



Ref No: SRL/2016/CO-ECC-1

Date: 20.05.2016

To,

The Additional Director (South)  
Ministry of Environment and Forest  
Regional Office (Southern Zone)  
Kendriya Sadan, IVth Floor, E & F Wings  
17<sup>th</sup> Main Road, II Block, Kormangala  
Bangalore – 560 034

**Sub: Six monthly compliance report of Colomba Iron Ore Mine (T.C. No. 35 Of 1952), Goa for the period October 2015 to March 2016.**

Respected Sir,

We are herewith submitting the condition wise compliance report as per the conditions laid down in the Environmental Clearance Letter No. J-11015/156 /2005-IA-II (M) dated 17/11/2005 for the period **October 2015 to March 2016**.

Thanking you,

Yours faithfully,

A handwritten signature in black ink, appearing to read "Joaquim D'Costa".

**Joaquim D'Costa**  
**Mines Manager**  
**Colomba iron ore Mine**

**Enclosed:** Six monthly compliance report of Colomba Iron Ore Mine for the period October 2015 to March 2016.

C.C: 1. Member Secretary, Goa State Pollution Control Board  
2. CGWB

Compliance report to conditions of environmental clearance issued by			
Ministry of Environment & Forests, Govt. of India, for Colomba Iron Ore Mine (T.C. No. 35 of 1952)			
Letter No. J-11015/156/2005-IA.II(M)			
Production: 0.1 MTPA as per Environment clearance, however the current production limit is 0.045 MTPA as per capping imposed by state govt.			
Period : October 2016–March 2017			
S. No	Condition of clearance	Status of compliance	Remarks
A.	Specific Conditions		
(i)	The environmental clearance is accorded only for two years during which period detailed hydro geological study (quality and quantity) on impact of mining on hydrogeology (pre-monsoon, monsoon and post-monsoon) shall be carried out and the report submitted to Ministry.	Environment clearance was granted dated 17.11.2005 and extension of validity vide letter No. J-11015/156/2005-IA-II(M) dated 02.01.2008.  Hydro geological report submitted to MoEF on December 2006.	
(ii)	Prior approval of the Chief Wildlife Warden, Government of Goa shall be obtained for mining at distance of 3 km from Netravali Wildlife Sanctuary.	The provisions of wild life protection Act is not applicable as the mines falls out of eco-sensitive zones notified by MoEF for the state of Goa.	
(iii)	No dumping of OB where natural slopes already exceeding 28° angle.	The Place identified for Dumping does not exceed slope of 30°.	Mining operations have not resumed.

(iv)	Top soil should be stacked properly with adequate measures at earmarked sites. It should be used for reclamation and rehabilitation of the mined out areas.	Whatever top soil encountered was used for Green belt Development purpose and no top Soil is Present now.	
(v)	OB and other wastes should be stacked at earmarked sites only and should not be kept active for long periods of time. Plantation should be taken up for soil stabilization along the slopes of the dump and terraced after every 5-6 m of height and overall slope angle shall be maintained not exceeding 28°. Sedimentation pits shall be constructed at the corners of the garland drains. Retention/Toe walls shall be provided at the base of the dumps.	OB and other waste are stacked at the earmarked site and these sites remain active for maximum five years and plantation is carried out after finalizing the site along the slopes. The total height of dump is around 20m and comprising of three stages. Overall slope angle is maintained within 30°. Sedimentation pits are constructed at possible corners of the Garland Drains. Retention/Toe walls are constructed at the toe of the dumps.	Mining operations have not resumed.  Attached list of plant saplings planted as Annexure 03.
(vi)	Use of geotextiles for dump stabilization shall be taken up in the critical areas.	Geotextiles are used for erosion control and stabilizing the dump slopes at critical areas observed.	
(vii)	Catch drains, and siltation ponds of appropriate size, gully plugs and check dams should be constructed to arrest silt and sediment flows from the mining operations, Desilting operations shall be undertaken regularly and particularly after very monsoon. Garland drain (size, gradient & length) shall be constructed for both mine pit and for the waste dump. Sump capacity should be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits should be constructed at the corners of the garland drains. Desilting operations shall be undertaken after very monsoon.	Trenches / Garland drains are constructed at the foot of the dumps. Settling ponds of sufficient depth are constructed at the toe of dump, keeping in mind the rainfall data. De-silting of settling ponds is carried out before onset of monsoon. Lateritic boulder walls are constructed at the toe of the dump. All the monsoon run-off water is channelized through garland drains into the mine pit. The water is treated with lime and Magnasol if required and clean water is pumped out.	



