



Ref No: HIL/LHD/VP (M)/MoEF/116

Date : 22.05.13

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

**Sub: Compliance Report of EC conditions for Gurdari (584.19 ha) Bauxite Mining project of M/s Hindalco Industries Limited located in Gumla, Jharkhand for the period Oct' 2012 - March' 2013.**

**Ref: Environmental Clearance letter no J-11015/136/2006-IA II(M) dated 7<sup>th</sup> February 2007**


Sir,

With reference to the above, we are submitting herewith the Compliance status report of EC conditions for **Gurdari (584.19 ha) Bauxite Mining project of M/s Hindalco Industries Limited located in Gumla, Jharkhand for the period Oct' 2012 - March' 2013.**

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**

**GURDARI BAUXITE MINES**  
**Period : Period : Oct'12 - March'13**  
**J-11015/136/2006-IA.II (M) dated 7.2.2007**

<b>Sl No</b>	<b>Conditions</b>	<b>Compliance Status</b>
<b>Specific Conditions</b>		
<b>1</b>	All the conditions stipulated by SPCB in their NOC shall be effectively implemented.	Complied.
<b>2</b>	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. Who is competent authority for diversion of agricultural land for non-agricultural use. (copy already submitted to your office)
<b>3</b>	The exploration shall be completed within 2.5 years and thereafter the proponent shall come up with a firm proposal for mining, based on the estimated reserves. The reclamation plan, post mine land use and progressive greenbelt development plan shall also be prepared and submitted with the revised proposal.	Mining is in progress. Required exploration is already done. Reserve and resource estimated on the basis of explored bore holes in the area. Revised reclamation plan, post mine land use, green belt development plan submitted and approved by the IBM (Scheme of Mining of Gurdari approved by IBM Nagpur vide letter no-314(3)/2011-MCCM(CZ)/MS-19 dated 19 <sup>th</sup> Jan 2012).
<b>4</b>	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.	Presently the maximum depth of mining is 20 m bgl. As per the survey, the ground water table is at 45-60 m below ground level. Hence there will be no intersecting of the ground water table due to mining activities.
<b>5</b>	Top soil shall be stacked properly with proper slope with adequate measures and should be used for reclamation and rehabilitation of mined out areas.	Sequential backfilling and reclamation of the mined out area are being exercised. Topsoil is being spread on backfilled area for reclamation of the area.
<b>6</b>	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	Overburden and waste rock are being used for back filling. Data pertaining to backfilling is enclosed as Annexure

	Environment & Forest on six month basis.	
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 run off is being generated from mining activities. However, to collect and manage rainwater during monsoon drains Pit sumps are made, part of mined out area is used as settling tank. Settled water is being used for sprinkling of quarry, roads, green belt development, etc.</p>
8	<p>Plantation shall be raised in an area of 78.44 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>In 2012-13, we have planted saplings on 3.5 acre reclaimed area. Rest to be complied during project period.</p>
9	<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>Suitable conservation measures to augment ground water have been taken.</p>
10	<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 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.</p>	<p>It is being monitored. Monitoring report is enclosed as <b>Annexure</b></p>

11	Prior permission from the competent authority should be obtained for drawl of water from the surface water bodies.	Rainwater harvested during rainy season is being used for sprinkling on haul roads and raising plantation. Spring water is drawn from the down the hill pockets ponds for drinking purposes. Hence, as per the terms and conditions in Part III, Clause 6 of Mining lease deed, we have obtained permission from the Deputy Commissioner for drawl of water from the surface water bodies. Water cess is also being paid to Jharkhand State Pollution Control Board.
12	Water monitoring both for quality and quantity shall be carried out at four locations namely one spring and three streams. Six monthly report should be submitted to the Ministry of Environment and Forest and its Regional Office located at Bhubneshwar.	Analysis of water quality is being carried out. Analysis data for period of reporting is enclosed in <b>Annexure</b>
13	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 and repaired. All the transporters have been instructed to obtain PUC for their vehicles from the competent authority and submit to the concerned officer for verification.
14	Drills should either be operated with dust extractors or should be equipped with water injection system.	Wet drilling is done in the drill holes intermittently for dust suppression.
15	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 i.e. 12.00 Noon to 1.00 PM on working days. Mobile mining activities are not being practiced during blasting. All the precautionary and mitigative measures to control ground vibration and to arrest fly rocks is being exercised.
16	Consent to operate should be obtained from SPCB prior to start of enhanced production from the mine.	CTO has been obtained and enclosed in <b>Annexure</b>
17	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 from mine; hence ETP has not been installed. The sewage water from domestic uses is being collected through individual Septic Tank and Soak Pits.

18	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> , <i>Melursus ursinus</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 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.	Action plan for conservation of flora and fauna spotted in the study area was prepared after due consultation with the local DFO and a copy of the same has already been submitted to the DFO for his comments, any suggestion and modification. On receipt of the same after vetting of State Forest Department, the action plan will be submitted to the MoEF
19	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 duly approved by Indian Bureau of Mines is available with us. The same has already been informed to Regional Office, MoEF.

### 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 Complied. Prior approval will be sought for, if any change is proposed.
2	No change in the calendar plan including excavation, quantum of mineral bauxite and waste should be made.	Excavation of Over Burden and Bauxite is being done as per the approved calendar plan.
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 Reports is enclosed 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 for reporting period is enclosed in <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 nos. of water tanker have been provided for sprinkling of water on haul roads and active mining areas to arrest fugitive dust. Water spraying at loading, unloading, etc is also being done properly.
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 being done regularly. Workers engaged in operation of HEMMs, etc have also been provided with PPEs such as ear plug and ear muffs. Monitoring of noise level is being conducted at various locations of the work zone area.
7	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.	There is no effluent discharge from Mine. Workshop has an Oil Catchment Pit to trap oil and grease. It is being ensured to make it operational and effective as and when required and accordingly the concern department is taking its due care.
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. Use of Personal Protective Equipment (PPE) by the individuals is being ensured. All the mine workers are being regularly and periodically sent to our own hospital for health checkup/ Occupational Health check up for any contraction of diseases due to exposure in dusty and noisy areas.</p> <p>Training on safety, health and environmental aspects of mining is being regularly imparted through VT training centre and also through various other training programmes conducted by the State Government, recognized agencies, etc.</p>
9	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.	Separate Environmental Management Cell (EMC) has been constituted and is functioning effectively. Copy Enclosed.
10	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.	Not applicable. The mine is an old and working since 1976.

11	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.	Statement of budgetary provision and actual expenses for the year 2012-13 for environmental protection measure is enclosed. It is once again reiterated that the funds so ear marked shall not be diverted for any other purposes other than it is committed at the beginning of the financial year. (Annexure).
12	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.	Complied.
13	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.
14	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.	Not Applicable .
15	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. Copies, of the advertisement made in the local newspapers, have already been submitted to the Regional Office Vide letter no HIL/GMO(M)/ENV/140 Dated 23.04.2007.



TEST REPORT

Report No. : CA:GL:3120015207

DATE : 19/10/2012

JOE No. : 1212806597

Report Control No.:3125016390

**SAMPLE IDENTIFIED AS : AMBIENT AIR QUALITY MONITORING**  
**CUSTOMER NAME HINDALCO INDUSTRIES LIMITED (MINES DIVISION)**  
**ADDRESS LOHARDAGA, JHARKHAND**  
**CITY 835302**  
**COUNTRY INDIA**  
**SAMPLING METHOD N.A.**  
**SAMPLE DESCRIPTION AMBIENT AIR QUALITY MONITORING**

**MARK/LOCATION SITE:GURDARI/KUJAM-II/KUJAM-I/AMTIPANI BAUXITE MINES (NETERHAT PLATEAU)**  
**LOCATION:MINE LEASE AREA (CORE ZONE)**  
**DATE:04.10.12 TO 05.10.12**  
**SAMPLE RECD ON 11/10/2012**  
**TEST START DATE 11/10/2012**  
**TEST END DATE 19/10/2012**

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			As per CPCB RESIDENTIAL AREA	
			MIN	MAX
CARBON MONOXIDE (CO)	USEPA CHAPTER-2	<0.1 ppm		1.7ppm(8h)
OXIDES OF NITROGEN (NOx)	IS 5182 PART 6:2006	8.7 µg/m3		80 µg/m3
PARTICULATE MATTER(10)	IS:5182(PART 23)2006	77.6 µg/m3		100 µg/m3
PARTICULATE MATTER(2.5)	USPEA CFR40(50), Appendix L	31.5 µg/m3		60 µg/m3
SULPHUR DIOXIDE (SO2)	IS 5182:PART 2:2001	< 4.0 µg/m3		80 µg/m3

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

per pro SGS India Private Ltd.

