	NIL
Cooling	455 (including dust suppression)
Domestic	856

Name of Products	*Process water consumption per unit of product output*	
	During the previous financial year (2021-22)	*During the Current financial (2022-23)*
(1) Washed Iron Ore	-	-

(2) Raw Material Consumption

Name of raw materials	*Name of products*	*Process water consumption per unit of product output*	
		During the previous financial year (2022-23)	*During the Current financial (2023-24)*
Diesel	-	2561170 ltrs	2802215 ltrs
Lubricants	-	111715 Ltrs	138890 Ltrs
Gas	-	5798 Cum	7102 Cum
Grease	-	22849 Kg	24365 Kg
Explosives	-	1354606 kg	1455390kg
Electricity	-	21197376 kWH	19965974 kWH

This is an opencast mine producing iron ore. Run-of-Mine (ROM) from the mine is processed to produce sized ore products. The ROM production during 2023-24 is 7.70 Million Tonne and during 2022-23 was 7.20 Million Tonne.

PART - C

Pollution discharged to environment / unit of output

a) Water Environment

Pollutants	*Quality of pollutants generated (mass/volume)*	*Concentrations of pollutants in discharges*	*Percentage of variation from prescribed standards with reason.* ***Standard***
1. **Process Effluent:** The Ore Beneficiation Plant was not operational during 2023-24. However, there is a system for treatment of the effluent generated from ore washing process in thickeners. The clear water from the thickeners is recycled back and the under flow slurry is discharged to the Tailings Pond in the adjoining 6.90 sq. miles ML of BOM.			
2. **Domestic Effluents:** No Domestic effluents are discharged to Natural Streams. The domestic effluent generated from the office area is directed to soak pits via intermediate septic tanks.			
3. **Workshop Effluents:** Workshop effluents are treated in ETPs provided at respective sites. The overflow is utilized for vehicle washing and gardening purposes.			

Location :- Oil Catch Pit Water Bottom Garage			
Test Parameters	Unit	Results	Desirable Limit
pH	mg/l	6.62 at 25^{O}C	5.5 – 9.0
TSS	mg/l	69.62 mg/l	500 mg/l
Oil & Grease	mg/l	5.1	10 mg/l
BOD	mg/l	17.27	30 mg/l
COD	mg/l	121.5	250 mg/l
Iron (Fe)	mg/l	2.75 mg/l	3 mg/l

Location :- Oil Catch Pit Water at G-area/CBRS			
Test Parameters	Unit	Results	Desirable Limit
pH	mg/l	6.38	5.5 – 9.0
TSS	mg/l	18	500 mg/l
Oil & Grease	mg/l	2.6	10 mg/l
BOD	mg/l	6.95	30 mg/l
COD	mg/l	27	250 mg/l
Iron (Fe)	mg/l	1.46	3 mg/l

b) Air Environment

This is an opencast mine and the air emissions are fugitive in nature mainly containing dust particles. The fugitive emissions are being controlled through various dust prevention and control measures. Hence, the quantity of air pollutants discharged in Kg/day cannot be ascertained. The annual average ambient air quality in and around the mines for the year 2023-24 is given below:

Unit: microgram/m^3

Pollutants	*Quality of pollutants generated (mass/volume)*	*Concentrations of pollutants in discharges ($\mu g/m^3$) except for CO(mg/m^3)*	*Percentage of variation from prescribed standards with reason.* ***Standard***
Location :- Bolani Community Center			
PM10	-	70.4	100 µg/m3
PM2.5	-	27.94	60 µg/m3
SO_2	-	14.11	80 µg/m3
NO_2	-	14.64	80 µg/m3
CO	-	0.42	04 mg/m3
Location :- DAV Public school			
PM10	-	75.24	100 µg/m3
PM2.5	-	22.87	60 µg/m3
SO_2	-	14.32	80 µg/m3
NO_2	-	14.88	80 µg/m3
CO	-	0.41	04 mg/m3
Location :- Main gate			
PM10	-	85.38	100 µg/m3
PM2.5	-	22.12	60 µg/m3
SO_2	-	14.94	80 µg/m3
NO_2	-	14.56	80 µg/m3
CO	-	0.42	04 mg/m3
Location :- Colony Nursery			
PM10	-	65.37	100 µg/m3
PM2.5	-	19.04	60 µg/m3
SO_2	-	18.25	80 µg/m3
NO_2	-	14.61	80 µg/m3
CO	-	0.53	04 mg/m3
Location :- Nimtur Village			
PM10	-	58.7275	100 µg/m3
PM2.5	-	23.655	60 µg/m3
Location :- Karo Guest House			
PM10	-	47.7775	100 µg/m3
PM2.5	-	19.45	60 µg/m3

