



Ref No: HIL/LHD/VP (M)/MoEF/ 692

Date: 26.05.14

To,  
Joint Director(S)  
MoEF ,GOI, Eastern Regional Office  
A/3, Chandrashekharpur,  
Bhubaneswar- 751023 (Orissa)

**Sub: Compliance Report of EC conditions for Jalim & Sanai Bauxite Mining project of M/s Hindalco Industries Limited located in Gumla, Jharkhand for the period Oct'13 to March'14.**

Ref: **Environmental Clearance letter no J-11015/138/2006-IA II (M) dated 10<sup>th</sup> April 2007**

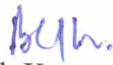
Sir,

With reference to the above, we are submitting herewith the Compliance status report of EC conditions for Jalim & Sanai Bauxite Mining project of M/s Hindalco located in Gumla, Jharkhand for the period **Oct'13 to March'14.**

Hope you will find the same in order.

Thanking You

Yours Sincerely  
FOR HINDALCO INDUSTRIES LIMITED

  
(Bijesh Kumar Jha)  
VP (Mines)

Enclosure: - As Above

**Compliance of conditions laid down in Environmental Clearance**

**JALIM & SANAI BAUXITE MINES**

**Period : Oct'13 - March'14**

J-11015/138/2006-IA.II (M) Dated 10.4.2007

<b>Sl No</b>	<b>Conditions</b>	<b>Compliance Status</b>
Specific Conditions		
1	All the conditions stipulated by SPCB in their NOC shall be effectively implemented.	Implementation of the stipulated conditions are fulfilled.
2	The environmental clearance is subject to approval of the state land use Department, Government of Jharkhand for diversion of agricultural land for non-agricultural use.	Mining Lease is granted / renewed by the State Govt. after due consideration & cabinet approval on recommendation of D.C. D.C is competent authority for diversion of agricultural land for non-agricultural use. Copy already submitted with previous six monthly compliance report.
3	Mining shall not intersect groundwater. The mine working shall be restricted to ground water table. Prior approval of the Ministry of Environment & Forests and Central Ground Water Authority shall be obtained for mining below water table.	Bauxite mining is being done at shallow depth in this mine also, hence at no point it will intersect the ground water table. Thus there will be no interference.
4	The project proponent shall ensure that no natural watercourse shall be obstructed due to any mining operations.	It is being ensured. No natural water course is obstructed during mining operation
5	Top soil shall be stacked properly with proper slope with adequate measures and should be used for reclamation and rehabilitation of mined out areas.	It is being ensured & the top soil is being used for reclamation & rehabilitation of mined out areas. Details of land reclamation for the year 2013-14 is enclosed as Annexure.
6	The waste generated shall be concurrently backfilled in the mined out area. There shall be no external OB 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 on six month basis.	Waste generated is used in backfilling, data enclosed.

7	<p>Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from mine working. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly desilted particularly after monsoon and maintained properly.</p> <p>Garland drain (size, gradient and length) shall be constructed for 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 retention period to allow proper setting of silt material. Sedimentation pits should be constructed at the corners of the garland drains and desilted at regular intervals.</p>	<p>No runoff is generated from mining activities. However, to collect &amp; manage rain water during monsoon, part of mined out area is used as settling tank for the runoff. Sediment rain water is being used for watering the mine area, roads, green belt development etc.</p>
8	<p>Plantation shall be raised in an area of 10.58 ha including a green belt of adequate width by planting the native species around the ML area, roads, reclaimed area etc. in consultation with the local DFO / Agriculture Department. The density of the trees should be around 1500 plants per ha.</p>	<p>During 2013-14, we have planted 500 plants. Rest to be complied during project period.</p>
9.	<p>The project proponent shall ensure that there shall be no discharge from the mine.</p>	<p>Ensured. There is no discharge from the mine.</p>
10.	<p>The project proponent shall carry out regular monitoring of spring discharge and its quality near Shrengdag village on long term basis.</p>	<p>It is being carried out.</p>
11	<p>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.</p>	<p>A plan is drawn on the basis of discussions with Scientists of State unit office of Central Ground Water Board, Ranchi to implement suitable conservation measures to augment ground water resources in the area and is also submitted to the <b>Regional Director</b>, Central Ground Water Board, Patna, for his further suggestions. Recommendation of CGWB shall be implemented to augment the ground water resources of the area. Copy of letter already submitted.</p>
12	<p>Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new piezometers during the mining operation. The</p>	<p>It is being monitored. Monitoring report is enclosed as <b>Annexure</b></p>