*S. A. Saha*  
**Asish Chakraborty**  
 Manager Laboratory

Page 1 of 1

**A. R. Datta**  
 Senior Analyst

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TEST REPORT

Report No. : CA:GL:3120015208

DATE : 19/10/2012

JOE No. : 1212806597

Report Control No.:3125016391

SAMPLE DRAWN BY SGS INDIA PRIVATE LIMITED  
 SAMPLE IDENTIFIED AS : AMBIENT AIR QUALITY MONITORING  
 CUSTOMER NAME HINDALCO INDUSTRIES LIMITED (MINES DIVISION)  
 ADDRESS LOHARDAGA, JHARKHAND  
 CITY 835302  
 COUNTRY INDIA  
 SAMPLING METHOD N.A.  
 SAMPLE DESCRIPTION AMBIENT AIR QUALITY MONITORING

MARK/LOCATION SITE:CHATAM VILLAGE (BUFFER ZONE)  
 LOCATION:MINE LEASE AREA (CORE ZONE)  
 DATE:04.10.12 TO 05.10.12  
 SAMPLE RECD ON 11/10/2012  
 TEST START DATE 11/10/2012  
 TEST END DATE 19/10/2012

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			As per CPCB RESIDENTIAL AREA	
			MIN	MAX
CARBON MONOXIDE (CO)	USEPA CHAPTER-2	< 0.1 ppm		1.7ppm(8h)
OXIDES OF NITROGEN (NOx)	IS 5182 PART 6:2006	10.6 µg/m3		80 µg/m3
PARTICULATE MATTER(10)	IS:5182(PART 23)2006	60.5 µg/m3		100 µg/m3
PARTICULATE MATTER(2.5)	USPEA CFR40(50), Appendix L	29.9 µg/m3		60 µg/m3
SULPHUR DIOXIDE (SO2)	IS 5182:PART 2:2001	< 4.0 µg/m3		80 µg/m3

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

per pro SGS India Private Ltd.

*F. A. Datta*  
 Asish Chakraborty  
 Manager Laboratory

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 Manager Laboratory

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TEST REPORT

Report No. : CA:GL:3120015209

DATE : 19/10/2012

JOE No. : 1212806597

Report Control No.:3125016392

**SAMPLE DRAWN BY SGS INDIA PRIVATE LIMITED**  
**SAMPLE IDENTIFIED AS : AMBIENT AIR QUALITY MONITORING**  
**CUSTOMER NAME HINDALCO INDUSTRIES LIMITED (MINES DIVISION)**  
**ADDRESS LOHARDAGA, JHARKHAND**  
**CITY 835302**  
**COUNTRY INDIA**  
**SAMPLING METHOD N.A.**  
**SAMPLE DESCRIPTION AMBIENT AIR QUALITY MONITORING**

**MARK/LOCATION SITE:GURDARI/KUJAM-II/KUJAM-I/AMTIPANI BAUXITE MINES (NETERHAT PLATEAU)**  
**LOCATION:RAJADERA VILLAGE (BUFFER ZONE)**  
**DATE:05.10.12 TO 06.10.12**  
**SAMPLE RECD ON 11/10/2012**  
**TEST START DATE 11/10/2012**  
**TEST END DATE 19/10/2012**

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			As per CPCB RESIDENTIAL AREA MIN	MAX
CARBON MONOXIDE (CO)	USEPA CHAPTER-2	< 0.1 ppm	1.7ppm(8h)	
OXIDES OF NITROGEN (NOx)	IS 5182 PART 6:2006	6.4 µg/m3	80 µg/m3	
PARTICULATE MATTER(10)	IS:5182(PART 23)2006	86.5 µg/m3	100 µg/m3	
PARTICULATE MATTER(2.5)	USPEA CFR40(50), Appendix L	39.0 µg/m3	60 µg/m3	
SULPHUR DIOXIDE (SO2)	IS 5182:PART 2:2001	< 4.0 µg/m3	80 µg/m3	

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

per pro SGS India Private Ltd.

*S. A. Chakraborty*  
**Asish Chakraborty**  
**Manager Laboratory**

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TEST REPORT

Report No. : CA:GL:3120015210

DATE : 19/10/2012

JOE No. : 1212806597

Report Control No.:3125016393

SAMPLE IDENTIFIED AS : AMBIENT AIR QUALITY MONITORING  
 CUSTOMER NAME HINDALCO INDUSTRIES LIMITED (MINES DIVISION)  
 ADDRESS LOHARDAGA, JHARKHAND  
 CITY 835302  
 COUNTRY INDIA  
 SAMPLING METHOD N.A.  
 SAMPLE DESCRIPTION AMBIENT AIR QUALITY MONITORING

MARK/LOCATION SITE:GURDARI/KUJAM-II/KUJAM-II/AMTIPANI BAUXITE MINES (NETERHAT PLATEAU)  
 LOCATION:DMAIL VILLAGE (BUFFER ZONE)  
 DATE:05.10.12 TO 06.10.12  
 SAMPLE RECD ON 11/10/2012  
 TEST START DATE 11/10/2012  
 TEST END DATE 19/10/2012

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			As per CPCB RESIDENTIAL AREA	
			MIN	MAX
CARBON MONOXIDE (CO)	USEPA CHAPTER-2	< 0.1 ppm		1.7ppm(8h)
OXIDES OF NITROGEN (NOx)	IS 5182 PART 6:2006	8.6 µg/m3		80 µg/m3
PARTICULATE MATTER(10)	IS:5182(PART 23)2006	73.5 µg/m3		100 µg/m3
PARTICULATE MATTER(2.5)	USPEA CFR40(50), Appendix L	29.8 µg/m3		60 µg/m3
SULPHUR DIOXIDE (SO2)	IS 5182:PART 2:2001	< 4.0 µg/m3		80 µg/m3

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

per pro SGS India Private Ltd.

*S. A. Chakraborty*  
 Asish Chakraborty  
 Manager Laboratory

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TEST REPORT

Report No. : CA:GL:3120013023

DATE : 12/09/2012

JOE No. : 1212805743

Control No.:3125014098

**SAMPLE COLLECTED BY SGS**

SAMPLE IDENTIFIED AS : GROUND WATER

COMPANY NAME HINDALCO INDUSTRIES LIMITED (MINES DIVISION)

ADDRESS LOHARDAGA, JHARKHAND  
CITY 835302

SAMPLING METHOD APHA 1060B 9060A

SAMPLE DESCRIPTION GROUND WATER

SAMPLE CONDITION IN PLASTIC BOTTLE

SAMPLE QTY. 6.5L APP

WELL/LOCATION GURDARI PAKRIGRAH WELL

COLLECTED ON 29/08/2012, TIME:1.00 PM

REGISTERED ON 01/09/2012

TEST START DATE 01/09/2012

TEST END DATE 12/09/2012

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			As per IS	
			10500:1991(REAFF.1993)	
			Desirable	Permissible
ALKALINITY (as CaCO <sub>3</sub> )	IS 3025:PART 23 :1986(Reaff.1998)	11.88 mg/l	200mg/l	600mg/l
ALUMINIUM (as Al)	IS 3025 : Part 55 : 2003	0.09 mg/l	0.03mg/l	0.2mg/l
ANIONIC DETERGENTS (as MBAS)	ANNEX. K of IS 13428: 2005	<0.05 mg/l	0.2mg/l	1mg/l
ARSENIC (as As)	IS 3025:PART 37:1988(Reaff.1999)BY ICPOES	<0.005 mg/l	0.01mg/l	No Relax.
BORON	Annex.H OF IS:13428:2005	<0.05 mg/l	1.0mg/l	5.0mg/l
CADMIUM (as Cd)	IS 3025:PART 41 :1992(Reaff.1998)BY ICPOES	<0.005 mg/l	0.01mg/l	No Relax.

