



Ref No: HIL/LHD/JP (M)/MoEF/0101

Date: 25.05.2015

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

Sub: **Compliance Report of EC conditions for Chiro-Kukud (152.57 ha) Bauxite Mining project of M/s Hindalco Industries Limited located in Gumla, Jharkhand for the period Oct'14 to March'15.**

Ref: **Environmental Clearance letter no J-11015/240/2006-1A II(M) dated 17<sup>th</sup> May 2007**


Sir,

With reference to the above, we are submitting herewith the Compliance status report of EC conditions for **Chiro-Kukud (152.57 ha) Bauxite Mining project of M/s Hindalco** located in Gumla, Jharkhand for the period **Oct'14 to March'15.**

Hope you will find the same in order.

Thanking You

Yours Sincerely  
FOR HINDALCO INDUSTRIES LIMITED

  
(Bijesh Kumar Jha)  
Joint President (Mines)

Enclosure: - As Above

Copy to: Regional Office, MoEF, Ranchi

**HINDALCO INDUSTRIES LIMITED**

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Corporate Identity No. L27020MH1958PLC011238

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

**CHIRO KUKUD BAUXITE MINES**

**Period Oct'14 to March'15**

**J-11015/240/2006-IA.II (M) Dated 17.5.2007**

<b>Sl No</b>	<b>Conditions</b>	<b>Compliance Status</b>
<b>Specific Conditions</b>		
1	Environmental Clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa foundation Vs Union of India in writ petition (civil) no 460 of 2004, as may be applicable to this project	It will be complied with as per the final decision of Hon'ble Supreme Court.
2.	Environmental Clearance is subject to obtaining clearance from Wildlife (Protection) Act '1972 from the competent authority.	Wildlife Management plan has been accepted by Chief Wildlife Warden, Jharkhand vide letter no 75(vivid)/ 940 dated 22.10.2008.
3.	All the conditions stipulated by SPCB in their NOC shall be effectively implemented.	Implementation of the stipulated conditions are fulfilled.
4	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 and Cabinet approval on recommendation of DC who is the competent authority to give permission for using the agricultural land for non-agricultural purpose.
5	Mining shall not intersect groundwater. The mine working shall be restricted to above ground water table. Prior approval of the Ministry of Environment & Forests and Central Ground Water Authority shall be obtained for mining below water table.	As the mining plan, mining is being carried out at shallow depth, at no point of time mining activities will intersect the ground water table.
6	The project proponent shall ensure that the mining shall be carried out in small blocks and at a given point of time active mining shall not be more than 2.0 ha.	Mining is being carried out in small blocks only.
7.	The project proponent shall ensure that no natural water course shall be obstructed due to any mining operations.	No natural water course is being obstructed due to any mining operations.
8	Top soil, if any, 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 is being practiced during mining operation.

9.	The overburden generated during the initial year shall be kept as temporary dump. Concurrent backfilling starts from the 2 <sup>nd</sup> year onwards and there shall be no external dump at the end of the mine life.	The overburdens generated during the initial year are kept as temporary dump. Concurrent backfilling starts from the 2 <sup>nd</sup> year onwards and there will be no external dump at the end of the mine life. Data enclosed.
10.	The entire excavated area of 86 ha shall be reclaimed, out of which 66 ha land shall be returned to rayats for agricultural purpose and in 20 ha plantation shall be raised. 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.	Will be complied with the progress of mining work.
11	<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>Catch drains and siltation ponds of appropriate size have been constructed to arrest silt and sediment flows from mine working. The water so collected are being utilized for watering the mine area, roads, green belt development etc. The drains are regularly desilted particularly after monsoon and maintained properly.</p> <p>Garland drains of appropriate size are provided.</p>
12	Dimension of the retaining wall at the OB benches within the mine to check run-off and siltation should be based on rainfall data.	The dimension of the retaining wall of OB dumps is based on the average rainfall.
13	Plantation shall be raised in an area of 20.0 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.	Will be carried out with progress of mining activity. Around 2600 saplings have been planted during the FY 2014-15.