(viii)	Drills should be wet operated or with dust extractors.	No Drilling and Blasting is Carried Out whereas Wet Drilling is adopted only for Exploration purpose as and when required.	
(ix)	Measures shall be taken for proper maintenance of vehicles used in mining operations and in transportation of mineral ore and in ensuring that emissions are within prescribed norms. The vehicles should be covered with tarpaulin and should not be overloaded.	All HEMM and Vehicles used in Colomba Mine are hired. The Maintenance and P.U.C. check (Pollution under control) is done by the Individual vehicle owners. All the ore carrying trucks are covered with tarpaulin before leaving the mining Premises. Free Board is provided and load is kept within the Limits.	Mining operations have not resumed.
(x)	Plantation shall be done which includes a green belt of adequate width around the ML area, along roads, OB dumps and non-mineralized areas identified for plantation by planting suitable native species in consultation with the local DFO/Agriculture Department. The density of trees should be around 2500 plants per hectare. Substantial allocation of funds shall be made for afforestation and reclamation and details furnished to the Ministry and to the MOEF RO, Bangalore.	Natural green belt of adequate width is present around the Mining Lease Boundary and plantation is carried out and maintained along roads, OB dumps and Non Mineralized areas.	Attached list of plant saplings planted as Annexure 03
(xi)	A Progressive Mine closure plan clearly indicating the year of backfilling, area to be backfilled, quantum of OB to be backfilled and are to be reclaimed with plantation shall be prepared and implemented.	A Progressive Mine Closure Plan is approved by IBM as part of mining Plan. The status of the same is submitted to IBM annually.	
(xii)	Mine water discharged from the lease shall be treated to prescribed standards and to ensure that there is no adverse impacts on River Kushavati.	No Mine Water is Discharged to Kushavati River hence there is no adverse impact on Kushavati River.	

(xiii)	Water harvesting measures should be taken up in and around mine site. Further, desiltation shall be done every year before the onset of monsoon.	All the monsoon run-off water is channelized in to mining pit. The settling ponds constructed at dump toe also acts as means to harvest rain water. The settling ponds are de-silted every year before the onset of monsoon.	
(xiv)	No additional groundwater shall be used for mining operations. Prior approval of the MOEF and CGWA shall be obtained for using groundwater for mining operations. Additional water requirement, if any, shall be met from recycling of water from mining/processing operations and from water harvesting measures.	No groundwater is used for mining operation. Rain water is harvested in the mine pit and the same is used for dust suppression activities.	Permission from WRD for pumping water from Mine pit is Renewed for Colomba Mine via registration certificate No.WRD/WDXIII/Ren/Certi/ Reg/Sang/F.100/16-17/04 Dated 02/12/2017
(xv)	Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new peizometers at suitable locations in project area. The frequency of monitoring should be minimum four times a year – January, pre monsoon (April/May), monsoon (August), post monsoon (November), and winter (January) seasons for groundwater level and in May for quality, particularly for heavy metals. Data generated from groundwater regime monitoring will be submitted to CGWB, Regional office on an annual basis. The monitoring shall include levels of heavy metals including iron.	No mining activities since September 2012. Ground water monitoring is conducted for Baseline study.	Reports Attached as Annexure 02.
(xvi)	A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	Final mine closure plan approved by IBM would be submitted to MOEF in due course of time in accordance with Rule 23(c) of MCDR 1988.	
(xvii)	Consent to Operate shall be obtained from the SPCB for expansion of	Consent to operate from GSPCB is granted on	Application given to the