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**TEST REPORT**

**Report No. : CA:GL:3120013023** **DATE : 12/09/2012**

JOE No. : 1212805743 Control No.:3125014098

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			As per IS 10500:1991(REAFF.1993)	
			Desirable	Permissible
CALCIUM (as Ca)	IS 3025:PART 40 :1991(Reaff.2003)	3.80 mg/l	75mg/l	200mg/l
CHLORIDE ( as Cl)	Clause 2 of IS 3025 Part 32:1988(Reaff. 1999)	4.02 mg/l	250mg/l	1000mg/l
CHROMIUM (Cr6+)	IS 3025:PART 52:2003	<0.01 mg/l	0.05mg/l	No Relax.
COLOUR ( HAZEN UNITS)	IS 3025:PART 4 :1983(Reaff.2002)	5	5.0	25
COPPER	IS 3025: PART 42:1992(Reaff. 2003) BY ICPOES	<0.01 mg/l	0.05mg/l	1.5mg/l
CYANIDE ( as CN)	IS 3025:PART 27 :1986(Reaff.1998)	<0.02 mg/l	0.05mg/l	No Relax.
E.coli	IS 1622:1981(Reaff.2003)	Absent/100ml		ABS/100ml
Faecal coliforms	IS 1622:1981(Reaff2003)	Absent/100ml		ABS/100ml
FLUORIDE	IS:3025(PART 60):2008	<0.10 mg/l	1.0mg/l	1.5mg/l
IRON ( as Fe)	IS 3025:PART 53:2003 (BY ICPOES)	0.22 mg/l	0.3mg/l	1 mg/l
LEAD (as Pb)	IS 3025:PART 47:1994(Reaff.2003) BY ICPOES	0.01 mg/l	0.05mg/l	No Relax.
MAGNESIUM ( as Mg)	IS 3025:PART 46 :1994(Reaff.1999)	<1.0 mg/l	30mg/l	100mg/l
MANGANESE	IS:3025(PART 59) 2006	0.07 mg/l	0.1mg/l	0.3mg/l

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**TEST REPORT**

<b>Report No. : CA:GL:3120013023</b>	<b>DATE : 12/09/2012</b>
JOE No. : 1212805743	Control No.:3125014098

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			As per IS 10500:1991(REAFF.1993)	
			Desirable	Permissible
MERCURY (as Hg)	IS 3025:PART 48 :1994(Reaff.1999)BY ICPOES	<0.001 mg/l	0.001mg/l	No Relax.
MINERAL OIL	CLAUSE 6 OF IS 3025:PART 39:1991(Reaff. 2003)	BDL(DL-0.01 mg/l)	0.01mg/l	0.03mg/l
NITRATE	IS 3025:PART 34 :1988(Reaff.1999)	1.93 mg/l	45mg/l	No Relax.
ODOUR	IS 3025:PART 5:1983(Reaff.2002)	Unobjectionable	Unobject.	Unobject.
pH	IS 3025:PART 11:1983(Reaff.2002)	7.2 *	6.5-8.5	No Relax.
PHENOLIC COMPOUNDS (as C6H5OH)	IS 3025(Part 43)1992(Reaff 2005)	<0.001 mg/l	0.001mg/l	0.002mg/l
RESIDUAL FREE CHLORINE	GEN/SOP/CALLAB-13 3	<0.10 mg/l *	0.2mg/l	--
SELENIUM	IS 3025:PART 56:2003 (BY ICPOES)	<0.005 mg/l	0.01mg/l	No Relax.
SULPHATE	CLAUSE 4 OF IS 3025:PART 24:1986(Reaff. 2003)	<2.0 mg/l	200mg/l	400mg/l
TASTE	IS 3025:PART 7 :1984(Reaff.2002)	Agreeable	Agreeable	-
Total Coliforms	IS 1622:1981(Reaff.2003)	<2 MPN/100ml		10/100 ml
TOTAL HARDNESS (as CaCO3)	IS 3025:PART 21 :1983(Reaff.2002)	11.40 mg/l	300mg/l	600mg/l
TURBIDITY( in NTU )	IS 3025:PART 10 :1984(Reaff.2002)	8.20	5.0NTU	10NTU

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TEST REPORT

Report No. : CA:GL:3120013023      DATE : 12/09/2012  
JOE No. : 1212805743      Control No.:3125014098

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			As per IS 10500:1991(REAFF.1993)	
			Desirable	Permissible
ZINC (as Zn)	IS 3025 Part 49:1991(Reaff.2003) BY ICPOES	0.25 mg/l	5mg/l	15mg/l
TOTAL DISSOLVED SOLIDS	IS 3025:PART 16:1984(Reaff.2002)	24 mg/l	500mg/l	2000mg/l

\* Analyzed at site.

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

per pro SGS India Private Ltd.

Dr.Nemal Ghosh  
Manager Laboratory

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TEST REPORT

Report No. : CA:GL:3120013020

DATE : 11/09/2012

JOE No. : 1212805742

Control No.:3125014051

**SAMPLE COLLECTED BY SGS**

SAMPLE IDENTIFIED AS : SPRING WATER

COMPANY NAME HINDALCO INDUSTRIES LIMITED (MINES DIVISION)

ADDRESS LOHARDAGA, JHARKHAND  
CITY 835302

SAMPLING METHOD APHA 1060B 9060A

SAMPLE DESCRIPTION SPRING WATER

SAMPLE CONDITION IN PLASTIC BOTTLE

SAMPLE QTY. 6.5L APP

MARK/LOCATION KUJAM-BHATIAPAT

COLLECTED ON 30.08.12, TIME:1.30 PM

REGISTERED ON 01/09/2012

TEST START DATE 01/09/2012

TEST END DATE 11/09/2012

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			As per IS 10500:1991(REAFF.1993)	
			Desirable	Permissible
ALKALINITY (as CaCO <sub>3</sub> )	IS 3025:PART 23 :1986(Reaff.1998)	8.64 mg/l	200mg/l	600mg/l
ALUMINIUM (as Al)	IS 3025 : Part 55 : 2003	0.03 mg/l	0.03mg/l	0.2mg/l
ANIONIC DETERGENTS (as MBAS)	ANNEX. K of IS 13428: 2005	<0.05 mg/l	0.2mg/l	1mg/l
ARSENIC (as As)	IS 3025:PART 37:1988(Reaff.1999)BY ICPOES	<0.005 mg/l	0.01mg/l	No Relax.
BORON	Annex.H OF IS:13428:2005	<0.05 mg/l	1.0mg/l	5.0mg/l
CADMIUM (as Cd)	IS 3025:PART 41 :1992(Reaff.1998)BY ICPOES	<0.005 mg/l	0.01mg/l	No Relax.

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TEST REPORT

Report No. : CA:GL:3120013020 DATE : 11/09/2012

JOE No. : 1212805742

Control No.:3125014051

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			Desirable	Permissible
CALCIUM (as Ca)	IS 3025:PART 40 :1991(Reaff.2003)	1.90 mg/l	75mg/l	200mg/l
CHLORIDE ( as Cl)	Clause 2 of IS 3025 Part 32:1988(Reaff. 1999)	<2.0 mg/l	250mg/l	1000mg/l
CHROMIUM (Cr6+)	IS 3025:PART 52:2003	<0.01 mg/l	0.05mg/l	No Relax.
COLOUR ( HAZEN UNITS)	IS 3025:PART 4 :1983(Reaff.2002)	5	5.0	25
COPPER	IS 3025: PART 42:1992(Reaff. 2003) BY ICPOES	<0.01 mg/l	0.05mg/l	1.5mg/l
CYANIDE ( as CN)	IS 3025:PART 27 :1986(Reaff.1998)	<0.02 mg/l	0.05mg/l	No Relax.
E.coli	IS 1622:1981(Reaff.2003)	Absent/100ml		ABS/100ml
Faecal coliforms	IS 1622:1981(Reaff2003)	Absent/100ml		ABS/100ml
FLUORIDE	IS:3025(PART 60):2008	<0.10 mg/l	1.0mg/l	1.5mg/l
IRON ( as Fe)	IS 3025:PART 53:2003 (BY ICPOES)	<0.05 mg/l	0.3mg/l	1 mg/l
LEAD (as Pb)	IS 3025:PART 47:1994(Reaff.2003) BY ICPOES	0.02 mg/l	0.05mg/l	No Relax.
MAGNESIUM ( as Mg)	IS 3025:PART 46 :1994(Reaff.1999)	<1.0 mg/l	30mg/l	100mg/l
MANGANESE	IS:3025(PART 59) 2006	<0.01 mg/l	0.1mg/l	0.3mg/l

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TEST REPORT

Report No. : CA:GL:3120013020 DATE : 11/09/2012

JOE No. : 1212805742

Control No.:3125014051

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			As per IS 10500:1991(REAFF.1993)	
			Desirable	Permissible
MERCURY (as Hg)	IS 3025:PART 48 :1994(Reaff.1999)BY ICPOES	<0.001 mg/l	0.001mg/l	No Relax.
MINERAL OIL	CLAUSE 6 OF IS 3025:PART 39:1991(Reaff. 2003)	BDL(DL-0.01 mg/l)	0.01mg/l	0.03mg/l
NITRATE	IS 3025:PART 34 :1988(Reaff.1999)	6.35 mg/l	45mg/l	No Relax.
ODOUR	IS 3025:PART 5:1983(Reaff.2002)	Unobjectionable	Unobject.	Unobject.
pH	IS 3025:PART 11:1983(Reaff.2002)	7.0*	6.5-8.5	No Relax.
PHENOLIC COMPOUNDS (as C6H5OH)	IS 3025(Part 43)1992(Reaff 2005)	<0.001 mg/l	0.001mg/l	0.002mg/l
RESIDUAL FREE CHLORINE	GEN/SOP/CALLAB-13 3	<0.10 ppm*	0.2mg/l	--
SELENIUM	IS 3025:PART 56:2003 (BY ICPOES)	<0.005 mg/l	0.01mg/l	No Relax.
SULPHATE	CLAUSE 4 OF IS 3025:PART 24:1986(Reaff. 2003)	<2.0 mg/l	200mg/l	400mg/l
TASTE	IS 3025:PART 7 :1984(Reaff.2002)	Agreeable	Agreeable	-
Total Coliforms	IS 1622:1981(Reaff.2003)	<2 MPN/100 ml		10/100 ml
TOTAL HARDNESS (as CaCO3)	IS 3025:PART 21 :1983(Reaff.2002)	6.65 mg/l	300mg/l	600mg/l
TURBIDITY( In NTU )	IS 3025:PART 10 :1984(Reaff.2002)	1.90	5.0NTU	10NTU