14	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.	Suitable measures have been adopted to augment ground water resources in the area.
15	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.	Regular monitoring of ground water level and quality are being carried out by recognized agency.
16	Prior permission from the competent authority should be obtained for drawl of water from the surface water bodies.	Water cess is being paid to JSPCB on regular basis.
17	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.	Vehicle engaged in mining operation are regularly checked and maintenance of vehicles is being done. The vehicles are being covered with tarpaulin.
18	Drills should either be operated with dust extractors or should be equipped with water injection system.	Wet drilling is being done in the holes for dust suppression, for jack hammer type drilling.
19	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 - fixed blasting period of 12.00 Noon to 1.00 Pm on working days. All the precautionary and mitigative measures to control ground vibration and to arrest generation of fly rocks are being implemented.
20	Consent to operate should be obtained from SPCB prior to start of enhanced production from the mine.	There is no proposal for production enhancement.
21	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 is not required to install. The sewage water from domestic uses is treated through septic tanks and soaks pits.
22	The project proponent should take all precautionary measures during mining operation for conservation and protection of endangered fauna such as Leopard, Indian Wolf, Indian elephant, Indian small civet, Indian Python, etc. Spotted in the study area. Action plan for	Wildlife Management plan has been accepted by Chief Wildlife Warden, Jharkhand vide letter no 75(vivid)/940 dated 22.10.2008.

	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.	
23	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.	Final mine closure plan (part) has been approved by IBM. FMCP for entire lease will be prepared in appropriate time.

### **GENERAL CONDITIONS**

<b>Sl No</b>	<b>Conditions</b>	<b>Compliance Status</b>
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.
2	No change in the calendar plan including excavation, quantum of mineral bauxite and waste should be made.	Excavation of OB and Bauxite is being done as per the approved plan, Details of excavation, quantum of mineral, OB etc have been furnished for the financial year 2014-15. Detail Annexed.
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. 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 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.	Water tankers with sprinkling facility have been provided for haul roads, loading unloading & at transfer points.
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.	Complied. PPE provided to all operators within the work zone.
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.	Presently, there is no generation of waste water from the mine.
8	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. 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.	Complied. PPE provided to workers. Training is being provided through VT centre.  Health survey will be done with progress of mining
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.	Complied. A suitable environmental management cell has been developed with qualified personal. 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.	Final mine closure plan has been submitted at IBM for approval. Mining is being carried out as per IBM approved Scheme of Mining.
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.	The funds earmarked for environmental protection measures are kept in separate account. Cost of environmental protection measures Annexed.

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.	Agreed.
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, Bhubneshwar CPCB 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
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.	Displayed.
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.	Already done and copies submitted with earlier six monthly compliance report.



Date: 10.11.14

**OFFICE ORDER**

In connection with the earlier office order dated 30.10.2013 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. Ajay Kumar Pandey, Manager (Bagru Mines)
3. A Anbarasu, Mines Manager (Serengdag Mines)
4. S P Jha, Mines Manager (Pakhar Mines)
5. Kiran Sankar Singh, Mines Manager (Gurdari)
6. Vidya Sagar Singh, Mines Manager (Kujam)
7. Amar Bharati, Mines Manager (Amtipani)
8. Rajesh Ambastha, Mines Manager (Chiro Kukud & Orsa)
9. Biplab Mukherjee (Asst Manager- Geology)

By order

  
Bijesh Kumar Jha  
Joint President (Mines)

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



**PRODUCTION, MINED OUT, BACKFILLED, PRODUCTION AND OVERBURDEN REMOVAL FROM APR-14 TO MAR-15**

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	16.19	14.33	255,035.00	492,188.00
Gurdari Bauxite Mines	584.19	17.20	35.48	323,655.00	790,462.00
Jalim & Sanai	12.14	1.68	1.48	43,675.00	20,400.00
Serangdag	140.06	2.00	0.50	31,650.00	18,956.06
Pakhar Buxite Mines	115.13	5.32	5.87	283,210.00	438,667.43
Pakhar Buxite Mines	8.09	-	-	-	-
Pakhar Buxite Mines	38.95	-	-	-	-
Kujam-I	80.87	7.76	7.51	149,360.00	200,998.43
Kujam-II	157.38	14.85	13.24	149,685.00	369,386.19
Amtipani	190.95	10.90	13.20	149,515.00	300,401.63
Chiro-Kukud	152.57	6.03	5.21	75,631.00	87,664.51
Orsa Bauxite Mines	196.36	-	-	-	-
Hisri New	14.55	1.29	0.65	54,529.00	9,471.00
Bagru	75.41	-	-	-	-
Bhusar	65.31	0.94	1.50	82,032.00	82,626.00
<b>Minerals &amp; Minerals Limited</b>					
Pakhar Buxite Mines	109.507	5.86	6.48	277,855.00	334,282.84
Pakhar Buxite Mines	15.58	0.30	0.20	31,175.00	98,966.29