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	mining operations.	07/09/2015 vide letter No. 5/5015/15-PCB/CI-574 and is valid till 20/05/2017.	board for renewal of consent.
(xviii)	Environmental Clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation vs Union of India in Civil Writ Petition No. 460 of 2004, as may be applicable to this project.	Noted	
(xix)	Adequate measures for soil erosion, prevention and control shall be undertaken. Details of implementation on the same shall be submitted to the regional Office of the Ministry within 6 months.	Rock walls and settling ponds are constructed at the toe of the dump. Environment protective measures like de-silting of settling ponds and drains have been carried out before the onset of monsoon. All the mine run-off water is channelized through garland drains and pipes within the mine pit. The pit water is treated with lime if required and clean water is pumped out. Geotextiles are laid on the Dumps and plantation is carried out.	
(xx)	Harvesting of mine pit discharge and rain water to recharge the aquifers shall be undertaken. Implementation details on the same shall be submitted to the regional office of the Ministry within six months. The result of such harvesting scheme shall be periodically submitted to the Ministry.	The pumped out water Discharge is passed through settling ponds which recharges the surrounding aquifers.	Mining operations have not resumed.

B.	General Conditions		
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S. No	Condition of clearance	Status of compliance	Remarks
(i)	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	Mining is done as per the IBM approved mining plan. In case of change of technology, will inform MoEFCC.	
(ii)	No change in the calendar plan including excavation, quantum of iron ore, waste dumps should be made.	Production & waste generation is being carried out in accordance with Mining plan.	Mining operations have not resumed.
(iii)	Four ambient air quality monitoring stations should be established in the core zone as well as in the buffer zone for monitoring RPM, SPM, NO <sub>x</sub> and SO <sub>2</sub> . Location of the ambient air quality stations should be decided based on meteorological data, topographical features and environmentally and ecologically sensitive targets and the frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.	No mining activities since September 2012 and hence there is no air monitoring being conducted.	The air monitoring will be started on resumption of mining activities.
(iv)	Data on environmental quality should be regularly submitted to the Ministry including its Regional Office at Bangalore and the State Pollution Control Board/Central Pollution Control Board once in six months.	Mining activities not yet resumed. There is no water discharge from this mine pit. Air monitoring would be resumed once the mining operations start.	
(v)	Adequate measures for control of fugitive emissions should be taken during drilling & blasting operations, loading and transportation of mineral, etc. Fugitive dust emission should be regularly monitored and data recorded properly. Water spraying arrangement over haul roads, loading and unloading points and transportation of minerals, etc. should be provided and properly maintained.	For the control of the fugitive dust, various possible measures are adopted some of which are as below: (a) Water sprinkling is carried out to prevent the dust from getting air borne (b) Ore carrying trucks plying on the public roads are covered with tarpaulin & free board is provided to prevent the spillage. (C) No blasting operations are carried out	

(vi)	Adequate measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operations of HEMM, etc., should be provided with ear plugs/muffs.	Adequate measures for control of noise levels like, regular monitoring of noise levels. PPE's are provided to all workmen.	
(vii)	Industrial waste water (workshop and wastewater from the 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 in the mine for treatment before discharge of effluents from the workshop. There shall be no discharge of wastewater from the mine site even during peak monsoon season.	There is no workshop within the mining lease; hence there is no industrial waste water generation or discharge.	
(viii)	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. Occupational health surveillance programme of the workers should be undertaken periodically and corrective measures taken, if required.	All the workmen and staff working in mines are provided with PPE's. Training and information on safety and health aspects is imparted periodically.	Mining operations have not resumed.
(ix)	The data on environmental quality should be collected and analyzed either through an in-house environmental laboratory established with adequate number and type of pollution monitoring and analysis equipment or got analyzed through an approved laboratory under the Environment (Protection) Rules, 1986 in consultation with the State Pollution Control Board.	No mining activities since September 2012 and hence there is no monitoring being carried out at this mine. Ground water monitoring is carried out for baseline study	The monitoring will be started on resumption of mining activities.
(x)	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.	The environmental management cell with suitable qualified personnel is set up under the control of Head (HSE) who reports directly to the CEO of the company.	