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**TEST REPORT**

**Report No. : CA:GL:3120013020** **DATE : 11/09/2012**

JOE No. : 1212805742

Control No.:3125014051

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			Desirable	Permissible

As per IS  
10500:1991(REAFF.1993)

ZINC (as Zn)	IS 3025 Part 49:1991(Reaff.2003) BY ICPOES	<0.01 mg/l	5mg/l	15mg/l
TOTAL DISSOLVED SOLIDS	IS 3025:PART 16:1984(Reaff.2002)	24 mg/l	500mg/l	2000mg/l

Remarks : Based on the above parameters the sample complies with maximum desirable and maximum permissible limit as per IS:10500:1991 (Reaff 1993) , BDL=Below Detection Limit ; DL=Detection Limit Abs=Absent

\* Analysed at site

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

per pro SGS India Private Ltd.

**Dr. Nimai Ghosh**  
Manager Laboratory

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TEST REPORT

Report No. : CA:GL:3120013019

DATE : 11/09/2012

JOE No. : 1212805741

Control No.:3125014050

**SAMPLE COLLECTED BY SGS**

SAMPLE IDENTIFIED AS : GROUND WATER

COMPANY NAME HINDALCO INDUSTRIES LIMITED (MINES DIVISION)

ADDRESS LOHARDAGA, JHARKHAND  
CITY 835302

SAMPLING METHOD APHA 1060B 9060A

SAMPLE DESCRIPTION GROUN WATER

SAMPLE CONDITION IN PLASTIC BOTTLE

SAMPLE QTY. 6.5L APP

MARK/LOCATION KUJAM-BHATIAPATH WELL

COLLECTED ON 30/09/12, TIME:12.30 PM

REGISTERED ON 01/09/2012

TEST START DATE 01/09/2012

TEST END DATE 11/09/2012

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			Desirable	Permissible
ALKALINITY (as CaCO <sub>3</sub> )	IS 3025:PART 23 :1986(Reaff.1998)	8.64 mg/l	200mg/l	600mg/l
ALUMINIUM (as Al)	IS 3025 : Part 55 : 2003	<0.02 mg/l	0.03mg/l	0.2mg/l
ANIONIC DETERGENTS (as MBAS)	ANNEX. K of IS 13428: 2005	<0.05 mg/l	0.2mg/l	1mg/l
ARSENIC (as As)	IS 3025:PART 37:1988(Reaff.1999)BY ICPOES	<0.005 mg/l	0.01mg/l	No Relax.
BORON	Annex.H OF IS:13428:2005	<0.05 mg/l	1.0mg/l	5.0mg/l
CADMIUM (as Cd)	IS 3025:PART 41 :1992(Reaff.1998)BY ICPOES	<0.005 mg/l	0.01mg/l	No Relax.

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**TEST REPORT**

**Report No. : CA:GL:3120013019** **DATE : 11/09/2012**  
 JOE No. : 1212805741 Control No.:3125014050

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			As per IS 10500:1991(REAFF.1993)	
			Desirable	Permissible
CALCIUM (as Ca)	IS 3025:PART 40 :1991(Reaff.2003)	3.04 mg/l	75mg/l	200mg/l
CHLORIDE ( as Cl)	Clause 2 of IS 3025 Part 32:1988(Reaff. 1999)	<2.0 mg/l	250mg/l	1000mg/l
CHROMIUM (Cr6+)	IS 3025:PART 52:2003	<0.01 mg/l	0.05mg/l	No Relax.
COLOUR ( HAZEN UNITS)	IS 3025:PART 4 :1983(Reaff.2002)	5	5.0	25
COPPER	IS 3025: PART 42:1992(Reaff. 2003) BY ICPOES	<0.01 mg/l	0.05mg/l	1.5mg/l
CYANIDE ( as CN)	IS 3025:PART 27 :1986(Reaff.1998)	<0.02 mg/l	0.05mg/l	No Relax.
E.coli	IS 1622:1981(Reaff.2003)	Absent/100 ml		ABS/100ml
Faecal coliforms	IS 1622:1981(Reaff2003)	Absent/100 ml		ABS/100ml
FLUORIDE	IS:3025(PART 60):2008	<0.10 mg/l	1.0mg/l	1.5mg/l
IRON ( as Fe)	IS 3025:PART 53:2003 (BY ICPOES)	0.02 mg/l	0.3mg/l	1 mg/l
LEAD (as Pb)	IS 3025:PART 47:1994(Reaff.2003) BY ICPOES	0.02 mg/l	0.05mg/l	No Relax.
MAGNESIUM ( as Mg)	IS 3025:PART 46 :1994(Reaff.1999)	<1.0 mg/l	30mg/l	100mg/l
MANGANESE	IS:3025(PART 59) 2006	<0.01 mg/l	0.1mg/l	0.3mg/l

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TEST REPORT

Report No. : CA:GL:3120013019 DATE : 11/09/2012  
 JOE No. : 1212805741 Control No.:3125014050

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			Desirable	Permissible
MERCURY (as Hg)	IS 3025:PART 48 :1994(Reaff.1999)BY ICPOES	<0.001 mg/l	0.001mg/l	No Relax.
MINERAL OIL	CLAUSE 6 OF IS 3025:PART 39:1991(Reaff. 2003)	BDL(DL-0.01 mg/l)	0.01mg/l	0.03mg/l
NITRATE	IS 3025:PART 34 :1988(Reaff.1999)	7.83 mg/l	45mg/l	No Relax.
ODOUR	IS 3025:PART 5:1983(Reaff.2002)	Unobjectionable	Unobject.	Unobject.
pH	IS 3025:PART 11:1983(Reaff.2002)	7.0*	6.5-8.5	No Relax.
PHENOLIC COMPOUNDS (as C6H5OH)	IS 3025(Part 43)1992(Reaff 2005)	<0.001 mg/l	0.001mg/l	0.002mg/l
RESIDUAL FREE CHLORINE	GEN/SOP/CALLAB-13 3	<0.10 ppm*	0.2mg/l	--
SELENIUM	IS 3025:PART 56:2003 (BY ICPOES)	<0.005 mg/l	0.01mg/l	No Relax.
SULPHATE	CLAUSE 4 OF IS 3025:PART 24:1986(Reaff. 2003)	<2.0 mg/l	200mg/l	400mg/l
TASTE	IS 3025:PART 7 :1984(Reaff.2002)	Agreeable	Agreeable	-
Total Coliforms	IS 1622:1981(Reaff.2003)	8.4 MPN/100ml		10/100 ml
TOTAL HARDNESS (as CaCO3)	IS 3025:PART 21 :1983(Reaff.2002)	10.45 mg/l	300mg/l	600mg/l
TURBIDITY( In NTU )	IS 3025:PART 10 :1984(Reaff.2002)	2.04	5.0NTU	10NTU

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TEST REPORT

Report No. : CA:GL:3120013019

DATE : 11/09/2012

JOE No. : 1212805741

Control No.:3125014050

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			Desirable	Permissible
ZINC (as Zn)	IS 3025 Part 49:1991(Reaff.2003) BY ICPOES	<0.01 mg/l	5mg/l	15mg/l
TOTAL DISSOLVED SOLIDS	IS 3025:PART 16:1984(Reaff.2002)	24 mg/l	500mg/l	2000mg/l

Remarks : Based on the above parameters the sample complies with maximum desirable and maximum permissible limit as per IS:10500:1991 (Reaff 1993) , BDL=Below Detection Limit ;  
DL=Detection Limit Abs=Absent  
\* Analysed at site

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

per pro SGS India Private Ltd.

