सेल SAIL

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
राउरकेला स्टील प्लांट
ROURKELA STEEL PLANT
बोलानी ओर्स माइन्स
BOLANI ORES MINES

Ref No: - BOM/ENV/5.1/HD-379 **Date:-31.01.2024**

To,

Dy. Director General of Forests (Central),
Ministry of Environment, Forest and Climate Change,
Regional Office (EZ),
A/3, Chandersekharpur,
Bhubaneswar – 751023

Sub: Six monthly status of compliance to the conditions stipulated in the Environmental Clearance granted by MoEF&CC for 12 MTPA Iron Ore production from 5.10 sq. Miles ML vide letter no. J–11015/418/2008–IA.II(M) dated 21/12/2012, Amendment vide letter no. J–11015/418/2008–IA.II(M) dated 30/07/2020, dated 05/08/2021, dated 19/09/2022 and dated 13/09/2023 for the period of Jul'23-Dec'23.

Sir,

Please find enclosed herewith the Six monthly compliance report for the period **Jul'23-Dec'23** with respect to the conditions stipulated by GoI, MoEF&CC, New Delhi, in the Environmental Clearance grant order of Bolani Ores Mines for the production of 12 MTPA Iron Ore from 5.10 sq Miles ML vide ministry's letter no. J–11015/418/2008–IA.II(M) dated 21/12/2012, Amendment vide letter no. J–11015/418/2008–IA.II(M) dated 30/07/2020, dated 05/08/2021, dated 19/09/2022 and dated 13/09/2023.

Thank you,

Yours faithfully,

31/01/24

Chief General Manager
Bolani Ores Mines

CGM (Mines), BOM
BOLANI

Encl: As above

Copy:

1. Director, IA Division, MoEF&CC, GOI, Indira Paryavaran Bhavan, Aliganj, Jor Bagh Road, New Delhi - 110 003.
2. The Member Secretary, State Pollution Control Board, Paribesh Bhawan, A/118, Nilkantha Naga, Unit – VIII, Bhubaneshwar – 751 012, Odisha

Six Monthly

COMPLIANCE REPORT
OF
ENVIRONMENTAL CLEARANCE CONDITIONS

(Grant Order no: J-11015/418/2008-IA.II(M) dated 21/12/2012
&
EC amendment Grant Orders no: J-11015/418/2008-IA.II(M) dated 30/07/2020, dated 05/08/2021 & dated 19/09/2022)

OF

BOLANI ORES MINES (5.10 Sq Miles ML)
In Keonjhar District of Orissa

For the Period July'2023 - December'2023

STEEL AUTHORITY OF INDIA LIMITED
ROURKELA STEEL PLANT
BOLANI ORES MINES
BOLANI - 758037

i. **Environmental Clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from the competent authority, as applicable.**

Compliance: Fully complied

Provision of Wildlife (Protection) ACT 1972 is not attracted to the Project as there are no Wildlife sanctuaries, National Parks or similar places specified in the Act within 10 KM radius of the project.

ii. **The project proponent shall obtain Consent to establish from the State Pollution Control Board, Orissa and effectively implement all the conditions stipulated therein.**

Compliance: Fully complied

Consent To Establish for expansion of the mine to sell 3 MTPA from Fines Dumps in open market within the 12 MTPA Iron Ore (ROM) and installation of 05 nos. of mobile Crushing and Screening plants, was granted by Odisha State Pollution Control Board vide No. 2151 dated 14.02.2023. Conditions stipulated in the Consent to Establish are complied.
The Consent to Operate (CTO) granted for 12 MTPA Iron Ore including excavation & dispatch of maximum upto 3 MTPA iron ore fines from the existing Fines Dumps/stacks and operation of Mobile Crushing & Screening Plants of capacity 05 nos. X 300 TPH has been granted vide letter No. 8821/IND-I-CON-242 Dt.31.05.2023 by Orissa State Pollution Control Board, which is valid till Dt.31-04-2023.

iii. **Forest Clearance for 73.20 ha of Safety Zone has not been obtained by the project proponent. This environmental clearance subject to the grant of forest clearance for diversion of 73.20 ha of safety zone within one year.**

Compliance: Fully complied

Forest Clearance over 73.12 ha of Safety Zone has been granted by MoEF & CC, vide F. No. 8-17/1997-FC(vol.) dt.12/11/14. A copy of the same was enclosed with six monthly EC compliance report for the period Apr'14 to Sep'14 vide our letter No. BOM/ENV/HD-1401 Dt.14.01.2015.

iv. **The Company shall submit within 3 months their policy towards Corporate Environment Responsibility which should inter- alia provide for (i) Standard operating process/ process to bring into focus any infringement/ deviation/**

violation of the environmental or forest norms/ conditions, (ii) Hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions and (iii) System of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders.

Compliance: Fully complied

The Policy towards Corporate Environmental Responsibility including details of set up was submitted to Ministry vide our letter no RMD/BOM/E&L/ 5.1sqMiles/EC/2013/91 dt.18-03-2013.

SAIL has always been environmentally conscious and responsible company. Way back in 1996, it was a pioneer in adopting a Corporate Environmental Policy. In view of the rapid technological advancements in the past two decades and growing stringency of regulatory requirements, SAIL has revised its Environmental Policy and made "Corporate Environmental Vision, Policy and Responsibility", which is under implementation and copy of the same was enclosed with six monthly EC compliance report for the period of Oct'15 to Mar'16 submitted vide letter no. BOM/ENV/5.1/HD-3600 Dt.30.06.2016.

v. **The mining operation shall be restricted to above ground water table and it shall not intersect groundwater table. In case of working below the ground water table, Prior approval of the Ministry of Environment & Forest and Central Ground Water Authority shall be obtained for which a detailed hydrogeological study shall be carried out.**

Compliance: Fully complied

At present, mining operations are restricted to levels above ground water table in all the pits within the leasehold area. The Ground Water Table within the Lease area is at 451m AMSL. Whereas the present working depth at the mines varies from 915m to 485m AMSL. The mines will not be dug deeper than the current depth of 485m AMSL till 2030.

Prior approval of the Ministry of Environment & Forest and Central Ground Water Authority will be obtained after conducting a detailed hydrogeological study, for working beyond Ultimate Pit Depth of 452 AMSL, if any, during subsequent plan periods as per duly approved Mining Plan.

vi. **Mitigation measures to control RSPM levels shall continue to be implemented and air quality data will also be collected during operation of the mines. The data so collected shall be analyzed to see the effectiveness of the mitigation measures implemented. Based on the same, additional safeguard measures, as may be required shall be implemented in the project.**

Compliance : Regular compliance in progress

Mitigation measures are regularly undertaken to control RSPM levels. Fugitive Air quality data is collected during operation of the mines. The collected data are analyzed on periodical basis to see the effectiveness of the mitigation measures implemented. Based on the same, safeguard measures such as increasing plying frequency of mobile water sprinklers, installation of dust suppression systems required, if any, are implemented in the project. The analysis of air quality monitoring data during the period of Jul'23 to Dec'23 is enclosed in **Annexure – I(A)**.

Fugitive dust emission control measures undertaken are listed as follows:

I. Dry Fog Dust Suppression system has been installed over entire Ore Crushing, Primary Stock Pile and Washing Plant circuit including the Primary Feed Hopper of Mineral Handling Plant at a financial outlay of Rs.2.16 crores.
II. The job to supplement existing pollution control measures at loading plant area with Dry Fog system at a cost of Rs. 1.38 crores, is under progress.
III. Proposal for installation of fixed water sprinkling on permanent haul roads and stock piles is in process
IV. Truck Mounted Mist cannon with a throw of 40 – 50m has been procured. photographs of the Mist Cannon are enclosed in **Annexure – II**

vii. **The biological survey shall be repeated during October - December and mid -May month to see the existence of wildlife corridors, if any. Based on the same, necessary Wildlife Conservation Plan as may be required shall be prepared and implemented in consultation with the state Forest and Wildlife Department.**

Compliance : Regular compliance in progress

Necessary biological surveys were conducted by expert committees and Wild Life Experts and based on the same, Site Specific Wildlife Conservation Plan (SSWCP) has been prepared and 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 outlay

of Rs.1676.41 lakhs, is implemented by Bolani Ores Mines, M/s SAIL. The Study revealed no Wildlife corridors within the Mining Lease area. The plan is being implemented in consultation with the state Forest and Wildlife Department.

viii. **The biological survey shall also be undertaken to identify the trees with orchids, if any such trees, so identified shall be protected and if need be, these trees may be relocated**.

Compliance: Regular compliance in progress

Detailed study of the area for identification of orchids by the MoEF&CC empaneled consultant, M/s Grow Green Consortium Pvt. Ltd, had been completed. A Report based on survey including recommendations for preservation of the species has been submitted to Regional Office of MoEF&CC vide our letter no. BOM/ENV/HD-1707A dt. 17.07.2019. The recommendations as per the report are implemented as follows:

Sl. No	Recommendation	Action Undertaken	Approx. financial value (in Rs.)
1.	Fencing, other infrastructure development Work for protection of Plantation	Structural layout and fencing of selected sites completed	departmental
2.	Green Shade house net	Procured and installation at site in progress	29,000.00
3.	Greenhouse structure	Erected by using discarded pipes and plates	Departmental
4.	Planting Materials other than orchids (2 Plants/ sqft i.e. total 20000 plants)	Saplings at in-house nursery regularly replenished	departmental
5.	Procuring of Polypots, CDM and good-earth	Sourced locally and from top-soil preserved at in-house nursery	departmental

ix. The project proponent shall ensure that no natural water course and/or water resources shall be obstructed due to any mining operations.

Compliance:

No water course & or water resources are obstructed due to any mining operation as Mining operation is continuing on Hill tops in every quarry. Regular de-silting of seasonal and perennial natural flow channels from those hill tops, are being done,

every year, before Monsoon. An amount of 64,500 m^3(approx.) silts have been de-silted from the above natural water courses during the past 06 (six) years.

x. The top soil, if any, shall temporarily be stored at earmarked site only and should not be kept unutilized for a period more than three years. The topsoil should be used for land reclamation and plantation.

Compliance:

The top soil excavated till date has been utilized for reclamation & rehabilitation of dumps. No, top soil was excavated during Jul'23 to Dec'23.

Top soil generated during the expansion of the mine pits to virgin areas, if any, is stored temporarily at earmarked site and subsequently used for plantation /dump reclamation/nursery development.

xi. The Over Burden (OB) generated during the mining operation shall be stacked at earmarked dump sites(s) only and should not be kept active for long period. In critical areas, use of geo textiles shall be undertaken for stabilization of dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forest and its Regional Office located at Bhubaneswar on six monthly basis.

Compliance:

Over Burden (OB) generated from the mines is dumped, as per approved Modification of review of Mining Plan, at earmarked sites only; the details of storage are as follows:

a. Over Burden (OB) generated from F-mining Area is dumped as backfilling inside the quarry in the southern part. 15,000 trees have been planted to rehabilitate 4.0 hects of already backfilled area.
b. Over Burden (OB) generated from other mining Areas is dumped on the existing earmarked active OB dumps as per the Mining Plan approved by Indian Bureau of Mines, which are adjacent to the respective quarries. Stabilization measures are undertaken over inactive dumps.
c. The active OB Dumps of D-area, G-Area and Panposh have been provided with Retaining Wall and necessary terracing for runoff management and slope stability respectively.
d. The Old OB Dumps of F-Area and D-area have been rehabilitated by Plantation. Plantation of around 25,000 nos plants have been completed as yet.

Gap filling activities are also undertaken by suitable replacement of species with low growth rate.

e. In the identified critical areas such as Fines dump near DH-5 Location and Old Fines Dump near 600 TPH, an area of 11,000 sq meters has been covered with Geo Textiles and Vetiver slips plantation over an area of 5,000 sq. m has been done under the consultancy of IIT Kharagpur over Old Fines Dump for slope stabilization.
f. Seeds of native grass species of *Thysanolaena Maxima* and *Stylosanthes Hamata* have been broadcasted and native grasses have been planted over D-area OB dump slope for stabilization.
g. Plantation of over 1000 nos. of saplings over 0.5 ha of G-area OB dump had been undertaken.
h. The photographs of above measures are attached as **Annexure-III.** Compliance status in this regard is submitted to the Ministry of Environment, Forest & Climate Change and its Regional Office located at Bhubaneswar in the six-monthly compliance reports.

xii. **Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flows from mine working, soil, OB and mineral dumps. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly de-silted particularly after monsoon and maintained properly. Garland drain of appropriate size, gradient and length shall be constructed for both mine pit and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 Years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate settling of slit material. Sedimentation pits should be constructed at the corners of the garland drains and de-silted at regular intervals**.

Compliance:

Bolani Ores Mines has prepared Run off mitigation and Water quality management plan with the objective to arrest silt and prevent the direct flow of runoff water from mining areas by providing siltation ponds and catch drains for treatment of runoff and enhance retention time for settling of suspended solids therein. Continuous efforts are made to retain, divert and settle the run offs / effluents by constructing necessary site-specific structures. Oil and grease catch pits have been constructed in the maintenance workshops to trap the waste water generated from vehicle washing. Over and above the measures envisaged in EIA & Environmental Management Plan, additional retaining walls, garland drains and settling pits have been constructed at the toe of different dumps to prevent wash-off & contamination of water. Masonry check weirs & loose boulder check dams

have been constructed at different nallas/streams, rills & gullies to arrest the suspended solids before allowing the mine water into river / seasonal / perennial stream so that the surface run off water from the existing runoff management system meets the prescribed standards.