Monitored water level (FY 2014-15)

Fig in meter

Location (Mines)	Elevation (Mtr)	Well type	Monsoon (July-Sep)		Post Monsoon (November)		Winter (January)		Pre Monsoon (April-May)	
			Inside ML	Outside ML	Inside ML	Outside ML	Inside ML	Outside ML	Inside ML	Outside ML
Bagru	905	Open Well		21.72		24.15			27.23	29.23
	910	Open Well		24.30		24.55			26.80	27.15
	915	Open Well		29.40		28.44			30.15	31.25
	903	Open Well		22.85		33.12			35.25	35.89
	909	Open Well		17.55		28.75			29.20	30.28
Pakhar	1000	Open Well		24.90		22.66			24.50	25.9
	1083	Hand Pump	35.35		31.65		34.34		35.49	
	1027	Open Well		25.85		28.35			30.50	31.45
Sherengdag	1094	Hand Pump	41.75		39.54		42.13		42.56	
	1081	Hand Pump	39.65		31.30		41.30		41.31	
	1055	Hand Pump	33.05		27.55		35.35		35.35	
	1066	Hand Pump	27.75		26.25		29.10		30.25	
	1045	Hand Pump	29.30		27.84		29.64		30.41	
Gurdari	1061	Hand Pump	28.35		24.90		25.42		26.79	
	1059	Hand Pump	38.15		36.63		35.21		35.98	
	1075	Hand Pump	28.22		26.88		28.49		29.53	
	1075	Hand Pump	28.36		29.30		30.2		30.05	
	1040	Open Well		33.95		21.85			35.21	36.78
Kujam	1041	Open Well		33.65		24.82			36.54	39.52
	1064	Hand Pump	31.58		28.65		35.91		42.12	
	1052	Hand Pump				21.12			24.13	23.54
	1148	Hand Pump	33.45		28.40		34.12		37.26	
Chiro Kukud	1151	Hand Pump	37.60		31.80		36.62		36.21	
	1084	Hand Pump	34.35		36.86		35.69		39.29	

*B Pakhar*



**BREAK UP THE COST OF ENVIRONMENTAL MEASURES DURING THE YEAR 2014-15**

The composite cost during the year 2014-15 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).

SI No	Description	Budget (in Lakh Rupees) FY 2014-15	Actual (in Lakh Rupees) FY 2014-2015
1	Pollution Control & Environment monitoring	5.50	8.58
2	Reclamation/ Back filing & Rehabilitation	42.50	98.51
3	Green belt & Plantation	60.03	98.87
4	Rural Development	85.29	282.62

\*\*Part of OB removed cost.

  
 Convener

Environment Management Cell  
 Hindalco Industries Limited



# *Eco Ventures Pvt. Ltd.*

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## **Mahabal Enviro Engineers Pvt. Ltd.**

At Booty, Near PHED Colony, Behind Pump House, PO – RMCC,  
District – Ranchi 834009

### **ORSA & CHIRO - ENVIRONMENTAL MONITORING REPORT**

**DECEMBER 2014**

Vijay Pandey  
**SENIOR EXECUTIVE**



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**Hindalco Industries: Environmental Monitoring report**

**December 2014**

Report no: DEC016/2014-15	Date: 12 <sup>th</sup> January, 2015
Sample described by customer: AMBIENT AIR QUALITY MONITORING	
Client Name: Hindalco Industries Limited	
Client Address: Lohardaga	
Postal Code: 835203	
State: Jharkhand	
Country: India	
Sample type: AMBIENT AIR QUALITY MONITORING	
Received: 26.12.2014	
Registered: 26.12.2014	
Marks on Sample: Location: Orsa & Chiro- Chiro Kukud Mine	
Sample collected on: 23.12.2014	
Test Start/End Date: 27.12.2014/29.12.2014	

LOCATION / IDENTIFICATION: Orsa & Chiro- Chiro Kukud Mine					
PARAMETERS		UNIT	LIMIT	METHOD	29/12/2014
Sulphur Dioxide	SO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182 (Part-2):2001 (Reaff:2006)	4.7
Nitrogen Dioxide	NO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182(Part-6):1975 (Reaff:2004)	9.5
Particulate Matter (size less than 10 µm)	PM <sub>10</sub>	µg/m <sup>3</sup>	100	IS:5182 (Part 23)	77.6
Particulate Matter (size less than 2.5 µm)	PM <sub>2.5</sub>	µg/m <sup>3</sup>	60	USEPA CFR(40) Appendix-L	41.8
Carbon Monoxide	CO	mg/m <sup>3</sup>	2	EPA 600/P-99/001F	0.36