Dr.Nemal Ghosh  
Manager Laboratory

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## Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 22/03/2013

Report No : KG13-001961.001

JOE No : KG13-001961

Report Control No : KGR0000012735

Sample Described by Customer as : SOIL(COMPOSITE)

Client Name : Hindalco Industries Limited(Mines Division)  
Client Address : Lohardaga,  
Postal Code : 835203  
State : Jharkhand  
Country : India  
Sample Type : SOIL(COMPOSITE)  
Received : 12/03/2013  
Registered : 12/03/2013  
Marks on Sample : Location:Reclaimed area in Quarry 6A  
Sampling Site : Gurdari/Kujam-II/Amtipani/Kujam-I Bauxite Mines(Netalhat Plateau)  
Sample Collected : 24.02.2013  
Quantity : 2.5Kg app  
Test Start/End Date : 12/03/2013 - 21/03/2013

Analysis	Method	Result	Limit of Reporting (LOR)	Unit
Conductivity (1:5) Soil Suspension. ( 1 : 2 aqueous solution )	F.A.U.N (2007)	37.6	1.00	µs/cm
pH (1:2) Soil Suspension ( 1 : 2 aqueous solution )	F.A.U.N (2007)	6	0.50	-
Porosity	F.A.U.N (2007)	48.02	-	%
Bulk Density	By Bulk Density Apparatus	1.07	0.10	gram/ml
Phosphorus (as P)	F.A.U.N (2007)	<20.000	20.00	mg/kg
Texture	F.A.U.N (2007)	Sandy clay	-	
Clay	F.A.U.N (2007)	37.5	5.00	%
Sand	F.A.U.N (2007)	47.5	1.00	%
Silt	F.A.U.N (2007)	15.0	1.00	%
Available Chloride (as Cl)	Soil & Agriculture Organization (U.N-2007)	<20.00	20.00	mg/kg
Available Nitrogen	Food & Agriculture Organization (U.N-2007)	322.46	20.00	mg/kg

Page 1 of 2

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SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 22/03/2013

Report No : KG13-001961.001

JOE No : KG13-001961

Report Control No : KGR0000012735

Analysis	Method	Result	Limit of Reporting (LOR)	Unit
Available Potassium (as K)	Soil & Water Book By P.K. Gupta	1577.59	1.00	mg/kg
Available Magnesium (as Mg)	Soil & Water Book By P.K. Gupta	2378.12	1.00	mg/kg
Lead (as Pb)	USEPA 3052	18.73	2.00	mg/kg
Chromium (as Cr)	USEPA 3052	95.95	2.00	mg/kg
Mercury (as Hg)	USEPA 3052	<1.00	1.00	mg/kg
Total Organic Matter	Black & Walkely Wet Digestion Method	0.53	0.01	%

Per pro SGS India Private Ltd



Satya Manna

Section Incharge - ENVI

Authorized Signatory

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

Page 2 of 2

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## Test Report

Report No : KG13-001961.002

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 22/03/2013

JOE No : KG13-001961

Sample Described by Customer as : SOIL(COMPOSITE) Report Control No : KGR0000012735

Client Name : Hindalco Industries Limited(Mines Division)  
Client Address : Lohardaga,  
Postal Code : 835203  
State : Jharkhand  
Country : India  
Sample Type : SOIL(COMPOSITE)  
Received : 12/03/2013  
Registered : 12/03/2013  
Marks on Sample : Location:Reclaimed area in quarry 6B  
Sampling Site : Gurdari/Kujam-II/Amtipani/Kujam-I Bauxite Mines(Netalhat Plateau)  
Sample Collected : 24.02.2013  
Quantity : 2.5Kg app  
Test Start/End Date : 12/03/2013 - 21/03/2013

Analysis	Method	Result	Limit of Reporting (LOR)	Unit
Conductivity (1:5) Soil Suspension. ( 1 : 2 aqueous solution )	F.A.U.N (2007)	30.5	1.00	µs/cm
pH (1:2) Soil Suspension ( 1 : 2 aqueous solution )	F.A.U.N (2007)	6	0.50	-
Porosity	F.A.U.N (2007)	50.25	-	%
Bulk Density	By Bulk Density Apparatus	1.05	0.10	gram/ml
Phosphorus (as P)	F.A.U.N (2007)	<20.000	20.00	mg/kg
Texture	F.A.U.N (2007)	Clay	-	
Clay	F.A.U.N (2007)	42.5	5.00	%
Sand	F.A.U.N (2007)	40.0	1.00	%
Silt	F.A.U.N (2007)	17.5	1.00	%
Available Chloride (as Cl)	Soil & Agriculture Organization (U.N-2007)	21.56	20.00	mg/kg
Available Nitrogen	Food & Agriculture Organization (U.N-2007)	339.84	20.00	mg/kg

Page 1 of 2

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## Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 22/03/2013

Report No : KG13-001961.002

JOE No : KG13-001961

Report Control No : KGR0000012735

Analysis	Method	Result	Limit of Reporting (LOR)	Unit
Available Potassium (as K)	Soil & Water Book By P.K. Gupta	1769.11	1.00	mg/kg
Available Magnesium (as Mg)	Soil & Water Book By P.K. Gupta	2304.82	1.00	mg/kg
Lead (as Pb)	USEPA 3052	10.84	2.00	mg/kg
Chromium (as Cr)	USEPA 3052	62.20	2.00	mg/kg
Mercury (as Hg)	USEPA 3052	<1.00	1.00	mg/kg
Total Organic Matter	Black & Walkely Wet Digestion Method	0.69	0.01	%

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

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

### Page 2 of 2

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## Test Report

Print Date : 18/03/2013

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Report No : KG13-001952.001

JOE No : KG13-001952

Report Control No : KGR0000012027

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 : 12/03/2013  
Registered : 12/03/2013  
Marks on Sample : Location : Mines Lease Area, date : 22.02.2013  
Sampling Site : Gurdari/Kujam-II/Amtipani/Kujam-I Bauxite Mines(Neterhal plateau)  
Test Start/End Date : 12/03/2013 - 18/03/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10 )	IS:5182 (Part-23 ):2006	81	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	41.36	ug/m3	-	60
Oxides of Nitrogen (NOx)	IS:5182 (Part-6):1975 (Reaff.2004)	8.19	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide	By NDIR Spectroscopy.	<0.10	PPM		

Remark : CO Analyzed at site.

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## Test Report

Report No : KG13-001952.001

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 18/03/2013

JOE No : KG13-001952

Report Control No : KGR0000012027

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

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

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# Test Report

Print Date : 18/03/2013

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Report No : KG13-001952.002

JOE No : KG13-001952

Report Control No : KGR000012027

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 : 12/03/2013  
 Registered : 12/03/2013  
 Marks on Sample : Location : Chatam Village, date : 22.02.2013  
 Sampling Site : Gurdari/Kujam-II/Amtipani/Kujam-I Bauxite Mines(Neterhal plateau)  
 Test Start/End Date : 12/03/2013 - 18/03/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10 )	IS:5182 (Part-23 ):2006	79	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	32.08	ug/m3	-	60
Oxides of Nitrogen (NOx)	IS:5182 (Part-6):1975 (Reaff.2004)	6.59	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide	By NDIR Spectroscopy.	<0.10	PPM		

Remark : CO Analyzed at site.

## Page 1 of 2

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## Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 18/03/2013

Report No : KG13-001952.002

JOE No : KG13-001952

Report Control No : KGR0000012027

Per pro SGS India Private Ltd

**Satya Manna**  
**Section Incharge - ENVI**  
**Authorized Signatory**

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

### Page 2 of 2

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# Test Report

Print Date : 18/03/2013

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Report No : KG13-001952.003

JOE No : KG13-001952

Report Control No : KGR0000012027

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 : 12/03/2013  
 Registered : 12/03/2013  
 Marks on Sample : Location : Dmail Village, date : 23.02.2013  
 Sampling Site : Gurdari/Kujam-II/Amtipani/Kujam-I Bauxite Mines(Neterhal plateau)  
 Test Start/End Date : 12/03/2013 - 18/03/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10 )	IS:5182 (Part-23 ):2006	67	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	25.94	ug/m3	-	60
Oxides of Nitrogen (NOx)	IS:5182 (Part-6):1975 (Reaff.2004)	6.37	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide	By NDIR Spectroscopy.	<0.10	PPM		

Remark : CO Analyzed at site.

### Page 1 of 2

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## Test Report

Report No : KG13-001952.003

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 18/03/2013

JOE No : KG13-001952

Report Control No : KGR0000012027

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 : 18/03/2013

Report No : KG13-001952.004

JOE No : KG13-001952

Report Control No : KGR0000012027  
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 : 12/03/2013  
Registered : 12/03/2013  
Marks on Sample : Location : Rajadera Village, date : 23.02.2013  
Sampling Site : Gurdari/Kujam-II/Amtipani/Kujam-I Bauxite Mines(Neterhal plateau)  
Test Start/End Date : 12/03/2013 - 18/03/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS:5182 (Part-23 ):2006	50	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	20.66	ug/m3	-	60
Oxides of Nitrogen (NOx)	IS:5182 (Part-6):1975 (Reaff.2004)	5.06	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide	By NDIR Spectroscopy.	<0.10	PPM		

Remark : CO Analyzed at site.

