

**CC**

Mine Owners

**ALTINHO - MAPUSA - GOA**

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

Date: 23.05.2017

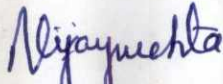
**Sub: Six monthly compliance report of Gaval Sonshi Iron Ore Mine (T.C. No. 110/53), Goa for the period October 2016 to March 2017.**

Respected Sir,

We are herewith submitting the condition wise compliance report and corresponding annexures as per the conditions laid down in the Environmental Clearance Letter No: J-11015/26/2008-IA.II(M) dated 26/03/2009 for the period **October 2016 to March 2017**.

Thanking you,

Yours faithfully,

**For M/s Cosme Costa & Sons.**

Mr. Vijay Mehta  
Mines Manager  
Gaval Sonshi Mines

**Enclosed: Six monthly compliance report of Gaval Sonshi Iron Ore Mine for the period October 2016 to March 2017.**

C.C - Member Secretary, Goa State Pollution Control Board

-- CGWB

**Ministry of Environment & Forests, Govt. of India, for Sonshi mine (T.C No.110 of 1953)**

**Letter No. J-11015/26/2008-IA.II(M)**

**Production 3.0 MTPA as per Environment clearance, however the current production limit is 1.60 MTPA as per capping imposed by state govt.**

**Period :October 2016 to March 2017**

<b>Sr. No.</b>	<b>Condition of clearance</b>	<b>Status of compliance</b>	<b>Remarks</b>
<b>A.</b>	<b>Specific Conditions</b>		
(i)	Environmental Clearance is subject to final order of the Hon'ble Supreme of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) no. 460 of 2004, as many as applicable to this project.	Will be complied with.	
(ii)	Environment Clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from the Competent Authority.	The provision of Wildlife (Protection) Act, 1972 is not applicable as the mine falls outside the Eco sensitive zones notified for the State of Goa	
(iii)	No two pits shall be simultaneously worked i.e. before the first pits are exhausted and reclamation work completed, no mineral bearing area shall be worked.	Sonshi mine has only single pit operation.	
(iv)	After exhausting the first mine pit and before starting mining operations in the next pit, reclamation and plantation works in the exhausted pit shall be completed so as to ensure that reclamation, forest cover and vegetation are visible during the first year of mining operations in the next pit. This process will follow till the last pit is exhausted. Adequate rehabilitation of mined pit shall be completed before any new ore bearing area is worked for expansion.	Not applicable, as it is a single pit mining operation.	
(v)	Adequate buffer zone shall be maintained between two consecutive mineral bearing deposits.	Since it is single pit operation, this is not applicable.	



(v)	Zero waste mining concept shall be implemented either by putting up pelletisation plant or dispose of 100% low grade ores/ fines to prospective buyers.	100% low grade ore has been utilized for blending and sale after processing. There is no low grade stock at the mines.			
(vi)	Hydro-geological study of the area shall be reviewed annually. In case adverse effect on ground water quality and quantity is observed mining shall be stopped and resumed only after mitigating steps to contain any adverse impact on ground water is implemented. Specific hydro-geological shall be conducted at the end of mining plan period of the 5th year of mining, before proceeding to undertake mining in the 6th year. The report shall be submitted to the Regional office of the ministry.	Yes, the hydro geological study is reviewed. CSIR- National Geophysical Research Institute has carried out a detailed hydro geological study of the area in 2010-11 and as per the study there is no adverse impact on the ground water. This is the first year after mining ban, we will carry out the study in the upcoming year.			
(vii)	A 50 m barrier of no mining zone all along both the sides (s) facing the nallah (if any) passing through the lease area shall be demarcated and thick vegetation of native species raised. Status of implementation shall be submitted to the Regional Office of the Ministry on half yearly basis.	Complied with			
(viii)	Need based assessment for the nearby villages shall be conducted to study economic measures which can help in upliftment of poor section of society. Income generating projects/ tools such as development of fodder farm, fruit bearing orchards, Vocational training etc. can from a part of such programme. Company shall provide separate budget for community development activities and income generating programmes. This will be in addition to vocational training for individuals imparted to take up self-employment and jobs. Status of implementation shall be reported to the ministry.	Baseline studies are carried out for the nearby villages in the year 2015. Depending on the stakeholder response, various community development works are initiated in the surrounding areas. Separate funds are earmarked for socio economic development of the villages.	Thrust area	Activity	Expenditure in Rs.
			Education	Transport facility for school students in Pissurlem Sonshi and Navelim	340537.69
				Career counseling, personality development for Students	8868
				Sesa Football Acadmy	2177111.869

			<table><tr><td>Need based</td><td>Need based rural development programs</td><td>986510.8</td></tr><tr><td></td><td></td><td>3513028.359</td></tr></table>	Need based	Need based rural development programs	986510.8			3513028.359
Need based	Need based rural development programs	986510.8							
		3513028.359							
(ix)	Land- use pattern of the nearby villages shall be studied and action plan for abatement and compensation for damage to agricultural land / common property land (if any ) in the nearby villages, due to mining activity shall be submitted to the Regional office of the Ministry within six months. Annual status of implementation of the plan and expenditure thereon shall be reported to the Regional Office of the Ministry from time to time.	Protective measures are taken to control the flow of mine silt in to the nearby villages. If any cases of agriculture damages due to mining activity observed, the farmers are compensated based on the reports prepared by agriculture consultants or State Governments Zonal Agriculture Officers report.							
(x)	Maintenance of village roads through which transportation of ores are undertaken shall be carried out by the company regularly at its own expenses. The roads shall be black topped.	Roads used for transporting iron ore are tarred and maintained by mining companies.							
(xi)	Rain water harvesting shall be undertaken to recharge the ground water sources .Status of implementation shall be submitted to the Regional Office of the Ministry within six months and thereafter every year from the next consequent year.	Mining pits are utilized for harvesting the rain water .The rain water harvested in mining pit is utilized for the dust suppression, vehicle washing etc.							



(xii)	<p>Measures for prevention and control of soil erosion and management of silt shall be undertaken. Protection of dumps against erosion shall be carried out with geo textile matting or other suitable materials, and thick plantations of native trees and shrubs shall be carried out at the dump slopes. Dumps shall be protected by retaining walls.</p>	<p>The mine run off water is channelized within the pit. The discharge water point is regularly monitored so as to keep a check on the water quality. The weak mine faces, ore stacks are covered with silpaulin to prevent overflow of silt.</p> <p>The old waste dumps are located outside mine lease. Protective measures are effectively implemented to control the silt flow. Geotextiles in the form of coir mats and jute mats are laid on the dump slopes. Glyricidia cuttings are used to staple the geotextiles to the dump surface. Seeds of stylo santhus hamata are sprayed on the geotextiles so as to form a green cover. Step dumping method is followed; each step is restricted to 10-12 m height. Settling ponds, check dams, filter beds are constructed all along the toe of the dump to prevent flow of silt outside the area.</p>	
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(xiii)	Trenches/ garland drains shall be constructed at foot of dumps and coco filters installed at regular intervals to arrest slit from being carried to water bodies. Adequate number of Check Dams and Gully Plugs shall be constructed across seasons / perennial nallahs (if any) flowing through the ML area and silts arrested. De-silting at regular intervals shall be carried out. Garland drain of appropriate size, gradient and length shall be constructed for both mine pit and for waste dump and sump capacity shall 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 shall also provide adequate retention period to allow proper settling of slit material. Sedimentation pits shall be constructed at the corners of the garland drains and deslited at regular intervals.	Dump run off water is channelised through Garland drains and M.S.pipes into the settling ponds at the toe of the dumps. De-silting was not required to carry out as there was no silt accumulated in the settling pond.	
(xiv)	Ground water in the core zone shall be regularly monitored for contamination and depletion due to mining activity and records maintained. The monitoring data shall be submitted to the regional office of the Ministry regularly .Further , monitoring points shall be located between the mine and drainage in the direction of flow of ground water shall be set up and records maintained .	Complied. Monitoring of Ground water is done in the wells surrounding the lease area periodically and the reports are submitted to Ministry and SPCB regularly.	Ground Water Monitoring Results are attached as <b>Annexure- 1</b>
(xv)	Cultivable waste land within 5km of lease shall be identified and fodder farming or other suitable productive use of waste land shall be taken up in phased manner. Status of implementation shall be submitted to the Regional office of Ministry.	There is no waste land available in the nearby area; however efforts are made to encourage farmers by conducting various agriculture development programme.	Stylosanthes scabra and Stylosanthes hamata which are fodder crops are used to cover the geotextile laid areas on the dump slopes. It also acts as a grazing ground for the cattle from the surrounding villages.