Further, Bolani Ores Mines has also prepared technical schemes/plans for taking up mitigative measures including construction of Check dams / weirs at appropriate places inside the mine lease area to prevent direct flow of sediment into nearby water bodies in consultation with State Forest Department which were approved by the Regional Chief Conservator of Forest, Rourkela vide his memo No 2991 dated 29.8.2012. As per the approved plans, the stipulated jobs have been implemented by Bolani Ores Mines**.** A summary of Runoff Management measures undertaken by Bolani Ores Mines, till date, is enclosed as below**:**

Sl. No.	**Location**	**Run off management Measure adopted**	**Dimensions L X H X W**
1.	Panposh OB Dump in eastern side	RRM Retaining Wall with Garland Drain	500m x 1.5m x 1.5m
		Settling Pit	01 no.
		Check Dyke	75m x 2m x 1.0m
		Native Grass Plantation	0.5 ha
2.	Western side of Panposh	Loose Boulder retaining wall	400m x 1.2m x 0.8m
3.	D-area OB Dump (WDD1)	RRM Retaining wall	282m x 1.0m x 1.6m
		Native Grass Plantation	0.5 ha
		Saplings plantation	1.0 ha
4.	Reclaimed and Rehabilitated D-area OB dump	RRM retaining wall with Garland Drain	310 m x 1.3 m x 0.8m
		Settling Pit	02 nos.
		Saplings Planted	7.5 ha
		Grass Plantation	0.5 ha
5.	Balagoda Nallah	RCC Checkdam	80m x 1.2m x 0.8m
		Earthen Checkdams	10m x 3m x 4m (02 nos.)
6.	Near Police Station	Settling Pond	40m x 40 m x 3m
7.	Besides New Fines stockpile	Settling Pond	60m x 25m x 2m
8.	Old Fines Dump near 600TPH	Retaining wall with garland drain	260m x 2m x 0.3m
9.	Pre-Crusher Stockpile	Retaining wall with garland drain	100m x 1.2m x 0.8m
10.	DH-5 Sub grade Fines Stockpile	Retaining Wall with Garland Drain	385m x 1.5m x 1.5m
		Settling Pits	04 nos.
11.	Along both sides of the	Gully Plugs (Loose Boulder)	65 nos. of 1-5m span

Sl. No.	Location	Run off management Measure adopted	Dimensions L X H X W
	Approach road to F & G-areas	RRM Contour Bundh near Makeup Water Tank	200m x 0.8m x 1.5m
12.	F-area OB dump Backfilling	Saplings Plantation	10 ha
13.	Valley b/w G & F areas	Loose Boulder Check dams	350m x 1.5m x 1.5m
14.	G-area OB Dump-1	Loose Boulder Retaining Wall	510 m x 1.5m x 1.5m
15.	G-area OB Dump-2	Loose Boulder Retaining Wall	815m x 1.75m x 1.5m
16.	Chapua Nallah	RRM Check Dam	55m x 1.2m x 1.5m,
17.	Jhikaria Nallah	RRM Check Dam	45m x 1.8m x 1.5m
18.	Junction near Bolani Basti	RRM Check Dam	62m x 1.8m x 1.5m
19.	Upstream of Jhinkaria Nallah, Chapua Nallah	Loose Boulder Checkdam	40m x 1.2m x 1.5m, 45m x 1.8m x 1.5m, 62m x 1.8m x 1.5m
20	Grassing & Plantation along hill slopes of degraded land	Bare/exposed surfaces have been covered under plantation and grassing	250 hectares
21	Construction of series check dams across Balagoda Nallah	RRM Check Dam with spillway	170m x 1.2m x 1.5m
22	Check dam with earthen trench across valley to the eastern side of Panposh area	RRM Check Dam with spillway & Earthen trench before and after the structure for ground water recharge	120m x 1.2m x 1.5m
23	Repair of check dam across Panposh nallah	RRM Check Dam with spillway	50m x 1.2m x 1.5m
24	Near Engineering cell	Settling pond with masonry spillway	50m x 17m x 3m
25	Near Valley plant Workshop	Settling Pond	75m x 20m x 2.5m
26	Various Locations	RRM Checkdams/Gully Plugs	150m x 1.2m x 1.5m
27	Along approach road to hilltop near SSP	RRM contour bundh with garland drain	200m x 1.05m x 1m
28	Near Washing plant turning to Valley plant workshop	RRM Retaining wall with garland drain	173m x 1.5m x 1.6m
29	Eastern Side of Panposh area near Culvert	Loose Boulder Retaining wall with garland drain	150m x 1.25m x 1.45m
30	South western side of G-area OB dump	Loose Boulder Retaining wall with garland drain	400m x 1.25m x 1.45m
31	North eastern Side of D-area OB dump	Loose Boulder Retaining wall with garland drain	500m x 1.25m x 1.45m
32	Around pre-crusher stockpile of 600 TPH plant	RRM Retaining wall with garland drain	120m x 1.5m x 1.6m

Sl. No.	Location	Run off management Measure adopted	Dimensions L X H X W
33	Lump Loading Plant near Junction House	02 (two) nos. of settling pits alongwith masonry drain	12m x 9m x 5m 11.5m x 8m x 5m
34	across Panposh Nallah	Sluice gates and retaining wall	03 nos. Sluice gates 115m retaining wall

Further, a series of Runoff Management measures have also been proposed in the review of approved mining plan which are to be completed during the span of five (5) years. Regular desilting activities of **Runoff Management Structures** are taken up during pre-monsoon seasons.

Due to the aforesaid mitigative measures, the runoff discharge quality from runoff management systems meet the prescribed standards. The analysis report of Water quality standards from various streams during Jul'23 to Dec'23 is attached as **Annexure – I(C).**

xiii. Dimension of retaining wall at the toe of dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data.

Compliance:

Dimensions of retaining walls at the toe of dumps and OB benches within the mine to check run-off and siltation are based on the rainfall data.

The details of existing retaining walls around the OB dumps and stockpiles are described in compliance to above condition, i.e., **condition no. xii**.

xiv. Plantation shall be raised in an area of 33.487 ha including a 7.5m wide green belt in the safety zone around the mining lease by planting the native species around OB dumps, reclaimed area, mine benches, along the roads etc. in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per hectare. Greenbelt shall be developed all along the mine lease areas in a phased manner and shall be completed within first five years.

Compliance: Fully complied

Plantation has been be raised in an area of 55.7 ha, **in excess of stipulated quantity** which includes 7.5m wide green belt in the safety zone around the mining lease and areas viz OB dumps, reclaimed/backfilled area, mine benches, along the roads, degraded lands within ML, etc. in consultation with the local DFO / Forest Department. Technical schemes have been prepared in consultation with DFO Keonjhar and the same is being implemented.

At Bolani Ores Mines, plantation/afforestation has been made a restoration strategy as a part of the all mitigative schemes in Environmental management plans, Mining plans & Conservation plans with the objective to increase greenery in and around mines. In restoration, emphasis is given to build vegetation cover to accelerate natural recovery process. Till date more than 5.0 lakhs of trees have been planted in around both the mining leases of Bolani Ores Mines.

The details of plantation undertaken in 5.10 sq. miles ML during 2023-24 are as follows:

Location	Total Area (in Hectares)	Type of Saplings planted	Saplings Planted (in Nos.)	Survival Rate
Near D.A.V. Public school	20 ha	Woody	1447	95
		Fruit bearing	5307	95
		Medicinal	2278	95
		Other	602	95
Casualty replacement in Safety zone near Kiriburu	0.5 ha	Medicinal	840	95
		Fruit bearing	52	95
		Other	10	100
Casualty replacement in plantation site near Kiriburu	0.5 ha	Medicinal	1078	100
Casualty replacement in plantation site near Tatiba	1 ha	Fruit bearing	510	100
		Medicinal	930	100
		Other	40	100
Over Sub-grade dump near Fines Loading Plant	0.2 ha	Medicinal	190	95
		woody	85	95
Near Bachelor's Hostel	0.1 ha	Other	80	95
Casualty replacement near B&C area plantation site	0.1 ha	Fruit bearing	400	100
		Medicinal	60	100
Casualty replacement in plantation site near Railway underpass	0.1 ha	Other	15	100
Near St Mary's school	0.1 ha	Other	15	100
Near Centre fines	0.2 ha	Fruit bearing	542	95
		Other	20	95
Safety zone near D-area	0.1 ha	Medicinal	82	100
Grand Total	**22.9 ha**		**14583**	

xv. **Effective safeguard measures such as Regular water sprinkling should be carried out in critical areas prone to air pollution and having high levels of particulate matter such as haul road, around crushing and screening plant, loading and unloading point and transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.**

Compliance : Fully complied

Regular and extensive water sprinkling are carried out in all areas prone to air/dust pollution and having high levels of particulate matter such as haul road, around crushing and screening plant, loading and unloading point and transfer points. Extensive water sprinkling shall be carried out on haul roads to keep the Ambient Air Quality parameters within norms prescribed by the Central Pollution Control Board. As such, the Air quality management measures proposed in the EIA & Environmental Management Plan are undertaken regularly.

The list of existing efforts to suppress the dust-by-dust suppression systems already installed in the operation.

Sl. No.	Location of critical points	Air Pollution control Measure installed	Remarks
1.	Drilling Machines at all quarries	Drilling Machines at all quarries are fitted with dust extraction system	Wet Drilling is practiced in semi-mechanized sections of D and Panposh quarry along with F & G quarry
2.	Haul Roads of F & G quarry & dumping area	28 KL BEML water sprinklers	Frequency: Hourly in summer season, less frequent in Monsoon
		Plantation along two sides of F-G area Haul Road	1000 nos plants have been planted along two sides of Haul Road
3.	Haul Roads of D & G Panposh & dumping area	Water sprinklers are provided contractually as per provision of ROM transportation contract	Frequency: Hourly in summer season, less frequent in Monsoon
		Plantation along two sides of F-G area Haul Road	1000 nos plants have been planted along two sides of Haul Road
		Fixed water sprinkling system on Panposh - 600TPH Haul Road	Fixed water sprinkling over 200 m has been provided
		Haulage roads are regularly maintained	Roads are graded to eliminate ruts and potholes.
4.	1600 TPH Primary Gyratory Crusher	Dry Fog Dust Suppression system	It operates during Feeding of Ore to Hopper
5	1200 TPH Secondary Cone Crusher House	Dust Extraction system	Bag Filter system exists

Sl. No.	Location of critical points	Air Pollution control Measure installed	Remarks
6	Ore Transportation from F&G Mining areas to Secondary Stock Pile / Ore Beneficiation Plan and Loading Point	Covered Conveyor system along with covering of Transfer points and Dust suppression system	There is no road transport from Hill Top Mining (F&G areas) till loading point
7.	Ore Beneficiation/ washing Plant	Dust suppression system at Transfer points	All transfer points are covered
8.	Approach Road from Hill Top Mines	Dense Plantation alongside approach road to act as dust barrier	Around 50,000 plantations have been undertaken along both sides of 4000m
9.	Loading Plant areas	Fixed water system in front of 600TPH Haul Road	Fixed water sprinkling over 200 m has been provided
		Provision of Rubber flaps along discharge chutes	Hanging Rubber flaps have been provided at discharge chutes to prevent fines
10	Wagon Loading system	Shuttle conveying system at Lump & Fines Loading plant to wagons	conveying system to wagons is covered to prevent fines becoming airborne
11.	600TPH Plant	Dry Fog Dust Suppression system	Dry Fog Dust Suppression system exist in the 600TPH Crushing & Screen plant
		Fixed water sprinkling system in fines dump side	Water sprinkling at Hopper of 600 TPH plant
12	Approach Roads, Township & Village Roads	Water sprinklers of 12 KL capacity and others	Frequency: Six Hourly in summer season, less frequent in Monsoon
13	Work zone personal Dust	Provisions of dust masks to the persons all persons employed in work zone	Regular Use ensured by respective section Incharges
14	Fines Handling area	Truck Mounted Mist Cannon of 50m Throw	Frequency: 2-3 Hourly basis in dry season, less frequent in Monsoon.

The result of monitoring of Fugitive Dust emission monitoring results inside ML area for the last six months is attached in **Annexure-I(B).** It can be observed that more than 95% of data conform to the norms prescribed by the Central Pollution Control Board in this regard.

xvi. **The project Authority should implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.**

Compliance:

The ground water recharge measures proposed in report of "Technical Feasibility Study on Rain Water Harvesting & Master Plan for Ground Water Recharges" prepared by the consultant, M/s KRG Rainwater Foundation, have been approved by CGWB Bhubaneswar vide their letter no.: 5-22/ CGWA/ SER/2018-19-1306 Dt. 26.12.2018.

Sl. No.	Recharge Structure	Dimensions	Location	Present Status
1	Construction of De-Silting Cum Percolation Pond	Pond Dia - 80 m, d- 5m De-silting chamber Dia - 3 m, Depth - 3 m	Broad valley on eastern side of Kutcha road and Panposh OB dump	Completed
2	Recovery Well	Dia – 3m, Dep – 4 m		
3	Spring Box	Dia - 3 m, Depth - 3 m	across Panposh nallah besides Panposh OB dump	constructed
4	Linear Retaining Wall	L-175 m, W-1 m, H-1.2m weepholes Dia-40mm	Across valley around Panposh area	Completed
5	Linear Desilting Pond with De-silting pit	L-175 m, W-5m, D-2m		Completed
6	Settling Pond with RRM spillway	L-50m W-20m D-3m	Besides Project office	Completed
7	Settling Pond	L-60m W-20m D-3m	Near valley plant workshop	Completed
8	Mega Settling Pond	L-80 m, B-50m, D-2.25m	across Panposh Nallah near checkdam	Completed

xvii. **Regular monitoring of ground water level and quality should be carried out in and around the mines lease by establishing a network of existing wells and installing new piezometers during the operation. The periodic monitoring (at least four times in a year: Pre- monsoon (April-May) monsoon (august), Post monsoon (November) and winter (January); once in each season) shall be carried out in consultation with the State Ground Water Board / Central Ground Water Authority and the data thus collected may be sent regularly to Ministry of Environment and Forests and its Regional Office, Bhubaneswar, Central Ground Water Authority and Regional Director, Central Ground Water Board. If at any stage, it is**

observed that the groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.

Compliance:

Regular monitoring of ground water level and quality is carried out in and around 5.10 ML of Bolani Ores Mines from a network of existing wells. The data is collected four times a year as directed and the same is regularly sent along with the six-monthly EC compliance reports to Ministry of Environment, Forest & Climate Change and its Regional Office, Bhubaneswar, Central Ground Water Authority and Regional Director, Central Ground Water Board.