Vijay Pandey  
SENIOR EXECUTIVE



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Client Name: Hindalco Industries Limited	
Client Address: Lohardaga	
Postal Code: 835203	
State: Jharkhand	
Country: India	
Sample type: AMBIENT AIR QUALITY MONITORING	
Received: 26.12.2014	
Registered: 26.12.2014	
Marks on Sample: Location: Orsa & Chiro- Orsa Village	
Sample collected on: 23.12.2014	
Test Start/End Date: 27.12.2014/29.12.2014	

### LOCATION / IDENTIFICATION: Orsa & Chiro- Orsa Village

PARAMETERS	UNIT	LIMIT	METHOD	29/12/2014	
Sulphur Dioxide	SO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182 (Part-2):2001 (Reaff:2006)	12.6
Nitrogen Dioxide	NO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182(Part-6):1975 (Reaff:2004)	10.7
Particulate Matter (size less than 10 µm)	PM <sub>10</sub>	µg/m <sup>3</sup>	100	IS:5182 (Part 23)	75.4
Particulate Matter (size less than 2.5 µm)	PM <sub>2.5</sub>	µg/m <sup>3</sup>	60	USEPA CFR(40) Appendix-L	38.7
Carbon Monoxide	CO	mg/m <sup>3</sup>	2	EPA 600/P-99/001F	0.40

Vijay Pandey  
SENIOR EXECUTIVE



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**December 2014**

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Client Address: Lohardaga	
Postal Code: 835203	
State: Jharkhand	
Country: India	
Sample type: AMBIENT AIR QUALITY MONITORING	
Received: 26.12.2014	
Registered: 26.12.2014	
Marks on Sample: Location: Orsa & Chiro- Amtahi Village (Orsa)	
Sample collected on: 23.12.2014	
Test Start/End Date: 27.12.2014/29.12.2014	

### LOCATION / IDENTIFICATION: Orsa & Chiro- Amtahi Village (Orsa)

PARAMETERS	UNIT	LIMIT	METHOD	29/12/2014
Sulphur Dioxide	SO <sub>2</sub> µg/m <sup>3</sup>	80	IS:5182 (Part-2):2001 (Reaff:2006)	9.7
Nitrogen Dioxide	NO <sub>2</sub> µg/m <sup>3</sup>	80	IS:5182(Part-6):1975 (Reaff:2004)	19.4
Particulate Matter (size less than 10 µm)	PM <sub>10</sub> µg/m <sup>3</sup>	100	IS:5182 (Part 23)	72.7
Particulate Matter (size less than 2.5 µm)	PM <sub>2.5</sub> µg/m <sup>3</sup>	60	USEPA CFR(40) Appendix-L	54.8
Carbon Monoxide	CO mg/m <sup>3</sup>	2	EPA 600/P-99/001F	0.15

Vijay Pandey  
SENIOR EXECUTIVE



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Test Start/End Date: 27.12.2014/29.12.2014	

### LOCATION / IDENTIFICATION: Orsa & Chiro- Saridih Village

PARAMETERS	UNIT	LIMIT	METHOD	29/12/2014
Sulphur Dioxide	SO <sub>2</sub> µg/m <sup>3</sup>	80	IS:5182 (Part-2):2001 (Reaff:2006)	10.7
Nitrogen Dioxide	NO <sub>2</sub> µg/m <sup>3</sup>	80	IS:5182(Part-6):1975 (Reaff:2004)	8.9
Particulate Matter (size less than 10 µm)	PM <sub>10</sub> µg/m <sup>3</sup>	100	IS:5182 (Part 23)	80.1
Particulate Matter (size less than 2.5 µm)	PM <sub>2.5</sub> µg/m <sup>3</sup>	60	USEPA CFR(40) Appendix-L	47.4
Carbon Monoxide	CO mg/m <sup>3</sup>	2	EPA 600/P-99/001F	0.29

Vijay Pandey  
SENIOR EXECUTIVE





# *Eco Ventures Pvt. Ltd.*

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## **Mahabal Enviro Engineers Pvt. Ltd.**

At Booty, Near PHED Colony, Behind Pump House, PO – RMCC,  
District – Ranchi 834009

### **ORSA & CHIRO - ENVIRONMENTAL MONITORING REPORT**

**MARCH 2015**

Vijay Pandey  
**SENIOR EXECUTIVE**



# Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries: Environmental Monitoring report