(xvi)	Shelter belt i.e. Wind Break of 30 m width and consisting of at least 5 tiers around lease facing the schools / agriculture fields/ human habitations shall be raised and the status of implementations shall be reported to the Ministry.	Sonshi mine is one of the oldest mine in Goa with over 50 years of operation. The entire lease area is broken up for mining. The lease is surrounded from all sides by other operational leases. Company has taken common boundary working permissions from Indian Bureau of Mines. However plantations are raised on waste dumps which are outside the mining lease.	
(xvii)	Fugitive dust generation shall be controlled .Fugitive dust emission shall be regularly monitored at locations at nearest human habitation (including schools and other public amenities located nearest to sources of dust generation as applicable )and records submitted to the Regional Office of the Ministry.	For the control of the fugitive dust, various possible measures are adopted some of which are as below: (a) To control the dust, dumps are covered with lateritic waste, Geotextile and afforested with plants/ grasses species, which helps in minimizing the fugitive dust (b) Water sprinkling is carried out to prevent the dust from getting air borne.	Graphical Representation of Air Monitoring Results are attached as <b>Annexure 1.</b>
(xviii)	Monitoring of soil samples for assessment of transformation to acidic stage or contamination due to mining activity (as applicable) shall be regularly conducted and records maintained.	Soil samples from the nearby fields and dump soil is monitored once in the year and records maintained.	
(xix)	Transportation of ore shall be done by covering the trucks with tarpaulin or other suitable mechanism so that no spillage of ore / dust takes place. Transportation shall be done only during day time.	All trucks moving out of mining premises are well covered with tarpaulin and sufficient free board is maintained to prevent the spillage of ore/ dust on the road.	

(xx)	Occupational health and safety measures for the workers including identification of work related health hazards, training on malaria eradication, HIV, and health effects on exposures to mineral dust etc. shall be carried out. The company shall engage a full time qualified doctor who is trained in occupational health. Periodic monitoring for exposure to respirable mineral dust on the workers shall be conducted and records maintained including health records of the Workers. Awareness program for workers on impact of mining on their health and precautionary measures like use of personal equipment etc. shall be carried out periodically. . Review of impact of various health measures undertaken (at interval of five years or less) shall be conducted followed by follow up action wherever required.	Company has employed doctor who is trained in occupational health. Well-equipped occupational health center is at the site to conduct the spirometry, audiometry etc. Periodic monitoring is carried out for all the employees for the exposure to dust and health records are maintained. Various awareness programs are organized for the workers related to occupational health and safety issues.	
(xxi)	Top soil/ solid waste shall be stacked properly with proper slope and adequate safeguards and shall be utilized for backfilling (wherever applicable) for reclamation and rehabilitation of mined out area . Top soil shall be separately stacked for utilization later for reclamation and shall not be stacked along with over burden. Monitoring and management of rehabilitated areas shall continue until the vegetation of area becomes self-sustaining. Compliance status shall be submitted to Ministry of Environment and Forests on six monthly basis.	There is no top soil within the lease area.	
(xxii)	Over burden (OB) shall be stacked at earmarked dump sites (s) only and shall not be kept active for long period. The maximum height of the dump shall not exceed 30 m, each stage shall preferably be of 10 m and overall slope of the dump shall not exceed 28°. The OB dump shall be backfilled. The OB dumps shall be scientifically vegetated with suitable native species to prevent erosion and surface run off. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self - sustaining. Compliance status shall be submitted to	Over Burden is been stacked at earmarked dumps sites only and not kept active for a long period. The dumps are located outside the lease area .Dumping is carried out as per the approved mining plan, Step dumping method is followed and each step is of 10 -15 m each. Over all angles is maintained approx. 28 degrees. The finalized areas are covered with geotextiles and jute and	



	the Ministry of Environment & Forest on six monthly basis.	taken up for plantation.	
(xxiii)	Slope of the mining bench and ultimate pit limit shall be as per the mining scheme approved by Indian Bureau of Mines.	It is implemented as per the mining scheme approved by Indian Bureau of mines	
(xxiv)	Adequate plantation shall be raised in the ML area, haul roads, OB dump sites etc. Green belt development shall be carried out considering CPCB guidelines including selection of plant species and in consultation with the local DFO/ Agriculture Department. Herbs and shrubs shall also form a part of afforestation program besides tree plantation .The density of the trees not be less than 2500 plants per ha, The company shall involve local people with the help of self-help group for plantation program. Details of year wise afforestation program including rehabilitation of mined out area shall be submitted to the Regional Office of the Ministry every year.	Finalized dumps portions are covered with geotextiles and subsequent years planted with fast growing and native species. Spacing of 2.5 meter by 2.5 meter is followed, covering around 2500 plants/ ha.	
(xxv)	Regular monitoring of ground water level and quantity shall be carried out by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring shall be carried out four times in a year - pre- monsoon (April-May), monsoon (August ), post -monsoon (November) and winter (January ) and the data thus collected shall be regularly sent to MOEF, Central Ground water Authority and Regional Director , Central Ground Water Board.	Regular monitoring of Ground water level and quality is carried out and data is submitted to Regional Director Central Ground Water Board, GSPCB and Ministry.	Water Monitoring Results is attached as <b>Annexure 1</b>

(xxvi)	Adequate air monitoring stations shall be installed in areas of human habitations near the mine and the Beneficiation Plant and the results of ambient air quality shall be maintained and regularly submitted to the Regional Office of the Ministry	Complied. Air monitoring stations are fixed within the core & buffer zone as per Consent to Operate and monitored as per new Mining standards in core zone and NAAQ in buffer zone.	Graphical Representation of Air Monitoring Results is attached as <b>Annexure 1</b> .
(xxvii)	The Waste water from the mine and the Beneficiation plant shall be treated to conform to the prescribe standards before discharging in to the natural stream. The discharged water from the Tailing Dam (if any) shall be regularly monitored and report submitted to the Ministry of Environment & Forest, Central Pollution Control Board and the State Pollution Control Board.	There is no beneficiation plant at this mine. Storm water / wash off during monsoon is channelized in the mine pit, Treated with lime and flocculants, used for dust suppression during the fair season.	
(xxviii)	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transportation of ores and others shall have valid permissions as prescribed under Central Motor Vehicle Rules, 1989 and its amendments .Transportation of ore shall be done only during day time . The vehicles transporting ores shall be covered with a tarpaulin or other suitable enclosures so that no dust particles / fine matters escape during the course of transportation. No overloading of ores for transportation shall be committed. The trunks transporting ore shall not pass through wild life sanctuary.	PUC check certificate of all the truck plying for the transportation of the ore is checked and kept as record. All trucks leaving mining premises are covered with tarpaulin. No wild life sanctuaries fall in our transport routes. Trucks are weighed before the exit point to prevent the overloading.	
(xxix)	Prior permission from the Competent Authority shall be obtained for extraction of ground water, if any.	We have taken water withdrawal permission from Water Resource Department license no R-9/MIN-03/16 dated: 02/12/2016	
(xxx)	Action plan with respect to suggestion /improvements and recommendations made during consultation / hearing shall be submitted to the Ministry and the State Govt within six months.	Action plan prepared for the issues / suggestion made during public hearing had been submitted to MOEF.	
(xxxi)	A final mine closure plan , along with details of Corpus Fund, shall be submitted to the Ministry of Environment & Forest ,5 years in advance of final	Final closure plan approved by Indian Bureau of mines would be submitted to MOEF in due course of time in	



	mine closure for approval.	accordance with rule 23C of MCDR	
<b>B.</b>	<b>General conditions</b>		
(i)	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment & Forest.	Mining is being carried out as per mining plan approved by Indian Bureau of Mines	
(ii)	No change in the calendar plan including excavation, quantum of mineral and waste shall be made.	Production & waste generation is being carried out in accordance with Mining plan approved by Indian Bureau of Mines. The copy of the same would be submitted to MOEF from time to time.	
(iii)	Fugitive dust emission from all the sources shall be controlled regularly. Water spraying arrangement on haul roads, loading and unloading and at transfer points shall be provided and properly maintained.	For the control of the fugitive dust, various possible measures are adopted some of which are as below: (a) To control the dust, dumps are covered with lateritic waste, Geotextile and afforested with plants/ grasses species, which helps in minimizing the fugitive dust. (b) Water sprinkling is carried out to prevent the dust from getting air borne	
(iv)	Four ambient air quality -monitoring stations shall be established in the core zone as well in the buffer zone for RPM, SPM,SO <sub>2</sub> ,NO <sub>x</sub> monitoring data , topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution control Board.	The Air Monitoring stations are installed according to the consent to operate issued by GSPCB.	
(v)	Data on ambient air quality (RPM, SPM, SO <sub>2</sub> , and NO <sub>x</sub> ) Should be regularly submitted to the Ministry including its Regional office located at Bangalore and the State Pollution Control Board /Central Board /Central Board / Central Pollution Control Board once in six months.	Will be complied with.	Graphical Representation of Air Monitoring Results is attached as <b>Annexure 1.</b>

(v)	Measures shall be taken for control of noise levels below 85 dB in the work environment .Workers engaged in operations of HEMM, etc. Shall be provided with ear Plugs /muffs.	Most of the dumpers & HEMM is with A/C cabins which minimize the impact of noise on operator. The personal protective equipments are provided to the operators.	
(vi)	Industrial waste water (Workshop and waste water 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 shall be installed before discharge of workshop effluents.	There is no workshop within the mining lease area	
(vii)	Personnel working in dusty areas shall be provided with protective respiratory devices and they shall also be imparted adequate training and information on safety and health aspects.	Personnel working in the dusty areas are provided with protective respiratory devices and they are given training and information on safety and health aspects.	
(viii)	Provision shall be made for the housing the laborers within the site with all necessary infrastructure and facilities such as fuel for cooking , mobile toilets , mobile STP, safe drinking water , medical health care , creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	Not applicable as there is no additional infrastructure facilities developed.	
(ix)	A separate Environment Management Cell with suitable qualified personnel shall be set - up under the control of a Senior Executive, who will report directly to the Head of the Organization.	Is complied with, environment cell is established with multidisciplinary staff which directly reports to the head of the organization.	
(x)	The project authorities shall inform to the Regional Office of the Ministry 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.	Shall be communicated in time	