The water quality monitoring data during indicates no abnormalities or violations of the prescribed standards.

xviii. **The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of surface water, if any, required for the project.**

Compliance:

Necessary permission of competent authorities has been obtained for drawl of requisite quantity of surface water, required for the project. Water Drawl agreement for extraction of the 7 cusec (for envisaged level of production) of surface water from Karo River and tributaries has been executed with Executive Engineer, Baitarini Division, Salapada vide agreement no.662 Dt.23.02.2023, with validity of 01 (One) year. The Average water consumption during the period is well within the permitted quantity.

xix. **The safeguard measures as suggested by the Central Ground Water Board vide letter No. 21-4(231)/CGWA/SER/2010-1010 dated 11.06.2010 shall be effectively implemented.**

Compliance :

A copy of the said letter has been requested from MoEF New Delhi so that the contents of the above letter could be known for compliance, if any, by BOM. The conditions stipulated in above said order will be complied as applicable to BOM.

xx. **The project proponent shall practice Suitable rain water harvesting measures on long term basis and work out detailed scheme rain water harvesting in consultation with Central Ground Water Authority and submit a copy of the same to the Ministry of Environment & Forests and its Regional Office, Bhubaneswar.**

Compliance:

The Rainwater Harvesting measures proposed in report of "Technical Feasibility Study on Rain Water Harvesting & Master Plan for Ground Water Recharges" prepared by the consultant, M/s KRG Rainwater Foundation, have been approved by CGWB Bhubaneswar vide their letter no.: 5-22/ CGWA/ SER/2018-19-1306 Dt. 26.12.2018. The details of prescribed measures installed within 5.10 sq. miles ML of BOM are as follows:

Sl. No.	Recharge Structure	Dimensions	Location	Present Status
1	Construction of De-Silting Cum Percolation Pond	Pond Dia - 80 m, d- 5m De-silting chamber Dia - 3 m, Depth - 3 m	Broad valley on eastern side of Kutcha road and Panposh OB dump	Completed
2	Recovery Well	Dia – 3m, Dep – 4 m		
3	Spring Box	Dia - 3 m, Depth - 3 m	across Panposh nallah besides Panposh OB dump	constructed
4	Linear Retaining Wall	L-175 m, W-1 m, H-1.2m weepholes Dia-40mm	Across valley around Panposh area	Completed
5	Linear Desilting Pond with De-silting pit	L-175 m, W-5m, D-2m		Completed
6	Settling Pond with RRM spillway	L-50m W-20m D-3m	Besides Project office	Completed
7	Settling Pond	L-60m W-20m D-3m	Near valley plant workshop	Completed
8	Mega Settling Pond	L-80 m, B-50m, D-2.25m	across Panposh Nallah near checkdam	Completed

xxi. Vehicular emissions should be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of Mineral. The vehicles should be covered with a tarpaulin and shall not be overloaded.

Compliance:

Transportation of Mineral from Hill Top to Dispatch point is done by covered conveyor belts**.** The ore is transported to various Steel Plants, through Railway wagons only. Vehicles carrying dump fines are weighed at in-house weigh bridges

and the load is adjusted immediately if any discrepancy is found. Then, the vehicles are covered by tarpaulin before leaving the premises.

Preventive Maintenance of all HEMM & light vehicles is undertaken regularly to keep the vehicular emissions under control. All the vehicles engaged in mining and transporting activity in the mine have Pollution Under Control (PUC) certificate. Records of PUC certificates have been maintained for ready reference of inspecting authorities. The list of vehicles engaged and their PUC details are mentioned as follows:

EQUIPMENT TYPE	AREA	EQUIPT. NO	MAKE	PUCC VALIDITY
EXPLOSIVE VAN	Mines	OD09C6302	TATA	06-04-2024
	Mines	OR09P9060	Ashok Leyland	06-10-2024
DIESEL BOWSER	Mines	UP16BT8809	Ashok Leyland	09-04-2024
TRUCK	Mechanical	OD09P1842	Mahindra&M	06-10-2024
	Store	OD09P3263	TATA	06-10-2024
MIST CANNON TRUCK	E & L	OD09P6495	EICHER	06-10-2024
WATER TANKER	Mines	OD09A2122	Ashok Leyland	06-04-2024
	Mines	OD09W7884	Ashok Leyland	04-07-2024
Maint. Van	Mechanical	OR09Q9263	Tata	06-04-2024
AMBULANCE	Hospital	OD09K3343	Tata	05-10-2024
	Hospital	OR09P9507	Force	05-04-2024
SCHOOL BUS	Mines	OD09A0946	Tata	05-04-2024
SCORPIO	P & A	OR09P7545	Mahindra	05-04-2024
MINI TRUCK	Store	OR09P5010	Mahindra	18-01-2025
SCORPIO-S11	CGM POL	OD09K6668	Mahindra	05-10-2024
BOLERO JEEP	CGM POL	OD09C2374	Mahindra	05-04-2024
	Mines	OD09C2375	Mahindra	05-04-2024
	Mines	OD09C2376	Mahindra	05-04-2024
	Plant	OD09V1162	Mahindra	26-03-2026
	CGM POL	OD09K3576	Mahindra	05-10-2024
BOLERO CAMPER	Survey	OD09C2371	Mahindra	05-04-2024
	Electrical	OD09C2372	Mahindra	05-04-2024
	Plant	OD09C2373	Mahindra	05-04-2024
	Plant	OD09K2575	Mahindra	05-10-2024
	Mechanical	OD09K2576	Mahindra	05-10-2024
TATA YODHA CAMPER	Mechanical	OD09W8346	TATA	04-07-2024
	Civil	OD09W8376	TATA	04-07-2024

xxii. **No Blasting shall be carried out after the sunset. Blasting operation should be carried out only during the day time. Controlled Blasting should be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.**

Compliance:

Blasting is carried out once in a notified fixed interval (12:00 PM – 02:00 PM) of daytime only. The following measures are practiced to mitigate blasting hazards:

a. Controlled blasting by use of SMS explosives along with "Staggered V" drilling pattern is in practice.
b. Blasting under supervision of qualified persons.
c. Use of NONEL / Delay detonators to control ground vibration
d. Avoiding overcharging of the blast holes & proper stemming to avoid blown out shots.
e. Blasting only for loosening of the strata and avoid fly rocks.
f. Maintaining suitable spacing and burden to avoid misfires/ fly rocks.
g. Restricting number of blast holes at any point of time to control ground vibrations.
h. Avoiding blasting on foggy days, after sunset and at times of high wind velocity.

xxiii. Drills shall either by operated with dust extractors or equipped with water injection system.

Compliance:

BOM has deployed 04 nos. of IDM30 model Drill machines of Atlas Copco make in the Hilltop Mining areas for winning of ore. All the 04 drill machines are equipped with state-of-the-art, integrated Dry Dust collection and wet drilling systems. The equipment is operated only by highly trained personnel with ample experience under their belt.

The photographs of the wet drilling are enclosed in **Annexure – II**

xxiv. Mineral handling area shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer point should also have efficient dust control arrangements. These should be properly maintained and operated.

Compliance:

Dry Fog Dust Suppression system has been installed over entire Ore Crushing, Primary Stock Pile and Washing Plant circuit including the Primary Feed Hopper of Mineral Handling Plant at a financial outlay of Rs.2.16 crores. The photographs of air pollution control measures are enclosed as **Annexure - II**. Additional dust suppression measures installed within the mines are detailed in compliance status of **condition no. xv.**

Work Order to supplement existing pollution control measures at loading plant area with Dry Fog system at a cost of Rs. 1.38 crores has been issued. The job is under progress.

xxv. Sewage treatment plant should be installed for the colony. ETP should also be provided for the workshop and wastewater generated during mining operation.

Compliance:

Based on the conceptual plan submitted by IIT KGP a detail feasibility report (FR), Technical Specification (TS) for STP of capacity 2.4 MLD Capacity has been prepared by CET, an in-house consultant of SAIL, for execution. Implementation period of the job is 24 months.

In this regard, Two Work Orders have been issued for laying of Drainage Network and Construction of STP at financial outlays of Rs. 4.40 crores and Rs. 6.68 crores respectively. The Job of installing the drainage network is in final stages of completion.

As such, individual septic tanks followed by soaking pits have been provided in all quarters and office locations. Further, 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.

xxvi. Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.

Compliance:

All newly appointed workers undergo a comprehensive medical examination (Pre-Employment Medical Examination) and subsequently a Periodical Medical Examination (PME) at regular intervals. All workers undergo a PME every 5 years; however, workers whose age is >45 years the PME is done every 3 years. All contractual workers also undergo medical examination. The findings are maintained in each worker's individual medical record, valid throughout his duration of service. These records are manually maintained and computerized. A three-tier health monitoring program is in vogue at Bolani Mines. The mine's hospital has an Occupational Health O.P.D. Centre, which is run by Occupational Health Physician. The mines' hospital is a 60 bedded multi-specialty hospital with facilities

to handle major and minor surgeries and casualty department. A 4-bedded ICU and a blood bank are being added.

The summary of medical examinations carried out during Jul'23 to Dec'23, is as follows:

Contractual workers		**Employees**	
Pre-placement medical examination	Periodical medical examination	Pre-placement medical examination	Periodical medical examination
134 nos.	143 nos.	03 nos.	13 nos.

xxvii. **Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.**

Compliance :

The labourers engaged in the construction activity belong to nearby villages. However, provision has been made, as and when necessary, for the housing of construction workers adjacent to the construction sites in non-forest lands, in the form of temporary structures removed after the completion of the project. Infrastructural facilities available at Bolani such as safe drinking water, medical health care etc. are enjoyed by the workers.

xxviii. **The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna such as elephant, leopard, sloth bear, wolf, gaur, python etc. Spotted in the study area and contribute towards the cost of implementation of the plan and/ or Regional Wild life Management plan for conservation of flora and fauna so prepared by the State Government. The amount so contributed shall be included in the project cost. A copy of action plan may be submitted to the Ministry and its Regional Office, Bhubaneswar within three months.**

Compliance:

The following precautionary measures have been adopted for conservation of Flora and Fauna at the project site is as follows:

a. A Site-Specific Wild Life Conservation plan has been prepared as per guidelines of Chief Wild life Warden by engaging an expert agency. The plan has been 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.

b. The necessary funds towards implementation of Regional Wild life management plan, i.e., an amount of Rs 5,68,22,350 (Five cores sixty-eight lakhs and twenty-two thousand, three hundred and fifty only) has been deposited in CAMPA on A/C No.-1585 for Regional Wild Life Management fund for 5.10 Sq. miles Mining Lease (ML).

c. Necessary Infrastructural Supports are provided to local forest departments as and when required for the cause of Wild Life Conservation. G-Mining Pit, closest to the habitation, has been covered by Barbed wire fencing to prevent wildlife from entering the mining premises.

xxix. **The critical parameters such as RSPM (Particulate matter with size less than 10 micron i.e. PM_{10} and NOx in the ambient air within the impact zone, peak particle velocity at 300 m distance or within the nearest habitation, whichever is closer shall be monitored periodically. Further, quality of discharged water shall also be monitored [TDS, DO, PH and Total Suspended Solids (TSS)]. The monitored data shall be uploaded on the website of the company as well as displayed on a display board at the project site at a suitable location near the main gate of the Company in public domain. The Circular No. J-20012/1/2006- IA.II(M) dated 27.05.2009 issued by Ministry of Environment and Forest, which is available on the website of the Ministry www.envfor.nic.in shall also be referred in this regard for the compliance.**

Compliance:

The critical parameters such as RSPM (Particulate matter with size less than 10 micron i.e. PM_{10}) and NOx in the ambient air are monitored within the impact zone, within the nearest habitation which fall inside our adjoining lease area. One monitoring station is online type at JNRC in Township and other stations are in nearby habitation areas.

Further, as beneficiation plant is not operational since last 2 years, there is no discharge of effluents from the ML area. However, quality of water of all the water bodies flowing inside the ML and also in the buffer / impact zones are monitored for TDS, DO, PH and Total Suspended Solids (TSS) along with other parameters. The monitored data are enclosed in the report which is being submitted to the Ministry's Regional Office at Bhubaneswar and to the State Pollution Control Board / Central Pollution Control Board periodically inform of six-monthly reports and are uploaded on the website of the company. The monitoring data are also

displayed near main gate in Public domain (easily accessible). The Environment parameter monitoring Reports are enclosed as **Annexure -I**.

xxx. A final mine closure plan along with details of Corpus Fund should Be submitted to the Ministry of Environment & Forest 5 years in Advance of final mine closure for approval.

Compliance:

Final Mine Closure plan along with details of Corpus fund will be submitted to the Ministry 5 years in advance of final mine closure for approval.

However, the Progressive Mine Closure Plan (PMCP) is approved by IBM vide their letter no. MRMP/A/12-ORI/BHU/2020-21 Dt. 08.09.2020.

xxxi. No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests and No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.

Compliance:

Amendment of Environmental Clearance for 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 ElA Notification 2006, has been granted vide. No. J-11015/418/2008-IA.II(M) Dt.30.07.2020. Further, amendment of extension of validity of EC dated 30.07.2020 has been granted vide. No. J-11015/418/2008-IA.II(M) Dt.05.08.2021 for one year along with permitting dispatch of 8.5 MTPA ROM Iron Ore from mines, 1.5 MTPA from fines dump by SAIL's Bolani Rly. Siding and dispatch of 0.5 MTPA from Iron Ore from Mines and 1.5 MTPA from fines dump by Public Sidings Bolani/Barbil or by Road keeping total production within approved EC Capacity 12 MTPA under Para 7(ii) of the EIA Notification 2006 at village Bolani, Tehsil- Barbil, District Keonjhar, Odisha.

Mining will be done as per the approved mining plan. All activities associated with amendment of EC have been commenced only after obtaining prior approval from Ministry of Environment, Forests and Climate Change, Govt. of India.

xxxii. **At least four ambient air quality- monitoring stations should be established in the core zone as well as in the buffer zone for RSPM (Particulate matter with size less than 10 micron i.e. PM_{10}), and NO_x monitoring. Location of the 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.**

Compliance:

The locations of Air quality monitoring stations including fugitive dust monitoring have been decided based on the metrological data, topographical features and environmentally and ecologically sensitive targets in consultation with the Regional Officer, State Pollution Control Board. The details of monitoring locations are provided as follows:

SL. NO.	LOCATION	PARAMETERS MONITORED	ZONE*
AMBIENT AIR QUALITY			
1	Bolani Basthi Community Center (Habitation area)	PM_{10}, $PM_{2.5}$, SO_2, NOx & CO	6.90 Core & 5.10 Buffer
2	General Office Area	PM_{10}, $PM_{2.5}$	5.10 Core & 6.90 Buffer
3	Field Station (Township Nursery – near Hospital)	PM_{10}, $PM_{2.5}$	5.10 Core & 6.90 Buffer
4	DAV Public School (Township)	PM_{10}, $PM_{2.5}$, SO_2, NOx & CO	6.90 Core & 5.10 Buffer
5	Karo Guest House	PM_{10}, $PM_{2.5}$, SO_2, NOx & CO	6.90 Core & 5.10 Buffer
6	Limtur Village	PM_{10}, $PM_{2.5}$, SO_2, NOx & CO	6.90 Core & 5.10 Buffer
FUGITIVE DUST MONITORING (WORKZONE)			
SL. NO.	**LOCATION**	**PARAMETERS MONITORED**	**ZONE***
7	Maingate Entry	RSPM, SPM	5.10 ML
8	F Mining area near hilltop Feed Crusher	RSPM, SPM	5.10 ML
9	G Mining area	RSPM, SPM	5.10 ML
10	D & Panposh Haul road	RSPM, SPM	5.10 ML
11	Mn Quarry - 10	RSPM, SPM	6.90 ML

SL. NO.	LOCATION	PARAMETERS MONITORED	ZONE*
12	Mn Quarry - 5	RSPM, SPM	6.90 ML
13	600 TPH cum Lump Loading plant area	RSPM, SPM	6.90 ML
14	Fines Loading plant area	RSPM, SPM	6.90 ML
15	Fines handling site (Near Weighbridge)	RSPM, SPM	5.10 ML

The AAQ monitoring stations at Sl. No. 04, 09 & 10 and Fugitive Emission monitoring station at Sl. No.17, are located in proximity to the ore transportation route as directed in the amendment of EC.

xxxiii. **Industrial waste water (workshop and waste water from mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents**.

