



Ref No: HIL/LHD/JP (M)/MoEF/ 1244

Date: 23.11.2016

To,  
The Additional Principal Chief Conservator of Forest (C)  
Ministry of Environment, Forests and Climate Changes  
Regional Office (ECZ), Ranchi-834002.

Sub: **Compliance Report of EC conditions for Pakhar (8.09 ha) Bauxite Mining project of M/s Hindalco Industries Limited located in Lohardaga, Jharkhand for the period April'16-Sep'16.**

Ref: **Environmental Clearance letter no J-11015/135/2006-IA II (M) dated 24<sup>th</sup> January 2007**

Sir,

With reference to the above, we are submitting herewith the Compliance status report of EC conditions for **Pakhar (8.09 ha) Bauxite Mining project** of M/s Hindalco located in Lohardaga, Jharkhand for the period **April'16-Sep'16**.

Hope you will find the same in order.

Thanking You

Yours Sincerely  
FOR HINDALCO INDUSTRIES LIMITED

  
(Bijesh Kumar Jha)  
Agent of Mines

Enclosure: - As Above

Copy to: Member Secretary, JSPCB, Ranchi  
RO, JSPCB, Ranchi  
<mef@ori.nic.in>, <mef@nic.in>, <mef.or@nic.in>, mef.or@nic.in

Compliance of conditions laid down in Environmental Clearance

**PAKHAR (8.09 ha) BAUXITE MINES**

**Period: April'16-Sep'16**

**J-11015/135 /2006-IA.II (M) Dated 24.1.2007**

| <b>Sl No</b> | <b>Specific Conditions</b>   | <b>Compliance Status</b>  |
|--------------|--|---|
| 1            | All the conditions stipulated by SPCB in their NOC shall be effectively implemented.   | Implementations of the stipulated condition are fulfilled.  |
| 2            | The environmental clearance is subject to approval of the state land use Department, Government of Jharkhand for diversion of agricultural land for non-agricultural use.  | Mining Lease is granted 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.                                   |
| 3            | Mining shall not intersect groundwater. The mine working shall be restricted to ground water table. Prior approval of the Ministry of Environment & Forests and Central Ground Water Authority shall be obtained for mining below water table.   | Mining operation not carried out in this lease during the financial year 2016-17 due to exhaustion of mineral reserve.<br><br>Final Mine closure Plan has been approved by Indian Bureau of Mines. We are in the process of implementation of Final Mine closure. |
| 4            | The project proponent shall ensure that no natural watercourse shall be obstructed due to any mining operation.  | No natural water course was obstructed during mining.   |
| 5            | Top soil shall be stacked properly with proper slope with adequate measures and should be used for reclamation and rehabilitation of mined out areas.  | Mining operation not carried out in this lease during the financial year 2016-17 due to exhaustion of mineral reserve.  |
| 6            | The waste generated shall be concurrently backfilled in the mined out area. There shall be no external OB dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forest on six monthly basis. | Mining operation not carried out in this lease during the financial year 2016-17 due to exhaustion of mineral reserve.  |

|    |  |   |
|----|--|---|
| 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> | Mining operation not carried out in this lease during the financial year 2016-17 due to exhaustion of mineral reserve.                        |
| 8  | Plantation shall be raised in an area of 6.35 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.   | In 2016-17, Around 7000 plantation carried out around this lease within Pakhar plateau.   |
| 9  | 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.  | We are in the process of final mine closure.  |
| 10 | 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.   | It is being monitored.<br>Monitoring report is enclosed as <b>Annexure</b>  |
| 11 | Prior permission from the competent authority should be obtained for drawl of water from the surface water bodies.   | We are in the process of final mine closure.  |
| 12 | 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   | We are in the process of final mine closure. .<br><br>Mining operation not carried out in this lease during the financial year 2016-17 due to |

|    |   |  |
|----|---|--|
|    | vehicles should be covered with a tarpaulin and shall not be overloaded.  | exhaustion of mineral reserve.   |
| 13 | Drills should either be operated with dust extractors or should be equipped with water injection system.  | We are in the process of final mine closure. . Mining operation not carried out in this lease during the financial year 2016-17 due to exhaustion of mineral reserve.  |
| 14 | 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.  | Mining operation not carried out in this lease during the financial year 2016-17 due to exhaustion of mineral reserve.   |
| 15 | Consent to operate should be obtained from SPCB prior to start of enhanced production from the mine.  | Mining operation not carried out in this lease during the financial year 2016-17 due to exhaustion of mineral reserve.   |
| 16 | Sewage treatment plant should be installed for the colony. ETP should also be provided for workshop and wastewater generated from mining operations.  | There was no effluent discharge from Mine; hence ETP has not been installed. The sewage water from domestic uses is being collected through individual septic tanks & soak pits. Sludge is collected to an integrated soak pit. Arrangement has been made for Pakhar group of Mines. |
| 17 | The project proponent should take all precautionary measures during mining operation for conservation and protection of endangered fauna such as Indian Python 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. | Mining operation not carried out in this lease during the financial year 2016-17 due to exhaustion of mineral reserve.   |
| 18 | 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 dully approved by Indian Bureau of Mines.  |

## 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  | Mining operation not carried out in this lease during the financial year 2016-17 due to exhaustion of mineral reserve.   |
| 2     | No change in the calendar plan including excavation, quantum of mineral bauxite and waste should be made.  | Mining operation not carried out in this lease during the financial year 2016-17 due to exhaustion of mineral reserve.   |
| 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 have been fixed after due consultation of SPCB and regular monitoring is being carried out. Monitoring Reports is enclosed.   |
| 4     | Data on ambient air quality (RPM, SPM, SO <sub>2</sub> , and NO <sub>x</sub> ) should be regularly submitted to the Ministry including its Regional office located at Bhubneshwar and the State Pollution Control Board / Central pollution Control Board once in six months.  | Regular monitoring is being carried out. Monitoring Reports 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.  | Mining operation not carried out in this lease during the financial year 2016-17 due to exhaustion of mineral reserve. Water spraying is being done around Mine Lease in dust prone areas. |
| 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.  | Mining operation not carried out in this lease during the financial year 2016-17 due to exhaustion of mineral reserve.   |

|    |   |  |
|----|---|--|
| 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.           | Mining operation not carried out in this lease during the financial year 2016-17 due to exhaustion of mineral reserve.   |
| 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. | Mining operation not carried out in this lease during the financial year 2016-17 due to exhaustion of mineral reserve.   |
| 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.  | Mining operation not carried out in this lease during the financial year 2016-17 due to exhaustion of mineral reserve.   |
| 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.   | Mining operation not carried out in this lease during the financial year 2016-17 due to exhaustion of mineral reserve. This was an operational mine and hence provision related to financial closure not applicable.   |
| 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 environmental protection measure is enclosed. It is once again reiterated that the funds so earmarked 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.  | Agreed.  |
| 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   |

|    |  |  |
|----|--|--|
| 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.  | Displayed.   |
| 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. |