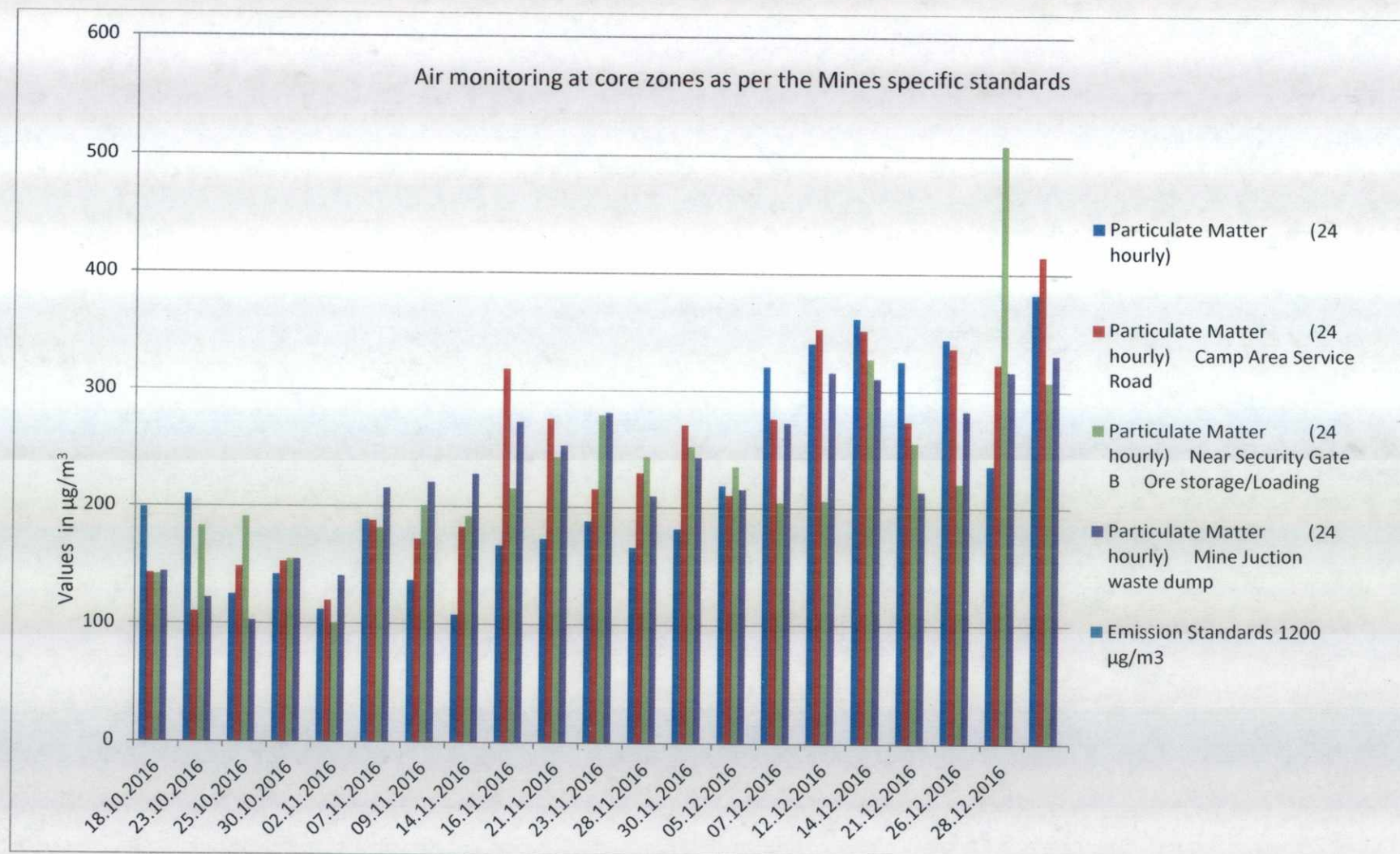
(xi)	The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose .Year wise expenditure shall be reported to the Ministry and its Regional Office located at Bangalore.	Separate Budget for all the environmental measure / monitoring /reclamation etc are earmarked in revenue cost.	Purpose	Expenditure in Rs.
			General expenditure	4,638.00
			Statutory requirement	99,173.45
			Mine reclamation	470,004.00
			Erosion Control	948,583.62
			Dust suppression	9,184,434.44
				10,706,833.51
(xii)	The project authorities shall inform to the Regional Office of the Ministry 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.	Will be communicated in time		
(xiii)	The Regional Office of the Ministry located at Bangalore shall monitor compliance of the stipulated conditions. The project authorities shall 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 clearance letter will be marked to concerned Panchayat /local NGO, if any , from whom suggestion / representation has been received while processing the proposal .	Clearance Letter has been already given to Local panchayat wide letter.		
(xv)	State Pollution Control Board shall display a copy of the clearance letter at the Regional office /Tehsildar's Office for 30 days.			

(xvi)	<p>The project authorities shall advertise at least in two local newspaper widely circulated , one of which shall be in the vernacular language of the locality concerned , within 7 days of the issues of the clearance letter informing that the project has been accorded environment clearance and copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forest at <a href="http://envfor.nic.in">http://envfor.nic.in</a> and a copy of the same shall be forwarded to the Regional Office of the Ministry located in Bangalore.</p>	<p>Copy of advertisement of the Environment Clearance letter in two local newspapers has been done.</p>	
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# Ambient Air Quality Monitoring Report