### Page 1 of 2

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## Test Report

Report No : KG13-001952.004

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 18/03/2013

JOE No : KG13-001952

Report Control No : KGR0000012027

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

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

Page 2 of 2

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# Test Report

Print Date : 02/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002097.004

JOE No : KG13-002097

Report Control No : KGR0000013918

Sample Described by Customer as : SPRING WATER

Client Name : Hindalco Industries Limited(Mines Division)  
 Client Address : Lohardaga,  
 Postal Code : 835203  
 State : Jharkhand  
 Country : India  
 Sample Type : SPRING WATER  
 Received : 18/03/2013  
 Registered : 18/03/2013  
 Marks on Sample : Location: Gurdari-Pol-pol Village  
 Quantity : 5.5L app  
 Sample Collected : 12.03.2013, time : 11.30 am  
 Test Start/End Date : 18/03/2013 - 01/04/2013

Analysis	Method	Result	Unit	Requirement/Limit	
				As per IS:10500:2012	
				Acceptable	Permissible
Colour	IS:3025 (Part-4):1983 (Reaff.2006)	15.0	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)	7.20*		6.5	8.5
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	12.12	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	0.80	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
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)	23.00	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		Absent/100ml

Page 1 of 3

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# Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 02/04/2013

Report No : KG13-002097.004

JOE No : KG13-002097

Report Control No : KGR0000013918

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012
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Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Present	per 100ml		Absent/100ml
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	3.23	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)	0.07	mg/L	0.1	0.3
Sulphate (as SO4)	IS:3025 (Part-24):1986 (Reaff.1998)	4.32	mg/L	200	400
Nitrate (as NO3)	IS:3025 (Part-34):1988 (Reaff.1999)	0.70	mg/L	45	No relaxation
Phenolic Compound (as C6H5OH)	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)	0.034	mg/L	0.01	No relaxation
Zinc (as Zn)	IS:3025 (Part-2)	<0.01	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
Total Alkalinity (as CaCO3)	IS:3025 (Part-23):1986 (Reaff.2003)	16.55	mg/L	200	600
Aluminium (as Al)	IS:3025 (Part-55):2003	0.49	mg/L	0.03	0.2
Boron (as B)	IS:3025 (Part-57):2005	0.12	mg/L	0.5	1.0
Turbidity	IS:3025 (Part-10):1984 (Reaff.2006)	4.55	NTU	1	5

Page 2 of 3

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## Test Report

Print Date : 02/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002097.004

JOE No : KG13-002097

Report Control No : KGR0000013918

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	Acceptable	Permissible
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Remark : \*Analyzed at site.

Per pro SGS India Private Lt

Asish Chakraborty  
Laboratory Manager  
Authorized Signatory

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

### Page 3 of 3

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## Test Report

Print Date : 02/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002097.005

JOE No : KG13-002097

Report Control No : KGR0000013918

Sample Described by Customer as : SPRING WATER

Client Name : Hindalco Industries Limited(Mines Division)  
Client Address : Lohardaga,  
Postal Code : 835203  
State : Jharkhand  
Country : India  
Sample Type : SPRING WATER  
Received : 18/03/2013  
Registered : 18/03/2013  
Marks on Sample : Location: Kujum-Deepa Kujam  
Quantity : 5.5L app  
Sample Collected : 13.03.2013, time : 12.00 pm  
Test Start/End Date : 18/03/2013 - 01/04/2013

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Colour	IS:3025 (Part-4):1983 (Reaff.2006)	5.0	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)	7.00*		6.5	8.5
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	4.54	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	0.05	mg/L	0.3	No relaxation
Fluoride (as F)	IS:3025 (Part-60):2008	<0.10	mg/L	1.0	1.0
Residual Free Chlorine	IS:3025 (Part-26):1986 (Reaff.2003)	<0.10	mg/L	0.2	1.0
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)	12.80	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		Absent/100ml

Page 1 of 3

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## Test Report

Print Date : 02/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002097.005

JOE No : KG13-002097

Report Control No : KGR0000013918

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Present	per 100ml		Absent/100ml
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	1.41	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)	2.33	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)	0.030	mg/L	0.01	No relaxation
Zinc (as Zn)	IS:3025 (Part-2)	<0.01	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
Total Alkalinity (as CaCO <sub>3</sub> )	IS:3025 (Part-23):1986 (Reaff.2003)	5.52	mg/L	200	600
Aluminium (as Al)	IS:3025 (Part-55):2003	<0.03	mg/L	0.03	0.2
Boron (as B)	IS:3025 (Part-57):2005	0.10	mg/L	0.5	1.0
Turbidity	IS:3025 (Part-10):1984 (Reaff.2006)	2.15	NTU	1	5

Page 2 of 3

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## Test Report

Print Date : 02/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002097.005

JOE No : KG13-002097

Report Control No : KGR0000013918

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012
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Acceptable Permissible

Remark : \*Analyzed at site.

Per pro SGS India Private Lt

**Asish Chakraborty**  
Laboratory Manager  
Authorized Signatory

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

Page 3 of 3

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# Test Report

Print Date : 01/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002094.003

JOE No : KG13-002094

Report Control No : KGR0000013687

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 : 18/03/2013  
 Registered : 18/03/2013  
 Marks on Sample : Location : Gurdari-Office  
 Quantity : 5.5L app  
 Sample Collected : 12.03.2013, time :10.30 am  
 Test Start/End Date : 18/03/2013 - 01/04/2013

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Colour	IS:3025 (Part-4):1983 (Reaff.2006)	15.0	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)	7.10*		6.5	8.5
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	6.06	mg/L	200	500
Iron (as Fe)	IS:3025 (Part-2)	9.22	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
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)	18.00	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		Absent/100ml
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Absent	per 100ml		Absent/100ml
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	2.02	mg/L	75	200
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	<1.00	mg/L	30	100

Page 1 of 3

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# Test Report

Print Date : 01/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002094.003

JOE No : KG13-002094

Analysis	Method	Result	Unit	Requirement/Limit	
				As per IS:10500:2012	
				Acceptable	Permissible
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 SO4)	IS:3025 (Part-24):1986 (Reaff.1998)	5.27	mg/L	200	400
Nitrate (as NO3)	IS:3025 (Part-34):1988 (Reaff.1999)	2.92	mg/L	45	No relaxation
Phenolic Compound (as C6H5OH)	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)	0.04	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
Total Alkalinity (as CaCO3)	IS:3025 (Part-23):1986 (Reaff.2003)	9.93	mg/L	200	500
Aluminium (as Al)	IS:3025 (Part-55):2003	<0.03	mg/L	0.03	0.2
Boron (as B)	IS:3025 (Part-57):2005	0.12	mg/L	0.5	1.0
Turbidity	IS:3025 (Part-10):1984 (Reaff.2006)	3.50	NTU	1	5

Remark : \*Analyzed at site.

### Page 2 of 3

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## Test Report

Print Date : 01/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002094.003

JOE No : KG13-002094

Report Control No : KGR0000013687

Per pro SGS India Private Lt

*Asish Chakraborty*

**Asish Chakraborty**  
**Laboratory Manager**  
**Authorized Signatory**

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

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# Test Report

Print Date : 01/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002094.004

JOE No : KG13-002094

Report Control No : KGR0000013687

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 : 18/03/2013  
 Registered : 18/03/2013  
 Marks on Sample : Location: Gurdari-Sagatali  
 Quantity : 5.5L app  
 Sample Collected : 12.03.2013, time : 11.00 am  
 Test Start/End Date : 18/03/2013 - 01/04/2013

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)	7.00*		6.5	8.5
Total Hardness (as CaCO3)	IS:3025 (Part-21):1983 (Reaff.2006)	17.17	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	6.88	mg/L	0.3	No relaxation
Fluoride (as F)	IS:3025 (Part-60):2008	0.36	mg/L	1.0	1.5
Residual Free Chlorine	IS:3025 (Part-26):1986 (Reaff.2003)	<0.10	mg/L	0.2	1.0
Chloride (as Cl)	IS:3025 (Part-32):1988 (Reaff.1999)	5.39	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff.1996)	36.00	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		Absent/100ml
Coliform bacteria	IS:1622:1981 (Reaffirmation 2003)	Absent	per 100ml		Absent/100ml
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	5.25	mg/L	75	200
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	<1.00	mg/L	30	100

Page 1 of 3

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# Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 01/04/2013

Report No : KG13-002094.004

JOE No : KG13-002094

Report Control No : KGR0000013687

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Copper (as Cu)	IS:3025 (Part-2)	0.05	mg/L	0.05	1.5
Manganese (as Mn)	IS:3025 (Part-2)	0.06	mg/L	0.1	0.2
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)	5.07	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
Total Alkalinity (as CaCO <sub>3</sub> )	IS:3025 (Part-23):1986 (Reaff.2003)	20.96	mg/L	200	500
Aluminium (as Al)	IS:3025 (Part-55):2003	<0.03	mg/L	0.03	0.2
Boron (as B)	IS:3025 (Part-57):2005	0.13	mg/L	0.5	1.0
Turbidity	IS:3025 (Part-10):1984 (Reaff.2006)	27.50	NTU	1	5

Remark : \*Analyzed at site.