# *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

### **PAKHAR PLATEAU- ENVIRONMENTAL MONITORING REPORT**

**APRIL TO JUNE 2016**

**For Mahabal Enviro Engineers Pvt. Ltd.**

Vijay Pandey  
**SENIOR EXECUTIVE**







# Mahabal Enviro Engineers Pvt. Ltd.

## Branch Office:

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Hindalco Industries: Environmental Monitoring report

April- June 2016

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|   | <b>SPOT NOISE LEVEL</b>   |
| 1 | Near Poclairn at Pakhar Mine (115.13 ha.)                                   |
| 2 | Loading point near Dumper at Pakhar Mines (109.507 ha. Minerals & Minerals) |
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|   | <b>SURFACE WATER</b>  |
| 1 | Pakhar Mine-115.13 Quarry   |





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Hindalco Industries: Environmental Monitoring report

April- June 2016

|  |                                   |
|--|-----------------------------------|
| Report no: : MEEPL/ JULY074/2016-17                          | Date: 18 <sup>th</sup> July, 2016 |
| 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: Pakhar Plateau-Near Office        |                                   |
| Sample collected on: 16.06.2016                              |                                   |
| Received: 20.06.2016   |                                   |
| Registered: 20.06.2016                                       |                                   |
| Test Start/End Date: 20.06.2016/23.06.2016                   |                                   |

| LOCATION / IDENTIFICATION: Pakhar Plateau-Near Office |  |                   |                |               |
|---|--|-------------------|----------------|---------------|
| Sl. No.   | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.   | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 61.2          |
| 02.   | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 40.1          |
| 03.   | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 24.5          |
| 04.   | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 32.5          |
| 05.   | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 13.6          |
| 06.   | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 10.2          |
| 07.   | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.50          |
| 08.   | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.02          |
| 09.   | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 8.9           |
| 10.   | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.89          |
| 11.   | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 2.9           |
| 12.   | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.40          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE



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Hindalco Industries: Environmental Monitoring report

April- June 2016

|   |                                   |
|---|-----------------------------------|
| Report no: : MEEPL/ JULY075/2016-17   | Date: 18 <sup>th</sup> July, 2016 |
| 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: Pakhar Plateau- Pakhar (115.13 ha.) Quarry No. 4 |                                   |
| Sample collected on: 16.06.2016   |                                   |
| Received: 20.06.2016  |                                   |
| Registered: 20.06.2016  |                                   |
| Test Start/End Date: 20.06.2016/23.06.2016                                  |                                   |

| LOCATION / IDENTIFICATION: Pakhar Plateau- Pakhar (115.13 ha.) Quarry No. 4 |  |                   |                |               |
|---|--|-------------------|----------------|---------------|
| Sl. No.   | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.   | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 59.8          |
| 02.   | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 40.1          |
| 03.   | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 29.8          |
| 04.   | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 41.2          |
| 05.   | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 8.90          |
| 06.   | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 9.2           |
| 07.   | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.51          |
| 08.   | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.02          |
| 09.   | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 8.1           |
| 10.   | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.89          |
| 11.   | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 3.0           |
| 12.   | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.51          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





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Hindalco Industries: Environmental Monitoring report

April- June 2016

|  |                                   |
|--|-----------------------------------|
| Report no: : MEEPL/ JULY076/2016-17  | Date: 18 <sup>th</sup> July, 2016 |
| 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: Pakhar Plateau- Pakhar Quarry 109.507 ha. (Near Shed) |                                   |
| Sample collected on: 16.06.2016  |                                   |
| Received: 20.06.2016   |                                   |
| Registered: 20.06.2016   |                                   |
| Test Start/End Date: 20.06.2016/23.06.2016                                       |                                   |

| LOCATION / IDENTIFICATION: Pakhar Plateau- Pakhar Quarry 109.507 ha. (Near Shed) |  |                   |                |               |
|--|--|-------------------|----------------|---------------|
| Sl. No.  | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.  | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 53.6          |
| 02.  | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 38.1          |
| 03.  | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 26.5          |
| 04.  | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 41.2          |
| 05.  | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 9.20          |
| 06.  | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 8.9           |
| 07.  | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.51          |
| 08.  | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.04          |
| 09.  | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 8.5           |
| 10.  | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.89          |
| 11.  | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 3.0           |
| 12.  | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.42          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





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Hindalco Industries: Environmental Monitoring report

April- June 2016

|   |                                   |
|---|-----------------------------------|
| Report no: : MEEPL/ JULY077/2016-17   | Date: 18 <sup>th</sup> July, 2016 |
| 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: Pakhar Plateau- Pakhar Quarry 109.507 ha. (Yatri Shed) |                                   |
| Sample collected on: 17.06.2016   |                                   |
| Received: 21.06.2016  |                                   |
| Registered: 21.06.2016  |                                   |
| Test Start/End Date: 21.06.2016/24.06.2016  |                                   |

| LOCATION / IDENTIFICATION: Pakhar Plateau- Pakhar Quarry 109.507 ha. (Yatri Shed) |  |                   |                |               |
|---|--|-------------------|----------------|---------------|
| Sl. No.   | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.   | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 54.2          |
| 02.   | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 39.5          |
| 03.   | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 29.5          |
| 04.   | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 40.7          |
| 05.   | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 8.9           |
| 06.   | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 8.2           |
| 07.   | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.51          |
| 08.   | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.04          |
| 09.   | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 10.1          |
| 10.   | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.89          |
| 11.   | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 3.5           |
| 12.   | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.51          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