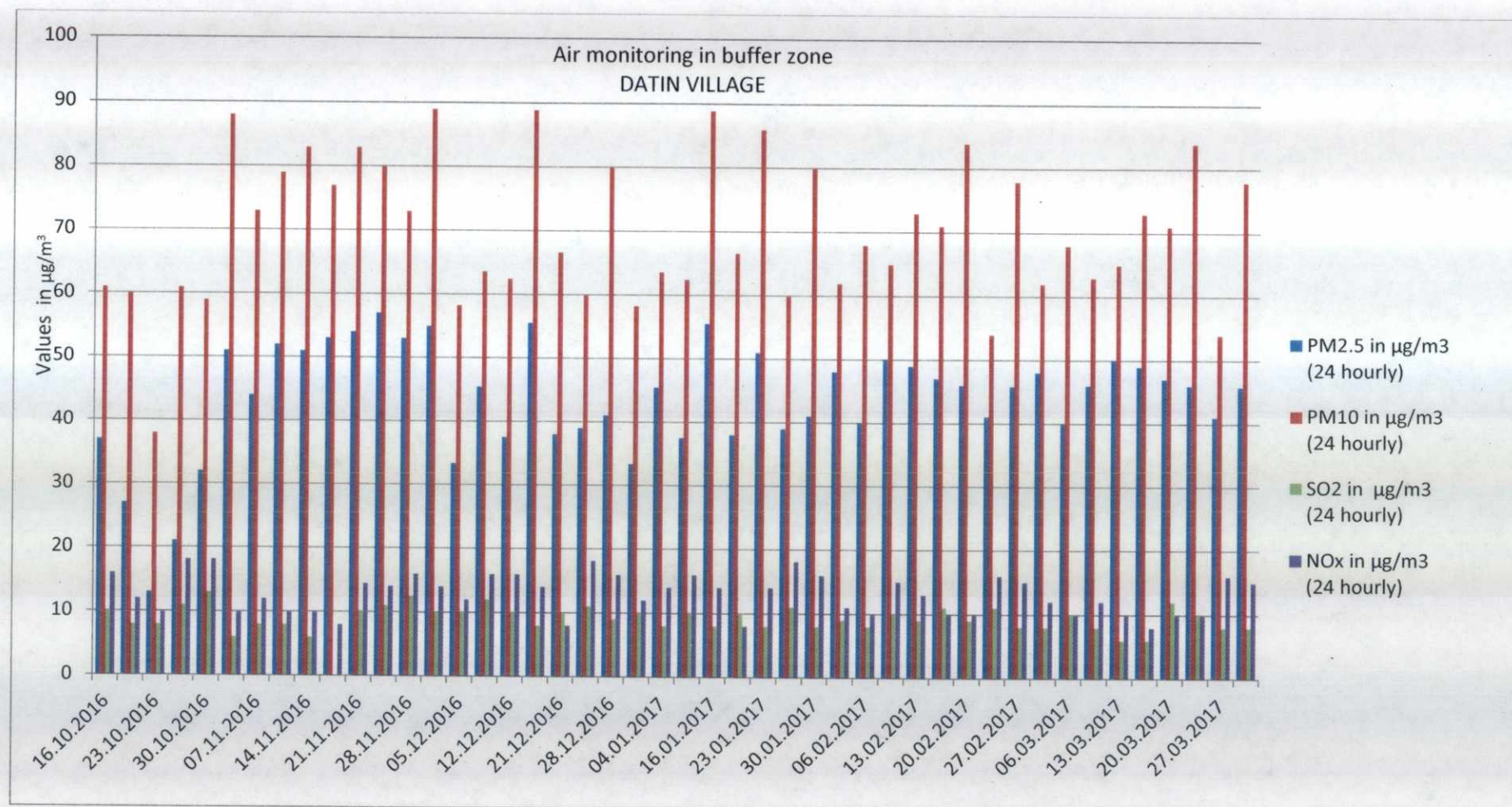
## Gaval Sonshi Iron Ore Mine





# Ambient Air Quality Monitoring Report

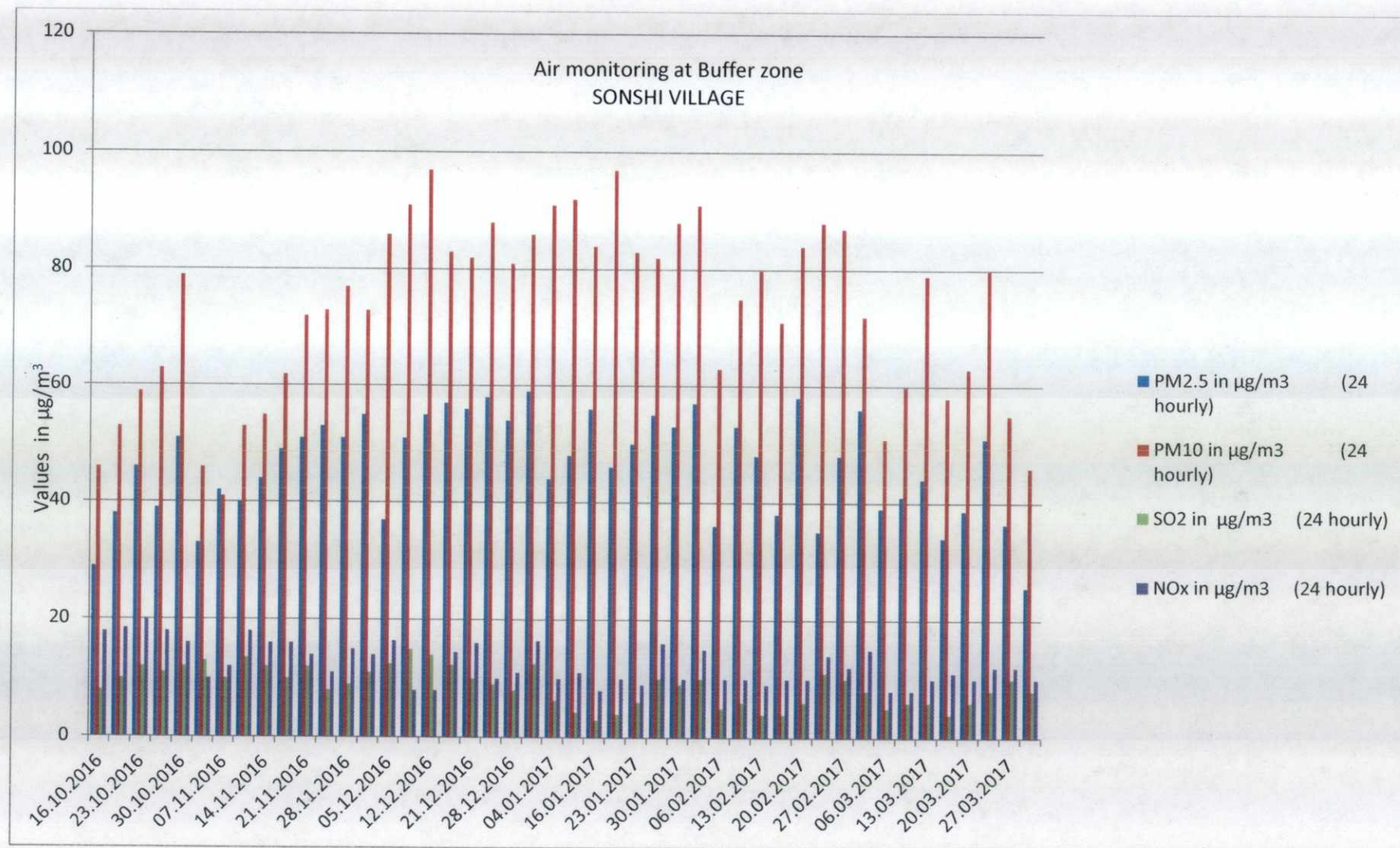
## Gaval Sonshi Iron Ore Mine





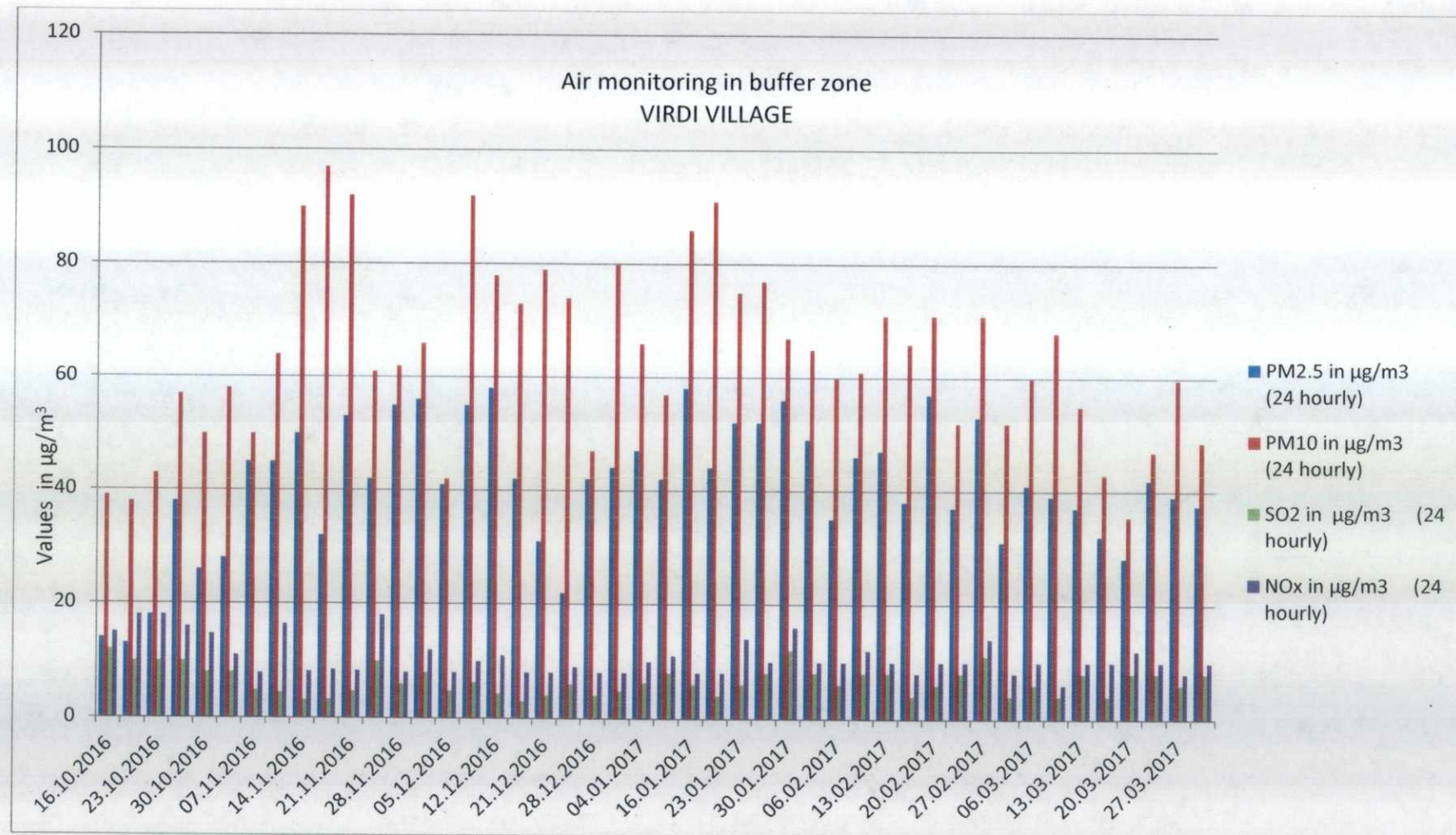
# Ambient Air Quality Monitoring Report

## Gaval Sonshi Iron Ore Mine



# Ambient Air Quality Monitoring Report

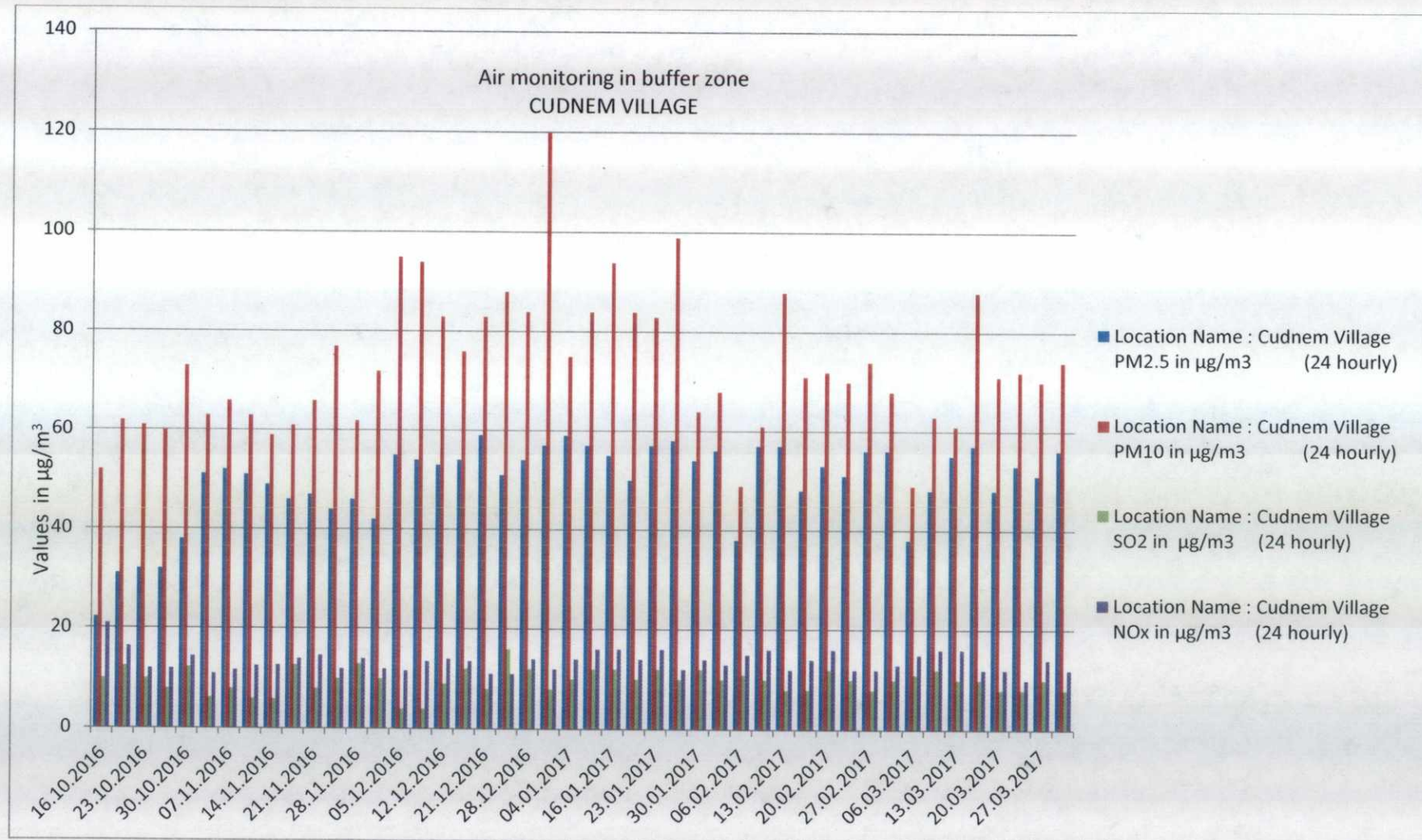
## Gaval Sonshi Iron Ore Mine





# Ambient Air Quality Monitoring Report

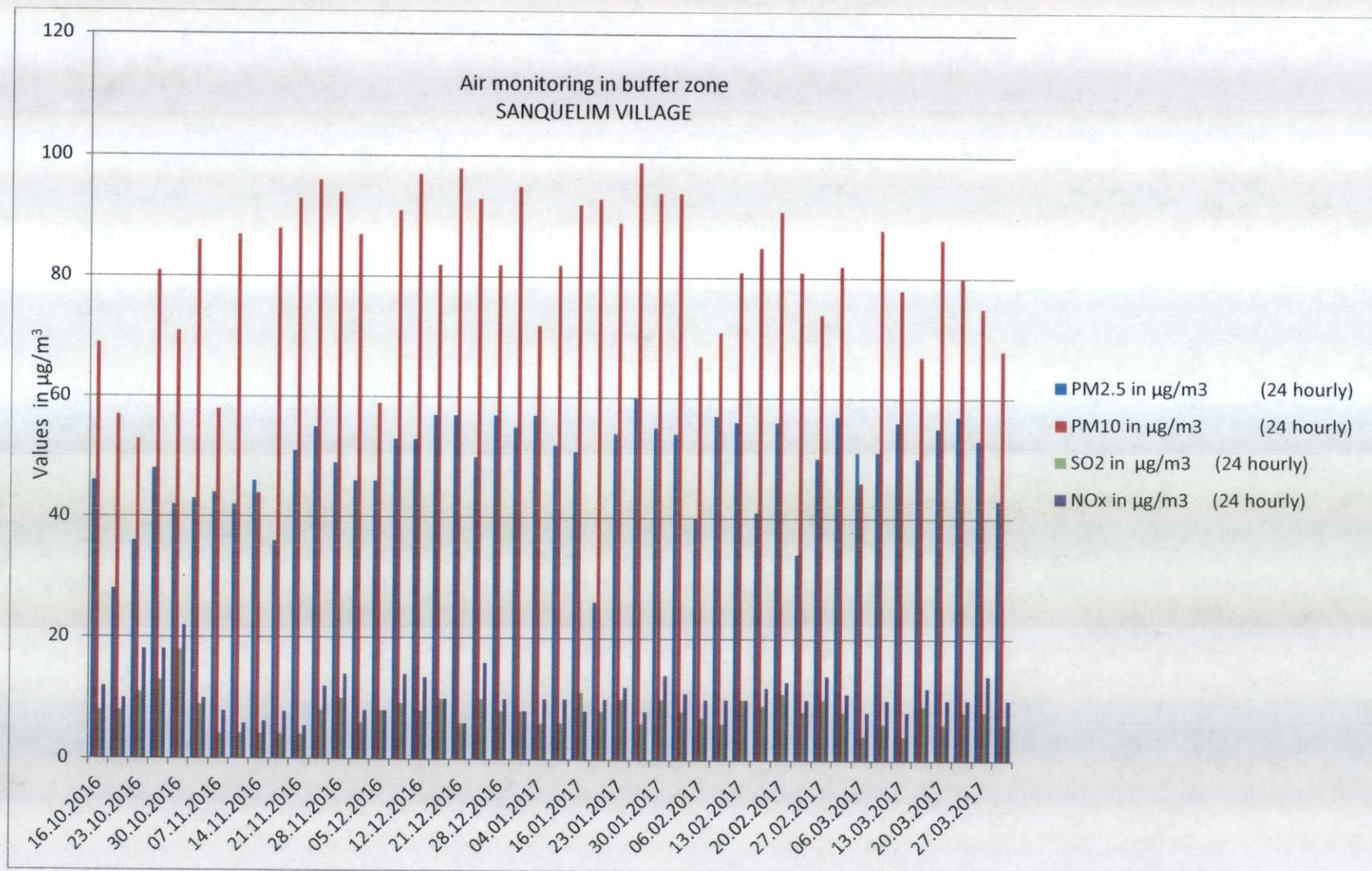
## Gaval Sonshi Iron Ore Mine





# Ambient Air Quality Monitoring Report

## Gaval Sonshi Iron Ore Mine





**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 12th January 2015, Valid up to 11.01.2020

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

**Surface Water Analysis Report for the Month of January 2017**

Mine Name: Sonshi Mine

Date of Sample collection: 17.01.2017

Standard method used for analysis: APHA Standard

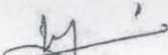
Test Report No: 223

Date of Receipt of sample: 17.01.2017


Analysis completion date: 24.01.2017

Parameter	Unit	Location						
		Permissible limits	Upstream Advoi Nallah	Downstream Advoi nallah	Upstream sonshi nallah	Down stream sonshi nallah	Pit Discharge	Sonshi Nallah near Ajoba Temple
Colour	Hazen	----	<5	<5	<5	<5	<5	<5
pH	----	5.5 to 9.0	6.5	6.60	6.7	6.75	6.5	6.48