Compliance : Fully complied

As beneficiation plant is not operational since last 2 years, there is no discharge of industrial effluents from the ML area. However, when operational, effluent generated from the beneficiation plant is treated in Thickeners followed by Tailing Ponds. Clear water to the tune of 60% is recycled and the underflow from thickener is discharged into Tailing Dam. 3 nos. of Oil and Grease catch traps have been provided at mechanical workshops and equipment washing junctions to collect and treat workshop effluent.

The quality report of tailing pond seepage water and workshop effluent after treatment is given in the **Annexure –I(C).**

xxxiv. 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.

Compliance: Fully complied

Protective respiratory devices such as Dust Masks are provided to all working personnel in the mines. The Fugitive Dust emission is within norms suggested in

NAAQMS, and due care is being taken to further reduce the RSPM levels and provide a dust free environment for the working personnel.

In-house training programs, including Refresher Training, Safety Awareness Training, Mock Drill Training etc., are held at Mines Vocational Training Centre (MVTC) on regular basis to augment the awareness of safety and communicate latest technological developments in mining and other allied sectors, among the working personnel.

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 as per ISO 45001:2018(certified by BSI).

xxxv. **Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed**.

Compliance:

Bolani Ores Mines is certified under the state-of-the-art ISO 45001:2018 for establishing flawless Occupational health and safety management system. Occupational Health Survey is carried out regularly to assess the existing condition and to check the effectiveness of the management measures and to observe any contractions due to exposure to dust and take corrective measures. The findings are maintained in the worker's medical record maintained throughout the duration of his service. Medical tests are carried out at the Bolani Mine Hospital. A three-tier health monitoring program is in vogue at Bolani Mines.

In case of a person, who is found to be suffering from some work-related disorder, he is treated accordingly at the mine's hospital or referred to SAIL's Hospital at Rourkela or to specialized hospitals elsewhere as per the requirement. If deemed necessary, the worker is reassigned elsewhere in the mine either temporarily or permanently. The course of action taken is duly recorded in the worker's medical file.

xxxvi. **A separate environmental management cell with suitable qualified personnel should be set - up under the control of a Senior Executive, who will report directly to the Head of the Organization.**

Compliance:

An Environment Management Section (EMS) is established as a separate section under the Mines Department under direct control of Chief General Manager (Mines). The details of constitution are as follows:

a. General Manager (Env & Lease)
b. Sr. Manager (Env & Lease)
c. Mining Mate (Env & Lease)

General Manager (Environment & Lease) co-ordinates the day-to-day activities pertaining to communications related to statutory clearances and compliances of Environment, Forest & Lease Renewal issues and reports to the General Manager (Mining) and Mines Manager who being statutory head regularly reviews the compliances of various Stipulations, Acts and Regulations pertaining to Environmental Matters of Mines and reports to Head of Mines. One (1) Sr. Manager (Environment & Lease) is posted in the EMC who expedites initiation of proposals as per Environmental Management Plan and coordinates field implementation of the jobs. A Mining Mate (Environment & Lease) assists him in the day-to-day activities. Necessary measures are also being taken up for capacity building of the Environment Management Cell by appointment of required qualified personnel as planned in EMP

Further, an Environmental Management System (EMS) has been implemented at Bolani Ore Mines which has been certified as per ISO 14001:2015 Standard. The EMS of BOM covers Mining activities, Maintenance activities, Mineral Beneficiation and all other allied activities. As per the EMS, a senior executive of the organization in the level of GM(Elect.) functions as Management Representative and is responsible for strict implementation.

xxxvii. **The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhubaneswar.**

Compliance:

The fund earmarked for environmental protection measures is kept in separate account and is not diverted for other purpose. An amount of Rs. 423.66 lakhs has been booked for environment & forest protection measures till date against an allocated budget of Rs.424.34 lakhs for the period of 2023-24.

xxxviii. **The project proponent shall submit six monthly report on the status of the compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the**

Ministry of Environmental and Forests, its Regional Office, Bhubaneswar, the respective Zonal office of Central Pollution Control Board and State Pollution Control Board. The proponent shall upload the status of compliance of the environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the Ministry of Environment and Forest, Bhubaneswar, the respective Zonal Officer of Central Pollution Control Board and the State Pollution Control Board.

Compliance:

Six monthly compliance reports on the status of implementation of environmental safeguards are being submitted to MoEF&CC, New Delhi, Regional Office – MoEF&CC, Bhubaneshwar, Central Pollution Control Board and State Pollution Control Board. Copy of the compliance report inclusive of Environmental Parameters Monitoring data is being uploaded to the SAIL web site i.e. www.sail.co.in.

xxxix. **A copy of clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad/ Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestion/ representation has been received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent, The State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Center and Collector's office/ Tehsildar's office for 30 days.**

Compliance:

Copies of clearance letter were distributed amongst local bodies, from whom valuable suggestions/ representation/feedback has been received while processing the proposal.

xl. **The project authorities should advertise at least in two local newspapers of the District or State in which the project is located and widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Boards and also at web site of the Ministry of Environment and Forests at http://envfor.nic.in and a copy of the same should be forwarded to the Regional Office of the this Ministry located Bhubaneswar**.

Compliance:

Advertisements regarding grant of environmental clearance was published in Odiya daily SAMBADA, Bhubaneswar & Sambalpur Edition on date 27-12-2012 and Business Standard on date 27-12-2012.

A copy of the same has been deposited with the authorities at Regional Office of the MoEF, Bhubaneswar.

7. **The Ministry or any other competent authority may alter /modify the above conditions or stipulate any further condition in the interest of environment protection.**

Compliance:

Agreed to. The conditions will be complied as and when stipulated.

8. **Failure to comply with any of the condition mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986**.

Compliance:

Duly Noted.

9. **The above condition will be enforced inter-alia, under the provisions of the Water (prevention & Control of Pollution) Act, 1974, the Air (prevention and control of pollution) Act, 1981, the Environment (protection) Act, 1986 and public liability Insurance Act, 1991 along with their amendments and rules made thereunder.**

Compliance:

Noted.

10. **Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days, as prescribed undersection-16 of the National Green Tribunal Act 2010.**

Compliance:

Duly Noted

A. ADDITIONAL SPECIFIC CONDITIONS STIPULATED IN AMENDMENT OF EC VIDE NO: J-11015/418/2008-IA.II(M) DT.30.07.2020

i. This amendment is valid for a period of one year and the same may be extended after the site visit or compliance monitoring by Regional Office, whichever is earlier.

Compliance: Duly complied.

In compliance to this condition, for the extension of amended EC, we have already requested the Regional Office (EZ), MoEF & CC, Bhubaneswar vide our letter no. RMD/EC/BOLANI-5.10 SQ MILE dated 15.02.2021 for site visit and to provide the certified Environment Clearance Compliance report.

Considering the unprecedented surge in Covid-19 cases across the country during the second wave, the ensuing travel restrictions and declaration of state wide lockdown by Government of Odisha vide letter no 2328 dated.01.05.2021 with effect from May 05, 2021, has made the required site visit and compliance monitoring by Regional Office a remote possibility to happen within the validity date and hence extension of EC for further period of one year is being applied.

ii. Fines from the tailing dam shall not be excavated during the monsoon period.

Compliance: Fully complied.

Excavation of Fines from the tailing dam is not done during the monsoon period.

iii. Mitigative measures proposed for excavation and transportation of mineral shall be complied with including moist and covered.

Compliance: Fully complied

Following mitigative measures were undertaken

(A) For control of fugitive dust emission at source :

a. Mobile water sprinklers are deployed at site and dump surface was made moist before excavation
b. Mobile water sprinklers are deployed at fines handling areas for keeping the ground wet
c. Truck Mounted Mist cannon of 50m Throw has been deployed at the site. Photographs of the equipment are enclosed in **Annexure-II.**

(B) **<u>For control of fugitive dust emission during transportation :</u>**

a. Covering of materials carrying vehicle with tarpaulin: All the mineral carrying trucks were covered. Conditions in this regard have been incorporated in all selling orders issued for carrying out excavation, stacking and transportation of dump fines.
b. Mobile water sprinklers are deployed on the transportation roads for keeping the transportation route all through the day

(C) **<u>For control of TSS in runoff from fines handing areas :</u>**

a. A mega settling pond of dimension 80m x 60m x 6m with 2 chambers has been erected at the runoff exit point from the fines dump areas to contain all the flow in any heaviest rainfall day with sufficient settling time before discharge of clear water.

iv. The PP shall monitor the fugitive emissions by installing at least two AAQ monitoring stations along the transportation route.

<u>Compliance:</u> Fully complied

03 Nos. of AAQ monitoring stations have been installed along the dump fines transportation route. The locations of the AAQ monitoring equipment are as follows:

Sl. no.	Location	Agency
1	Near exit point of Selling Site	M/s Ecomen Pvt Ltd (an NABL accredited agency)
2	Near Bolani Village (community centre)	-do-
3	Online CAAQMS	M/s Envea India Pvt ltd

The reports of monitoring are attached in Annexure – I, which indicates that the parameters are well within the limits .

v. The stripping ratio and total excavation for each year shall remain same as approved in the previous EC. Any change in the same is with prior approval of the Ministry.

<u>Compliance:</u>

There is no change in stripping ratio and total excavation from the planned quantity remains with the approved limit of Mining Plan and EC.

B. ADDITIONAL SPECIFIC CONDITIONS STIPULATED IN AMENDMENT OF EXTENSION OF EC VIDE NO: J-11015/418/2008-IA-II(M) DT.05.08.2021

i. **This amendment will be valid for a period of one year from the date of issue of this EC and the same may be extended after the site visit or compliance monitoring by IRO, whichever is earlier.**

Compliance:

Duly Noted. Application for renewal of the EC Grant order has been granted vide no. J-11015/418/2008-IA-II(M) DT.19.09.2022.

ii. **The Project Proponent needs to monitor the air quality at the siding in terms of dust emission during the dispatch of fresh fines of 0.5 MTPA through road and the data needs to be submitted to the Ministry.**

Compliance:

The Air Quality Monitoring reports near siding in terms of dust emission during the dispatch of fresh fines of 0.5 MTPA through road are submitted as **Annexure - I**.

iii. **The Project Proponent shall ensure that there is no change in air quality at the road. Particle size analysis of the emissions that are likely to emerge from the dumps and storage at the site and railway sliding to be carried out.**

Compliance:

Duly Noted. A scientific study for Particle size analysis of the emissions that are likely to emerge from the dumps and storage at the site and railway sliding was conducted by IIT Kharagpur. The Study report has been submitted to the Ministry along with the renewal application.

iv. **The Project Proponent shall also ensure that the dispatch by road should be as per the standard practice.**

Compliance:

The dispatch of mineral by road is carried out following all the standard practices applicable in the region. Few of the practices in vogue during the transportation of the mineral are as follows:

a. A truck lay-by area with provisions for drinking water and toilets has been arranged for drivers.
b. Overloading and Underloading of the vehicles is prevented by deployment of excavators near weighbridges for adjustment of the load, before leaving the premises.
c. All the vehicles carrying ore are covered with tarpaulin, before leaving the premises, to prevent spillage and mitigate fugitive dust generation during transport.
d. The mineral transportation route is regularly watered by designated mobile sprinklers to mitigate fugitive emission.
e. Spillage on transportation road, if any, is promptly dealt by workers deployed along the route.

C. ADDITIONAL SPECIFIC CONDITIONS STIPULATED IN AMENDMENT OF EXTENSION OF EC VIDE NO: J-11015/418/2008-IA-II(M) DT.19.09.2022

i. The project proponent should restore the Mine lease area by planting with native species only.

Compliance:

Duly Noted. A Central nursery with capacity of holding 1,50,000 saplings has been developed at Bolani Ores Mines under the aegis of OFDC, Keonjhar. Almost 90% of the existing 75000 saplings in the nursery are native species. The saplings are used in restoration of the Mine lease area.

ii. The project proponent shall take additional measures to prevent the washout of fines during monsoon season. Project proponent shall also ensure that the desilting should be carried out at regular intervals.

Compliance:

A network of Drains connected to central mega settling pond has been provided to manage the runoff generated from Fines handling areas during monsoon period. Regular desilting of the drains as well as the intermediate pits along with the mega-settling pond is undertaken as a part of monsoon preparedness plan each year.

iii. Project Proponent shall conduct Bio-assay test of Karo River and Jhinkaria Nallah on Half-yearly basis and submit the status of quality of river to Ministry's IRO with six monthly compliance report.

Compliance:

The Bio-assay Study report of Karo River and Jhinkaria Nallah for the period of Jan'23 to Jun'23 is submitted as **Annexure - I(B)**.

iv. Project Proponent shall restrict seepage of water from tailing pond and plan of action shall be submitted to the Ministry's IRO and measure concentration of heavy metals regularly.

Compliance:

As such, the wet beneficiation is not operational since 2017 and hence there is no discharge in tailing pond since then. The clear water is siphoned off by nearby villagers for irrigational purposes. The quality of the said seepage water from the tailing pond is checked on a monthly basis for 21 parameters including any traces of heavy metals within and found within the prescribed limits.

v. **Hon'ble Supreme Court in an Writ Petition(s) Civil No. 114/2014, Common Cause vs Union of India & Ors vide its judgment dated 8th January, 2020 has directed the Union of India to impose a condition in the mining lease and a similar condition in the environmental clearance and the mining plan to the effect that the mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. Compliance of this condition after the mining activity is over at the cost of the mining lease holders/Project Proponent".**

Compliance:

An application along with draft of Supplementary lease deed to this effect has already been submitted to the Collector, Keonjhar for execution of the same vide our letter no. CGM/B-1015 Dt.10.09.2020.

vi. **PP shall deploy only 40-50 tones covered trucks/dumper to reduce fleet size till railway siding.**

Compliance:

The dispatch of mineral by road is carried out in 40-50 tones covered trucks following all the standard practices applicable in the region.

vii. **PP shall deploy of atleast 10 nos of fog cannon with adequate throw length for mitigation of fugitive dust on the haul road, storage yard, crushers, during handling at fines loading unit and transportation route in addition of already proposed Fugitive Dust Mitigation Measures implemented at BOM.**

Compliance:

A truck mounted mist Cannon vehicle of 50m throw is already deployed in the mines for dust suppression at Fines Handling site and Loading plants of Bolani Ores Mines. Moreover, the mobile sprinklers of 28 KL and 09 KL capacities are engaged for mitigation of fugitive dust on the haul road, dump fines transportation

route. In addition, proposals for installation of 05 nos. of mist cannons with 40-100 m throw are under process.

viii. **No village road shall be used for transportation of mineral and no road transport route shall be adopted, which is passing through any sensitive location such as schools, hospitals etc.**

Compliance:

No village road is used for transportation of mineral and no road transport route passes through any sensitive location such as schools, hospitals etc.

ix. **Yearly plantation scheme and three tire green belt development scheme to be done by PP and a record of which must be submitted to IRO with satellite imagery showing the progressive change in land use with six monthly compliance report.**

Compliance:

The Half-yearly Plantation progress details are shared under compliance status of Condition no. xiv of the six monthly compliance report submitted to the Ministry's IRO. The Google earth imagery depicting the progressive green coverage is attached as **Annexure – IV.**

x. **All other terms and Conditions mentioned in earlier EC dated 21.12.2012, 17.02.2014, 30.07.2020 and 05.08.2021 shall remain unchanged.**

Compliance:

Duly Noted.