March 2015

Report no: APR036/2015-16	Date: 6 <sup>th</sup> April, 2015
<b>Sample described by customer: DRINKING WATER</b>	
Client Name: Hindalco Industries Limited	
Client Address: Lohardaga	
Postal Code: 835203	
State: Jharkhand	
Country: India	
Sample type: DRINKING WATER	
Marks on Sample: Location: Chiro Kukud Mines Drinking Water (Hand Pump)	
Sample collected by: Mahabal EnviroEngineers Pvt Limited	
Sample collected on: 01.03.2015	
Quantity: 5 L X 2 No. PVC Can	
Received: 10.03.2015	
Registered: 10.03.2015	
Test Start/End Date: 23.03.2015/25.03.2015	

S.No	Parameters	Unit	Result	Acceptable Limit (IS10500:2012)	Method Reference
1.	Colour	Hazen	< 1	5 Max	APHA 22nd Ed. 2012, 2120-B, 2-6
2.	Odour	-	Agreeable	Agreeable	IS 3025 (Part 5):1983, Reaffirmed 2006
3.	Taste	-	Agreeable	Agreeable	IS 3025 (Part 7):1984, Reaffirmed 2006
4.	Turbidity	NTU	0.7	1 Max	APHA 22nd Ed. 2012, 2130-B, 2-13
5.	pH	-	6.8	6.5-8.5	APHA 22nd Ed. 2012, 4500-H+-B, 4-92
6.	Free Chlorides( Residual)	mg/l	<0.05	0.2 min	APHA 22nd Ed. 2012, 4500-Cl G, 4-69
7.	Total Dissolved Solids	mg/l	87	500 Max	IS 3025 (Part 16):1984 Reaffirmed 2006
8.	Monochloramines	mg/l	<0.05	-	APHA 22nd Ed. 2012, 4500-ClG, 4-69
9.	Dichloramines	mg/l	<0.05	-	APHA 22nd Ed. 2012, 4500-ClG, 4-69
10.	Total Hardness (as CaCO <sub>3</sub> )	mg/l	55	200 Max	APHA 22nd Ed. 2012, 2340-C, 2-44,45
11.	Alkalinity Total (as CaCO <sub>3</sub> )	mg/l	66	200 Max	IS 3025 (Part 23):1986 Reaffirmed 2009
12.	Chloride (as Cl)	mg/l	8.0	250 Max	APHA 22nd Ed. 2012, 4500-Cl-B, 4-72
13.	Sulphate (as SO <sub>4</sub> )	mg/l	4.2	200 Max	APHA 22nd Ed. 2012, 4500-SO4-E, 4-190



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**Hindalco Industries:Environmental Monitoring report**