Turbidity	NTU	----	1.0	0.9	0.9	1.0	0.9	1
Dissolved Solids	mg/lit	----	22	26	33	18	16	20
Conductivity	µS/cm	----	44	47	66	35	32	34
Suspended Solids	mg/lit	100	2	2	2	2	2	2
Chlorides	mg/lit	----	7	6	7	7	6	6
Total Hardness as CaCO <sub>3</sub>	mg/lit	----	16	16	28	24	16	14
Calcium as Ca <sup>++</sup>	mg/lit	----	2.4	2.4	6.4	4.8	2.4	2.4
Magnesium as Mg <sup>++</sup>	mg/lit	----	2.4	2.4	2.9	2.9	2.4	1.9
Sulphate as SO <sub>4</sub>	mg/lit	----	1.2	1	1	2	1	1
Phosphate as PO <sub>4</sub>	mg/lit	5	BDL	BDL	0.1	BDL	BDL	0.1
Nitrate as NO <sub>3</sub>	mg/lit	10	0.1	0.1	0.1	BDL	BDL	BDL
B.O.D (3days, 27°C)	mg/lit	30	<3	<3	5	5	<3	<3
C.O.D	mg/lit	250	<10	<10	18	14	<10	<10
Total Iron	mg/lit	3	0.14	0.11	0.12	0.15	0.16	0.11
Manganese as Mn	mg/lit	2	0.05	0.06	0.05	0.08	0.06	0.04
D.O	mg/lit	----	7.0	6.9	7	7	7	7
Oil & Grease	mg/lit	10	<1	<1	<1	<1	1	1

Note :- No water discharge from Pissurlem dump run off, Sonshi Dump run off & Vaghure side dump run off  
BDL- Below Detection Limit

  
Govt. Analyst



  
Laboratory Incharge

## 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

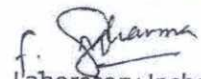
Mine Name: Sonshi mine

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
			17.01.2016	
1	Well of M/s Vedanta Limited	7.28	4.1	3.18
2	Well of Mr. Mahesh Gaude	3	1.4	1.6
3	Well of Mr. Gokuldas Gaude	7.4	4.3	3.1
4	PTI camp well	6	3.4	2.6