D. ADDITIONAL SPECIFIC CONDITIONS STIPULATED IN AMENDMENT OF EXTENSION OF EC VIDE NO: J-11015/418/2008-IA-II(M) DT.13.09.2023

1.1 All other terms and conditions mentioned in the earlier EC dated 21.12.2012, 17.02.2014, 30.07.2020, 05.08.2021 and 19.08.2022 shall remain unchanged.

Compliance:

Duly Noted.

2.1 The Project Proponent shall monitor the air quality, noise level, soil quality, water quality, water level and ground vibration at the edge of the mine, near the village and at other sensitive receptors and such collected data shall be submitted quarterly to the Ministry's Regional Office.

Compliance:

Bolani Ores Mines monitors the air quality, soil quality, water quality, water level at the edge of the mine, near the village and at other sensitive receptors through NABL accredited third party i.e., M/s Ecomen Pvt. Ltd., the copy of the WO awarded for the job is enclosed as **Annexure-V.** The collected data will be submitted quarterly to the Ministry's Regional Office.

3.1 The Project Proponent shall create awareness among the local people working within the project area as well as its surrounding area on the ban of Single Use Plastic (SUP) in order to ensure the compliance of Notification published by MoEF&CC on 12/08/2021. A report, along with photographs, on the measures taken shall also be included in the six monthly compliance report.

Compliance:

Bolani Ores Mines has created awareness among the local people working within the project area as well as its surrounding area on the ban of Single Use Plastic (SUP) by use of canvassing using loudspeakers. The photographs are enclosed in **Annexure-II**.

4.1 The Project Proponent shall monitor the environmental quality of the land use before and after continuation of excavation and dispatch of dump fines.

Compliance:

A proposal to monitor the environmental quality of the land use before and after continuation of excavation and dispatch of dump fines is underway.

5.1 The Project Proponent shall ensure that the vehicles should not be overloaded. All the trucks should be properly covered during transportation of fines.

Compliance:

a. Overloading and Underloading of the vehicles is prevented by deployment of excavators near weighbridges for adjustment of the load, before leaving the premises.
b. All the vehicles carrying ore are covered with tarpaulin, before leaving the premises, to prevent spillage and mitigate fugitive dust generation during transport.

5.2 The Project Proponent shall regularly maintain the transport route for improvement of road capacity and to control the fugitive emissions during transportation and shall ensure that the transport of minerals will be as per IRC Guidelines with respect to complying with traffic congestion and density.

Compliance:

Duly Noted.

01/02/24

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

ANNEXURE - I(A)
AMBIENT AIR QUALITY

Real Time Data Acquisition And Monitoring

Site Name: Bolani Iron Ore Mines (6.9 SQ. Miles) Of M/s Steel Authority Of India Ltd.

Report: Custom Report

From Date: 2023/07/01 00:00:00 To Date : 2024/01/01 00:00:00

Description	AAQMS_1_CISF_Colony-PM10_U	AAQMS_1_CISF_Colony-PM2.5_U
Prescribed Standards	0 - 100	0 - 60
Maximum Data	195.85	235.69
Minimum Data	0.0	0.0
Arithmetic Mean	49.55	27.96
Median	52.25	22.11
Standard Deviation	23.89	28.68
Maximum Value At Time	2023-08-23	2023-08-25
Minimum Value At Time	2023-08-26	2023-09-19
Valid Data Points	176	176
Total Data Points	185	185
Data Availability %	95.14%	95.14%

	Time	AAQMS_1_CISF_Colony-PM10_U	AAQMS_1_CISF_Colony-PM2.5_U
Sl No.			
1	2023-07-01	31.75	21.56
2	2023-07-02	31.94	21.28
3	2023-07-03	31.69	21.21
4	2023-07-04	31.39	21.11
5	2023-07-05	31.48	21.33
6	2023-07-06	31.39	20.92
7	2023-07-07	31.56	21.03
8	2023-07-08	31.83	20.81
9	2023-07-09	31.63	20.30
10	2023-07-10	31.61	20.10
11	2023-07-11	31.47	20.10
12	2023-07-12	31.14	20.10
13	2023-07-13	31.60	20.10
14	2023-07-14	31.34	20.10

Sl No.	Time	AAQMS_1_CISF_Colony-PM10_U	AAQMS_1_CISF_Colony-PM2.5_U
15	2023-07-15	31.42	20.10
16	2023-07-16	31.14	20.10
17	2023-07-17	31.66	20.10
18	2023-07-18	34.71	20.10
19	2023-07-19	38.76	20.10
20	2023-07-20	35.80	14.24
21	2023-07-21	35.65	4.59
22	2023-07-22	36.01	10.58
23	2023-07-23	38.03	10.58
24	2023-07-24	41.67	10.58
25	2023-07-25	40.37	10.58
26	2023-07-26	36.97	21.53
27	2023-07-27	35.93	21.74
28	2023-07-28	40.12	21.58
29	2023-07-29	44.40	21.33
30	2023-07-30	36.14	21.53
31	2023-07-31	39.43	21.62
32	2023-08-01	36.49	21.75
33	2023-08-02	35.48	21.19
34	2023-08-03	32.60	20.99
35	2023-08-04	32.09	21.36
36	2023-08-05	37.52	21.39
37	2023-08-06	45.53	22.29
38	2023-08-07	51.26	21.84
39	2023-08-08	58.03	21.70
40	2023-08-09	63.10	22.23

Sl No.	Time	AAQMS_1_CISF_Colony-PM10_U	AAQMS_1_CISF_Colony-PM2.5_U
41	2023-08-10	63.62	22.01
42	2023-08-11	59.13	22.09
43	2023-08-12	53.82	21.50
44	2023-08-13	52.10	21.32
45	2023-08-14	53.06	21.76
46	2023-08-15	49.82	22.03
47	2023-08-16	55.46	22.38
48	2023-08-17	40.23	26.48
49	2023-08-18	43.42	21.96
50	2023-08-19	NA	NA
51	2023-08-20	NA	NA
52	2023-08-21	NA	NA
53	2023-08-22	NA	NA
54	2023-08-23	195.85	22.90
55	2023-08-24	31.66	168.44
56	2023-08-25	47.50	235.69
57	2023-08-26	0.00	198.36
58	2023-08-27	0.00	131.87
59	2023-08-28	35.20	77.81
60	2023-08-29	60.25	22.27
61	2023-08-30	60.24	27.41
62	2023-08-31	31.56	21.63
63	2023-09-01	30.13	21.57
64	2023-09-02	30.13	22.00
65	2023-09-03	27.06	20.79
66	2023-09-04	30.13	21.71

Sl No.	Time	AAQMS_1_CISF_Colony-PM10_U	AAQMS_1_CISF_Colony-PM2.5_U
67	2023-09-05	30.13	21.17
68	2023-09-06	30.13	21.06
69	2023-09-07	30.13	21.09
70	2023-09-08	30.13	20.86
71	2023-09-09	NA	NA
72	2023-09-10	65.25	22.35
73	2023-09-11	65.25	22.35
74	2023-09-12	65.25	21.34
75	2023-09-13	110.70	23.70
76	2023-09-14	70.70	142.20
77	2023-09-15	46.85	109.41
78	2023-09-16	65.25	31.14
79	2023-09-17	65.25	31.14
80	2023-09-18	31.73	15.14
81	2023-09-19	0.00	0.00
82	2023-09-20	0.00	0.00
83	2023-09-21	0.00	0.00
84	2023-09-22	0.00	13.12
85	2023-09-23	23.21	18.91
86	2023-09-24	52.25	22.75
87	2023-09-25	52.25	22.19
88	2023-09-26	52.25	22.65
89	2023-09-27	52.25	23.18
90	2023-09-28	52.25	23.55
91	2023-09-29	52.25	23.70
92	2023-09-30	52.25	22.33

	Time	AAQMS_1_CISF_Colony-PM10_U	AAQMS_1_CISF_Colony-PM2.5_U
Sl No.			
93	2023-10-01	52.25	22.13
94	2023-10-02	50.34	24.26
95	2023-10-03	52.25	22.56
96	2023-10-04	52.25	21.92
97	2023-10-05	52.25	23.17
98	2023-10-06	52.25	22.83
99	2023-10-07	52.25	22.87
100	2023-10-08	52.25	22.47
101	2023-10-09	52.25	23.24
102	2023-10-10	52.25	23.70
103	2023-10-11	52.25	23.49
104	2023-10-12	52.25	22.66
105	2023-10-13	52.25	22.35
106	2023-10-14	52.25	25.83
107	2023-10-15	52.25	25.01
108	2023-10-16	52.25	31.17
109	2023-10-17	52.25	25.18
110	2023-10-18	52.25	25.71
111	2023-10-19	58.88	23.70
112	2023-10-20	65.25	22.87
113	2023-10-21	65.25	22.48
114	2023-10-22	65.25	22.75
115	2023-10-23	65.25	23.45
116	2023-10-24	65.25	24.00
117	2023-10-25	65.25	23.70
118	2023-10-26	65.25	23.63

	Time	AAQMS_1_CISF_Colony-PM10_U	AAQMS_1_CISF_Colony-PM2.5_U
Sl No.			
119	2023-10-27	65.25	23.30
120	2023-10-28	65.25	23.28
121	2023-10-29	65.25	23.74
122	2023-10-30	65.25	23.48
123	2023-10-31	49.35	18.19
124	2023-11-01	20.46	12.53
125	2023-11-02	19.90	11.72
126	2023-11-03	19.69	11.25
127	2023-11-04	19.42	10.76
128	2023-11-05	18.41	10.73
129	2023-11-06	18.36	11.57
130	2023-11-07	17.87	11.16
131	2023-11-08	18.54	10.58
132	2023-11-09	18.17	10.54
133	2023-11-10	19.07	11.37
134	2023-11-11	19.30	12.21
135	2023-11-12	19.42	12.69
136	2023-11-13	49.65	13.22
137	2023-11-14	80.93	10.46
138	2023-11-15	101.44	9.65
139	2023-11-16	104.88	17.06
140	2023-11-17	68.51	12.63
141	2023-11-18	40.42	12.42
142	2023-11-19	65.34	11.94
143	2023-11-20	60.70	12.01
144	2023-11-21	59.75	12.82

Sl No.	Time	AAQMS_1_CISF_Colony-PM10_U	AAQMS_1_CISF_Colony-PM2.5_U
145	2023-11-22	74.75	12.10
146	2023-11-23	78.55	40.60
147	2023-11-24	83.61	45.90
148	2023-11-25	91.17	49.08
149	2023-11-26	80.85	44.31
150	2023-11-27	70.36	37.43
151	2023-11-28	68.49	36.11
152	2023-11-29	63.99	32.14
153	2023-11-30	73.15	34.04
154	2023-12-01	71.79	37.88
155	2023-12-02	83.66	44.39
156	2023-12-03	81.89	38.90
157	2023-12-04	73.59	40.22
158	2023-12-05	33.39	19.22
159	2023-12-06	34.63	17.04
160	2023-12-07	24.02	11.59
161	2023-12-08	NA	NA
162	2023-12-09	NA	NA
163	2023-12-10	NA	NA
164	2023-12-11	37.84	24.09
165	2023-12-12	53.03	27.29
166	2023-12-13	61.95	30.51
167	2023-12-14	50.48	28.18
168	2023-12-15	62.34	28.80
169	2023-12-16	56.10	26.38
170	2023-12-17	58.48	29.13

Sl No.	Time	AAQMS_1_CISF_Colony-PM10_U	AAQMS_1_CISF_Colony-PM2.5_U
171	2023-12-18	66.22	35.04
172	2023-12-19	59.51	32.21
173	2023-12-20	70.20	35.65
174	2023-12-21	68.17	39.18
175	2023-12-22	73.92	35.86
176	2023-12-23	66.59	35.73
177	2023-12-24	51.11	26.27
178	2023-12-25	56.60	27.71
179	2023-12-26	87.77	39.28
180	2023-12-27	68.68	39.13
181	2023-12-28	79.57	45.14
182	2023-12-29	81.96	45.42
183	2023-12-30	85.83	48.16
184	2023-12-31	103.52	57.84
185	2024-01-01	NA	NA

Real Time Data Acquisition And Monitoring

Site Name: Bolani Iron Ore Mines (6.9 SQ. Miles) Of M/s Steel Authority Of India Ltd.