PART –D
Hazardous Wastes

Hazardous Wastes	Total Quantity(kg)	
	During the previous Financial Year (2022-23)	During the current Financial Year (2023-24)
a) From Process	Burnt Oil – 33.81 KLtr Oil Containing Wastes –10Kg	Burnt Oil – 38.64 KLtr Oil Containing Wastes –15 Kg
b) From Pollution Control facilities	5.5 Kg slits from hazardous waste pits / oil catch trap	10 Kg slits from hazardous waste pits / oil catch trap

PART – E
Solid Wastes

Wastes	Total Quantity(Tonnes)	
	During the previous Financial Year (2022-23)	During the current Financial Year (2023-24)
(a) From Process (1) Overburden / rejects (2) Ore washing slimes	 1,354,498 T NIL	 1307252.5 T NIL
(b) From Pollution Control facilities	NIL	NIL
(c) (1) Quantity recycled or re- utilized within the unit (2) Sold (3) Disposal	Disposed	Disposed

PART –F

No Hazardous waste is generated from the mining process except used oil which is drained from Machineries / Equipment and auctioned to the CPCB authorized recyclers.

Description of Hazardous / Solid Waste	Temporary Disposal practice
Used Oil (Oil & Lubricants)	Centrally placed disposal yard with an enclosed shed and Concrete flooring having spillage containment facility, has been earmarked for storage of Used Oil sourced from various departments. 3 nos. of Oil collection systems are established, Oil is collected through pipe into barrels placed on the concrete floor, sealed properly and securely stored at the Site till further disposal through SPCB/CPCB authorized vendors.
Empty Oil barrels.	Empty MSD Oil drums collected from various departments after the auction of Used Oil to authorized vendor are stacked on concrete floor within shed inside scrap yard. They are auctioned to authorized vendors.
Wastes Containing Oil e.g. filters / jutes, sludge etc.	3 nos of impervious Pits have been constructed at Bottom Garage, CBRS and Electrical Workshop for disposal of oil containing wastes. 3.14 metric Tonnes of Wastes containing Oil filters, jutes etc has been disposed through Ramky Enviro Engineers Ltd. during 2017-18.
Used batteries.	Used batteries are shifted to the storage yard, as and when generated. These are sold by auction to authorized recyclers.
Overburden from mines.	Mostly lateritic in nature, Overburden (OB) generated from mines is used in back filling the excavated quarry of F- area and Panposh; and in G & D – areas, OB is dumped in earmarked OB dumps.
Tailings	Tailings / Slime are discharged to designated Tailing pond within adjoining 6.90 sq. miles ML of Bolani Ores Mines.
E-Waste	The E-waste report for the year 2023-24 has been submitted vide our letter No. BOM/CGM Sectt./2024-25/B-677 Dt.15/06/2024.

PART – G

Impact of pollution control measures on conservation of natural resources and consequently on the cost of production.

1. Systematic and procedural mining operations are carried out.
2. Strict Blending Norms to cater to the needs of Steel Plants are in place for optimal utilization of low-grade Ore.
3. Separate storage of Sub-grade Mineral for later utilization.
4. Controlled Blasting Techniques for optimum Ore fragmentation are followed
5. Extensive Geological mapping and updating Resource/reserve charts by conducting regular Exploration programmes.
6. Mineral Conservation Awareness classes are conducted on regular basis at Mines Vocational Training Centre, Bolani.
7. Checkdams and Settling ponds are built across the nallah courses to mitigate the silt flow.
8. Plantation had been undertaken within ML area for carbon sequestration, Soil erosion control and trapping airborne dust.

PART-H

Environmental Protection Measures undertaken for abatement of pollution.

SL.	ISSUES	POLLUTION ABATEMENT MEASURES
i.	**Top soil preservation & utilization**	The top soil excavated till date has been utilized for reclamation & rehabilitation of dumps. The entire quantity of topsoil generated during 2023-24was utilized for plantation and nursery development.
ii.	**Reclamation of Mined out Land**	Mineral Deposits have not been exhausted beyond the Cut-off point. Progressive Mine Closure/Back-filling has been taken up in F & Panposh Areas. The Backfilled portion of the mines (F-area) has already been reclaimed by plantation of 25000 saplings over the years with 75% survival rate. No Backfilling undertaken in 2023-24.
iii.	**OB/Fines Dump rehabilitation**	All the OB Dumps were active during 2023-24. Hence rehabilitation through plantation of any OB dump could not be done during 2023-24. However, 275 nos. of saplings have been planted over 0.2 ha of Dump fines evacuated area near Fines handling area in 2023-24.
iv.	**Management of Run off from Dump areas**	De-silting of Panposh nallah was done with an financial expenditure of Rs.2759487/- during 2023-24.
v.	**Afforestation activities**	A total 3084 nos. of saplings have been planted over 1.4 ha of degraded forest land and causality replacement during 2023-24.
vi.	**Air quality Management**	i. Dry Fog Dust Suppression system covering the entire Ore Crushing, Primary Stock Pile and Washing Plant circuit including the Primary Feed Hopper, has been installed. ii. All the Drill machines are equipped with Dust suppression and water injection systems. iii. Pre-wetting of blasting site is practiced to control blasting emissions. iv. 03 nos. of 28KL and 03 nos. of 09 KL mobile sprinklers are used to control fugitive emissions on haul roads v. High Pressure Fixed sprinklers installed at Feed hopper of 600 TPH plant. vi. Ore transferred through Covered conveyor gallery of 3200 m(approx..) from Hilltop Plant to