  
Govt Analyst



  
Laboratory Incharge



**M/s Sesa Environment Laboratory**

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

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

**Surface Water Analysis Report for the Month of January 2017**

Mine Name: Sonshi Mine

Date of Sample collection: 17.01.2017

Standard method used for analysis: APHA Standard

Test Report No: 223

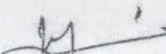

Date of Receipt of sample: 17.01.2017

Analysis completion date: 24.01.2017

Parameter	Unit	Location						
		Permissible limits	Upstream Advoi Nallah	Downstream Advoi nallah	Upstream sonshi nallah	Down stream sonshi nallah	Pit Discharge	Sonshi Nallah near Ajoba Temple
Colour	Hazen	----	<5	<5	<5	<5	<5	<5
pH	----	5.5 to 9.0	6.5	6.60	6.7	6.75	6.5	6.48
Turbidity	NTU	----	1.0	0.9	0.9	1.0	0.9	1
Dissolved Solids	mg/lit	----	22	26	33	18	16	20
Conductivity	$\mu$ S/cm	----	44	47	66	35	32	34
Suspended Solids	mg/lit	100	2	2	2	2	2	2
Chlorides	mg/lit	----	7	6	7	7	6	6
Total Hardness as CaCO <sub>3</sub>	mg/lit	----	16	16	28	24	16	14
Calcium as Ca <sup>++</sup>	mg/lit	----	2.4	2.4	6.4	4.8	2.4	2.4
Magnesium as Mg <sup>++</sup>	mg/lit	----	2.4	2.4	2.9	2.9	2.4	1.9
Sulphate as SO <sub>4</sub>	mg/lit	----	1.2	1	1	2	1	1
Phosphate as PO <sub>4</sub>	mg/lit	5	BDL	BDL	0.1	BDL	BDL	0.1
Nitrate as NO <sub>3</sub>	mg/lit	10	0.1	0.1	0.1	BDL	BDL	BDL
B.O.D (3days, 27°C)	mg/lit	30	<3	<3	5	5	<3	<3
C.O.D	mg/lit	250	<10	<10	18	14	<10	<10
Total Iron	mg/lit	3	0.14	0.11	0.12	0.15	0.16	0.11
Manganese as Mn	mg/lit	2	0.05	0.06	0.05	0.08	0.06	0.04
D.O	mg/lit	----	7.0	6.9	7	7	7	7
Oil & Grease	mg/lit	10	<1	<1	<1	<1	1	1

Note :- No water discharge from Pissurlem dump run off, Sonshi Dump run off &amp; Vaghure side dump run off

BDL- Below Detection Limit

  
Govt. Analyst  
Laboratory Incharge



# M/s Sesa Environment Laboratory

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

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## Well Water Analysis Report

Mine Name: Sonshi Mine

Date of Sample collection: 17.01.2017


Standard method used for analysis: APHA Standard

Test Report No: 231

Date of Receipt of sample: 17.01.2017

Analysis completion date: 31.01.2017

Parameter	Unit	Permissible Limit	Location			
			Sonshi Well	PTI Camp Well	Maresh Gaude Well	Mr. Gokuldas Gawde Well
Colour	Hazen	<5.0	<5	<5	<5	<5
pH	-	6.5-8.5	6.4	6.5	6.5	6.5
Turbidity	NTU	5	1	1.0	0.9	0.8
Conductivity	µs/cm	-	50	38	47	51
Dissolved Solids	mg/lit	500	25	19	28	32
Suspended Solids	mg/lit	-	2	1	2	2
Chloride	mg/lit	250	6.9	7	7	8
Total Hardness as CaCO3	mg/lit	200	12	14	18	18
Calcium as Ca++	mg/lit	75	2	3.2	4.0	4.0
Magnesium as mg++	mg/lit	30	1.5	1.5	1.9	1.9
Sulphate as SO4	mg/lit	200	1.0	2.1	0.6	4.8
Nitrate as NO3	mg/lit	45	BDL	BDL	0.1	0.1
Alkalinity	mg/lit	200	21	26	16	33
Iron as Fe	mg/lit	0.3	0.21	0.20	0.06	0.16
Manganese as Mn	mg/lit	0.1	0.09	0.01	BDL	0.05
MPN/100ml	mg/lit	Absent	4	21	10	20

  
Govt. Analyst



  
Laboratory Incharge



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### Surface Water Analysis Report for the Month of February 2017

Mine Name: Sonshi Mine

Date of Receipt of sample: 22.02.2017

Date of Sample collection: 22.02.2017

Analysis completion date: 27.02.2017

Standard method used for analysis: APHA Standard

Test Report No: 249

Parameter	Unit	Location		
		Permissible limits	Pit Discharge	Sonshi Nallah near Ajoba Temple
Colour	Hazen	----	<5	<5
pH	----	5.5 to 9.0	6.58	6.51
Turbidity	NTU	----	0.9	0.9
Dissolved Solids	mg/lit	----	25	29
Conductivity	$\mu$ S/cm	----	50	58
Suspended Solids	mg/lit	100	2	2
Chlorides	mg/lit	----	7	7
Total Hardness as CaCO <sub>3</sub>	mg/lit	----	16	20
Calcium as Ca <sup>++</sup>	mg/lit	----	2.4	4.0
Magnesium as Mg <sup>++</sup>	mg/lit	----	2.4	2.4
Sulphate as SO <sub>4</sub>	mg/lit	----	2.3	2
Phosphate as PO <sub>4</sub>	mg/lit	5	0.1	0.1
Nitrate as NO <sub>3</sub>	mg/lit	10	BDL	BDL
B.O.D (3days, 27°C)	mg/lit	30	<3	<3
C.O.D	mg/lit	250	<10	<10
Total Iron	mg/lit	3	0.20	0.16
Manganese as Mn	mg/lit	2	0.09	0.06
D.O	mg/lit	----	7	7
Oil & Grease	mg/lit	10	1	<1

Note :- No water discharge from Pissurlem dump run off, Sonshi Dump run off, Vaghure side dump run off, Upstream Advoi Nallah, Downstream Advoi nallah, Upstream sonshi nallah, & Downstream sonshi nallah

BDL- Below Detection Limit

Govt. Analyst



Laboratory Incharge



### M/s Sesa Environment Laboratory

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#### Well Water level Report


Mine Name: Sonshi mine

Instrument Used: Well water tape

Sr.No	Location	Total Depth of well in mtrs	Depth of Water level from the reference point in mtrs	Water Column in mtrs
			22.02.2017	
1	Well of M/s Vedanta Limited	7.28	5.7	1.58
2	Well of Mr. Mahesh Gaude	3	1.8	1.2
3	Well of Mr. Gokuldas Gaude	7.4	4.9	2.5
4	PTI camp well	6	4	2

  
Authorized Govt. Analyst



  
Laboratory Incharge



# M/s Sesa Environment Laboratory

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## Well Water Analysis Report

Mine Name: Sonshi Mine

Date of Sample collection :22.02.2017

Standard method used for analysis: APHA Standard

Test Report No:250

Date of Receipt of sample:22.02.2017

Analysis completion date:27.02.2017

Parameter	Unit	Desirable Limit	Location			
			Sonshi Well	PTI Camp Well	Mahesh Gaude Well	Mr. Gokuldas Gawde Well
Colour	Hazen	<5	<5	<5	<5	<5
pH	-	6.5-8.5	6.45	6.19	6.40	5.63
Turbidity	NTU	1	1	0.9	1	1
Conductivity	µs/cm	-	40	54	52	60
Dissolved Solids	mg/lit	500	20	27	26	30
Suspended Solids	mg/lit	-	1	1	2	1
Chloride	mg/lit	250	7	8	7	8
Total Hardness as CaCO <sub>3</sub>	mg/lit	200	12	14	16	18
Calcium as Ca <sup>++</sup>	mg/lit	75	2.4	3.2	3.2	4.0
Magnesium as mg <sup>++</sup>	mg/lit	30	1.5	1.5	1.9	1.9
Sulphate as SO <sub>4</sub>	mg/lit	200	1	4.7	3.1	2.8
Nitrate as NO <sub>3</sub>	mg/lit	45	0.1	0.2	0.2	0.2
Alkalinity	mg/lit	200	18	26	23	13
Iron as Fe	mg/lit	0.3	0.11	0.11	0.12	0.15
Manganese as Mn	mg/lit	0.1	0.03	0.02	0.04	0.05
MPN/100ml	mg/lit	Absent	10	17	17	21

Authorized Govt. Analyst



Laboratory Incharge



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## Well Water Analysis Report

Mine Name: Sonshi Mine

Date of Sample collection : 20.03.2017

Standard method used for analysis: APHA Standard

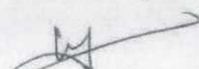
Test Report No: 262

Date of Receipt of sample: 20.03.2017

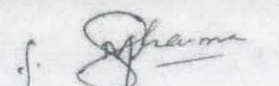
Analysis completion date: 25.03.2017

Parameter	Unit	Permissible Limit	Location			
			Sonshi Well	PTI Camp Well	Mahesh Gaude Well	Mr. Gokuldas Gawde Well
Colour	Hazen	<5	<5	<5	<5	<5
pH	-	6.5-8.5	6.46	6.29	6.45	6.11
Turbidity	NTU	5	1.6	1.1	1.1	0.9
Conductivity	µs/cm	-	44	52	52	58
Dissolved Solids	mg/lit	500	22	26	26	29
Suspended Solids	mg/lit	-	1	2	2	1
Chloride	mg/lit	250	7	8	10	8
Total Hardness as CaCO <sub>3</sub>	mg/lit	200	16	14	14	18
Calcium as Ca <sup>++</sup>	mg/lit	75	4.0	3.2	3.2	4.0
Magnesium as mg <sup>++</sup>	mg/lit	30	1.5	1.5	1.5	2.0
Sulphate as SO <sub>4</sub>	mg/lit	200	1	2	3	3
Nitrate as NO <sub>3</sub>	mg/lit	45	0.1	0.1	0.1	0.2
Alkalinity	mg/lit	200	15	20	15	14
Iron as Fe	mg/lit	0.3	0.05	0.06	0.08	0.04
Manganese as Mn	mg/lit	0.1	0.02	0.02	0.03	0.02
MPN/100ml	mg/lit	Absent	6	8.3	10	4