**March 2015**

S.No	Parameters	Unit	Result	Acceptable Limit (IS 10500:2012)	Method Reference
14.	Nitrate (as NO <sub>3</sub> )	mg/l	1.15	45 Max	APHA 22nd Ed. 2012, 4500-NO <sub>3</sub> -E, 4-125
15.	Fluoride (as F)	mg/l	0.19	1 Max	APHA 22nd Ed. 2012, 4500-FB& D, 4-84, 4-87
16.	Boron (as B)	mg/l	0.17	0.5 Max	APHA 22nd Ed. 2012, 4500-BB, 4-25
17.	Calcium(as Ca)	mg/l	18.2	75 Max	APHA 22nd Ed. 2012, 3500-Ca-B, 3-67
18.	Magnesium (as Mg)	mg/l	3.2	30 Max	APHA 22nd Ed. 2012, 3500- Mg- B, 3-84
19.	Ammonical Nitrogen/ Total Ammonia	mg/l	<0.1	-	APHA 22nd Ed. 2012, 4500 NH <sub>3</sub> -F, 4-115
20.	Iron (as Fe)	mg/l	0.18	0.3 Max	APHA 22nd Ed. 2012, 3111-B,3-18
21.	Manganese (as Mn)	mg/l	N.D	0.1 Max	APHA 22nd Ed. 2012, 3111-B, 318
22.	Aluminium (as Al)	mg/l	0.09	0.03 Max	APHA 22nd Ed. 2012, 3500- Al-B, 3-61
23.	Cadmium (as Cd)	mg/l	N.D	0.003 Max.	APHA 22nd Ed. 2012, 3111-B,3-18
24.	Chromium Total (as Cr)	mg/l	N.D	0.05 Max.	APHA 22nd Ed. 2012, 3111-B,3-18
25.	Copper (as Cu)	mg/l	N.D	0.05 Max.	APHA 22nd Ed. 2012, 3111-B,3-18
26.	Lead (as Pb)	mg/l	N.D	0.01 Max.	APHA 22nd Ed. 2012, 3111-B,3-18
27.	Zinc (as Zn)	mg/l	0.03	5 Max.	APHA 22nd Ed. 2012, 3111-B,3-18
28.	Arsenic (as As)	mg/l	<0.01	0.01 Max.	APHA 22nd Ed. 2012, 3114-C,3-38
29.	Mercury (as Hg)	mg/l	N.D.	0.001 Max.	APHA 22nd Ed. 2012, 3112-B,3-23
30.	Selenium (as Se)	mg/l	N.D.	0.01 Max.	APHA 22nd Ed. 2012, 3114-C, 3-38
31.	Nickel (as Ni)	mg/l	<0.06	0.02 Max.	APHA 22nd Ed. 2012, 3111 B,3-18
32.	Mineral Oil	mg/l	N.D.	0.5 Max.	IS 3025 (Part 39): 1991, Reaffirmed 2003, Ed. 2.1
33.	Cyanide (as CN)	mg/l	N.D.	0.05 Max.	APHA 22nd Ed. 2012, 4500-CN, C & E, 4-39 & 4-44
34.	Anionic detergents as MBAS	mg/l	<0.1	0.2 Max.	APHA 22nd Ed. 2012, 5540-C, 5-53
35.	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	N.D	0.001 Max.	APHA 22nd Ed. 2012, 5530- B & C, 5-47
36.	Polynuclear aromatic hydrocarbons (PAH)	µg/L	N.D	0.0001 mg/L Max.	APHA 22nd Ed. 2012, 6440, 6-93
37.	Polychlorinated Biphenyls (PCBs)	µg/L	N.D	0.0005 mg/l Max.	USEPA Method 8082
38.	Sulphide (as S)	mg/l	N.D	-	APHA 22nd Ed. 2012, 4500- S2-C 4-175 & F 4-178

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Hindalco Industries: Environmental Monitoring report

March 2015

S.No	Parameters	Unit	Result	Acceptable Limit (IS 10500:2012)	Method Reference
<b>Microbiological Analysis</b>					
1.	Total Colliforms	MPN/100 mL	<1.1	N.D	APHA 22nd Ed. 2012, 9221-B & C, 9-66, 9-69
2.	E-Coli	MPN/100 mL	Absent	N.D	APHA 22nd Ed. 2012, 9221-B, C & G, 9-66, 9-69 and 9-76
<b>Pesticides Residues</b>					
3.	p,p DDT	µg/L	N.D	1	US EPA 508-1995
4.	o,p DDT	µg/L	N.D	1	US EPA 508-1995
5.	p,p DDE	µg/L	N.D	1	US EPA 508-1995
6.	o,p DDE	µg/L	N.D	1	US EPA 508-1995
7.	p,p DDD	µg/L	N.D	1	US EPA 508-1995
8.	o,p DDD	µg/L	N.D	1	US EPA 508-1995
9.	γ-HCH (Lindane)	µg/L	<0.01	2	US EPA 508-1995
10.	α-HCH	µg/L	<0.01	0.01	US EPA 508-1995
11.	β-HCH	µg/L	N.D	0.04	US EPA 508-1995
12.	δ - HCH	µg/L	N.D	0.04	US EPA 508-1995
13.	Butachlor	µg/L	N.D	125	US EPA 508-1995
14.	Alachlor	µg/L	N.D	20	US EPA 508-1995
15.	Atrazine	µg/L	N.D	2	US EPA 532-2000
16.	α Endosulfan	µg/L	N.D	0.4	US EPA 508-1995
17.	β Endosulfan	µg/L	N.D	0.4	US EPA 508-1995
18.	Endosulfan Sulphate	µg/L	N.D	0.4	US EPA 508-1995
19.	Ethion	µg/L	N.D	3	US EPA 8141A-1994
20.	Malathion	µg/L	N.D	190	US EPA 8141A -1994
21.	Methyl Parathion	µg/L	N.D	0.3	US EPA 8141A -1994
22.	Monocrotophos	µg/L	N.D	1	US EPA 8141A-1994
23.	Phorate	µg/L	N.D	2	US EPA 8141A -1994
24.	Chlorpyrifos	µg/L	N.D	30	US EPA 8141A -1994
25.	Aldrin	µg/L	N.D	0.03	US EPA 508-1995
26.	Dieldrin	µg/L	N.D	0.03	US EPA 508-1995
<b>Remarks: N.D- Not Detected</b>					