	monitoring should 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 may be sent regularly to MOEF, Central Ground water Authority and Regional Director Central Ground Water Board.	
13	Prior permission from the competent authority should be obtained for drawl of water from the surface water bodies.	Water cess is being paid regularly to JSPCB.
14	Vehicular emissions should be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and transportation of mineral. The vehicles should be covered with a tarpaulin and shall not be overloaded.	To keep vehicular emissions in control, company vehicles are periodically checked & repaired. All measures are being taken to control vehicular emission.
15	Drills should either be operated with dust extractors or should be equipped with water injection system.	Drilling is done with water pouring in the holes intermittently for dust suppression which is the best method for jackhammer type drilling.
16	Blasting operation should be carried out only during the daytime. Controlled blasting should be practiced. The mitigative measures for control of ground vibration and to arrest fly rocks and boulders should be implemented.	Blasting at Mines is done at fixed blasting period of 12.00 Noon to 1.00 PM on working days. Mobile mining activities are stopped during blasting. All the precautionary and mitigative measures to control ground vibration and to arrest generation of fly rocks is being exercised
17	Consent to operate should be obtained from SPCB prior to start of enhanced production from the mine.	There is no proposal for production enhancement.
18	Sewage treatment plant should be installed for the colony. ETP should also be provided for workshop and wastewater generated from mining operations.	There is no effluent discharge from Mine, hence ETP has not been installed. The sewage water from domestic uses is being collected through individual septic tanks & soak pits. Sullage is collected to an integrated soak pit.
19	The project proponent should take all precautionary measures during mining operation for conservation and protection of endangered fauna such as Indian Python, <i>Presbytis phayrei</i> etc. Spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds so	Action plan for conservation of flora and fauna spotted in the study area has been prepared based on discussions with D.F.O of the area for implementation and a copy of the same is submitted to the D.F.O on receipt of any suggestion to our action plan the same will be intimated to MOEF. A copy of Action plan drawn and of letter for submission to DFO is al ready

	conservation plan shall be made and the funds so allocated shall be included in the project cost. Copy of action plan may be submitted to the Ministry and its Regional Office within 3 months.	for submission to DFO is al ready submitted to regional office.
20	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.	Progressive mine Closure Plan along with scheme of mining has been prepared and submitted to IBM timely for approval.

#### GENERAL CONDITIONS

Sl No	Conditions	Compliance Status
1	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forest	Being adhered to. Mining is being done as per approved Mining plan/scheme.
2	No change in the calendar plan including excavation, quantum of mineral bauxite and waste should be made.	Excavation of over burden & bauxite are within calendar plan. Details attached as Annexure for the financial year FY13-14
3	Four ambient air quality-monitoring station should be established in the core zone as well as in the buffer zone for RPM, SPM, SO <sub>2</sub> , NO <sub>x</sub> monitoring. Location of the stations should be decided based on the metrological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.	Monitoring locations has been fixed and regular monitoring is being done with available in-house facilities.  Monitoring Reports of AAQ data is attached as <b>Annexure</b>
4	Data on ambient air quality (RPM, SPM, SO <sub>2</sub> , NO <sub>x</sub> ) should be regularly submitted to the Ministry including its Regional office located at Bhubneshwar and the State Pollution Control Board / Central pollution Control Board once in six months.	Monitoring Reports of AAQ data is attached as <b>Annexure</b>
5	Fugitive dust emission from all the sources should be controlled regularly. Water spraying arrangements on haul roads, loading and unloading and at transfer points should be provided and properly maintained.	Two no of mobile water tanker with sprinkling facility have been provided along haul roads, loading unloading & at transfer points to arrest dust emissions.
6	Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operation of HEMM, etc. should be provided with ear plug / muffs.	Noise monitoring is done regularly. Workers engaged in operation of HEMM, etc. are provided with ear plug / muffs. Monitoring report enclosed as annexure.



7	<p>Industrial waste water (workshops and waste water from the mine) Should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19<sup>th</sup> May, 1993 and 31<sup>st</sup> December, 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.</p>	<p>There is no effluent discharge from Mine ,</p> <p>Discharge of Workshop effluents is being passed through Oil catchment pit to trap Oil and grease.</p>
8	<p>Personnel working in dusty areas should wear protective respiratory devices and they should also provided with adequate training and information on safety and health aspects.</p> <p>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.</p>	<p>Complied</p> <p>Use of Personal Protective Equipment is provided &amp; used by the individuals. we have an well equipped hospital at mine site where health checkup of workmen is carried out regularly.</p> <p>Training on safety, health &amp; environmental aspects of mining is being regularly imparted through VT training &amp; other training programmes.</p>
9	<p>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.</p>	<p>Separate management cell is functioning with qualified in-house members. Copy enclosed.(Annexure )</p>
10	<p>The project authorities should inform to the Regional Office located at Bhubneshwar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.</p>	<p>Not applicable.</p> <p>The mine is a running mine since 1<sup>st</sup> nov 1983. Yearly date of financial closure is 31<sup>st</sup> March.</p>
11	<p>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 Bhubneshwar.</p>	<p>Statement of Budgetary provision &amp; actual expenses for environmental protection measure is submitted.(Annexure).</p>
12	<p>The Regional Office of this Ministry located at Bhubneshwar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information / monitoring reports.</p>	<p>Agreed.</p>

13.	The project proponent shall submit six monthly report on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment and Forests, its Regional Office, Lucknow, Central Pollution Control Board and State Pollution Control Board.	Duly submitted.
14	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.	Complied .Copy submitted to regional office.
15	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.	Agreed.
16	The project authorities should advertise at least in two local newspapers widely circulated, one of which locality concerned, within 7days 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 Board and also at web site of the Ministry of Environment and Forests at <a href="http://envfor.nic.in">http://envfor.nic.in</a> and a copy of the same should be forwarded to the Regional Office of this Ministry located Bhubneshwar.	Complied. Copy of paper cuttings containing advertisements is already submitted vide letter no.HIL/GMO(M)/ENV/141 dated 23.04.07.