(xi)	The funds earmarked for environmental protection measures should be kept in separate account and not diverted for any other purpose. Year-wise expenditure should be reported to the Ministry of Environment & Forests.	Environment budget is prepared and funds are earmarked under various heads like Mine reclamation, Erosion Control, Dust Suppression, Water Treatment and . Environment Monitoring.	No Mining Operation till date.
(xii)	The project authorities should inform to the Regional Office located at Bangalore regarding date of financial closures and final approval of the project by the concerned authorities, and the date of start of land development work.	It is an ongoing mining project.	
(xiii)	The Regional Office of this Ministry located at Bangalore shall monitor compliance of the stipulated environmental conditions. The project authorities should extend full cooperation to the officer(s) of the Regional Office by furnishing the requisite data/ information/ monitoring reports.	Necessary support shall be provided to the regional officer for the visit, furnishing requisite data etc.	
(xiv)	A copy of the clearance letter should be market to concerned Panchayat/local NGO, if any, from whom any suggestion/ representation has been received while processing the proposal.	Clearance Letter has been given to Local Panchayat/SPCB.	
(xv)	The State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and the collector's/Tehsildar's Office for 30 days.	--	
(xvi)	The project authorities should advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within 7 days of issuance 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 Board and may also be seen at web site of the Ministry of Environment and forests at <a href="http://envfor.nic.in">http://envfor.nic.in</a> .	The issue of EC was advertised on NavHind Times and Gomantak on 22/11/2005.	

### M/s Sesa Environment Laboratory

Vedanta Limited ,Mining Division ,Codli Mines,P.O. Kirlapale ,Goa-403727

Recognised by Ministry of Environment, Forests and Climate change, Govt. of India Vide Notification .S.O.137(E). dated 12<sup>th</sup> January 2015 , Valid up to 11.01.2020

\* Certified by ISO 9001: 2008, ISO 14001:2004 and OHSAS 18001:2007

#### Well water level Report

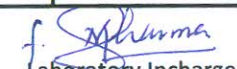
Mine Name:Colomba Mine

Instrument Used: Well water tape

Sr.No	Location	Total Depth of well	Depth of Water level from the reference point in mtrs		Water Column in mtrs	
			26.11.2016	29.12.2016	26.11.2016	29.12.2016
1	Colomba Village Well	12.25	10.6	11.1	1.7	1.2
2	Shivsüre Village Well	8	4.65	6.1	3.4	1.9
3	Mollewada Village Well	4.8	3.8	3.75	1	1.1
4	Near Mine office	8.4	6.6	6.8	1.8	1.6

Sr.No	Location	Total Depth of well in mtr	Depth of Water level from the		Water Column in mtr	
			18.02.2017	18.03.2017	18.02.2017	18.03.2017
1	Colomba Village Well	12.25	11.2	11.2	1.1	1.1
2	Shivsüre Village Well	8	6.5	6.57	1.5	1.43
3	Mollewada Village Well	4.8	3.8	3.9	1	0.9
4	Near Mine office	8.4	7	7.1	1.4	1.3

  
Govt Analyst

  
Laboratory Incharge



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Dated 12th January 2015, valid up to 11.01.2020

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### Well Water Analysis Report