**Conclusion:** The Physical & Chemical Analysis report indicates that water is not contaminated.

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Hindalco Industries: Environmental Monitoring report

March 2015

Report no: APR037/2015-16	Date: 6 <sup>th</sup> April, 2015
Sample described by customer: AMBIENT AIR QUALITY MONITORING	
Client Name: Hindalco Industries Limited	
Client Address: Lohardaga	
Postal Code: 835203	
State: Jharkhand	
Country: India	
Sample type: AMBIENT AIR QUALITY MONITORING	
Marks on Sample: Location: Orsa & Chiro- Chiro Kukud Mine	
Sample collected on: 01.03.2015	
Received: 10.03.2015	
Registered: 10.03.2015	
Test Start/End Date: 23.03.2015/25.03.2015	

LOCATION / IDENTIFICATION: Orsa & Chiro- Chiro Kukud Mine					
PARAMETERS		UNIT	LIMIT	METHOD	01/03/2015
Sulphur Dioxide	SO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182 (Part-2):2001 (Reaff:2006)	5.9
Nitrogen Dioxide	NO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182(Part-6):1975 (Reaff:2004)	10.9
Particulate Matter (size less than 10 µm)	PM <sub>10</sub>	µg/m <sup>3</sup>	100	IS:5182 (Part 23)	76.8
Particulate Matter (size less than 2.5 µm)	PM <sub>2.5</sub>	µg/m <sup>3</sup>	60	USEPA CFR(40) Appendix-L	40.9
Carbon Monoxide	CO	mg/m <sup>3</sup>	2	EPA 600/P-99/001F	0.32

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**Hindalco Industries: Environmental Monitoring report**

**March 2015**

<b>Report no:</b> APR038/2015-16	<b>Date:</b> 6 <sup>th</sup> April, 2015
<b>Sample described by customer:</b> AMBIENT AIR QUALITY MONITORING	
<b>Client Name:</b> Hindalco Industries Limited	
<b>Client Address:</b> Lohardaga	
<b>Postal Code:</b> 835203	
<b>State:</b> Jharkhand	
<b>Country:</b> India	
<b>Sample type:</b> AMBIENT AIR QUALITY MONITORING	
<b>Marks on Sample:</b> Location: Orsa & Chiro- Saridih Village	
<b>Sample collected on:</b> 01.03.2015	
<b>Received:</b> 10.03.2015	
<b>Registered:</b> 10.03.2015	
<b>Test Start/End Date:</b> 23.03.2015/25.03.2015	

LOCATION / IDENTIFICATION: Orsa & Chiro- Saridih Village					
PARAMETERS		UNIT	LIMIT	METHOD	01/03/2015
Sulphur Dioxide	SO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182 (Part-2):2001 (Reaff:2006)	11.9
Nitrogen Dioxide	NO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182(Part-6):1975 (Reaff:2004)	11.6
Particulate Matter (size less than 10 µm)	PM <sub>10</sub>	µg/m <sup>3</sup>	100	IS:5182 (Part 23)	80.8
Particulate Matter (size less than 2.5 µm)	PM <sub>2.5</sub>	µg/m <sup>3</sup>	60	USEPA CFR(40) Appendix-L	48.9
Carbon Monoxide	CO	mg/m <sup>3</sup>	2	EPA 600/P-99/001F	0.32

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**Hindalco Industries: Environmental Monitoring report**

**March 2015**

Report no: APR039/2015-16	Date: 6 <sup>th</sup> April, 2015
Sample described by customer: AMBIENT AIR QUALITY MONITORING	
Client Name: Hindalco Industries Limited	
Client Address: Lohardaga	
Postal Code: 835203	
State: Jharkhand	
Country: India	
Sample type: AMBIENT AIR QUALITY MONITORING	
Marks on Sample: Location: Orsa & Chiro- Orsa Village	
Sample collected on: 02.03.2015	
Received: 10.03.2015	
Registered: 10.03.2015	
Test Start/End Date: 23.03.2015/25.03.2015	