**BREAK UP THE COST OF ENVIRONMENTAL MEASURES DURING THE YEAR 2013-14**

The composite cost during the year 2013-14 for environmental protection & pollution control by Jharkhand Mines division of M/s Hindalco Industries Ltd & M/s Minerals & Minerals Ltd for implementation of the suggested measures in EC at our all the operating mines in the state of Jharkhand-namely Pakhar (115.13 Ha), Pakhar (15.58 Ha), Pakhar (109.507 Ha), Pakhar (8.09 Ha), Pakhar (35.12Ha), Serengdag (140.06 Ha), Serengdag (155.81 Ha), Jalim & Sanai (12.14 Ha), Gurdari (584.19 Ha), Amtipani (190.95 Ha), Kujam I (80.97 Ha) Kujam II (157.38 Ha) and Bagru (75.41 Ha), Hisri New (14.55 Ha), Chiro kukud, Orsa pat(196.36 Ha), Bhusar (65.31 Ha)& Bimarla Bauxite Mines (134.52 Ha).

Sl No	Description	Budget (in Lakh Rupees) FY 2013-2014	Actual (in Lakh Rupees) FY 2013-2014 from April'13 to Sep'13	Actual (in Lakh Rupees) FY 2013-2014 from Oct'13 to March'14
1	Pollution Control & Environment monitoring	10.00	6.44	-
2	Reclamation/ Back filing & Rehabilitation	**	153.60	71.50
3	Green belt & Plantation	40.00	30.75	9.50
4	Rural Development	70.00	67.72	85.35

\*\*Part of OB removed cost.

  
Convener

Environment Management Cell.





Date: 30.10.13

**OFFICE ORDER**

In connection with the earlier office order dated 12.11.2011 the re constituted team of Environment management cell to ensure compliance of various environmental Acts, regulations & rules at Mines Division, Hindalco, Lohardaga as follows:

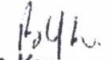
The Environment Management Cell will consist of:

1. B. K. Mahapatra, AGM (Quality & Environment), Convenor.

Members:

2. Utpal Gupta, Manager (Environment)
3. Biplab Mukherjee (Asst Manager Geology)
4. S. Joshi, Mines Manager (Bagru Mines)
5. A. Anbarasu, Mines Manager (Serengdag A)
6. Ajay Pandey, Mines Manager (Pakhar 109.507 Hect)
7. Kiran Sankar Singh, Mines Manager (Gurdari)
8. Vidya Sagar Singh, Mines Manager (Kujam )
9. Amar Bharati, Mines Manager (Amtipani)
10. S P Jha, Mines Manager (Pakhar)
11. Rajesh Ambastha, Mines Manager (Chiro Kukud & Orsa)

By order

  
Bijesh Kumar Jha  
VP (Mines)

Cc to: - All Mines Manager  
All Department head  
Notice Board.

**PRODUCTION, MINED OUT, BACKFILLED, PRODUCTION AND OVERBURDEN REMOVAL FROM APR-13 TO MAR-14**

Name of Mines	Mining lease area (Ha)	Mined Out area (in Acres)	Backfilled area (in Acres)	Production (in MT)	Overburden Removal (in Cub.M.)
Shrengdag Bauxite Mines	155.81	25.95	19.20	253610.00	371290
Gurdari Bauxite Mines	584.19	33.20	25.60	313975.00	487773
Jalim & Sanai	12.14	4.00	2.00	49445.00	30124
Serangdag	140.06	7.96	3.48	99795.00	98371
Pakhar Buxite Mines	115.13	3.71	5.09	296950.00	449483
Pakhar Buxite Mines	8.09	1.70	0.80	68400.00	11380
Kujam-I	80.87	14.12	7.52	149255.00	99902
Kujam-II	157.38	5.41	3.60	149790.00	82386
Amtipani	190.95	16.46	16.03	149665.00	419976
Chiro-Kukud	152.57	2.90	6.18	52929.00	62222
Orsa Bauxite Mines	196.36	0.00	0.00	0.00	0
Hisri New	14.55	1.17	0.00	93813.00	6699
Bagru	75.41	0.94	0.24	56804.00	31935
Bhusar	65.31	2.26	8.32	203532.00	150616
<b>Minerals &amp; Minerals Limited</b>					
Pakhar Buxite Mines	109.507	7.61	6.45	234500.00	210702
Pakhar Buxite Mines	15.58	1.45	1.85	57065.00	174812