# Mahabal Enviro Engineers Pvt. Ltd.

## Branch Office:

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Hindalco Industries: Environmental Monitoring report

April- June 2016

|  |                                   |
|--|-----------------------------------|
| Report no: : MEEPL/ JULY078/2016-17                                  | Date: 18 <sup>th</sup> July, 2016 |
| 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: Pakhar Plateau- 109.507 ha. Loading Area. |                                   |
| Sample collected on: 17.06.2016                                      |                                   |
| Received: 21.06.2016   |                                   |
| Registered: 21.06.2016   |                                   |
| Test Start/End Date: 21.06.2016/24.06.2016                           |                                   |

### LOCATION / IDENTIFICATION: Pakhar Plateau- 109.507 ha. Loading Area.

| Sl. No. | PARAMETERS   | UNIT              | Standard Limit | Concentration |
|---------|--|-------------------|----------------|---------------|
| 01.     | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 56.2          |
| 02.     | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 34.2          |
| 03.     | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 24.5          |
| 04.     | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 38.5          |
| 05.     | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 7.54          |
| 06.     | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 8.92          |
| 07.     | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.48          |
| 08.     | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.03          |
| 09.     | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 9.4           |
| 10.     | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.92          |
| 11.     | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 3.1           |
| 12.     | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.42          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





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Hindalco Industries: Environmental Monitoring report

April- June 2016

|  |                                   |
|--|-----------------------------------|
| Report no: : MEEPL/ JULY079/2016-17                          | Date: 18 <sup>th</sup> July, 2016 |
| 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: Pakhar Plateau-Near Weigh Bridge  |                                   |
| Sample collected on: 17.06.2016                              |                                   |
| Received: 21.06.2016   |                                   |
| Registered: 21.06.2016                                       |                                   |
| Test Start/End Date: 21.06.2016/24.06.2016                   |                                   |

| LOCATION / IDENTIFICATION: Pakhar Plateau-Near Weigh Bridge |  |                   |                |               |
|---|--|-------------------|----------------|---------------|
| Sl. No.   | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.   | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 58.9          |
| 02.   | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 39.5          |
| 03.   | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 30.1          |
| 04.   | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 41.2          |
| 05.   | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 8.9           |
| 06.   | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 8.5           |
| 07.   | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.45          |
| 08.   | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.04          |
| 09.   | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 9.9           |
| 10.   | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.91          |
| 11.   | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 3.0           |
| 12.   | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.46          |

For Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries: Environmental Monitoring report

April- June 2016

|   |                                   |
|---|-----------------------------------|
| Report no: : MEEPL/ JULY080/2016-17                     | Date: 18 <sup>th</sup> July, 2016 |
| Sample described by customer: Measurement of Noise      |                                   |
| Client Name: Hindalco Industries Limited                |                                   |
| Client Address: Lohardaga                               |                                   |
| Postal Code: 835203                                     |                                   |
| State: Jharkhand  |                                   |
| Country: India  |                                   |
| Sample Description: Measurement of Noise                |                                   |
| Sampling Method: Instrumental, using Sound level Metter |                                   |
| Data Collection Date: 16.06.2016                        |                                   |
| Analyse Date: 16.06.2016                                |                                   |

| Location/Identification | Unit            | Limit (day) | Result | Limit (night) | Result | Dates      |
|-------------------------|-----------------|-------------|--------|---------------|--------|------------|
| Pakhar Near Office      | dB (A) $L_{eq}$ | 75          | 48.9   | 70            | 45     | 16.06.2016 |

For Mahabal Enviro Engineers Pvt. Ltd.

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**Hindalco Industries: Environmental Monitoring report**

**April- June 2016**

|   |   |
|---|---|
| <b>Report no: : MEEPL/ JULY081/2016-17</b>                | <b>Date: 18<sup>th</sup> July, 2016</b> |
| Sample described by customer: <b>Measurement of Noise</b> |   |
| Client Name: <b>Hindalco Industries Limited</b>           |   |
| Client Address: Lohardaga                                 |   |
| Postal Code: 835203                                       |   |
| State: Jharkhand  |   |
| Country: India  |   |
| Sample Description: <b>Measurement of Noise</b>           |   |
| Sampling Method: Instrumental, using Sound level Metter   |   |
| Data Collection Date: <b>16.06.2016</b>                   |   |
| Analyse Date: <b>16.06.2016</b>                           |   |

| Location/Identification      | Unit            | Limit (day) | Result | Limit (night) | Result | Dates      |
|------------------------------|-----------------|-------------|--------|---------------|--------|------------|
| Pakhar Mines<br>(115.13 ha.) | dB (A) $L_{eq}$ | 75          | 62.0   | 70            | 41.2   | 16/06/2016 |

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Hindalco Industries: Environmental Monitoring report

April- June 2016

|   |   |
|---|---|
| <b>Report no: : MEEPL/ JULY082/2016-17</b>                | <b>Date: 18<sup>th</sup> July, 2016</b> |
| Sample described by customer: <b>Measurement of Noise</b> |   |
| Client Name: <b>Hindalco Industries Limited</b>           |   |
| Client Address: Lohardaga                                 |   |
| Postal Code: 835203                                       |   |
| State: Jharkhand  |   |
| Country: India  |   |
| Sample Description: <b>Measurement of Noise</b>           |   |
| Sampling Method: Instrumental, using Sound level Metter   |   |
| Data Collection Date: <b>16.06.2016</b>                   |   |
| Analyse Date: <b>16.06.2016</b>                           |   |

| Location/Identification                                | Unit                      | Limit (day) | Result | Limit (night) | Result | Dates      |
|--|---------------------------|-------------|--------|---------------|--------|------------|
| Pakhar Mine<br>(109.507 ha. of Minerals<br>& Minerals) | dB (A)<br>L <sub>eq</sub> | 75          | 65.0   | 70            | 39.8   | 16/06/2016 |

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Hindalco Industries: Environmental Monitoring report