LOCATION / IDENTIFICATION: Orsa & Chiro- Orsa Village					
PARAMETERS		UNIT	LIMIT	METHOD	02/03/2015
Sulphur Dioxide	SO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182 (Part-2):2001 (Reaff:2006)	12.0
Nitrogen Dioxide	NO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182(Part-6):1975 (Reaff:2004)	11.2
Particulate Matter (size less than 10 µm)	PM <sub>10</sub>	µg/m <sup>3</sup>	100	IS:5182 (Part 23)	78.2
Particulate Matter (size less than 2.5 µm)	PM <sub>2.5</sub>	µg/m <sup>3</sup>	60	USEPA CFR(40) Appendix-L	40.1
Carbon Monoxide	CO	mg/m <sup>3</sup>	2	EPA 600/P-99/001F	0.34

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**Hindalco Industries: Environmental Monitoring report**

**March 2015**

<b>Report no:</b> APR040/2015-16	<b>Date:</b> 6 <sup>th</sup> April, 2015
<b>Sample described by customer:</b> AMBIENT AIR QUALITY MONITORING	
<b>Client Name:</b> Hindalco Industries Limited	
<b>Client Address:</b> Lohardaga	
<b>Postal Code:</b> 835203	
<b>State:</b> Jharkhand	
<b>Country:</b> India	
<b>Sample type:</b> AMBIENT AIR QUALITY MONITORING	
<b>Marks on Sample:</b> Location: Orsa & Chiro- Amtahi Village (Orsa)	
<b>Sample collected on:</b> 02.03.2015	
<b>Received:</b> 10.03.2015	
<b>Registered:</b> 10.03.2015	
<b>Test Start/End Date:</b> 23.03.2015/25.03.2015	

LOCATION / IDENTIFICATION: Orsa & Chiro- Amtahi Village (Orsa)					
PARAMETERS		UNIT	LIMIT	METHOD	02/03/2015
Sulphur Dioxide	SO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182 (Part-2):2001 (Reaff:2006)	10.9
Nitrogen Dioxide	NO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182(Part-6):1975 (Reaff:2004)	20.4
Particulate Matter (size less than 10 µm)	PM <sub>10</sub>	µg/m <sup>3</sup>	100	IS:5182 (Part 23)	73.8
Particulate Matter (size less than 2.5 µm)	PM <sub>2.5</sub>	µg/m <sup>3</sup>	60	USEPA CFR(40) Appendix-L	54.9
Carbon Monoxide	CO	mg/m <sup>3</sup>	2	EPA 600/P-99/001F	0.16

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**Hindalco Industries: Environmental Monitoring report**

**March 2015**

<b>Report no:</b> APR041/2015-16	<b>Date:</b> 6 <sup>th</sup> April, 2015
<b>Sample Description: Measurement of Noise</b>	
<b>Client Name:</b> Hindalco Industries Limited	
<b>Client Address:</b> Lohardaga	
<b>Postal Code:</b> 835203	
<b>State:</b> Jharkhand	
<b>Country:</b> India	
<b>Sample Description:</b> Measurement of Noise Level.	
<b>Sampling Method:</b> Instrumental, Using Sound level Meter	
<b>Sampling Done by:</b> Mahabal Enviro.	
<b>Data Collection Date:</b> 01.03.2015	
<b>Analyse Date:</b> 23.03.2015	

Location / Identification	Unit	Limit (day)	Result Average of 24 continuous hours	Limit (night)	Result Average of 24 continuous hours	Dates
Chiro Kukud Mining Area	dB(A) L <sub>eq</sub>	75	64.6	70	62.4	01/03/2015

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**Hindalco Industries: Environmental Monitoring report**

**March 2015**

Report no: APR042/2015-16	Date: 6 <sup>th</sup> April, 2015
<b>Sample Description: Measurement of Noise: Spot Noise</b>	
Client Name: Hindalco Industries Limited	
Client Address: Lohardaga	
Postal Code: 835203	
State: Jharkhand	
Country: India	
Sample Location: Chiro Kukud Mine Pit	
Sample Description: Measurement of Noise Level.	
Sampling Method: Instrumental, Using Sound level Meter	
Sampling Done by: Mahabal Enviro.	
Data Collection Date: 01.03.2015	
Analyse Date: 23.03.2015	

Location / Identification	Unit	Limit (day)	Result	Dates
POCKLAN	dB(A) $L_{eq}$	75	67.9	01/03/2015
COMPRESSOR	dB(A) $L_{eq}$	75	71.5	01/03/2015
WAGAN DRILL	dB(A) $L_{eq}$	75	71.9	01/03/2015
DUMPER	dB(A) $L_{eq}$	75	71.8	01/03/2015

Note : (i) The value is the  $L_{eq}$  of twenty readings taken in location (Day time).

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