		Ore Dispatch site. vii. Fixed water sprinklers are installed near 600TPH stock Yard, along the 600TPH plant, Panposh and F& G area haul road. viii. 06 nos. of Fog cannons (02 nos at Lump loading plant, 02 nos at Fines Loading plant and 02 nos at SSP) have been installed to mitigate air borne dust.
vii.	**Water Quality Management**	i. Provision for recycling more than 50% of water used in Ore beneficiation by recirculating to system using 02(two) Thickeners. ii. 02(two) flow meters are installed to monitor industrial water usage. iii. 3 nos. of ETPs (Oil and Grease catch traps) have been provided at mechanical workshops and equipment washing junctions to collect and treat workshop effluent. iv. Checkdams and Settling ponds are built across the nallah courses to mitigate the silt flow.
viii.	**Hazardous Waste management**	Facilities provided for temporary storage of hazardous wastes for centralized auction. Oil contaminated wastes disposed in impervious pits and Oil and grease catch traps have been provided at vehicle maintenance areas to prevent oil and grease pollution.
ix.	**Noise**	(i) Provision of ear plugs to workers posted at high noise level sites. (ii) Regular maintenance of HEMMs. (iii) Plantation has been done around Washing plant, Loading plant and Mining areas to act as Noise Barriers (iv) Audiometric tests of all the employees conducted as a part of Personal Medical Examination (PME) indicates no abnormality.

x.	**Ground Vibration**	(i) Use of SMS (slurry) explosives, (ii) Use of delay detonator (iii) Blasting only for loosening of the strata and explosive charge reduced to avoid fly rocks. (iv) Restricting number of blast holes at any point of time to control ground vibration (v) Blast vibration monitoring is carried out by expert agency at regular interval.
xi.	**Forest Fire Prevention**	10 nos. of forest watchers have been engaged for Forest fire prevention by fire line creation and maintenance during the months of Feb'24-Aug'24 at a cost of Rs.13.84 lakhs.
xii.	**Environmental Monitoring**	AAQ, Fugitive Dust and Water Quality monitoring at Bolani Ores Mines were outsourced to M/s Ecomen Mining Pvt. Ltd., a NABL accredited laboratory, in conformance with the stipulations in EC and CTO. 04(four) nos. of CAAQMS stations were installed at a cost of Rs.1.75 (approx.) crores as per the directive of MS, SPCB and stipulation in CTO grant order.
xiii.	**Scientific Studies**	A Biological Study to identify and preserve orchids within both 5.10 and 6.90 sq. miles MLs of BOM has been conducted and the report has been submitted to MoEF&CC vide no. BOM/ENV/HD-1707A Dt.17.07.2019 for technical approval of the said report.
xiv.	**Wild Life conservation**	SSWCP has been prepared as per guidelines of Chief Wildlife Warden by engaging an expert agency. The plan was approved by the State Forest and Wildlife Department vide order no 4506/1 WL(C)SSP-126/2012 Dt. 23.06.2014 with a total financial implication of Rs.1676.41 lakhs to Bolani Ores Mines, M/s SAIL which is under implementation.

PART – I

Additional environment protection and abatement of pollution measures undertaken in 2023-24:

1. Creating awareness amongst employees and public regarding protection of environment by observing Vana Mahotsav week, Earth Day, World Environment day and Mines Environment & Mineral Conservation week.
2. Display of Boards carrying environmental slogans. LED display boards for displaying environment monitoring data & environment care.
3. Celebration for Mass awareness by slogans, working models & Cultural Program by employees & school children in Mines Environment & Mineral Conservation week under the aegis of IBM.
4. Free distribution of over 10,000 saplings developed in Nursery of BOM, to local dwellers till date.
5. Bolani Ores Mines has also implemented Environment Management System (EMS) as per ISO 14001:2015 standard, Quality Management System (QMS) as per ISO 9001:2015 standard and Occupational Health and Safety Management System (OH&S) as per ISO 45001:2018 standard certified by BSI.
6. Environmental Management Cell and Sustainable Development Unit constituted that operate directly under the unit head, i.e., Chief General Manager, BOM.
7. An Expenditure of Rs. 219.29 lakhs has been made for various Environmental management and related activities in 2023-24.

Date: 26/09/24

Chief General Manager (Mines)
Bolani Ores Mines, RSP-SAIL