April- June 2016

|   |  |
|---|--|
| <b>Report no:</b> : MEEPL/ JULY083/2016-17                | <b>Date:</b> 18 <sup>th</sup> July, 2016 |
| Sample described by customer: <b>Measurement of Noise</b> |  |
| Client Name: Hindalco Industries Limited                  |  |
| Client Address: Lohardaga                                 |  |
| Postal Code: 835203                                       |  |
| State: Jharkhand  |  |
| Country: India  |  |
| Sample Description: Measurement of Noise                  |  |
| Sampling Method: Instrumental, using Sound level Metter   |  |
| Data Collection Date: <b>17.06.2016</b>                   |  |
| Analyse Date: <b>17.06.2016</b>                           |  |

| Location/Identification                    | Unit            | Limit (day) | Result | Limit (night) | Result | Dates      |
|--|-----------------|-------------|--------|---------------|--------|------------|
| Pakhar Mine<br>(109.507 ha. of Yatri Shed) | dB (A) $L_{eq}$ | 75          | 54.5   | 70            | 42.5   | 17/06/2016 |

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Hindalco Industries: Environmental Monitoring report

April- June 2016

|   |  |
|---|--|
| <b>Report no:</b> : MEEPL/ JULY084/2016-17                | <b>Date:</b> 18 <sup>th</sup> July, 2016 |
| Sample described by customer: <b>Measurement of Noise</b> |  |
| Client Name: Hindalco Industries Limited                  |  |
| Client Address: Lohardaga                                 |  |
| Postal Code: 835203                                       |  |
| State: Jharkhand  |  |
| Country: India  |  |
| Sample Description: <b>Measurement of Noise</b>           |  |
| Sampling Method: Instrumental, using Sound level Metter   |  |
| Data Collection Date: <b>17.06.2016</b>                   |  |
| Analyse Date: <b>17.06.2016</b>                           |  |

| Location/Identification      | Unit            | Limit (day) | Result | Limit (night) | Result | Dates      |
|------------------------------|-----------------|-------------|--------|---------------|--------|------------|
| Pakhar Quarry<br>(Near Shed) | dB (A) $L_{eq}$ | 75          | 52.1   | 70            | 43.5   | 17/06/2016 |

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Hindalco Industries: Environmental Monitoring report

April- June 2016

|  |   |
|--|---|
| <b>Report no: : MEEPL/ JULY085/2016-17</b>                     | <b>Date: 18<sup>th</sup> July, 2016</b> |
| Sample described by customer: <b>Measurement of Spot Noise</b> |   |
| Client Name: Hindalco Industries Limited                       |   |
| Client Address: Lohardaga                                      |   |
| Postal Code: 835203  |   |
| State: Jharkhand   |   |
| Country: India   |   |
| Sample Description: <b>Measurement of Spot Noise</b>           |   |
| Sampling Method: Instrumental, using Sound level Metter        |   |
| Data Collection Date: <b>17.06.2016</b>                        |   |
| Analyse Date: <b>17.06.2016</b>                                |   |

| Location/Identification | Unit            | Limit (day) | Result | Dates      |
|-------------------------|-----------------|-------------|--------|------------|
| Pakhar Mines            | dB (A) $L_{eq}$ | 75          | 64.0   | 17/06/2016 |

For Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries: Environmental Monitoring report

April- June 2016

|  |   |
|--|---|
| <b>Report no: : MEEPL/ JULY086/2016-17</b>                     | <b>Date: 18<sup>th</sup> July, 2016</b> |
| Sample described by customer: <b>Measurement of Spot Noise</b> |   |
| Client Name: Hindalco Industries Limited                       |   |
| Client Address: Lohardaga                                      |   |
| Postal Code: 835203  |   |
| State: Jharkhand   |   |
| Country: India   |   |
| Sample Description: <b>Measurement of Spot Noise</b>           |   |
| Sampling Method: Instrumental, using Sound level Metter        |   |
| Data Collection Date: <b>17.06.2016</b>                        |   |
| Analyse Date: <b>17.06.2016</b>                                |   |

| Location/Identification  | Unit                   | Limit (day) | Result | Dates      |
|--|------------------------|-------------|--------|------------|
| Pakhar Mines (109.507 ha. Of Minerals & Minerals)<br>Loading point near Dumper | dB (A) L <sub>eq</sub> | 75          | 71.2   | 17/06/2016 |

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Hindalco Industries: Environmental Monitoring report

April- June 2016

|  |                                   |
|--|-----------------------------------|
| Report No: MEEPL/JULY087/2016-17                         | Date: 18 <sup>th</sup> July, 2016 |
| Sample described by customer : DRINKING WATER-POTABILITY |                                   |
| Client Name: Hindalco Industries Limited                 |                                   |
| Client Address: Lohardaga                                |                                   |
| Postal Code: 835203                                      |                                   |
| State: Jharkhand   |                                   |
| Country: India   |                                   |
| Sample Type: DRINKING WATER-POTABILITY                   |                                   |
| Marks on Sample: Location: Near Canteen                  |                                   |
| Quantity: 5 L X 2 No. PVC Can                            |                                   |
| Sample collected on: 17.06.2016                          |                                   |
| Received: 18.06.2016                                     |                                   |
| Registered: 18.06.2016                                   |                                   |
| Test Start/End Date: 18.06.2016/22.06.2016               |                                   |