### Page 2 of 3

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## Test Report

Print Date : 01/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002094.004

JOE No : KG13-002094

Report Control No : KGR0000013687

Per pro SGS India Private Lt

Asish Chakraborty  
Laboratory Manager  
Authorized Signatory

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

Page 3 of 3

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# Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 01/04/2013

Report No : KG13-002094.005

JOE No : KG13-002094

Report Control No : KGR0000013687

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 : 18/03/2013  
 Registered : 18/03/2013  
 Marks on Sample : Location: Gurdari Deepapath  
 Quantity : 5.5L app  
 Sample Collected : 12.03.2013, time : 11.45 am  
 Test Start/End Date : 18/03/2013 - 01/04/2013

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)	7.10		6.5	8.5
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	50.50	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	0.3	mg/L	0.3	No relaxation
Fluoride (as F)	IS:3025 (Part-60):2008	0.45	mg/L	1.0	1.5
Residual Free Chlorine	IS:3025 (Part-26):1986 (Reaff.2003)	<0.10	mg/L	0.2	1.0
Chloride (as Cl)	IS:3025 (Part-32):1988 (Reaff.1999)	10.77	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff.1996)	86.00	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		Absent/100ml
Coliform bacteria	IS:1622:1981 (Reaffirmation 2003)	Absent	per 100ml		Absent/100ml
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	12.12	mg/L	75	200
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	4.91	mg/L	30	100

Page 1 of 3

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# Test Report

Print Date : 01/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002094.005

JOE No : KG13-002094

Report Control No : KGR0000013687

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
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 SO4)	IS:3025 (Part-24):1986 (Reaff.1998)	<2.00	mg/L	200	400
Nitrate (as NO3)	IS:3025 (Part-34):1988 (Reaff.1999)	10.02	mg/L	45	No relaxation
Phenolic Compound (as C6H5OH)	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)	0.02	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
Total Alkalinity (as CaCO3)	IS:3025 (Part-23):1986 (Reaff.2003)	33.09	mg/L	200	600
Aluminium (as Al)	IS:3025 (Part-55):2003	<0.03	mg/L	0.03	0.2
Boron (as B)	IS:3025 (Part-57):2005	0.13	mg/L	0.5	1.0
Turbidity	IS:3025 (Part-10):1984 (Reaff.2006)	17.40	NTU	1	5

### Page 2 of 3

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## Test Report

Print Date : 01/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002094.005

JOE No : KG13-002094

Report Control No : KGR0000013687

Per pro SGS India Private Lt

**Asish Chakraborty**  
**Laboratory Manager**  
**Authorized Signatory**

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

### Page 3 of 3

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# Test Report

Print Date : 01/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002094.006

JOE No : KG13-002094

Report Control No : KGR0000013687

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 : 18/03/2013  
 Registered : 18/03/2013  
 Marks on Sample : Location: Gurdari Kuttupani  
 Quantity : 5.5L app  
 Sample Collected : 12.03.2013, time : 2.00 pm  
 Test Start/End Date : 18/03/2013 - 01/04/2013

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Colour	IS:3025 (Part-4):1983 (Reaff.2006)	5.0	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)	7.30*		6.5	8.5
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	51.51	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	0.25	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-25):1986 (Reaff.2003)	<0.10	mg/L	0.2	1.0
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)	74.00	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		Absent/100ml
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Absent	per 100ml		Absent/100ml
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	12.93	mg/L	75	200
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	4.66	mg/L	30	100

Page 1 of 3

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# Test Report

Print Date : 01/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002094.006

JOE No : KG13-002094

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
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 SO4)	IS:3025 (Part-24):1986 (Reaff.1998)	<2.00	mg/L	200	400
Nitrate (as NO3)	IS:3025 (Part-34):1988 (Reaff.1999)	1.28	mg/L	45	No relaxation
Phenolic Compound (as C6H5OH)	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)	0.23	mg/L	5	5
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
Total Alkalinity (as CaCO3)	IS:3025 (Part-23):1986 (Reaff.2003)	60.67	mg/L	200	600
Aluminium (as Al)	IS:3025 (Part-55):2003	<0.03	mg/L	0.03	0.2
Boron (as B)	IS:3025 (Part-57):2005	0.11	mg/L	0.5	1.0
Turbidity	IS:3025 (Part-10):1984 (Reaff.2006)	4.45	NTU	1	5

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## Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 01/04/2013

Report No : KG13-002094.006

JOE No : KG13-002094

Report Control No : KGR0000013687

Per pro SGS India Private Li

*Asish Chakraborty*

**Asish Chakraborty**  
**Laboratory Manager**  
**Authorized Signatory**

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

Page 3 of 3

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# Test Report

Print Date : 01/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002094.007

JOE No : KG13-002094

Report Control No : KGR0000013687

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 : 18/03/2013  
 Registered : 18/03/2013  
 Marks on Sample : Location: Kajum Navatuli2  
 Quantity : 5.5L app  
 Sample Collected : 13.03.2013, time : 10.00 am  
 Test Start/End Date : 18/03/2013 - 01/04/2013

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-6):1983 (Reaff.2006)	Agreeable		Agreeable	Agreeable
pH	IS:3025 (Part-11):1983 (Reaff.2006)	7.20*		6.5	6.5
Total Hardness (as CaCO3)	IS:3025 (Part-21):1983 (Reaff.2006)	29.29	mg/L	200	200
Iron (as Fe)	IS:3025 (Part-2)	0.2	mg/L	0.3	No relaxation
Fluoride (as F)	IS:3025 (Part-60):2008	0.16	mg/L	1.0	1.5
Residual Free Chlorine	IS:3025 (Part-26):1986 (Reaff.2003)	<0.10	mg/L	0.2	1.0
Chloride (as Cl)	IS:3025 (Part-32):1988 (Reaff.1999)	5.39	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff.1996)	49.00	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		Absent/100ml
Coliform bacteria	IS:1622:1981 (Reaffirmation 2003)	Absent	per 100ml		Absent/100ml
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	8.08	mg/L	75	200
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	2.21	mg/L	30	100

Page 1 of 3

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# Test Report

Print Date : 01/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002094.007

JOE No : KG13-002094

Report Control No : KGR0000013687

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Copper (as Cu)	IS:3025 (Part-2)	0.01	mg/L	0.05	1.5
Manganese (as Mn)	IS:3025 (Part-2)	0.02	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)	5.37	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)	0.11	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-30):1991 (Reaff.2003)	<0.01	mg/L	0.5	No relaxation
Total Alkalinity (as CaCO <sub>3</sub> )	IS:3025 (Part-23):1986 (Reaff.2003)	31.99	mg/L	200	500
Aluminium (as Al)	IS:3025 (Part-55):2003	<0.03	mg/L	0.03	0.2
Boron (as B)	IS:3025 (Part-57):2005	0.12	mg/L	0.5	1.0
Turbidity	IS:3025 (Part-10):1984 (Reaff.2006)	17.50	NTU	1	5

### Page 2 of 3

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## Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 01/04/2013

Report No : KG13-002094.007

JOE No : KG13-002094

Report Control No : KGR0000013687

Per pro SGS India Private Lt

**Asish Chakraborty**  
Laboratory Manager  
Authorized Signatory

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

Page 3 of 3

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# Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 01/04/2013

Report No : KG13-002094.008

JOE No : KG13-002094

Report Control No : KGR0000013687

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 : 18/03/2013  
 Registered : 18/03/2013  
 Marks on Sample : Location : Kujam-Bhatipath  
 Quantity : 5.5L app  
 Sample Collected : 13.03.2013,time :11.00 am  
 Test Start/End Date : 18/03/2013 - 01/04/2013

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Colour	IS:3025 (Part-4):1983 (Reaff.2006)	5.0	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)	7.10*		6.5	8.5
Total Hardness (as CaCO3)	IS:3025 (Part-21):1983 (Reaff.2006)	9.09	mg/L	200	500
Iron (as Fe)	IS:3025 (Part-2)	0.13	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
Chloride (as Cl)	IS:3025 (Part-32):1988 (Reaff.1999)	5.03	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff.1996)	21.00	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		Absent/100ml
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Absent	per 100ml		Absent/100ml
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	3.03	mg/L	75	200
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	<1.00	mg/L	30	100

Page 1 of 3

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# Test Report

Print Date : 01/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002094.008

JOE No : KG13-002094

Report Control No : KGR0000013687

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
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	0.2
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)	<0.50	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)	0.14	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
Total Alkalinity (as CaCO <sub>3</sub> )	IS:3025 (Part-23):1986 (Reaff.2003)	12.13	mg/L	200	600
Aluminium (as Al)	IS:3025 (Part-55):2003	<0.03	mg/L	0.03	0.2
Boron (as B)	IS:3025 (Part-57):2005	0.13	mg/L	0.5	1.0
Turbidity	IS:3025 (Part-10):1984 (Reaff.2006)	0.45	NTU	1	5

### Page 2 of 3

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## Test Report

Print Date : 01/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002094.008

JOE No : KG13-002094

Report Control No : KGR0000013687

Per pro SGS India Private Lt

Asish Chakraborty  
Laboratory Manager  
Authorized Signatory

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

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झारखण्ड राज्य प्रदूषण नियंत्रण पर्वद  
**JHARKHAND STATE POLLUTION CONTROL BOARD**  
[ CONSTITUTED UNDER SECTION 4 OF THE WATER (PREVENTION & CONTROL OF POLLUTION ACT, 1974 )  
T.A.DIVISION BUILDING (GROUND FLOOR),HEC COMPLEX, DHURWA, RANCHI-834004.  
Phone No:-0651- 2400852, 2400851, Fax No:- 2400850.