BDL- Below Detection Limit

  
Govt. Analyst



  
Laboratory Incharge



### M/s Sesa Environment Laboratory

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#### Well Water level Report

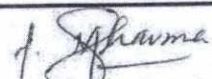
Mine Name: Sonshi mine

Instrument Used: Well water tape

Sr.No	Location	Total Depth of well in mtr	Depth of Water level from the reference point in mtr	Water Column in mtr
			20.03.2017	
1	Well of M/s Vedanta Limited	7.28	5.9	1.38
2	Well of Mr. Mahesh Gaude	3	2	1
3	Well of Mr. Gokuldas Gaude	7.4	5.5	1.9
4	PTI camp well	6	4.6	1.4

  
Govt Analyst



  
Laboratory Incharge

### M/s Sesa Environment Laboratory

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### Surface Water Analysis Report for the Month of March 2017

Mine Name: Sonshi Mine

Date of Receipt of sample: 20.03.2017

Date of Sample collection: 20.03.2017

Analysis completion date: 25.03.2017


Standard method used for analysis: APHA Standard

Test Report No: 261


Parameter	Unit	Location		
		Permissible limits	Pit Discharge	Sonshi Nallah near Ajoba Temple
Colour	Hazen	----	<5	<5
pH	----	5.5 to 9.0	6.61	6.56
Turbidity	NTU	----	1.0	0.9
Dissolved Solids	mg/lit	----	32	32
Conductivity	$\mu$ S/cm	----	64	64
Suspended Solids	mg/lit	100	2	2
Chlorides	mg/lit	----	9	7
Total Hardness as CaCO <sub>3</sub>	mg/lit	----	20	24
Calcium as Ca <sup>++</sup>	mg/lit	----	3.2	4.9
Magnesium as Mg <sup>++</sup>	mg/lit	----	2.9	2.9
Sulphate as SO <sub>4</sub>	mg/lit	----	3.0	2
Phosphate as PO <sub>4</sub>	mg/lit	5	0.1	0.1
Nitrate as NO <sub>3</sub>	mg/lit	10	0.1	BDL
B.O.D (3days, 27°C)	mg/lit	30	<3	4
C.O.D	mg/lit	250	<10	19
Total Iron	mg/lit	3	0.18	0.17
Manganese as Mn	mg/lit	2	0.08	0.06
D.O	mg/lit	----	7	7
Oil & Grease	mg/lit	10	1.2	<1

**Note :-** No water discharge from Pissurlem dump run off, Sonshi Dump run off, Vaghure side dump run off, Upstream Advoi Nallah, Downstream Advoi nallah, Upstream sonshi nallah & Down stream sonshi nallah.

BDL- Below Detection Limit

  
Govt. Analyst



  
Laboratory Incharge



# M/s Sesa Environment Laboratory

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## Surface Water Analysis Report for the Month of October 2016

Date of Receipt of sample: 10.10.2016

Analysis completion date: 17.10.2016

Mine Name: Sonshi Mine


Date of Sample collection: 10.10.2016

Standard method used for analysis: APHA Standard

Test Report No: 175

Parameter	Unit	Permissible limits	Location								
			Upstream Advoi Nallah	Downstream Advoi nallah	Upstream sonshi nallah	Down stream sonshi nallah	Pit Discharge	Pissurtem dump run off	Sonshi dump run off	Sonshi Nallah near Ajoba Temple	Vaghurem side dump runoff
Colour	Hazen	---	6	5	6	5	6	12	11	9	8
pH	---	5.5 to 9.0	5.88	5.85	6.18	6.2	6.26	6.13	6.21	6.25	6.19
Turbidity	NTU	---	1.5	1.8	1.9	2.1	3.0	4	4.5	5	2.2
Dissolved Solids	mg/lit	---	18	18	20	21	17	16	19	22	17
Conductivity	µS/cm	---	36	35	40	42	34	32	38	44	35
Suspended Solids	mg/lit	100	6	3	2	2	2	8	2	3	7
Chlorides	mg/lit	---	6	5	5	5	6	4	4	5	5
Total Hardness as CaCO <sub>3</sub>	mg/lit	---	12	14	16	16	12	12	14	20	12
Calcium as Ca <sup>++</sup>	mg/lit	---	3.2	2.4	4.0	4.0	2.4	2.4	2.4	3.2	3.2
Magnesium as Mg <sup>++</sup>	mg/lit	---	1.0	1.9	1.5	1.5	1.5	1.5	1.9	2.9	1.0
Sulphate as SO <sub>4</sub>	mg/lit	---	0.6	0.8	0.6	1.0	1.0	0.6	0.6	0.6	0.6
Phosphate as PO <sub>4</sub>	mg/lit	---	BDL	BDL	BDL	BDL	BDL	0.1	0.1	BDL	BDL
Nitrate as NO <sub>3</sub>	mg/lit	10	0.1	0.1	BDL	BDL	BDL	0.1	0.1	0.1	0.1
B.O.D (3days, 27°C)	mg/lit	30	<3	<3	4.6	<3	<3	<3	<3	<3	<3
C.O.D	mg/lit	250	<10	<10	19	<10	<10	<10	<10	<10	<10
Total Iron	mg/lit	3	0.06	0.07	0.08	0.07	0.07	BDL	0.06	0.09	BDL
Manganese as Mn	mg/lit	2	BDL	BDL	0.03	0.03	0.02	BDL	BDL	0.03	BDL
D.O	mg/lit	---	6.6	6.9	7	7	7	7	7	7	7
Oil & Grease	mg/lit	10	<1	<1	<1	<1	<1	Nil	Nil	<1	Nil

BDL- Below Detection Limit

  
Govt. Analyst



for   
Laboratory Incharge



### M/s Sesa Environment Laboratory

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

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### Well Water Analysis Report

Mine Name: Sonshi Mine

Date of Sample collection : 10.10.2016

Standard method used for analysis: APHA Standard


Test Report No:176

Date of Receipt of sample: 10.10.2016


Analysis completion date: 17.10.2016

Parameter	Unit	Permissible Limit	Location			
			Sonshi Well	PTI Camp Well	Mahesh Gaude Well	Mr. Gokuldas Gawde Well
Colour	Hazen	<5	<5	<5	<5	<5
pH	-	6.5-8.5	5.5	6.3	5.2	5.7
Turbidity	NTU	5	1.3	2.5	1.8	2.4
Conductivity	µs/cm	-	31	46	44	67
Dissolved Solids	mg/lit	500	16	23	22	34
Suspended Solids	mg/lit	-	2	2	2	2
Chloride	mg/lit	250	8	2	6	9
Total Hardness as CaCO <sub>3</sub>	mg/lit	200	10	16	14	16
Calcium as Ca <sup>++</sup>	mg/lit	75	2.4	4.8	2.4	3.2
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	0.6	2.9	1.7	8.1
Nitrate as NO <sub>3</sub>	mg/lit	45	BDL	0.1	0.1	0.1
Alkalinity	mg/lit	200	24	35	13	31
Iron as Fe	mg/lit	0.3	0.03	BDL	0.04	0.04
Manganese as Mn	mg/lit	0.1	BDL	BDL	BDL	0.01
MPN/100ml	-	Absent	6	10	21	17

BDL- Below Detection Limit

  
Govt. Analyst



  
for Laboratory Incharge



### M/s Sesa Environment Laboratory

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#### Well Water level Report

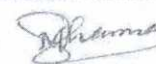
Mine Name: Sonshi mine

Instrument Used: Well water tape

Sr.No	Location	Total Depth of well in mtr	Depth of Water level from the reference point in mtr	Water Column in mtr
			10.10.2016	
1	Well of M/s Vedanta Limited	7.28	1.8	5.5
2	Well of Mr. Mahesh Gaude	3	0.6	2.4
3	Well of Mr. Gokuldas Gaude	7.4	2.1	5.3
4	PTI camp well	6	2.0	4.0

  
Govt Analyst



for   
Laboratory Incharge

### M/s Sesa Environment Laboratory

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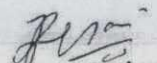
#### Well Water level Report

Mine Name: Sonshi Mine

Instrument Used: Well water tape

Sr.No	Location	Total Depth of well in mtr	Depth of Water level from the reference point in mtr	Water Column in mtr
			16.11.2016	
1	Well of M/s Vedanta Limited	7.28	4.0	3.3
2	Well of Mr. Mahesh Gaude	3	1.0	2.0
3	Well of Mr. Gokuldas Gaude	7.4	4.4	3.0
4	PTI camp well	6	3.6	2.4