Mine Name: Colomba Mine

Date of Sample collection :26.11.2016

Standard method used for analysis: APHA Standard

Test Report No: 204

Date of Receipt of sample: 26.11.2016

Analysis completion date: 02.12.2016

Parameter	Unit	Permissible Limit	Location			
			Colomba Village Well	Shivsüre Village Well	Mollewada Village Well	Near Mine office
Colour	Hazen	<5.0	<5	<5	<5	<5
pH	-	6.5-8.5	6.60	6.71	6.49	6.58
Turbidity	NTU	5	1.91	2.3	2.1	1.86
Conductivity	µs/cm	-	26	38	47	52
Dissolved Solids	mg/lit	500	15	19	24	26
Suspended Solids	mg/lit	-	2	2	2	2
Chloride	mg/lit	250	5	6.9	6.9	7.8
Total Hardness as CaCO <sub>3</sub>	mg/lit	200	8.0	10	14	14
Calcium as Ca <sup>++</sup>	mg/lit	75	1.6	2.4	2.4	2.4
Magnesium as mg <sup>++</sup>	mg/lit	30	1.0	1.0	1.9	1.9
Sulphate as SO <sub>4</sub>	mg/lit	200	1	0.9	2	2
Nitrate as NO <sub>3</sub>	mg/lit	45	0.1	0.1	0.1	0.1
Alkalinity	mg/lit	200	6	5	8	5
Iron as Fe	mg/lit	0.3	0.08	0.09	0.10	0.10
Manganese as Mn	mg/lit	0.1	BDL	BDL	BDL	BDL
MPN/100ml	-	Absent	31	17	22	15

BDL- Below Detection Limit



Govt. Analyst



Laboratory Incharge



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Recognised by Ministry of Environment, Forests and Climate change, Govt. of India Vide Notification .S.O.137(E).

Dated 12th January 2015, valid up to 11.01.2020

\* Certified by ISO 9001:2008, ISO 14001 :2004 and OHSAS 18001:2007

### Well Water Analysis Report

**Mine Name:** Colomba Mine

**Date of Sample collection :** 29.12.2016

**Standard method used for analysis:** APHA Standard

**Test Report No:** 222

**Date of Receipt of sample:** 29.12.2016

**Analysis completion date:** 03.17.2016

Parameter	Unit	Permissible Limit	Location			
			Colomba Village Well	Shivsures Village Well	Mollewada Village Well	Near Mine office
Colour	Hazen	<5.0	<5	<5	<5	<5
pH	-	6.5-8.5	6.61	6.39	6.53	6.7
Turbidity	NTU	5	1	1.23	1.6	1
Conductivity	µs/cm	-	31	31	47	47
Dissolved Solids	mg/lit	500	15	15	23	23
Suspended Solids	mg/lit	-	2	1	1	2
Chloride	mg/lit	250	6	7	7	6
Total Hardness as CaCO <sub>3</sub>	mg/lit	200	10	8	14	14
Calcium as Ca <sup>++</sup>	mg/lit	75	2.4	1.6	3.2	4.0
Magnesium as mg <sup>++</sup>	mg/lit	30	1.0	1.0	1.5	1.0
Sulphate as SO <sub>4</sub>	mg/lit	200	1	0.6	2	1.5
Nitrate as NO <sub>3</sub>	mg/lit	45	BDL	BDL	0.1	0.1
Alkalinity	mg/lit	200	7	5	10	6
Iron as Fe	mg/lit	0.3	0.07	0.10	0.08	0.09
Manganese as Mn	mg/lit	0.1	BDL	0.03	0.02	0.03
MPN/100ml	-	Absent	31	17	21	17

**BDL-** Below Detection Limit



Govt. Analyst



Laboratory Incharge

**PLANTATION DETAILS  
FOR THE FINANCIAL YEAR 2016-2017  
Colomba Iron Ore Mine**

Sr. No.	Name of the Species		WML	
	Botanical Name	Common Name	Nos.	Area
	Anacardium occidentale	Cashew	25	Gap Filling
2)	Mangifera indica	Mango	5	
3)	Phyllanthus emblica	Awla	5	
4)	Tamarindus indica	Tamarind	5	
5)	Peltophorum	Peltophorum	5	
6)	Bauhinia Racemosa	Apta	5	
7)	Sapindus mukorossi	Reetha	5	
	TOTAL		50	