**Monitored water level**

Location (Mines)	Elevation (feet)	Elevation (Mtr)	Well type	Monsoon 2013		Post Monsoon 2013		Winter		Pre Monsoon		
				Inside ML	Outside ML	Inside ML	Outside ML	Inside ML	Outside ML	Inside ML	Outside ML	
Bagru	2970	905	Open Well		21.70		24.10			27.32		29.23
	2985	910	Open Well		24.20		24.50			26.89		27.19
	3001	915	Open Well		29.30		28.40			30.14		31.26
	2963	903	Open Well		22.90		33.10			35.21		35.89
	2983	909	Open Well		17.60		28.70			29.62		30.18
Pakhar	3279	1000	Open Well		24.90		22.60			24.51		25.93
	3552	1083	Hand Pump	35.40		31.60		34.34			35.49	
Sherengdag	3370	1027	Open Well		25.80		28.30			30.53		31.42
	3587	1094	Hand Pump	41.80		39.58		42.13			42.56	
	3546	1081	Hand Pump	39.60		31.26		41.37			41.31	
	3459	1055	Hand Pump	33.10		27.50		35.31			35.35	
	3495	1066	Hand Pump	27.70		26.13		29.12			30.25	
Gurdari	3428	1045	Hand Pump	29.34		27.85		29.64			30.41	
	3481	1061	Hand Pump	28.30		24.87		25.42			26.79	
	3472	1059	Hand Pump	38.10		36.63		35.21			35.98	
	3527	1075	Hand Pump	28.20		26.83		28.49			29.53	
	3526	1075	Hand Pump	28.30		29.32		30.29			30.05	
Kujam	3412	1040	Open Well		33.90		21.80			35.21		36.78
	3414	1041	Open Well		33.70		24.80			36.54		39.52
	3491	1064	Hand Pump	31.50		28.60		35.91			42.12	
	3450	1052	Hand Pump				21.12			24.13		23.54
Chiro Kukud	3765	1148	Hand Pump	33.40		28.35		34.12			37.26	
	3776	1151	Hand Pump	37.60		31.84		36.67			36.21	
	3556	1084	Hand Pump	34.30		36.85		35.69			39.19	

*B. Chand*



## Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 30/01/2014

Report No : KG14-000219.001

JOE No : KG14-000219

Report Control No : KGR0000046003  
Sample Described by Customer as : AMBIENT AIR QUALITY MONITORING

Client Name : Hindalco Industries Limited(Mines Division)  
Client Address : Lohardaga,  
Postal Code : 835203  
State : Jharkhand  
Country : India  
Sample Type : AMBIENT AIR QUALITY MONITORING  
Received : 09/01/2014  
Registered : 09/01/2014  
Marks on Sample : shrengdag A pit quarry no. 1, (shrengdag plateau), sampling date : 24.12.2013  
Test Start/End Date : 09/01/2014 - 14/01/2014

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10 )	IS:5182 (PART 23)	35.76	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	15.75	ug/m3	-	60
Nitrogen Dioxide (NO2)	IS:5182 (Part-6):1975 (Reaff.2004)	<5.00	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide (CO)	EPA 800/P-99/001F	<0.10	PPM		

Analyzed at site.

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Regd & Corp. Off. SGS House, 4B, A.S. Marg, Vikhroli (West), Mumbai-400083. Tel: (022) 25798421 to 28 Fax: (022) 25798431 to 35 [www.sgs.com](http://www.sgs.com)

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## Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 30/01/2014

Report No : KG14-000219.001

JOE No : KG14-000219

Report Control No : KGR0000046003

Per pro SGS India Private Ltd



Satya Manna

Section Incharge - ENVI

Authorized Signatory

\*\*\*\*End of Report\*\*\*\*

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Repd & Corp. Off : SGS House, 4B, A.S. Marg, Vikhroli (West), Mumbai-400083. Tel : (022) 25798421 to 28 Fax : (022) 25798431 to 35 [www.sgs.com](http://www.sgs.com)

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## Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 30/01/2014

Report No : KG14-000219.002

JOE No : KG14-000219

Sample Described by Customer as : AMBIENT AIR QUALITY MONITORING  
Report Control No : KGR0000046003

Client Name : Hindalco Industries Limited(Mines Division)  
Client Address : Lohardaga,  
Postal Code : 835203  
State : Jharkhand  
Country : India  
Sample Type : AMBIENT AIR QUALITY MONITORING  
Received : 09/01/2014  
Registered : 09/01/2014  
Marks on Sample : location: shrengdag village (shrengdag plateau), sampling dt. 24.12.2013  
Test Start/End Date : 09/01/2014 - 14/01/2014

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10 )	IS:5182 (PART 23)	35.10	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	20.54	ug/m3	-	60
Nitrogen Dioxide (NO2)	IS:5182 (Part-6):1975 (Reaff.2004)	18.47	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide (CO)	EPA 600/P-99/001F	<0.10	PPM		

Analyzed at site.

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## Test Report

Report No : KG14-000219.002

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 30/01/2014

JOE No : KG14-000219

Report Control No : KGR0000046003

Per pro SGS India Private Ltd

Satya Manna  
Section Incharge - ENVI  
Authorized Signatory

\*\*\*\*End of Report\*\*\*\*

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## Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 30/01/2014

Report No : KG14-000219.003

JOE No : KG14-000219

Report Control No : KGR0000046003  
Sample Described by Customer as : AMBIENT AIR QUALITY MONITORING

Client Name : Hindalco Industries Limited(Mines Division)  
Client Address : Lohardaga,  
Postal Code : 835203  
State : Jharkhand  
Country : India  
Sample Type : AMBIENT AIR QUALITY MONITORING  
Received : 09/01/2014  
Registered : 09/01/2014  
Marks on Sample : Shrengdag\_b pit(shrengdag plateau), sampling dt. 25.12.2013  
Test Start/End Date : 09/01/2014 - 14/01/2014

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS:5182 (PART 23)	58.28	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	22.29	ug/m3	-	60
Nitrogen Dioxide (NO2)	IS:5182 (Part-6):1975 (Reaff.2004)	<5.00	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide (CO)	EPA 600/P-99/001F	<0.10	PPM		

Analyzed at site.