| Sl. No. | Parameters                               | Unit  | Result    | Acceptable Limit (IS 10500:2012) | Method reference                                  |
|---------|--|-------|-----------|----------------------------------|---|
| 1       | Colour                                   | Hazen | <1        | 5 Max                            | APHA 22 <sup>nd</sup> Ed. 2012, 2120-B, 2-6       |
| 2       | Odour                                    | --    | Agreeable | Agreeable                        | IS 3025 (Part 7): 1983, Reaffirmed 2006           |
| 3       | Taste                                    | --    | Agreeable | Agreeable                        | IS 3025 (Part 7): 1983, Reaffirmed 2006           |
| 4       | Turbidity                                | NTU   | 0.32      | 1 Max                            | APHA 22 <sup>nd</sup> Ed. 2012, 2130-B, 2-13      |
| 5       | pH                                       | --    | 7.1       | 6.5-8.5                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-H+-B, 4-92   |
| 6       | Free Chlorides (Residual)                | mg/l  | <0.05     | 0.2 min                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CI-G, 4-69   |
| 7       | Total Dissolved Solids                   | mg/l  | 100       | 500 max                          | IS 3025 (Part 16): 1984, Reaffirmed 2006          |
| 8       | Monochloramines                          | mg/l  | <0.05     | --                               | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CIG, 4-69    |
| 9       | Dichloramines                            | mg/l  | <0.05     | --                               | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CIG, 4-69    |
| 10      | Total hardness (as CaCO <sub>3</sub> )   | mg/l  | 71        | 200 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CIG, 4-69    |
| 11      | Alkalinity Total (as CaCO <sub>3</sub> ) | mg/l  | 79        | 200 max                          | IS 3025 (Part 237): 1986, Reaffirmed 2009         |
| 12      | Chloride (as Cl)                         | mg/l  | 10.5      | 250 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CI-b, 4-72   |
| 13      | Sulphate (as SO <sub>4</sub> )           | mg/l  | 6.5       | 200 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-so4-e, 4-190 |



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Hindalco Industries: Environmental Monitoring report

April- June 2016

Continuation Sheet  
MEEPL/JULY087/2016-17

| Report No: MEEPL/JULY087/2016-17 |  |      |        |                                 | Date: 18 <sup>th</sup> July, 2016                              |
|----------------------------------|--|------|--------|---------------------------------|--|
| Sl. No.                          | Parameters   | Unit | Result | Acceptable Limit (IS10500:2012) | Method reference   |
| 14                               | Nitrate (as NO <sub>3</sub> )                            | mg/l | 1.10   | 45 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-NO <sub>3</sub> -E, 4-125 |
| 15                               | Fluoride (as F)  | mg/l | 0.5    | 1 max                           | APHA 22 <sup>nd</sup> Ed. 2012, 4500-FB & D, 4-84, 4-87        |
| 16                               | Boron (as B)   | mg/l | 0.12   | 0.5 max                         | APHA 22 <sup>nd</sup> Ed. 2012, 4500-BB, 4-25                  |
| 17                               | Calcium (as Ca)  | mg/l | 20.1   | 75 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 3500-Ca-B, 3-67                |
| 18                               | Magnesium (as Mg)  | mg/l | 6.0    | 30 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 3500-Mg-B, 3-84                |
| 19                               | Ammonical Nitrogen/Total Ammonia                         | mg/l | <0.1   | --                              | APHA 22 <sup>nd</sup> Ed. 2012, 4500-NH <sub>3</sub> -F, 4-115 |
| 20                               | Iron (as Fe)   | mg/l | 0.12   | 0.3 max                         | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 21                               | Manganese (as Mn)  | mg/l | N.D    | 0.1 max                         | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 22                               | Aluminium (as Al)  | mg/l | 0.01   | 0.03 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3500-Al-B, 3-61                |
| 23                               | Cadmium (as Cd)  | mg/l | N.D    | 0.003 max                       | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 24                               | Chromium Total (as Cr)                                   | mg/l | N.D    | 0.05 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 25                               | Copper (as Cu)   | mg/l | N.D    | 0.05 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 26                               | Lead (as Pb)   | mg/l | N.D    | 0.01 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 27                               | Zinc (as Zn)   | mg/l | 0.15   | 5 max                           | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 28                               | Arsenic (as As)  | mg/l | 0.006  | 0.01 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3114-B, 3-38                   |
| 29                               | Selenium (as Se)   | mg/l | N.D    | 0.001 max                       | APHA 22 <sup>nd</sup> Ed. 2012, 3112-B, 3-23                   |
| 30                               | Mercury (as hg)  | mg/l | N.D    | 0.01 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3114-B, 3-38                   |
| 31                               | Nickel (as Ni)   | mg/l | <0.008 | 0.02 max                        | APHA 22 <sup>nd</sup> 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 22 <sup>nd</sup> ED. 2012, 4500-C.N.C & 4-39 & 4-44       |
| 34                               | Anionic detergents as MBAS                               | mg/l | <0.1   | 0.2 max                         | APHA 22 <sup>nd</sup> ED. 2012, 5540-C.C & 5-53                |
| 35                               | Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH) | mg/l | N.D    | 0.001 max                       | APHA 22 <sup>nd</sup> ED. 2012, 5530-B & C 5-4753              |
| 36                               | Polynuclear aromatic hydrocarbons (PAH)                  | mg/l | N.D    | 0.0001 max                      | APHA 22 <sup>nd</sup> ED. 2012, 6440, 6-93                     |
| 37                               | Polychlorinated Biphenyls (PCBs)                         | mg/l | N.D    | 0.0005 max                      | USEPA Method 8082  |
| 38                               | Sulphide (as S)  | mg/l | N.D    | 0.05 max                        | APHA 22 <sup>nd</sup> ED. 2012, 4500-S2-C 4-175 & F 4-178      |



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# Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries: Environmental Monitoring report

April- June 2016

Continuation Sheet  
MEEPL/JULY087/2016-17

| Report No: MEEPL/JULY087/2016-17 |                     |           |        |                                  | Date: 18 <sup>th</sup> July, 2016                               |
|----------------------------------|---------------------|-----------|--------|----------------------------------|---|
| Sl. No.                          | Parameters          | Unit      | Result | Acceptable Limit (IS 10500:2012) | Method Reference  |
| <b>Microbiological Analysis</b>  |                     |           |        |                                  |   |
| 1                                | Total Colliforms    | MPN/100mL | N.D    | <1.1                             | APHA 22 <sup>nd</sup> Ed. 2012, 9221-B & C, 9-66, 9-69 and 9-67 |
| 2                                | E-Coli              | MPN/100mL | N.D    | Absent                           | APHA 22 <sup>nd</sup> Ed. 2012, 9221-B & C, 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 508-1995   |
| 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                               | Methoyle 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   |
| Remarks: N.D- Not Detected       |                     |           |        |                                  |   |

Conclusion : The Physical & Chemical Analysis report indicates that the water is not contaminated and potable.