Report: Custom Report

From Date: 2023/07/01 00:00:00 To Date : 2024/01/01 00:00:00

Description	AAQMS_2_Campus_Store-PM10_U	AAQMS_2_Campus_Store-PM2.5_U	AAQMS_2_Campus_Store-SO2_U	AAQMS_2_Campus_Store-NOx_U	AAQMS_2_Campus_Store-CO_U
Prescribed Standards	0 - 100	0 - 60	0 - 80	0 - 80	0 - 4
Maximum Data	94.72	36.05	44.12	85.72	1.06
Minimum Data	24.27	6.59	15.15	10.38	0.1
Arithmetic Mean	42.67	14.05	19.26	19.94	0.76
Median	29.82	12.17	17.81	18.66	0.86
Standard Deviation	19.05	5.79	5.03	8.96	0.2
Maximum Value At Time	2023-11-13	2023-11-04	2023-12-31	2023-09-25	2023-09-07
Minimum Value At Time	2023-09-14	2023-07-21	2023-11-04	2023-11-06	2023-10-14
Valid Data Points	148	148	148	148	145
Total Data Points	185	185	185	185	185
Data Availability %	80.0%	80.0%	80.0%	80.0%	78.38%

Sl No.	Time	AAQMS_2_Campus_Store-PM10_U	AAQMS_2_Campus_Store-PM2.5_U	AAQMS_2_Campus_Store-SO2_U	AAQMS_2_Campus_Store-NOx_U	AAQMS_2_Campus_Store-CO_U
1	2023-07-01	30.95	9.43	18.65	18.19	0.59
2	2023-07-02	40.24	10.75	19.55	18.67	0.59
3	2023-07-03	29.77	10.51	18.90	18.66	0.70
4	2023-07-04	25.83	18.55	17.69	18.28	0.67
5	2023-07-05	29.69	10.18	17.05	18.66	0.59
6	2023-07-06	28.35	10.62	16.79	18.22	0.59
7	2023-07-07	27.70	8.20	18.41	18.66	0.59
8	2023-07-08	27.04	7.23	16.96	18.66	0.60
9	2023-07-09	28.02	8.28	16.71	18.66	0.79
10	2023-07-10	29.33	10.04	17.28	18.66	0.79
11	2023-07-11	30.16	10.30	17.91	18.65	0.79
12	2023-07-12	28.95	8.64	16.95	18.66	0.79
13	2023-07-13	28.49	8.78	16.83	18.61	0.79

	Time	AAQMS_2_Campus_Store-PM10_U	AAQMS_2_Campus_Store-PM2.5_U	AAQMS_2_Campus_Store-SO2_U	AAQMS_2_Campus_Store-NOx_U	AAQMS_2_Campus_Store-CO_U
Sl No.						
14	2023-07-14	28.62	12.03	17.23	18.66	0.79
15	2023-07-15	27.87	10.17	16.84	18.66	0.79
16	2023-07-16	27.78	8.67	17.77	18.66	0.79
17	2023-07-17	27.56	7.81	17.78	18.66	0.79
18	2023-07-18	27.90	7.81	17.61	18.66	0.83
19	2023-07-19	28.50	7.51	16.96	18.22	0.86
20	2023-07-20	27.01	7.09	17.34	18.66	0.86
21	2023-07-21	27.27	6.59	16.95	18.66	0.86
22	2023-07-22	27.33	6.89	17.32	18.66	0.86
23	2023-07-23	26.31	7.26	17.69	18.22	0.86
24	2023-07-24	27.66	8.06	17.49	18.66	0.86
25	2023-07-25	27.88	7.77	17.14	17.79	0.86
26	2023-07-26	26.57	6.91	17.71	18.66	0.87
27	2023-07-27	27.41	6.97	17.57	18.18	0.87
28	2023-07-28	28.33	7.88	17.97	18.59	0.86
29	2023-07-29	27.01	9.22	17.51	18.66	0.86
30	2023-07-30	27.10	8.21	17.54	18.66	0.86
31	2023-07-31	26.62	9.24	17.04	18.66	0.86
32	2023-08-01	27.39	8.13	17.58	18.66	0.86
33	2023-08-02	27.40	7.86	17.66	18.66	0.86
34	2023-08-03	27.49	6.86	17.28	18.66	0.86
35	2023-08-04	26.90	6.98	17.20	18.66	0.86
36	2023-08-05	27.92	7.84	17.25	18.66	0.87
37	2023-08-06	28.74	9.76	17.39	18.66	0.88
38	2023-08-07	28.22	11.48	17.76	18.66	0.86
39	2023-08-08	29.62	12.72	18.16	18.66	0.86
40	2023-08-09	30.15	14.45	17.64	18.66	0.86
41	2023-08-10	31.41	15.64	17.81	18.24	0.88
42	2023-08-11	28.91	21.30	18.05	18.66	0.86

Sl No.	Time	AAQMS_2_Campus_Store-PM10_U	AAQMS_2_Campus_Store-PM2.5_U	AAQMS_2_Campus_Store-SO2_U	AAQMS_2_Campus_Store-NOx_U	AAQMS_2_Campus_Store-CO_U
43	2023-08-12	29.13	13.46	17.61	18.66	0.86
44	2023-08-13	28.45	13.27	18.04	18.66	0.86
45	2023-08-14	29.50	13.46	18.06	18.66	0.86
46	2023-08-15	29.26	13.25	18.31	18.66	0.86
47	2023-08-16	29.30	13.87	18.77	18.66	0.88
48	2023-08-17	28.29	9.64	17.36	18.24	0.87
49	2023-08-18	27.42	12.53	17.63	18.66	0.89
50	2023-08-19	NA	NA	NA	NA	NA
51	2023-08-20	NA	NA	NA	NA	NA
52	2023-08-21	NA	NA	NA	NA	NA
53	2023-08-22	NA	NA	NA	NA	NA
54	2023-08-23	27.37	11.98	16.95	18.65	0.86
55	2023-08-24	27.60	9.91	19.04	18.65	0.94
56	2023-08-25	28.96	11.79	18.24	18.66	1.00
57	2023-08-26	30.41	13.67	18.16	18.66	1.00
58	2023-08-27	32.10	17.66	18.09	18.66	1.00
59	2023-08-28	32.91	18.52	18.82	18.66	1.00
60	2023-08-29	34.16	20.10	19.28	18.66	1.00
61	2023-08-30	34.30	18.14	18.07	18.66	1.00
62	2023-08-31	31.30	15.11	18.64	18.66	1.00
63	2023-09-01	32.70	16.84	18.02	18.66	1.00
64	2023-09-02	31.62	17.24	18.92	18.66	1.00
65	2023-09-03	29.50	13.09	19.37	18.66	0.94
66	2023-09-04	28.13	10.86	19.32	18.66	0.92
67	2023-09-05	28.66	8.33	17.80	18.66	0.90
68	2023-09-06	28.27	7.84	18.70	18.66	1.05
69	2023-09-07	28.05	8.41	18.23	18.66	1.06
70	2023-09-08	27.40	7.78	17.21	17.73	1.05
71	2023-09-09	NA	NA	NA	NA	NA

Sl No.	Time	AAQMS_2_Campus_Store-PM10_U	AAQMS_2_Campus_Store-PM2.5_U	AAQMS_2_Campus_Store-SO2_U	AAQMS_2_Campus_Store-NOx_U	AAQMS_2_Campus_Store-CO_U
72	2023-09-10	27.89	13.98	19.33	18.66	0.87
73	2023-09-11	29.88	13.55	18.84	18.66	0.90
74	2023-09-12	30.55	11.82	18.38	18.66	0.90
75	2023-09-13	28.58	11.33	18.40	18.23	0.89
76	2023-09-14	24.27	15.34	17.05	18.66	0.86
77	2023-09-15	27.32	9.68	17.57	18.66	0.86
78	2023-09-16	28.58	11.87	18.57	18.66	0.86
79	2023-09-17	27.38	14.07	18.12	18.66	0.86
80	2023-09-18	28.84	13.44	17.47	18.66	0.86
81	2023-09-19	28.74	12.31	17.39	18.17	0.86
82	2023-09-20	27.26	10.75	17.20	18.25	0.90
83	2023-09-21	28.04	11.16	18.18	18.66	0.86
84	2023-09-22	27.60	11.13	16.96	18.65	0.86
85	2023-09-23	27.57	10.73	16.82	57.40	0.86
86	2023-09-24	28.03	12.68	17.46	64.43	0.86
87	2023-09-25	28.34	15.23	15.51	85.72	0.86
88	2023-09-26	30.74	16.98	17.29	35.60	0.86
89	2023-09-27	28.23	14.95	17.04	18.57	0.86
90	2023-09-28	27.45	14.68	17.13	18.60	0.86
91	2023-09-29	29.86	17.14	18.32	18.82	0.86
92	2023-09-30	28.66	11.95	17.39	18.74	0.86
93	2023-10-01	27.61	10.21	18.03	18.55	0.86
94	2023-10-02	27.91	11.20	18.19	18.45	0.86
95	2023-10-03	28.09	10.03	18.26	18.66	0.86
96	2023-10-04	27.65	10.39	17.76	18.25	0.86
97	2023-10-05	36.70	13.17	17.93	18.59	0.86
98	2023-10-06	34.14	11.85	17.63	19.09	0.86
99	2023-10-07	40.36	15.09	17.72	18.64	0.75
100	2023-10-08	48.53	17.07	18.52	18.64	0.64

	Time	AAQMS_2_Campus_Store-PM10_U	AAQMS_2_Campus_Store-PM2.5_U	AAQMS_2_Campus_Store-SO2_U	AAQMS_2_Campus_Store-NOx_U	AAQMS_2_Campus_Store-CO_U
Sl No.						
101	2023-10-09	65.08	21.61	18.96	18.58	0.64
102	2023-10-10	67.45	21.65	18.57	18.65	0.64
103	2023-10-11	63.72	20.65	18.25	18.67	0.65
104	2023-10-12	63.34	20.27	17.82	18.68	0.67
105	2023-10-13	54.71	17.62	17.40	18.45	0.37
106	2023-10-14	71.58	22.68	18.65	18.64	0.10
107	2023-10-15	69.85	21.74	18.49	18.70	1.03
108	2023-10-16	69.48	21.41	19.27	18.66	1.03
109	2023-10-17	68.21	21.88	18.86	18.66	0.98
110	2023-10-18	64.86	22.37	18.53	18.66	0.95
111	2023-10-19	68.01	23.02	17.74	18.24	0.90
112	2023-10-20	60.77	26.65	17.75	18.23	0.61
113	2023-10-21	55.30	28.32	18.17	18.61	0.73
114	2023-10-22	59.54	19.58	18.06	18.66	0.76
115	2023-10-23	61.99	20.88	18.24	18.66	0.78
116	2023-10-24	56.45	19.93	18.60	18.65	0.78
117	2023-10-25	58.84	19.43	17.77	18.66	0.78
118	2023-10-26	68.21	22.25	18.55	18.66	0.68
119	2023-10-27	63.68	21.18	18.37	18.66	0.66
120	2023-10-28	61.38	19.85	18.92	18.66	0.63
121	2023-10-29	57.90	19.69	17.56	18.66	0.59
122	2023-10-30	65.13	21.43	18.63	18.66	0.59
123	2023-10-31	67.11	22.95	18.80	18.66	0.59
124	2023-11-01	64.59	20.71	18.08	18.21	0.59
125	2023-11-02	60.90	20.33	18.57	18.65	0.59
126	2023-11-03	57.07	18.52	17.98	18.66	0.59
127	2023-11-04	58.03	36.05	15.15	67.07	0.48
128	2023-11-05	54.66	21.73	16.47	11.14	0.35
129	2023-11-06	62.70	22.19	16.39	10.38	0.41

Sl No.	Time	AAQMS_2_Campus_Store-PM10_U	AAQMS_2_Campus_Store-PM2.5_U	AAQMS_2_Campus_Store-SO2_U	AAQMS_2_Campus_Store-NOx_U	AAQMS_2_Campus_Store-CO_U
130	2023-11-07	70.92	22.12	16.36	10.78	0.43
131	2023-11-08	75.12	24.41	16.49	10.77	0.54
132	2023-11-09	79.43	24.92	16.66	10.53	0.67
133	2023-11-10	77.38	24.14	16.60	10.72	0.96
134	2023-11-11	70.79	20.26	16.45	10.70	0.96
135	2023-11-12	76.31	20.09	16.85	10.80	0.93
136	2023-11-13	94.72	25.81	16.41	10.78	0.83
137	2023-11-14	79.18	21.94	16.32	10.79	0.61
138	2023-11-15	67.51	19.70	17.30	10.84	0.61
139	2023-11-16	63.09	18.53	16.81	10.82	0.61
140	2023-11-17	NA	NA	NA	NA	NA
141	2023-11-18	NA	NA	NA	NA	NA
142	2023-11-19	NA	NA	NA	NA	NA
143	2023-11-20	NA	NA	NA	NA	NA
144	2023-11-21	NA	NA	NA	NA	NA
145	2023-11-22	NA	NA	NA	NA	NA
146	2023-11-23	NA	NA	NA	NA	NA
147	2023-11-24	NA	NA	NA	NA	NA
148	2023-11-25	NA	NA	NA	NA	NA
149	2023-11-26	NA	NA	NA	NA	NA
150	2023-11-27	NA	NA	NA	NA	NA
151	2023-11-28	NA	NA	NA	NA	NA
152	2023-11-29	NA	NA	NA	NA	NA
153	2023-11-30	NA	NA	NA	NA	NA
154	2023-12-01	NA	NA	NA	NA	NA
155	2023-12-02	NA	NA	NA	NA	NA
156	2023-12-03	NA	NA	NA	NA	NA
157	2023-12-04	NA	NA	NA	NA	NA
158	2023-12-05	NA	NA	NA	NA	NA

Sl No.	Time	AAQMS_2_Campus_Store-PM10_U	AAQMS_2_Campus_Store-PM2.5_U	AAQMS_2_Campus_Store-SO2_U	AAQMS_2_Campus_Store-NOx_U	AAQMS_2_Campus_Store-CO_U
159	2023-12-06	NA	NA	NA	NA	NA
160	2023-12-07	NA	NA	NA	NA	NA
161	2023-12-08	NA	NA	NA	NA	NA
162	2023-12-09	NA	NA	NA	NA	NA
163	2023-12-10	NA	NA	NA	NA	NA
164	2023-12-11	NA	NA	NA	NA	NA
165	2023-12-12	NA	NA	NA	NA	NA
166	2023-12-13	NA	NA	NA	NA	NA
167	2023-12-14	NA	NA	NA	NA	NA
168	2023-12-15	NA	NA	NA	NA	NA
169	2023-12-16	NA	NA	NA	NA	NA
170	2023-12-17	NA	NA	NA	NA	NA
171	2023-12-18	64.59	8.89	28.06	22.40	NA
172	2023-12-19	59.31	9.13	28.03	23.00	NA
173	2023-12-20	62.88	8.78	26.45	23.00	NA
174	2023-12-21	62.74	8.86	31.11	22.97	0.14
175	2023-12-22	63.78	8.79	37.24	23.10	0.27
176	2023-12-23	67.18	9.03	38.16	22.95	0.25
177	2023-12-24	50.45	8.92	25.68	23.06	0.28
178	2023-12-25	56.54	9.03	28.04	22.94	0.22
179	2023-12-26	81.42	10.88	31.04	35.33	0.46
180	2023-12-27	73.14	8.81	33.30	26.30	0.28
181	2023-12-28	79.52	10.05	38.82	22.96	0.30
182	2023-12-29	78.25	9.54	36.44	23.12	0.37
183	2023-12-30	80.71	9.54	42.78	23.11	0.38
184	2023-12-31	86.68	9.54	44.12	23.03	0.41
185	2024-01-01	NA	NA	NA	NA	NA

Real Time Data Acquisition And Monitoring

Site Name: Bolani Iron Ore Mines (6.9 SQ. Miles) Of M/s Steel Authority Of India Ltd.