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## Test Report

Report No : KG14-000219.003

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 30/01/2014

JOE No : KG14-000219

Report Control No : KGR0000046003

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

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## Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 30/01/2014

Report No : KG14-000219.004

JOE No : KG14-000219

Report Control No : KGR0000046003

Sample Described by Customer as : AMBIENT AIR QUALITY MONITORING

Client Name : Hindalco Industries Limited(Mines Division)  
Client Address : Lohardaga,  
Postal Code : 835203  
State : Jharkhand  
Country : India  
Sample Type : AMBIENT AIR QUALITY MONITORING  
Received : 09/01/2014  
Registered : 09/01/2014  
Marks on Sample : jalim & Sanai pit(shrengdag plateau), sampling dt. 25.12.2013  
Test Start/End Date : 09/01/2014 - 14/01/2014

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10 )	IS:5182 (PART 23)	39.05	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	11.66	ug/m3	-	60
Nitrogen Dioxide (NO2)	IS:5182 (Part-6):1975 (Reaff 2004)	11.12	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff 2006)	<5.00	ug/m3	-	80
Carbon Monoxide (CO)	EPA 600/P-99/001F	<0.10	PPM		

Analyzed at site.

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## Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 30/01/2014

Report No : KG14-000219.004

JOE No : KG14-000219

Report Control No : KGR0000046003

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

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## TEST REPORT

Report No. : KG14-000253.001

Date : 11.01.2014

JOE No. : KG13-000252

Report Control No. : KGR0000044245

### SAMPLE DRAWN BY SGS INDIA PVT. LTD.

<b>SAMPLE DESCRIPTION</b>	<b>MEASUREMENT OF NOISE LEVEL</b>
<b>COMPANY NAME</b>	<b>M/S. HINDALCO INDUSTRIES LIMITED (MINES DIVISION)</b>
<b>ADDRESS</b>	<b>MINES DIVISION, LOHARDAGA, JHARKHAND, PIN – 835 302</b>
<b>SAMPLING SITE</b>	<b>SHRENGDAG-A (SHRENGDAG PLATEAU)</b>
<b>PROTOCOL</b>	<b>IS:9989/IS:7194</b>
<b>DATE OF SAMPLING</b>	<b>25.12.2013 TO 26.12.2013</b>
<b>TEST START DATE</b>	<b>10.01.2014</b>
<b>TEST END DATE</b>	<b>11.01.2014</b>

LOCATION	RESULT		LIMIT IN dB(A) Leq ( INDUSTRIAL AREA )	
	Day Time (L <sub>eq</sub> ) in dB(A)	Night time (L <sub>eq</sub> ) in dB(A)	Day Time	Night time
NEAR HINDALCO OFFICE	56	47	75	70

\*\*\*\*\*End of Report\*\*\*\*\*

Note: (i) The value is the Leq of One Hundred Seventy readings taken in day time and seventy reading taken in night time.  
(ii) Day time shall mean from 6:00 am to 10:00 pm  
(iii) Night time shall mean from 10:00 pm to 6:00 am

Checked by

per pro SGS India Private Ltd.

**Dipankar De Sarkar**  
Manager (Operations)

**Dr. Asish Chakraborty**  
Manager-Laboratory

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## Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 20/01/2014

Report No : KG14-000151.001

JOE No : KG14-000151

Report Control No : KGR0000045058

Sample Described by Customer as : DRINKING WATER

Client Name : Hindalco Industries Limited(Mines Division)  
Client Address : Lohardaga,  
Postal Code : 835203  
State : Jharkhand  
Country : India  
Sample Type : DRINKING WATER  
Received : 08/01/2014  
Registered : 08/01/2014  
Marks on Sample : Location: Hindalco MAss, Shrengdag-A  
- : Shrengdag plateau  
Quantity : 5.5L app  
Sample Collected on : 27.12.2013  
Sampling Method : APHA 1060B/9060A  
Test Start/End Date : 08/01/2014 - 20/01/2014

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Colour	IS:3025 (Part-4):1983 (Reaff.2006)	10.0	Hz	5	15
Odour	IS:3025 (Part-5):1983 (Reaff.2006)	Agreeable		Agreeable	Agreeable
Taste	IS:3025 (Part-8):1983 (Reaff.2006)	Agreeable		Agreeable	Agreeable
pH	IS:3025 (Part-11):1983 (Reaff.2006)	7.39		6.5	8.5
<i>Analyzed at site.</i>					
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	3.72	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	0.09	mg/L	0.3	No relaxation
Fluoride (as F)	IS:3025 (Part-60):2008	<0.10	mg/L	1.0	1.5
Residual Free Chlorine	IS:3025 (Part-26):1986 (Reaff.2003)	<0.10	mg/L	0.2	1.0

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SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 20/01/2014