  
Govt Analyst

  
Laboratory Incharge





**M/s Sesa Environment Laboratory**

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**Well Water Analysis Report**

Mine Name: Sonshi Mine

Date of Sample collection : 16.11.2016

Standard method used for analysis: APHA Standard

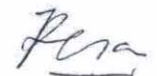
Test Report No: 196

Date of Receipt of sample: 16.11.2016

Analysis completion date: 21.11.2016

Parameter	Unit	Permissible Limit	Location			
			Sonshi Well	PTI Camp Well	Mahesh Gaude Well	Mr. Gokuldas Gawde Well
Colour	Hazen	<5	<5	<5	<5	<5
pH	-	6.5-8.5	6.1	6.2	6.3	6.0
Turbidity	NTU	5	1.0	2.0	1.2	1.1
Conductivity	µs/cm	-	30	50	38	70
Dissolved Solids	mg/lit	500	15	25	19	35
Suspended Solids	mg/lit	-	2	2	2	2
Chloride	mg/lit	250	6	3	5	9
Total Hardness as CaCO <sub>3</sub>	mg/lit	200	8	18	14	18
Calcium as Ca <sup>++</sup>	mg/lit	75	1.6	4.0	2.4	4.0
Magnesium as mg <sup>++</sup>	mg/lit	30	1.0	1.9	1.9	1.9
Sulphate as SO <sub>4</sub>	mg/lit	200	0.8	2	0.6	4.8
Nitrate as NO <sub>3</sub>	mg/lit	45	BDL	BDL	BDL	0.1
Alkalinity	mg/lit	200	25	33	15	33
Iron as Fe	mg/lit	0.3	0.1	0.06	0.07	0.08
Manganese as Mn	mg/lit	0.1	0.08	BDL	BDL	0.05
Coliform (MPN) Organism/100ml	-	Absent	13	16	20	12

BDL- Below Detection Limit

  
Govt. Analyst  
Laboratory Incharge

**M/s Sesa Environment Laboratory**

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

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

**Surface Water Analysis Report for the Month of November 2016**

Mine Name: Sonshi Mine

Date of Sample collection: 16.11.2016

Standard method used for analysis: APHA Standard

Test Report No: 195

Date of Receipt of sample: 16.11.2016

Analysis completion date: 21.11.2016


Parameter	Unit	Location						
		Permissible limits	Upstream Advoi Nallah	Downstream Advoi nallah	Upstream sonshi nallah	Down stream sonshi nallah	Pit Discharge	Sonshi Nallah near Ajoba Temple
Colour	Hazen	----	<5	<5	<5	<5	<5	<5
pH	----	5.5 to 9.0	6.23	6.16	6.2	6.31	6.39	6.2
Turbidity	NTU	----	1.0	1.2	1.3	1.7	2.1	2
Dissolved Solids	mg/lit	----	19	18	22	23	20	26
Conductivity	µS/cm	----	38	36	44	46	40	52
Suspended Solids	mg/lit	100	2	2	2	2	2	2
Chlorides	mg/lit	----	6	5	6	5	6	6
Total Hardness as CaCO <sub>3</sub>	mg/lit	----	14	12	16	18	14	20
Calcium as Ca <sup>++</sup>	mg/lit	----	3.2	2.4	4.0	4.0	3.2	3.2
Magnesium as Mg <sup>++</sup>	mg/lit	----	1.5	1.5	1.5	1.9	1.5	2.9
Sulphate as SO <sub>4</sub>	mg/lit	----	1	1	0.8	1	1	1
Phosphate as PO <sub>4</sub>	mg/lit	5	BDL	BDL	BDL	BDL	BDL	BDL
Nitrate as NO <sub>3</sub>	mg/lit	10	0.1	0.1	0.1	0.1	BDL	0.1
B.O.D (3days, 27°C)	mg/lit	30	<3	<3	3.2	3.6	<3	<3
C.O.D	mg/lit	250	<10	<10	18	18	<10	<10
Total Iron	mg/lit	3	0.1	0.08	0.07	0.10	0.16	0.09
Manganese as Mn	mg/lit	2	0.08	0.03	0.03	0.04	0.04	0.04
D.O	mg/lit	----	6.6	6.9	7	7	7	7
Oil & Grease	mg/lit	10	1	1	<1	<1	1.1	1

Note :- No water discharge from Pissurlem dump run off, Sonshi Dump run off & Vaghure side dump run off

BDL- Below Detection Limit

  
Govt. Analyst



  
Laboratory Incharge



## 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


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### Well Water level Report

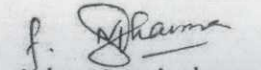
Mine Name: Sonshi Mine

Instrument Used: Well water tape

Sr.No	Location	Total Depth of well in mtr	Depth of Water level from the reference point in mtr	Water Column in mtr
			26.12.2016	
1	Well of M/s Vedanta Limited	7.28	4.3	3.0
2	Well of Mr. Mahesh Gaude	3	1.6	1.4
3	Well of Mr. Gokuldas Gaude	7.4	4.25	3.2
4	PTI camp well	6	3.8	2.2

  
Govt Analyst



  
Laboratory Incharge

**M/s Sesa Environment Laboratory**

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**Well Water Analysis Report**

Mine Name: Sonshi Mine

Date of Sample collection : 26.12.2016

Standard method used for analysis: APHA Standard


Test Report No: 216

Date of Receipt of sample: 26.12.2016

Analysis completion date: 31.12.2016

Parameter	Unit	Permissible Limit	Location			
			Sonshi Well	PTI Camp Well	Mahesh Gaude Well	Mr. Gokuldas Gawde Well
Colour	Hazen	<5	<5	<5	<5	<5
pH	-	6.5-8.5	6.4	6.5	6.2	6.5
Turbidity	NTU	5	0.9	1.0	1.0	0.8
Conductivity	µs/cm	-	32	48	49	65
Dissolved Solids	mg/lit	500	16	24	25	32
Suspended Solids	mg/lit	-	2	1	2	2
Chloride	mg/lit	250	7	6	8	8
Total Hardness as CaCO <sub>3</sub>	mg/lit	200	8	14	16	18
Calcium as Ca <sup>++</sup>	mg/lit	75	10	3.2	3.2	4.6
Magnesium as mg <sup>++</sup>	mg/lit	30	1.6	1.5	1.9	1.9
Sulphate as SO <sub>4</sub>	mg/lit	200	1.0	2.1	0.6	4.8
Nitrate as NO <sub>3</sub>	mg/lit	45	BDL	BDL	0.1	0.1
Alkalinity	mg/lit	200	22	30	18	33
Iron as Fe	mg/lit	0.3	0.1	0.08	0.05	0.09
Manganese as Mn	mg/lit	0.1	0.04	0.02	0.03	0.04
MPN/100ml	-	Absent	17	16	21	12

BDL- Below Detection Limit

  
Govt. Analyst  
Laboratory Incharge



**M/s Sesa Environment Laboratory**

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

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

**Surface Water Analysis Report for the Month of December 2016**

Mine Name: Sonshi Mine

Date of Sample collection: 26.12.2016

Standard method used for analysis: APHA Standard

Test Report No: 215


Date of Receipt of sample: 26.12.2016

Analysis completion date: 31.12.2016

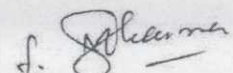
Parameter	Unit	Location						
		Permissible limits	Upstream Advoi Nallah	Downstream Advoi nallah	Upstream sonshi nallah	Down stream sonshi nallah	Pit Discharge	Sonshi Nallah near Ajoba Temple
Colour	Hazen	----	<5	<5	<5	<5	<5	<5
pH	----	5.5 to 9.0	6.51	6.56	6.83	6.57	6.52	6.39
Turbidity	NTU	----	1.0	1.0	0.8	1.0	1.3	2
Dissolved Solids	mg/lit	----	22	21	33	20	16	16
Conductivity	µS/cm	----	44	42	66	39	32	33
Suspended Solids	mg/lit	100	2	2	2	2	2	2
Chlorides	mg/lit	----	7	6	7	5	5	6
Total Hardness as CaCO <sub>3</sub>	mg/lit	----	16	14	26	20	12	12
Calcium as Ca <sup>++</sup>	mg/lit	----	2.4	2.4	5.6	3.2	2.4	2.4
Magnesium as Mg <sup>++</sup>	mg/lit	----	2.4	1.9	2.9	2.9	1.5	1.5
Sulphate as SO <sub>4</sub>	mg/lit	----	0.9	1	0.8	1	1	1
Phosphate as PO <sub>4</sub>	mg/lit	5	BDL	BDL	BDL	BDL	BDL	0.1
Nitrate as NO <sub>3</sub>	mg/lit	10	0.1	0.1	0.1	BDL	BDL	0.1
B.O.D (3days, 27°C)	mg/lit	30	<3	<3	4	4	<3	<3
C.O.D	mg/lit	250	<10	<10	18	18	<10	<10
Total Iron	mg/lit	3	0.12	0.11	0.09	0.15	0.15	0.1
Manganese as Mn	mg/lit	2	0.06	0.03	0.04	0.07	0.05	0.04
D.O	mg/lit	----	7.0	6.9	7	7	7	7
Oil & Grease	mg/lit	10	<1	1	<1	<1	<1	1

Note :- No water discharge from Pissurlem dump run off, Sonshi Dump run off & Vaghure side dump run off

BDL- Below Detection Limit

  
Govt. Analyst



  
Laboratory Incharge