Report: Custom Report

From Date: 2023/07/01 00:00:00 To Date : 2024/01/01 00:00:00

Description	AAQMS_3_JNRC-PM10_U	AAQMS_3_JNRC-PM2.5_U
Prescribed Standards	0 - 100	0 - 60
Maximum Data	364.77	69.15
Minimum Data	23.2	13.6
Arithmetic Mean	61.12	29.44
Median	52.64	27.54
Standard Deviation	37.89	13.48
Maximum Value At Time	2023-12-24	2023-12-31
Minimum Value At Time	2023-07-06	2023-08-03
Valid Data Points	176	176
Total Data Points	185	185
Data Availability %	95.14%	95.14%

	Time	AAQMS_3_JNRC-PM10_U	AAQMS_3_JNRC-PM2.5_U
Sl No.			
1	2023-07-01	31.54	27.54
2	2023-07-02	35.49	27.54
3	2023-07-03	34.05	27.54
4	2023-07-04	31.19	27.54
5	2023-07-05	29.64	27.54
6	2023-07-06	23.20	27.54
7	2023-07-07	25.03	26.14
8	2023-07-08	23.65	22.19
9	2023-07-09	34.14	20.54
10	2023-07-10	46.31	24.76
11	2023-07-11	45.80	29.54
12	2023-07-12	37.80	29.54
13	2023-07-13	39.66	29.54
14	2023-07-14	45.32	27.02

Sl No.	Time	AAQMS_3_JNRC-PM10_U	AAQMS_3_JNRC-PM2.5_U
15	2023-07-15	37.57	15.87
16	2023-07-16	35.47	15.80
17	2023-07-17	33.61	14.94
18	2023-07-18	32.02	14.86
19	2023-07-19	30.24	14.00
20	2023-07-20	28.90	13.87
21	2023-07-21	29.44	13.68
22	2023-07-22	27.54	13.69
23	2023-07-23	32.34	14.26
24	2023-07-24	34.83	14.72
25	2023-07-25	30.93	14.78
26	2023-07-26	27.36	13.73
27	2023-07-27	30.23	13.98
28	2023-07-28	35.75	14.83
29	2023-07-29	37.41	16.68
30	2023-07-30	30.08	14.75
31	2023-07-31	32.46	15.09
32	2023-08-01	28.84	14.58
33	2023-08-02	28.62	14.48
34	2023-08-03	26.20	13.60
35	2023-08-04	27.52	13.84
36	2023-08-05	29.38	14.72
37	2023-08-06	35.25	15.94
38	2023-08-07	39.72	16.65
39	2023-08-08	46.92	17.09
40	2023-08-09	51.48	17.50

Sl No.	Time	AAQMS_3_JNRC-PM10_U	AAQMS_3_JNRC-PM2.5_U
41	2023-08-10	54.81	18.42
42	2023-08-11	56.27	18.30
43	2023-08-12	56.43	25.70
44	2023-08-13	45.89	17.17
45	2023-08-14	53.01	20.79
46	2023-08-15	45.39	17.52
47	2023-08-16	58.34	20.26
48	2023-08-17	41.83	17.60
49	2023-08-18	35.71	16.20
50	2023-08-19	NA	NA
51	2023-08-20	NA	NA
52	2023-08-21	NA	NA
53	2023-08-22	NA	NA
54	2023-08-23	41.73	17.28
55	2023-08-24	35.81	16.20
56	2023-08-25	41.84	16.92
57	2023-08-26	49.71	18.43
58	2023-08-27	65.28	25.12
59	2023-08-28	67.33	26.28
60	2023-08-29	69.12	28.28
61	2023-08-30	56.78	52.04
62	2023-08-31	52.82	34.94
63	2023-09-01	59.82	21.46
64	2023-09-02	55.60	20.68
65	2023-09-03	38.92	20.77
66	2023-09-04	33.84	15.56

Sl No.	Time	AAQMS_3_JNRC-PM10_U	AAQMS_3_JNRC-PM2.5_U
67	2023-09-05	31.50	14.34
68	2023-09-06	27.88	13.72
69	2023-09-07	25.06	17.11
70	2023-09-08	31.12	14.59
71	2023-09-09	NA	NA
72	2023-09-10	39.78	16.10
73	2023-09-11	43.32	16.92
74	2023-09-12	41.10	16.73
75	2023-09-13	36.24	16.46
76	2023-09-14	26.96	13.76
77	2023-09-15	33.87	14.88
78	2023-09-16	36.08	15.19
79	2023-09-17	40.21	16.52
80	2023-09-18	40.88	16.26
81	2023-09-19	36.98	15.49
82	2023-09-20	29.78	14.96
83	2023-09-21	31.01	14.69
84	2023-09-22	33.48	16.15
85	2023-09-23	38.45	16.54
86	2023-09-24	75.38	20.14
87	2023-09-25	89.74	23.51
88	2023-09-26	63.68	21.26
89	2023-09-27	63.21	20.89
90	2023-09-28	84.39	23.09
91	2023-09-29	74.10	22.93
92	2023-09-30	56.15	19.62

Sl No.	Time	AAQMS_3_JNRC-PM10_U	AAQMS_3_JNRC-PM2.5_U
93	2023-10-01	33.65	15.01
94	2023-10-02	98.63	18.75
95	2023-10-03	77.35	35.24
96	2023-10-04	35.79	17.49
97	2023-10-05	46.74	20.84
98	2023-10-06	47.20	19.40
99	2023-10-07	58.25	20.43
100	2023-10-08	74.57	26.45
101	2023-10-09	109.57	36.05
102	2023-10-10	131.41	36.09
103	2023-10-11	131.75	35.96
104	2023-10-12	122.66	34.91
105	2023-10-13	91.20	34.14
106	2023-10-14	124.95	37.59
107	2023-10-15	117.88	33.65
108	2023-10-16	124.97	35.29
109	2023-10-17	122.01	35.92
110	2023-10-18	99.73	33.73
111	2023-10-19	81.48	36.89
112	2023-10-20	83.51	60.62
113	2023-10-21	91.47	30.62
114	2023-10-22	95.32	29.15
115	2023-10-23	97.14	33.50
116	2023-10-24	85.22	31.21
117	2023-10-25	69.13	29.14
118	2023-10-26	66.27	34.20

Sl No.	Time	AAQMS_3_JNRC-PM10_U	AAQMS_3_JNRC-PM2.5_U
119	2023-10-27	54.91	34.58
120	2023-10-28	50.57	33.70
121	2023-10-29	40.50	30.13
122	2023-10-30	41.02	32.87
123	2023-10-31	50.22	35.01
124	2023-11-01	51.30	54.84
125	2023-11-02	99.03	31.73
126	2023-11-03	80.13	28.40
127	2023-11-04	68.60	25.90
128	2023-11-05	59.35	34.70
129	2023-11-06	106.55	45.89
130	2023-11-07	104.85	35.96
131	2023-11-08	130.51	43.63
132	2023-11-09	135.46	43.59
133	2023-11-10	126.80	43.29
134	2023-11-11	127.02	40.74
135	2023-11-12	146.21	46.83
136	2023-11-13	130.50	60.74
137	2023-11-14	80.15	49.79
138	2023-11-15	64.17	41.60
139	2023-11-16	61.53	38.14
140	2023-11-17	45.98	34.05
141	2023-11-18	50.75	26.70
142	2023-11-19	54.81	29.68
143	2023-11-20	56.58	31.59
144	2023-11-21	67.69	40.15

Sl No.	Time	AAQMS_3_JNRC-PM10_U	AAQMS_3_JNRC-PM2.5_U
145	2023-11-22	72.23	45.94
146	2023-11-23	89.53	47.09
147	2023-11-24	84.28	52.72
148	2023-11-25	89.92	57.92
149	2023-11-26	74.62	53.14
150	2023-11-27	66.37	45.65
151	2023-11-28	68.15	47.51
152	2023-11-29	61.78	42.27
153	2023-11-30	49.98	45.90
154	2023-12-01	75.41	52.12
155	2023-12-02	84.32	58.19
156	2023-12-03	64.69	48.05
157	2023-12-04	72.98	46.21
158	2023-12-05	29.14	24.94
159	2023-12-06	30.97	22.34
160	2023-12-07	25.16	18.13
161	2023-12-08	NA	NA
162	2023-12-09	NA	NA
163	2023-12-10	NA	NA
164	2023-12-11	52.16	38.97
165	2023-12-12	52.46	38.30
166	2023-12-13	59.24	43.90
167	2023-12-14	50.16	37.71
168	2023-12-15	57.90	42.30
169	2023-12-16	47.78	46.61
170	2023-12-17	51.49	40.18

Sl No.	Time	AAQMS_3_JNRC-PM10_U	AAQMS_3_JNRC-PM2.5_U
171	2023-12-18	64.44	47.72
172	2023-12-19	55.60	44.33
173	2023-12-20	59.23	46.80
174	2023-12-21	58.19	42.97
175	2023-12-22	60.82	43.90
176	2023-12-23	66.99	52.47
177	2023-12-24	364.77	38.01
178	2023-12-25	195.11	40.20
179	2023-12-26	62.45	57.62
180	2023-12-27	65.25	49.51
181	2023-12-28	67.80	53.96
182	2023-12-29	69.63	54.57
183	2023-12-30	76.32	57.60
184	2023-12-31	86.44	69.15
185	2024-01-01	NA	NA

Real Time Data Acquisition And Monitoring

Site Name: Bolani Iron Ore Mines (6.9 SQ. Miles) Of M/s Steel Authority Of India Ltd.

Report: Custom Report

From Date: 2023/07/01 00:00:00 To Date : 2024/01/01 00:00:00

Description	AAQMS_4_Near_Karo_Bridge-PM10_U	AAQMS_4_Near_Karo_Bridge-PM2.5_U
Prescribed Standards	0 - 100	0 - 60
Maximum Data	289.96	264.67
Minimum Data	31.75	9.76
Arithmetic Mean	148.41	80.33
Median	142.4	80.24
Standard Deviation	56.27	38.75
Maximum Value At Time	2023-12-31	2023-08-05
Minimum Value At Time	2023-09-08	2023-08-07
Valid Data Points	176	176
Total Data Points	185	185
Data Availability %	95.14%	95.14%

	Time	AAQMS_4_Near_Karo_Bridge-PM10_U	AAQMS_4_Near_Karo_Bridge-PM2.5_U
Sl No.			
1	2023-07-01	113.71	120.82
2	2023-07-02	125.41	64.73
3	2023-07-03	125.36	61.27
4	2023-07-04	85.24	66.85
5	2023-07-05	120.68	50.68
6	2023-07-06	89.20	37.09
7	2023-07-07	101.57	45.34
8	2023-07-08	111.53	36.01
9	2023-07-09	73.98	40.51
10	2023-07-10	125.68	79.34
11	2023-07-11	140.10	55.35
12	2023-07-12	115.23	44.56
13	2023-07-13	95.70	41.81
14	2023-07-14	124.73	63.53

	Time	AAQMS_4_Near_Karo_Bridge-PM10_U	AAQMS_4_Near_Karo_Bridge-PM2.5_U
Sl No.			
15	2023-07-15	120.40	45.47
16	2023-07-16	94.02	38.19
17	2023-07-17	42.06	42.89
18	2023-07-18	59.80	33.15
19	2023-07-19	86.21	31.59
20	2023-07-20	67.03	33.47
21	2023-07-21	72.25	30.28
22	2023-07-22	73.13	32.43
23	2023-07-23	58.63	38.83
24	2023-07-24	84.96	34.58
25	2023-07-25	87.71	31.79
26	2023-07-26	71.01	26.00
27	2023-07-27	62.01	33.79
28	2023-07-28	97.15	35.46
29	2023-07-29	126.09	49.63
30	2023-07-30	73.42	34.60
31	2023-07-31	105.99	53.05
32	2023-08-01	117.94	66.92
33	2023-08-02	65.89	33.24
34	2023-08-03	123.37	70.07
35	2023-08-04	205.30	155.03
36	2023-08-05	91.02	264.67
37	2023-08-06	96.22	53.78
38	2023-08-07	140.63	9.76
39	2023-08-08	144.91	9.76
40	2023-08-09	118.85	58.61

Sl No.	Time	AAQMS_4_Near_Karo_Bridge-PM10_U	AAQMS_4_Near_Karo_Bridge-PM2.5_U
41	2023-08-10	217.77	9.76
42	2023-08-11	153.24	9.76
43	2023-08-12	88.34	21.31
44	2023-08-13	162.85	56.98
45	2023-08-14	139.45	60.14
46	2023-08-15	169.61	85.17
47	2023-08-16	100.46	64.06
48	2023-08-17	104.79	49.66
49	2023-08-18	88.75	34.57
50	2023-08-19	NA	NA
51	2023-08-20	NA	NA
52	2023-08-21	NA	NA
53	2023-08-22	NA	NA
54	2023-08-23	153.51	54.24
55	2023-08-24	130.48	45.16
56	2023-08-25	128.05	44.61
57	2023-08-26	130.95	103.08
58	2023-08-27	209.13	55.20
59	2023-08-28	216.73	62.52
60	2023-08-29	133.30	68.67
61	2023-08-30	198.28	53.22
62	2023-08-31	179.09	54.45
63	2023-09-01	143.91	76.83
64	2023-09-02	158.07	63.74
65	2023-09-03	136.51	53.49
66	2023-09-04	85.23	40.18

Sl No.	Time	AAQMS_4_Near_Karo_Bridge-PM10_U	AAQMS_4_Near_Karo_Bridge-PM2.5_U
67	2023-09-05	56.58	40.73
68	2023-09-06	77.73	29.01
69	2023-09-07	74.84	31.81
70	2023-09-08	31.75	59.07
71	2023-09-09	NA	NA
72	2023-09-10	111.96	49.93
73	2023-09-11	78.41	63.16
74	2023-09-12	120.30	53.56
75	2023-09-13	91.42	43.57
76	2023-09-14	73.89	33.38
77	2023-09-15	84.18	35.10
78	2023-09-16	106.16	42.65
79	2023-09-17	117.23	46.13
80	2023-09-18	88.73	58.46
81	2023-09-19	102.95	41.30
82	2023-09-20	78.06	35.88
83	2023-09-21	80.78	30.75
84	2023-09-22	117.62	54.77
85	2023-09-23	122.92	42.29
86	2023-09-24	107.65	48.60
87	2023-09-25	104.23	84.40
88	2023-09-26	158.60	85.91
89	2023-09-27	171.73	87.74
90	2023-09-28	141.73	95.00
91	2023-09-29	144.34	88.24
92	2023-09-30	97.61	64.54