Report No : KG14-000151.001

JOE No : KG14-000151

Report Control No : KGR0000045058

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Chloride (as Cl)	IS:3025 (Part-32):1988 (Reaff.1999)	<5.00	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff.1996)	11.40	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Absent	per 100ml		
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	1.12	mg/L	75	200
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	<1.00	mg/L	30	100
Copper (as Cu)	IS:3025 (Part-2)	<0.01	mg/L	0.05	1.5
Manganese (as Mn)	IS:3025 (Part-2)	0.01	mg/L	0.1	0.3
Sulphate (as SO <sub>4</sub> )	IS:3025 (Part-24):1986 (Reaff.1998)	<2.00	mg/L	200	400
Nitrate (as NO <sub>3</sub> )	IS:3025 (Part-34):1988 (Reaff.1999)	1.19	mg/L	45	No relaxation
Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	IS:3025 (Part-43):1992 (Reaff.2003)	<0.001	mg/L	0.001	0.002
Mercury (as Hg)	IS:3025 (Part-48):1994 (Reaff.1999)	<0.001	mg/L	0.001	No relaxation
Cadmium (as Cd)	IS:3025 (Part-41):1992 (Reaff.2003)	<0.003	mg/L	0.003	No relaxation
Selenium (as Se)	IS:3025 (Part-2)	<0.005	mg/L	0.01	No relaxation
Arsenic (as As)	IS:3025 (Part-37):1988 (Reaff.1999)	<0.005	mg/L	0.01	No relaxation
Cyanide (as CN)	IS:3025 (Part-27):1986 (Reaff.2003)	<0.020	mg/L	0.05	No relaxation
Lead (as Pb)	IS:3025 (Part-47):1994 (Reaff.1999)	<0.005	mg/L	0.01	No relaxation
Zinc (as Zn)	IS:3025 (Part-2)	0.07	mg/L	5	15
Anionic Surface Active Agent (as MBAS)	IS:13428:2005: Annex K	<0.05	mg/L	0.2	1.0
Chromium (as Cr)	IS:3025 (Part-2)	<0.01	mg/L	0.05	No relaxation
Mineral Oil	IS:3025 (Part-39):1991 (Reaff.2003)	<0.01	mg/L	0.5	No relaxation

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## Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 20/01/2014

Report No : KG14-000151.001

JOE No : KG14-000151

Report Control No : KGR0000045058

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Total Alkalinity (as CaCO <sub>3</sub> )	IS:3025 (Part-23):1986 (Reaff.2003)	4.56	mg/L	200	600
Aluminium (as Al)	IS:3025 (Part-55):2003	0.04	mg/L	0.03	0.2
Boron (as B)	IS:3025 (Part-57):2005	<0.05	mg/L	0.5	1.0
Turbidity	IS:3025 (Part-10):1984 (Reaff.2006)	0.48	NTU	1	5

Per pro SGS India Private Ltd

Aniruddha Das

Section Incharge-Microbiology

Authorized Signatory

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

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\*\*\*\*End of Report\*\*\*\*

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## Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 30/01/2014

Report No : KG14-000236.001

JOE No : KG14-000236

Report Control No : KGR0000045990  
Sample Described by Customer as : FUGITIVE AIR

Client Name : Hindalco Industries Limited(Mines Division)  
Client Address : Lohardaga,  
Postal Code : 835203  
State : Jharkhand  
Country : India  
Sample Type : FUGITIVE AIR  
Received : 10/01/2014  
Registered : 10/01/2014  
Marks on Sample : Location: Shrengdag -A pit quarry No. 3(Shrengdag Plateau), date :27.12.2013  
Test Start/End Date : 10/01/2014 - 15/01/2014

Analysis	Method	Result	Unit	Requirement/Limit as Per FACTORY ACT. 1948 & BIHAR/JHARKAND FACTORY RULE-1950 Min Max
Suspended Particulate Matter (SPM)	IS:5182 (Part-23):2006	568.85	ug/m3	10000

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

\*\*\*\*End of Report\*\*\*\*

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## Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 20/01/2014

Report No : KG14-000160.001

JOE No : KG14-000160

Report Control No : KGR0000045097

Sample Described by Customer as : GROUND WATER

Client Name : Hindalco Industries Limited(Mines Division)  
Client Address : Lohardaga,  
Postal Code : 835203  
State : Jharkhand  
Country : India  
Sample Type : GROUND WATER  
Received : 08/01/2014  
Registered : 08/01/2014  
Marks on Sample : Location:Hand Tubewell Shrengdag Village  
- : Shrengdag Plateau  
Quantity : 5.5L app  
Sample Collected on : 27.12.2013  
Sampling Method : APHA 1060B/9060A  
Test Start/End Date : 08/01/2014 - 20/01/2014

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Colour	IS:3025 (Part-4):1983 (Reaff.2006)	25.0	Hz	5	15
Odour	IS:3025 (Part-5):1983 (Reaff.2006)	Agreeable		Agreeable	Agreeable
Taste	IS:3025 (Part-8):1983 (Reaff.2006)	Agreeable		Agreeable	Agreeable
pH	IS:3025 (Part-11):1983 (Reaff.2006)	8.23		6.5	8.5
<i>Analyzed at site.</i>					
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	55.80	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	9.81	mg/L	0.3	No relaxation
Fluoride (as F)	IS:3025 (Part-60):2008	0.47	mg/L	1.0	1.5
Residual Free Chlorine	IS:3025 (Part-26):1986 (Reaff.2003)	<0.10	mg/L	0.2	1.0

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## Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 20/01/2014