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





# Mahabal Enviro Engineers Pvt. Ltd.

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**Hindalco Industries: Environmental Monitoring report**

**April- June 2016**

|  |  |
|--|--|
| <b>Report No:</b> MEEPL/JULY088/2016-17                          | <b>Date:</b> 18 <sup>th</sup> July, 2016 |
| <b>Sample described by customer :</b> SURFACE WATER - POTABILITY |  |
| <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> SURFACE WATER                                |  |
| <b>Marks on Sample: Location:</b> 115.13 Quarry                  |  |
| <b>Quantity:</b> 5 L X 2 No. PVC Can                             |  |
| <b>Sample collected on:</b> 17.06.2016                           |  |
| <b>Received:</b> 18.06.2016                                      |  |
| <b>Registered:</b> 18.06.2016                                    |  |
| <b>Test Start/End Date:</b> 18.06.2016/22.06.2016                |  |

| Sl. No. | Parameters                               | Unit  | Result    | Acceptable Limit (IS 10500:2012) | Method reference                                  |
|---------|--|-------|-----------|----------------------------------|---|
| 1       | Colour                                   | Hazen | <1        | 5 Max                            | APHA 22 <sup>nd</sup> Ed. 2012, 2120-B, 2-6       |
| 2       | Odour                                    | --    | Agreeable | Agreeable                        | IS 3025 (Part 7): 1983, Reaffirmed 2006           |
| 3       | Taste                                    | --    | Agreeable | Agreeable                        | IS 3025 (Part 7): 1983, Reaffirmed 2006           |
| 4       | Turbidity                                | NTU   | 0.32      | 1 Max                            | APHA 22 <sup>nd</sup> Ed. 2012, 2130-B, 2-13      |
| 5       | pH                                       | --    | 7.0       | 6.5-8.5                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-H+-B, 4-92   |
| 6       | Free Chlorides (Residual)                | mg/l  | <0.05     | 0.2 min                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CI-G, 4-69   |
| 7       | Total Dissolved Solids                   | mg/l  | 100       | 500 max                          | IS 3025 (Part 16): 1984, Reaffirmed 2006          |
| 8       | Monochloramines                          | mg/l  | <0.05     | --                               | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CIG, 4-69    |
| 9       | Dichloramines                            | mg/l  | <0.05     | --                               | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CIG, 4-69    |
| 10      | Total hardness (as CaCO <sub>3</sub> )   | mg/l  | 72        | 200 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CIG, 4-69    |
| 11      | Alkalinity Total (as CaCO <sub>3</sub> ) | mg/l  | 80        | 200 max                          | IS 3025 (Part 237): 1986, Reaffirmed 2009         |
| 12      | Chloride (as Cl)                         | mg/l  | 10.2      | 250 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CI-b, 4-72   |
| 13      | Sulphate (as SO <sub>4</sub> )           | mg/l  | 7.2       | 200 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-so4-e, 4-190 |



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Hindalco Industries: Environmental Monitoring report

April- June 2016

Continuation Sheet  
MEEPL/JULY088/2016-17

| Report No: MEEPL/JULY088/2016-17 |  |      |        |                                 | Date: 18 <sup>th</sup> July, 2016                              |
|----------------------------------|--|------|--------|---------------------------------|--|
| Sl. No.                          | Parameters   | Unit | Result | Acceptable Limit (IS10500:2012) | Method reference   |
| 14                               | Nitrate (as NO <sub>3</sub> )                            | mg/l | 1.25   | 45 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-NO <sub>3</sub> -E, 4-125 |
| 15                               | Fluoride (as F)  | mg/l | 0.2    | 1 max                           | APHA 22 <sup>nd</sup> Ed. 2012, 4500-FB & D, 4-84, 4-87        |
| 16                               | Boron (as B)   | mg/l | 0.24   | 0.5 max                         | APHA 22 <sup>nd</sup> Ed. 2012, 4500-BB, 4-25                  |
| 17                               | Calcium (as Ca)  | mg/l | 21.2   | 75 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 3500-Ca-B, 3-67                |
| 18                               | Magnesium (as Mg)  | mg/l | 6.0    | 30 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 3500-Mg-B, 3-84                |
| 19                               | Ammonical Nitrogen/Total Ammonia                         | mg/l | <0.1   | --                              | APHA 22 <sup>nd</sup> Ed. 2012, 4500-NH <sub>3</sub> -F, 4-115 |
| 20                               | Iron (as Fe)   | mg/l | 0.10   | 0.3 max                         | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 21                               | Manganese (as Mn)  | mg/l | N.D    | 0.1 max                         | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 22                               | Aluminium (as Al)  | mg/l | 0.01   | 0.03 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3500-Al-B, 3-61                |
| 23                               | Cadmium (as Cd)  | mg/l | N.D    | 0.003 max                       | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 24                               | Chromium Total (as Cr)                                   | mg/l | N.D    | 0.05 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 25                               | Copper (as Cu)   | mg/l | N.D    | 0.05 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 26                               | Lead (as Pb)   | mg/l | N.D    | 0.01 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 27                               | Zinc (as Zn)   | mg/l | 0.15   | 5 max                           | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 28                               | Arsenic (as As)  | mg/l | <0.01  | 0.01 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3114-B, 3-38                   |
| 29                               | Selenium (as Se)   | mg/l | N.D    | 0.001 max                       | APHA 22 <sup>nd</sup> Ed. 2012, 3112-B, 3-23                   |
| 30                               | Mercury (as hg)  | mg/l | N.D    | 0.01 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3114-B, 3-38                   |
| 31                               | Nickel (as Ni)   | mg/l | <0.008 | 0.02 max                        | APHA 22 <sup>nd</sup> 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 22 <sup>nd</sup> ED. 2012, 4500-CN.C & 4-39 & 4-44        |
| 34                               | Anionic detergents as MBAS                               | mg/l | <0.1   | 0.2 max                         | APHA 22 <sup>nd</sup> ED. 2012, 5540-C.C & 5-53                |
| 35                               | Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH) | mg/l | N.D    | 0.001 max                       | APHA 22 <sup>nd</sup> ED. 2012, 5530-B & C 5-4753              |
| 36                               | Polynuclear aromatic hydrocarbons (PAH)                  | mg/l | N.D    | 0.0001 max                      | APHA 22 <sup>nd</sup> ED. 2012, 6440, 6-93                     |
| 37                               | Polychlorinated Biphenyls (PCBs)                         | mg/l | N.D    | 0.0005 max                      | USEPA Method 8082  |
| 38                               | Sulphide (as S)  | mg/l | N.D    | 0.05 max                        | APHA 22 <sup>nd</sup> ED. 2012, 4500-S2-C 4-175 & F 4-178      |