Sl No.	Time	AAQMS_4_Near_Karo_Bridge-PM10_U	AAQMS_4_Near_Karo_Bridge-PM2.5_U
93	2023-10-01	84.00	54.61
94	2023-10-02	125.07	66.87
95	2023-10-03	82.85	54.97
96	2023-10-04	63.10	67.40
97	2023-10-05	106.98	66.48
98	2023-10-06	102.99	63.07
99	2023-10-07	103.71	67.96
100	2023-10-08	133.90	74.08
101	2023-10-09	188.04	96.77
102	2023-10-10	178.76	107.99
103	2023-10-11	212.61	96.18
104	2023-10-12	206.99	92.44
105	2023-10-13	144.04	104.00
106	2023-10-14	199.37	101.68
107	2023-10-15	228.96	109.52
108	2023-10-16	130.56	106.50
109	2023-10-17	213.68	114.52
110	2023-10-18	185.71	103.30
111	2023-10-19	183.46	108.35
112	2023-10-20	136.09	100.30
113	2023-10-21	130.64	84.11
114	2023-10-22	172.28	104.63
115	2023-10-23	154.51	97.15
116	2023-10-24	135.53	84.40
117	2023-10-25	170.20	88.07
118	2023-10-26	199.56	97.02

Sl No.	Time	AAQMS_4_Near_Karo_Bridge-PM10_U	AAQMS_4_Near_Karo_Bridge-PM2.5_U
119	2023-10-27	186.13	103.75
120	2023-10-28	164.70	106.57
121	2023-10-29	171.88	93.36
122	2023-10-30	167.35	102.07
123	2023-10-31	159.75	108.10
124	2023-11-01	162.91	110.36
125	2023-11-02	165.92	98.46
126	2023-11-03	146.68	98.65
127	2023-11-04	143.08	87.27
128	2023-11-05	139.49	81.36
129	2023-11-06	131.37	100.66
130	2023-11-07	195.85	110.59
131	2023-11-08	219.89	124.16
132	2023-11-09	238.44	134.36
133	2023-11-10	226.35	132.13
134	2023-11-11	208.56	124.88
135	2023-11-12	218.88	129.17
136	2023-11-13	224.75	147.77
137	2023-11-14	230.23	145.34
138	2023-11-15	182.62	126.76
139	2023-11-16	178.20	106.96
140	2023-11-17	139.50	83.17
141	2023-11-18	190.85	85.60
142	2023-11-19	153.34	81.15
143	2023-11-20	171.92	95.28
144	2023-11-21	195.03	105.78

Sl No.	Time	AAQMS_4_Near_Karo_Bridge-PM10_U	AAQMS_4_Near_Karo_Bridge-PM2.5_U
145	2023-11-22	223.83	118.54
146	2023-11-23	204.26	119.03
147	2023-11-24	182.87	126.27
148	2023-11-25	243.20	129.20
149	2023-11-26	225.88	117.81
150	2023-11-27	238.84	109.30
151	2023-11-28	235.79	110.42
152	2023-11-29	209.94	102.81
153	2023-11-30	153.23	107.30
154	2023-12-01	220.73	109.88
155	2023-12-02	278.69	125.00
156	2023-12-03	159.87	121.31
157	2023-12-04	285.46	115.52
158	2023-12-05	151.46	72.48
159	2023-12-06	68.60	67.22
160	2023-12-07	80.25	59.99
161	2023-12-08	NA	NA
162	2023-12-09	NA	NA
163	2023-12-10	NA	NA
164	2023-12-11	146.45	84.98
165	2023-12-12	231.75	107.36
166	2023-12-13	269.01	101.12
167	2023-12-14	197.99	108.38
168	2023-12-15	216.19	111.67
169	2023-12-16	214.84	121.14
170	2023-12-17	186.22	94.12

Sl No.	Time	AAQMS_4_Near_Karo_Bridge-PM10_U	AAQMS_4_Near_Karo_Bridge-PM2.5_U
171	2023-12-18	181.30	147.21
172	2023-12-19	196.22	121.18
173	2023-12-20	201.40	125.35
174	2023-12-21	213.11	124.03
175	2023-12-22	228.03	128.76
176	2023-12-23	234.41	137.11
177	2023-12-24	152.37	116.52
178	2023-12-25	203.19	119.89
179	2023-12-26	175.25	118.77
180	2023-12-27	232.08	138.44
181	2023-12-28	230.16	145.69
182	2023-12-29	224.35	150.70
183	2023-12-30	241.86	149.12
184	2023-12-31	289.96	170.69
185	2024-01-01	NA	NA

ANNEXURE - I(B)
BIO-ASSAY TEST

Mitra S. K. Private Limited

At/P.O.:BARBIL Ward No-6
Dist.: Keonjhar, Odisha - 758035
CIN: U51909WB1956PTC023037

T : +91 94370 09815,94370 09820,94370 75269
E : barbil@mitrask.co.in
W : www.mitrask.com

MSK TESTING & INSPECTION

Ref. No. BBL/ENV/3902

Date:31/03/2023

ANALYSIS REPORT OF WATER

Name of Client:	Steel Authority of India Ltd.
Site:	Bolani Ores Mines
Address:	P.o: Bolani, Dist-Keonjhar, Odisha
Date of Sampling:	18.03.2023
Type of Sample:	Surface Water

Sampling Location:				Karo River	Jhikaria Nala
Sl. No.	Test Parameters	Unite	Max. Tolerance Limit as per IS: 2490 and CPCB	Result	Result
01	Bio-assay	---	90% survival in 100% effluent	90% survival in 100% effluent	90% survival in 100% effluent

Checked by:-

M/S. S. K. (P) LTD. BARBIL

For Mitra S. K. Private Limited

Authorized Signatory

ANNEXURE - I(C)

NOISE MONITORING DATA

NOISE MONITORING REPORT

MONTH OF JULY- 2023

Sl No	Location	Noise Level 1 hr Leq in dB(A)
A	**AMBIENT NOISE LEVEL**	
1	Bolani Township	54.5
2	Karo Guest House	59.1
B	**WORK ZONE NOISE LEVEL**	
1	F- Area Mine Pit	63.9
2	G-Area Mine pit	60.8
3	Panposh Quarry	69.6
4	D-Area Mine Pit	67.3
5*	Near Feed Hopper , F-area	76.9
6*	Secondary Crusher room	73.6
7*	Washing Plant	73.1
8	Loading Plant	67.4
9*	Inside operator's Cabin Drill Machine(in running condition)	74.9
10*	Inside operator's Cabin of running Dumper with Load	78.0
11*	Inside engine Testing Room during Engine Testing	80.2
12	Quarry-5 Mine Pit	69.9
13	600 TPH C&S Plant	73.4
14*	Inside operator's Cabin of running Loader	79.1

*Noise Exposure less than - 8 hours

NOISE MONITORING REPORT

MONTH OF AUGUST- 2023

Sl No	Location	Noise Level 1 hr Leq in dB(A)
A	**AMBIENT NOISE LEVEL**	
1	Bolani Township	54.9
2	Karo Guest House	57.2
B	**WORK ZONE NOISE LEVEL**	
1	F- Area Mine Pit	64.1
2	G-Area Mine pit	60.4
3	Panposh Quarry	69.2
4	D-Area Mine Pit	67.6
5*	Near Feed Hopper , F-area	76.3
6*	Secondary Crusher room	72.6
7*	Washing Plant	72.1
8	Loading Plant	66.4
9*	Inside operator's Cabin Drill Machine(in running condition)	73.9
10*	Inside operator's Cabin of running Dumper with Load	77.2
11*	Inside engine Testing Room during Engine Testing	79.2
12	Quarry-5 Mine Pit	68.5
13	600 TPH C&S Plant	73.6
14*	Inside operator's Cabin of running Loader	78.9

*Noise Exposure less than - 8 hours

NOISE MONITORING REPORT

MONTH OF SEPTEMBER- 2023

Sl No	Location	Noise Level 1 hr Leq in dB(A)
A	**AMBIENT NOISE LEVEL**	
1	Bolani Township	53.9
2	Karo Guest House	59.2
B	**WORK ZONE NOISE LEVEL**	
1	F- Area Mine Pit	64.2
2	G-Area Mine pit	59.9
3	Panposh Quarry	68.9
4	D-Area Mine Pit	68.2
5*	Near Feed Hopper , F-area	75.9
6*	Secondary Crusher room	74.8
7*	Washing Plant	74.4
8	Loading Plant	74.1
9*	Inside operator's Cabin Drill Machine(in running condition)	75.6
10*	Inside operator's Cabin of running Dumper with Load	79.2
11*	Inside engine Testing Room during Engine Testing	80.1
12	Quarry-5 Mine Pit	70.3
13	600 TPH C&S Plant	72.5
14*	Inside operator's Cabin of running Loader	79.3

*Noise Exposure less than - 8 hours

NOISE MONITORING REPORT

MONTH OF OCTOBER- 2023

Sl No	Location	Noise Level 1 hr Leq in dB(A)
A	**AMBIENT NOISE LEVEL**	
1	Bolani Township	58.2
2	Karo Guest House	54.8
B	**WORK ZONE NOISE LEVEL**	
1	F- Area Mine Pit	63.8
2	G-Area Mine pit	68.8
3	Panposh Quarry	65.7
4	D-Area Mine Pit	69.5
5*	Near Feed Hopper , F-area	72.7
6*	Secondary Crusher room	79.2
7*	Washing Plant	70.4
8	Loading Plant	72.6
9*	Inside operator's Cabin Drill Machine(in running condition)	69.8
10*	Inside operator's Cabin of running Dumper with Load	78.9
11*	Inside engine Testing Room during Engine Testing	81.2
12	Quarry-5 Mine Pit	68.9
13	600 TPH C&S Plant	69.1
14*	Inside operator's Cabin of running Loader	76.3

*Noise Exposure less than - 8 hours

NOISE MONITORING REPORT

MONTH OF NOVEMBER- 2023

Sl No	Location	Noise Level 1 hr Leq in dB(A)
A	**AMBIENT NOISE LEVEL**	
1	Bolani Township	51.2
2	Karo Guest House	58.4
B	**WORK ZONE NOISE LEVEL**	
1	F- Area Mine Pit	68.2
2	G-Area Mine pit	69.1
3	Panposh Quarry	70.3
4	D-Area Mine Pit	62.7
5*	Near Feed Hopper , F-area	74.5
6*	Secondary Crusher room	74.8
7*	Washing Plant	78.1
8	Loading Plant	69.4
9*	Inside operator's Cabin Drill Machine(in running condition)	75.9
10*	Inside operator's Cabin of running Dumper with Load	81.4
11*	Inside engine Testing Room during Engine Testing	78.2
12	Quarry-5 Mine Pit	69.5
13	600 TPH C&S Plant	69.9
14*	Inside operator's Cabin of running Loader	77.2

*Noise Exposure less than - 8 hours

NOISE MONITORING REPORT

MONTH OF DECEMBER- 2023

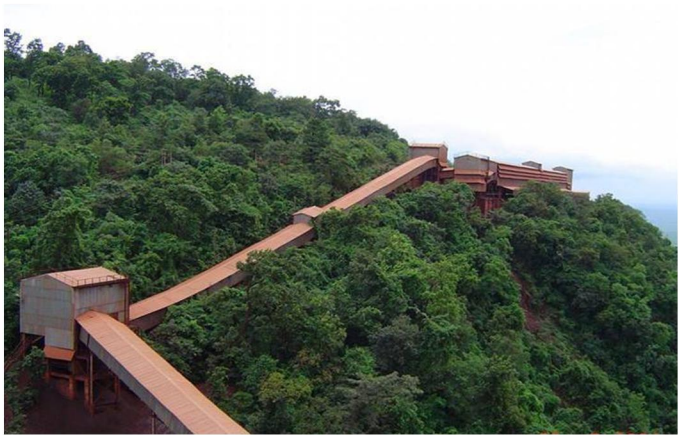
Sl No	Location	Noise Level 1 hr Leq in dB(A)
A	**AMBIENT NOISE LEVEL**	
1	Bolani Township	56.6
2	Karo Guest House	51.4
B	**WORK ZONE NOISE LEVEL**	
1	F- Area Mine Pit	64.6
2	G-Area Mine pit	63.7
3	Panposh Quarry	65.8
4	D-Area Mine Pit	64.6
5*	Near Feed Hopper , F-area	71.3
6*	Secondary Crusher room	76.2
7*	Washing Plant	72.2
8	Loading Plant	68.5
9*	Inside operator's Cabin Drill Machine(in running condition)	78.9
10*	Inside operator's Cabin of running Dumper with Load	80.5
11*	Inside engine Testing Room during Engine Testing	80.8
12	Quarry-5 Mine Pit	62.8
13	600 TPH C&S Plant	69.2
14*	Inside operator's Cabin of running Loader	70.8

*Noise Exposure less than - 8 hours

ANNEXURE - II

Annexure-II

PHOTOGRAPHS SHOWING MITIGATION MEASURES FOR COPNTROL OF RESPIRABLE SUSPENDED PARTICULATE MATTERS (RSPM)



Photograph showing Covered conveyors from feed hopper at Hill top

Imagery showing Covered conveyors from feed hopper at Hill top till Despatch Point

Photograph showing Bag House installed at seconndary Crushing Point

Photograph showing Dry Fog Dust suppression System installed at Feed Hopper at Hill Top Plant

Photograph showing Wet Drilling

Photograph showing Water sprinkling on Haul Road by 28 KL BEML Water Sprinkler

Annexure-II

PHOTOGRAPHS SHOWING MITIGATION MEASURES FOR CONTROL OF RESPIRABLE SUSPENDED PARTICULATE MATTERS (RSPM)

FOR SUPPRESSION OF FUGITIVE DUST AROUND STOCK PILE AREAS AND HAUL ROAD

Photograph showing Fixed water sprinkling system on Haul Road from Panposh

Photograph showing water sprinkling system on Haul Road near 600 TPH Plant

Photograph showing Mist generation for suppression of dust at Ore stockpiles

Photograph showing Truck Mounted Mist cannon in operation

Photograph showing canvassing on the ban of Single Use Plastic (SUP)

Photograph showing distribution of phamplets for awareness on ban of Single Use Plastics(SUP)

ANNEXURE - III

Annexure-IV OB DUMP RECLAMATION AND REHABILITATION

Vetiver Plantation on Old fines dump

Native grass species broadcasted on Panposh OB dump

Plantation of Drought hardy species on G-area OB dump

Coir Matting on DH-5 subgrade dump

ANNEXURE - IV

PLANTATION OVER 20 HA NEAR KIRIBURU

2014

2017

2020

2022

ECORESTORATION SITE OF OVER 40 HA NEAR D-AREA QUARRY

2018

2019

2020

2022

PLANTATION OVER 5 HA NEAR G-AREA QUARRY SAFETY ZONE

2014

2016

2020

2022

PLANTATION OVER 10.5 HA NEAR G-AREA OB DUMP

2014

2018

2016

2022

FRUIT ORCHARD OVER 5 HA NEAR KARO GUEST HOUSE

2019

2020

2022