Report No : KG14-000160.001

JOE No : KG14-000160

Report Control No : KGR0000045097

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Chloride (as Cl)	IS:3025 (Part-32):1988 (Reaff.1999)	5.35	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff.1996)	111.20	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Absent	per 100ml		
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	11.90	mg/L	75	200
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	6.33	mg/L	30	100
Copper (as Cu)	IS:3025 (Part-2)	0.02	mg/L	0.05	1.5
Manganese (as Mn)	IS:3025 (Part-2)	0.05	mg/L	0.1	0.3
Sulphate (as SO <sub>4</sub> )	IS:3025 (Part-24):1986 (Reaff.1998)	<2.00	mg/L	200	400
Nitrate (as NO <sub>3</sub> )	IS:3025 (Part-34):1988 (Reaff.1999)	4.65	mg/L	45	No relaxation
Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	IS:3025 (Part-43):1992 (Reaff.2003)	<0.001	mg/L	0.001	0.002
Mercury (as Hg)	IS:3025 (Part-48):1994 (Reaff.1999)	<0.001	mg/L	0.001	No relaxation
Cadmium (as Cd)	IS:3025 (Part-41):1992 (Reaff.2003)	<0.003	mg/L	0.003	No relaxation
Selenium (as Se)	IS:3025 (Part-2)	<0.005	mg/L	0.01	No relaxation
Arsenic (as As)	IS:3025 (Part-37):1988 (Reaff.1999)	<0.005	mg/L	0.01	No relaxation
Cyanide (as CN)	IS:3025 (Part-27):1986 (Reaff.2003)	<0.020	mg/L	0.05	No relaxation
Lead (as Pb)	IS:3025 (Part-47):1994 (Reaff.1999)	0.008	mg/L	0.01	No relaxation
Zinc (as Zn)	IS:3025 (Part-2)	0.03	mg/L	5	15
Anionic Surface Active Agent (as MBAS)	IS:13428:2005: Annex K	<0.05	mg/L	0.2	1.0
Chromium (as Cr)	IS:3025 (Part-2)	<0.01	mg/L	0.05	No relaxation
Mineral Oil	IS:3025 (Part-39):1991 (Reaff.2003)	<0.01	mg/L	0.5	No relaxation

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## Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 20/01/2014

Report No : KG14-000160.001

JOE No : KG14-000160

Report Control No : KGR0000045097

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Total Alkalinity (as CaCO <sub>3</sub> )	IS:3025 (Part-23):1986 (Reaff.2003)	53.18	mg/L	200	600
Aluminium (as Al)	IS:3025 (Part-55):2003	0.17	mg/L	0.03	0.2
Boron (as B)	IS:3025 (Part-57):2005	<0.05	mg/L	0.5	1.0
Turbidity	IS:3025 (Part-10):1984 (Reaff.2006)	96.30	NTU	1	5

Per pro SGS India Private Ltd

Aniruddha Das

Section Incharge-Microbiology

Authorized Signatory

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

\*\*\*\*End of Report\*\*\*\*

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## Test Report

Print Date : 29/01/2014

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG14-000144.001

JOE No : KG14-000144

Report Control No : KGR0000045908

Sample Described by Customer as : SOIL

Client Name : Hindalco Industries Limited(Mines Division)  
Client Address : Lohardaga,  
Postal Code : 835203  
State : Jharkhand  
Country : India  
Sample Type : SOIL  
Received : 08/01/2014  
Registered : 08/01/2014  
Marks on Sample : Location:Reclaim Area Shrengdag B  
- : (Shrengdag plateau)  
Sample Collected on : 25.12.2013  
Quantity : 2.5Kg app  
Test Start/End Date : 08/01/2014 - 22/01/2014

Analysis	Method	Result	Unit
Conductivity (1:5) Soil Suspension.	F.A.U.N (2007)	7.3	µs/cm
pH (1:2) Soil Suspension	F.A.U.N (2007)	5.77	--
Porosity	F.A.U.N (2007)	54.27	%
Bulk Density	By Bulk Density Apparatus	1.11	gram/ml
Phosphorus (as P)	F.A.U.N (2007)	<20.000	mg/kg
Texture	F.A.U.N (2007)	Sandy clay	
Clay	F.A.U.N (2007)	39.8	%
Sand	F.A.U.N (2007)	44.2	%
Silt	F.A.U.N (2007)	16.0	%
Available Chloride (as Cl)	Soil & Agriculture Organization (U.N-2007)	<20.00	mg/kg
Available Nitrogen	Food & Agriculture Organization (U.N-2007)	300.34	mg/kg

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## Test Report

Print Date : 29/01/2014

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG14-000144.001

JOE No : KG14-000144

Report Control No : KGR0000045908

Analysis	Method	Result	Unit
Available Potassium (as K)	Soil & Water Book By P.K. Gupta	1107.59	mg/kg
Available Magnesium (as Mg)	Soil & Water Book By P.K. Gupta	1345.54	mg/kg
Lead (as Pb)	USEPA 3052	17.47	mg/kg
Chromium (as Cr)	USEPA 3052	56.15	mg/kg
Mercury (as Hg)	USEPA 3052	<1.00	mg/kg
Total Organic Matter	Black & Walkely Wet Digestion Method	0.47	%