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Hindalco Industries: Environmental Monitoring report

April- June 2016

Continuation Sheet  
MEEPL/JULY088/2016-17

| Report No: MEEPL/JULY088/2016-17 |                     |           |        |                                  | Date: 18 <sup>th</sup> July, 2016                               |
|----------------------------------|---------------------|-----------|--------|----------------------------------|---|
| Sl. No.                          | Parameters          | Unit      | Result | Acceptable Limit (IS 10500:2012) | Method Reference  |
| <b>Microbiological Analysis</b>  |                     |           |        |                                  |   |
| 1                                | Total Colliforms    | MPN/100mL | N.D    | <1.1                             | APHA 22 <sup>nd</sup> Ed. 2012, 9221-B & C, 9-66, 9-69 and 9-67 |
| 2                                | E-Coli              | MPN/100mL | N.D    | Absent                           | APHA 22 <sup>nd</sup> Ed. 2012, 9221-B & C, 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 508-1995   |
| 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                               | Methoysl 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   |
| Remarks: N.D- Not Detected       |                     |           |        |                                  |   |

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

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





# Eco Ventures Pvt. Ltd.

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Corporate Office: 7/8 Bhaveshwar Bhuvan, Opp Portugese Church, Near Dindayal Upadhyay Garden,  
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## Mahabal Enviro Engineers Pvt. Ltd.

At Booty, Near PHED Colony, Behind Pump House, PO – RMCC,  
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### PAKHAR PLATEAU- ENVIRONMENTAL MONITORING REPORT

JULY TO SEPTEMBER 2016

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





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**Hindalco Industries: Environmental Monitoring Report**

**JULY - SEPTEMBER 2016**

## CONTENT

|   | LOCATION  |
|---|---|
|   | <b>AMBIENT AIR QUALITY</b>  |
| 1 | Pakhar Plateau- Near Office   |
| 2 | Pakhar Plateau- Pakhar (115.13 ha.) Quarry No. 4                            |
| 3 | Pakhar Plateau- Pakhar Quarry (109.507 ha. Near Shed)                       |
| 4 | Pakhar Plateau Pakhar Mines(109.507 ha. Yatri Shed)                         |
| 5 | Pakhar Plateau- Pakhar Loading Area (109.507 ha.)                           |
| 6 | Pakhar Plateau-Near Weigh Bridge  |
|   | <b>NOISE LEVEL</b>  |
| 1 | Pakhar Near Office.   |
| 2 | Pakhar Mine (115.13 ha. ) Pakhar Plateau                                    |
| 3 | Pakhar Mine (109.507 ha. Loading Area) Pakhar Plateau                       |
| 4 | Pakhar Mine (109.507 Ha Yatri Shed ) Pakhar Plateau                         |
| 5 | Pakhar Quarry (Near Shed)   |
|   | <b>SPOT NOISE LEVEL</b>   |
| 1 | Near Poclain at Pakhar Mine (115.13 ha.)                                    |
| 2 | Loading point near Dumper at Pakhar Mines (109.507 ha. Minerals & Minerals) |
|   | <b>DRINKING WATER</b>   |
| 1 | Pakhar Mine-Near Canteen  |
|   | <b>SURFACE WATER</b>  |
| 1 | Pakhar Mine-115.13 Quarry   |





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**Hindalco Industries: Environmental Monitoring Report**

**JULY – SEPTEMBER 2016**

|  |                                      |
|--|--------------------------------------|
| Report no: : MEEPL/ OCT0147/2016-17                          | Date: 31 <sup>st</sup> October, 2016 |
| 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: Pakhar Plateau-Near Office        |                                      |
| Sample collected on: 22.09.2016                              |                                      |
| Received: 23.09.2016   |                                      |
| Registered: 23.09.2016                                       |                                      |
| Test Start/End Date: 23.09.2016/25.09.2016                   |                                      |

| LOCATION / IDENTIFICATION: Pakhar Plateau-Near Office |  |                   |                |               |
|---|--|-------------------|----------------|---------------|
| Sl. No.   | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.   | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 68.1          |
| 02.   | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 34.7          |
| 03.   | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 26.3          |
| 04.   | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 34.8          |
| 05.   | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 14.1          |
| 06.   | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 17.5          |
| 07.   | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.42          |
| 08.   | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.02          |
| 09.   | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 5.1           |
| 10.   | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.74          |
| 11.   | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 2.5           |
| 12.   | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.36          |

For Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries: Environmental Monitoring Report

JULY – SEPTEMBER 2016

|   |                                      |
|---|--------------------------------------|
| Report no: : MEEPL/ OCT0148/2016-17   | Date: 31 <sup>st</sup> October, 2016 |
| 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: Pakhar Plateau- Pakhar (115.13 ha.) Quarry No. 4 |                                      |
| Sample collected on: 25.09.2016   |                                      |
| Received: 26.09.2016  |                                      |
| Registered: 26.09.2016  |                                      |
| Test Start/End Date: 26.09.2016/28.09.2016                                  |                                      |

| LOCATION / IDENTIFICATION: Pakhar Plateau- Pakhar (115.13 ha.) Quarry No. 4 |  |                   |                |               |
|---|--|-------------------|----------------|---------------|
| Sl. No.   | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.   | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 65.0          |
| 02.   | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 43.7          |
| 03.   | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 21.9          |
| 04.   | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 34.0          |
| 05.   | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 11.5          |
| 06.   | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 13.2          |
| 07.   | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.48          |
| 08.   | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.02          |
| 09.   | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 6.4           |
| 10.   | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.72          |
| 11.   | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 2.8           |
| 12.   | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.47          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE







# Mahabal Enviro Engineers Pvt. Ltd.

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E-mail: [mahabalranchi@gmail.com](mailto:mahabalranchi@gmail.com)