Ref.No- PC/RNC/58/07-

Date.....

**CONSENT TO OPERATE**

With reference to the application dated 28.08.2012 of G.M. (Operation), M/s Hindalo Industries Ltd; Court Road, I/C Gurdari Bauxite Mines-584.19 Ha, P.O+Dist- Gumla for consent under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and that under section 21 of the Air (Prevention & Control of Pollution) Act,1981, he (they) is (are) granted consent to bring into use his(their) new/altered/existing outlet(s) for discharge of trade effluent and (or) domestic sewage and to operate his (their) industrial plant to produce maximum 3,25,000 TPA of Bauxite At – Gurdari , P.O + Dist- Gumla for the period from 01.01.2013 to 31.12.2013 with the following conditions :

1. That, he(they) shall not make any alteration, addition, deletion or modification in the mines without the prior clearance from the Board.
2. That, he(they) shall abide by the obligations provided under section 24, 31 and 33A of the Water (Prevention & Control of Pollution) Act, 1974 and shall extend co-operation to the Board in performing its functions entrusted under section 20, 21, 23, 30 and 32 of the Act.
3. That, he(they) shall comply with the requirements of the Water (Prevention & Control of Pollution) Cess Act, 1977 read with the Water (Prevention & Control of Pollution) Cess Rules, 1978.
4. That, he(they) shall abide by the obligations provided under section 22, 23 and 31A of the Air (Prevention & Control of Pollution) Act, 1981 and shall extend co-operation to the Board in performing its functions entrusted under sections 24, 25 and 26 of the Act.
5. That, he(they) shall abide by the obligations provided under sections 5, 7, 8 and 9 of the Environment (Protection) Act, 1986 and shall extend co-operation in performing the functions entrusted under section 3, 10 and 11 of the Act.
6. That, he(they) shall abide by the applicable provisions of the Environment (Protection) Rules, 1986, the Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008; the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989; the Bio-medical Waste (Management & Handling) Rules, 1998; the Municipal Solid Wastes (Management & Handling) Rules, 2000 and the Batteries (Management & Handling) Rules, 2001.
7. That, he(they) shall maintain the quality of discharge and (or) emission and (or) noise level of environmental pollutants in conformity with the standards as laid under Rule 3 of the Environment (Protection) Rules, 1986.
8. That, he(they) shall monitor his(their) effluent(s), emission(s) and the ambient air, noise level regularly and shall submit the report to the Board in compliance of the condition laid in paragraph 7.

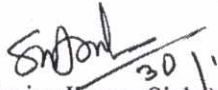
9. That, he(they) shall establish well equipped environmental laboratory with the facilities of system(s) of continuous monitoring of effluent(s), emission(s) ambient water quality(ies), ambient air quality(ies) and ambient noise level(s) and transferring them (monitoring results) to his(their) website(s) and to the e-mail address(es) of the key persons of Jharkhand State Pollution Control Board, Zonal Office, Kolkata and Ministry of Environment & Forests, Regional Office, Bhubaneswar with simultaneous displaying at prominent locations in front of his(their) premises. [\*Unit(s) of medium and large scale under 17 categories of polluting industries of category A of EIA Notification, 2006.]
10. That, he(they) shall submit the environmental statement every year by 30<sup>th</sup> September and shall harvest all rain water precipitating in the premises and do three tier tree plantation in the premises as air barrier.
11. That, he(they) shall submit application for consent under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and that under section 21 of the Air (Prevention & Control of Pollution) Act, 1981 again 120 days before the expiration of the consent order **31.12.2013** or within 120 days from the date of receipt of the order, whichever is earlier.
12. *That, unit shall submit quality report of Ambient Air Quality and Ground Water Quality every quarter of the year.*
13. *That, unit shall submit the status of compliance Environmental Clearance every quarter to the Board.*
14. *That, unit shall reclaim the mined out area in phased manner as per EIA/EMP report.*
15. *That, the unit shall implement harvest rain water of the mine and recharge it to the ground by the method of Central Ground Water Board Guideline that fits most to the mine.*
16. *That, the unit shall make arrangement to control the fugitive emissions occurring during the mining activities and plying of vehicles on haul as well as transport roads.*
17. *That, the unit shall ensure that no transport vehicle should ply on road without covering the materials.*
18. *That, the proponent shall submit compliance report of Environmental Clearance dated 07.02.2007 and submit photographs in compliance of special condition No. VII and IX of the same.*

Sd/-  
(Sanjay Kumar Sinha)  
**MEMBER SECRETARY**

Memo no. PC/RNC/58/07- 16335

Ranchi, Dated .....30/11/13

Copy forwarded to:- **G.M. (Operation), M/S Hindalco Industries Ltd; (I/C Gurdari Bauxite Mines-584.19 Ha.), Court Road, P.O+Dist- Lohardaga/ Deputy Commissioner, Gumla/ D.F.O, Ranchi West Forest Division, Lohardaga/ D.M.O, Gumla/ Regional Officer, Regional Office, Ranchi** for information & necessary action.

  
(Sanjay Kumar Sinha)  
**MEMBER SECRETARY**

ADITYA BIRLA



**BREAK UP THE COST OF ENVIRONMENTAL MEASURES DURING THE YEAR 2012-13**

The composite cost during the year 2012-13 (April to March) for environmental protection & pollution control by Jharkhand Mines division of Hindalco Industries Ltd for implementation 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, Chiro kukud, & Orsa pat.

Sl No	Description	Budget (in Lakh Rs.)	Actual (in Lakh Rs.) FY 2012-2013
1	Pollution Control & Environment monitoring	7.50	11.32
2	Reclamation/ Back filing & Rehabilitation	**	46.60
3	Green belt & Plantation	25.00	88.09
4	Rural Development	65.00	81.50

\*\*part of OB removed cost.

  
Convener

Environment Management Cell.

HINDALCO INDUSTRIES LIMITED  
Hindalco Complex  
Court Road, Lohardaga-835302  
Distt: Lohardaga (Jharkhand)

Telephone: +91 6526 224112/224015/223113  
Fax: +91 6526 224118

Website: www.hindalco.com



Date:20.03.13

**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, Manager (Bagru Mines)
5. A. Anbarasu, Mines Manager (Serengdag A)
6. Ajay Pandey, Mines Manager (Pakhar)
7. Kiran Sankar Singh, Mines Manager (Gurdari)
8. Vidya Sagar Singh, Mines Manager (Serengdag B)
9. Ashish Upadhyay, Mines Manager (Kujam I & II)
10. Amar Bharati, Mines Manager (Amtipani)
11. Monaj Kumar Singh, Mines Manager (Pakhar 109.507 Ha)
12. Rajesh Ambastha, Mines Manager (Chiro Kukud & Orsa)

By order

  
Bijesh Kumar Jha  
VP (Mines)

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

**DETAILS OF PRODUCTION, OVERBURDEN HANDLING, AREA MINED OUT AND AREA RECLAIMED**  
**FROM APR-12 TO MAR-13**

SN	Name of Leases	Lease Area (in Ha)	Production (in MT)	Overburden Handling (in MT)	Mined Out Area (in Acres)	Reclaimed Area (in Acres)
1	Pakhar Bauxite Mines	8.09	78470	51682	0.75	1.10
2	Pakhar (115.13)	115.13	208503	425872	7.42	2.42
3	Gurdari	584.19	324648	832640	14.70	24.80
4	Kujam-I	80.87	149018	158530	14.70	12.10
5	Kujam-II	157.38	149542	677633	18.18	11.41
6	Amtipani	190.95	149579	468731	18.02	15.37
7	Shrengdag	155.81	259630	570878	19.50	35.00
8	Serengdag Bauxite Mines	140.06	99772	133089	6.52	5.80
9	Jalim & Sanai	12.14	49505	34438	1.24	0.80
10	Bagru	75.41	84320	188767	1.78	9.69
11	Hisri New	14.55	99651	115676	1.24	0.00
12	Chiro-Kukud	152.57	64847	78598	3.13	5.37
<b>M/s Minerals &amp; Minerals Limited</b>						
1	Pakhar Bauxite Mines	15.58	34445	115848	1.25	2.00
2	Pakhar (109.507)	109.507	99840	204868	6.76	1.92