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

\*\*\*\*End of Report\*\*\*\*

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### TEST REPORT

Report No. : KG17-000184.001- 005

Date : 10.01.2014

JOE No. : KG14-000184

Report Control No:KGR0000044169

#### SAMPLE DRAWN BY SGS INDIA PRIVATE LTD.

**SAMPLE DESCRIPTION** : MEASUREMENT OF NOISE LEVEL  
**NAME OF THE CLIENT** : M/S. HINDALCO INDUSTRIES LIMITED  
**ADDRESS** : MINES DIVISION, LOHARDAGA, JHARKHAND, PIN – 835 302  
**SAMPLING METHOD** : INSTRUMENTAL, USING SOUND LEVEL METER  
**SAMPLING SITE** : SHRENGDAG-A PIT (SHRENGDAG PLATEAU)  
**PROTOCOL** : GENSOP/CALLAB-116  
**TEST START DATE** : 09.01.2014  
**TEST END DATE** : 10.01.2014

SL NO.	SAMPLING LOCATION	DATE & TIME OF SAMPLING	DAY TIME NOISE LEVEL dB (A) Leq	LIMIT IN dB(A) Leq DAY TIME ( INDUSTRIAL AREA )
1.	POCKLEN (L & T KOHATSU PC-300)	25.12.2013 (14:40 Hrs)	78	75
2.	WAGON DRILL (ATLAS COPCO SW-2)	25.12.2013 (14:58 Hrs)	83	75
3.	COMPRESSER (INGERSOLL ROND P-40)	25.12.2013 (15:18 Hrs)	80	75
4.	PAYLODER (TWL 3036)	25.12.2013 (15:30 Hrs)	80	75
5.	DUMPER - 20	25.12.2013 (15:40 Hrs)	74	75

\*\*\*\*End of Report\*\*\*\*

Note: (i) The value is the Leq of twenty readings taken in each location (Day time).  
(ii) Day time shall mean from 6:00 am to 10:00 pm

Checked by

per pro SGS India Private Ltd.

**Dipankar De Sarkar**  
Manager (Operations)

**Dr. Asish Chakraborty**  
Manager-Laboratory

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### TEST REPORT

Report No. : KG17-000185.001- 003

Date : 10.01.2014

JOE No. : KG14-000185

Report Control No:KGR0000044167

#### SAMPLE DRAWN BY SGS INDIA PRIVATE LTD.

**SAMPLE DESCRIPTION** : MEASUREMENT OF NOISE LEVEL  
**NAME OF THE CLIENT** : M/S. HINDALCO INDUSTRIES LIMITED  
**ADDRESS** : MINES DIVISION, LOHARDAGA, JHARKHAND, PIN – 835 302  
**SAMPLING METHOD** : INSTRUMENTAL, USING SOUND LEVEL METER  
**SAMPLING SITE** : SHRENGDAG-B PIT (SHRENGDAG PLATEAU)  
**PROTOCOL** : GENSOP/CALLAB-116  
**TEST START DATE** : 09.01.2014  
**TEST END DATE** : 10.01.2014

SL NO.	SAMPLING LOCATION	DATE & TIME OF SAMPLING	DAY TIME NOISE LEVEL dB (A) Leq	LIMIT IN dB(A) Leq DAY TIME ( INDUSTRIAL AREA )
1.	POCKLEN (TATA HITACHI EX200 BLC)	25.12.2013 (10:00 Hrs)	78	75
2.	WAGON DRILL (ATLAS COPCO ROC 203)	25.12.2013 (10:20 Hrs)	83	75
3.	COMPRESSER (XAH 2100)	25.12.2013 (10:35 Hrs)	81	75

\*\*\*\*End of Report\*\*\*\*

Note: (i) The value is the Leq of twenty readings taken in each location (Day time).  
(ii) Day time shall mean from 6:00 am to 10:00 pm

Checked by

per pro SGS India Private Ltd.

Dipankar De Sarkar  
Manager (Operations)

Dr. Asish Chakraborty  
Manager-Laboratory

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## Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 25/04/2014

Report No : KG14-002517.004

JOE No : KG14-002517

Report Control No : KGR0000054475  
Sample Described by Customer as : AMBIENT AIR QUALITY MONITORING

Client Name : Hindalco Industries Limited(Mines Division)  
Client Address : Lohardaga,  
Postal Code : 835203  
State : Jharkhand  
Country : India  
Sample Type : AMBIENT AIR QUALITY MONITORING  
Received : 16/04/2014  
Registered : 16/04/2014  
Marks on Sample : Location: Jalim & Sanai Pit  
Sampling Date : 02.04.2014  
Test Start/End Date : 16/04/2014 - 24/04/2014

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS:5182 (PART 23)	115.25	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	28.39	ug/m3	-	60
Nitrogen Dioxide (NO2)	IS:5182 (Part-6):1975 (Reaff.2004)	<5.00	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide (CO)	EPA 600/P-99/001F	<1.00	PPM		

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## Test Report

Report No : KG14-002517.004

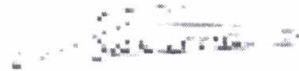
SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 25/04/2014

JOE No : KG14-002517

Report Control No : KGR0000054475

Per pro SGS India Private Ltd



Satya Manna

Section Incharge - ENVI

Authorized Signatory

\*\*\*\*End of Report\*\*\*\*

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