Hindalco Industries: Environmental Monitoring Report

JULY - SEPTEMBER 2016

|  |                                      |
|--|--------------------------------------|
| Report no: : MEEPL/ OCT0149/2016-17  | Date: 31 <sup>st</sup> October, 2016 |
| 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: Pakhar Plateau- Pakhar Quarry 109.507 ha. (Near Shed) |                                      |
| Sample collected on: 22.09.2016  |                                      |
| Received: 23.09.2016   |                                      |
| Registered: 23.09.2016   |                                      |
| Test Start/End Date: 23.09.2016/25.09.2016                                       |                                      |

| LOCATION / IDENTIFICATION: Pakhar Plateau- Pakhar Quarry 109.507 ha. (Near Shed) |  |                   |                |               |
|--|--|-------------------|----------------|---------------|
| Sl. No.  | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.  | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 59.2          |
| 02.  | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 34.5          |
| 03.  | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 22.9          |
| 04.  | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 39.2          |
| 05.  | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 12.1          |
| 06.  | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 16.4          |
| 07.  | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.49          |
| 08.  | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.03          |
| 09.  | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 6.4           |
| 10.  | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.85          |
| 11.  | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 2.8           |
| 12.  | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.41          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





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Hindalco Industries: Environmental Monitoring Report

JULY – SEPTEMBER 2016

|   |                                      |
|---|--------------------------------------|
| Report no: : MEEPL/ OCT0150/2016-17   | Date: 31 <sup>st</sup> October, 2016 |
| 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: Pakhar Plateau- Pakhar Quarry 109.507 ha. (Yatri Shed) |                                      |
| Sample collected on: 25.09.2016   |                                      |
| Received: 26.09.2016  |                                      |
| Registered: 26.09.2016  |                                      |
| Test Start/End Date: 26.09.2016/28.09.2016  |                                      |

| LOCATION / IDENTIFICATION: Pakhar Plateau- Pakhar Quarry 109.507 ha. (Yatri Shed) |  |                   |                |               |
|---|--|-------------------|----------------|---------------|
| Sl. No.   | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.   | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 42.9          |
| 02.   | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 25.1          |
| 03.   | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 21.5          |
| 04.   | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 35.8          |
| 05.   | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 11.3          |
| 06.   | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 17.5          |
| 07.   | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.51          |
| 08.   | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.02          |
| 09.   | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 7.2           |
| 10.   | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.84          |
| 11.   | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 3.1           |
| 12.   | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.49          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





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**Hindalco Industries: Environmental Monitoring Report**

**JULY – SEPTEMBER 2016**

|  |                                      |
|--|--------------------------------------|
| Report no: : MEEPL/ OCT0151/2016-17                                  | Date: 31 <sup>st</sup> October, 2016 |
| 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: Pakhar Plateau- 109.507 ha. Loading Area. |                                      |
| Sample collected on: 22.09.2016                                      |                                      |
| Received: 23.09.2016   |                                      |
| Registered: 23.09.2016   |                                      |
| Test Start/End Date: 23.09.2016/25.09.2016                           |                                      |

### LOCATION / IDENTIFICATION: Pakhar Plateau- 109.507 ha. Loading Area.

| Sl. No. | PARAMETERS   | UNIT              | Standard Limit | Concentration |
|---------|--|-------------------|----------------|---------------|
| 01.     | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 61.8          |
| 02.     | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 37.3          |
| 03.     | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 23.7          |
| 04.     | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 38.1          |
| 05.     | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 9.5           |
| 06.     | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 13.7          |
| 07.     | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.45          |
| 08.     | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.02          |
| 09.     | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 8.1           |
| 10.     | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.90          |
| 11.     | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 2.8           |
| 12.     | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.40          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey

SENIOR EXECUTIVE





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Hindalco Industries: Environmental Monitoring Report

JULY – SEPTEMBER 2016

|  |                                      |
|--|--------------------------------------|
| Report no: : MEEPL/ OCT0152/2016-17                          | Date: 31 <sup>st</sup> October, 2016 |
| 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: Pakhar Plateau-Near Weigh Bridge  |                                      |
| Sample collected on: 25.09.2016                              |                                      |
| Received: 26.09.2016   |                                      |
| Registered: 26.09.2016                                       |                                      |
| Test Start/End Date: 26.09.2016/28.09.2016                   |                                      |

| LOCATION / IDENTIFICATION: Pakhar Plateau-Near Weigh Bridge |  |                   |                |               |
|---|--|-------------------|----------------|---------------|
| Sl. No.   | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.   | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 63.0          |
| 02.   | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 35.7          |
| 03.   | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 26.1          |
| 04.   | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 39.5          |
| 05.   | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 10.2          |
| 06.   | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 13.7          |
| 07.   | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.48          |
| 08.   | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.03          |
| 09.   | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 8.1           |
| 10.   | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.83          |
| 11.   | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 2.9           |
| 12.   | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.41          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





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Hindalco Industries: Environmental Monitoring Report

JULY - SEPTEMBER 2016

|   |                                      |
|---|--------------------------------------|
| Report no: : MEEPL/ OCT0153/2016-17                     | Date: 31 <sup>st</sup> October, 2016 |
| Sample described by customer: Measurement of Noise      |                                      |
| Client Name: Hindalco Industries Limited                |                                      |
| Client Address: Lohardaga                               |                                      |
| Postal Code: 835203                                     |                                      |
| State: Jharkhand  |                                      |
| Country: India  |                                      |
| Sample Description: Measurement of Noise                |                                      |
| Sampling Method: Instrumental, using Sound level Metter |                                      |
| Data Collection Date: 22.09.2016                        |                                      |
| Analyse Date: 23.09.2016                                |                                      |

| Location/Identification | Unit            | Limit (day) | Result | Limit (night) | Result | Dates      |
|-------------------------|-----------------|-------------|--------|---------------|--------|------------|
| Pakhar Near Office      | dB (A) $L_{eq}$ | 75          | 51.1   | 70            | 43.5   | 22.09.2016 |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE



Head Office: Plot No. F-7, Road No. 21, Wagle Estate, Thane West - 400604, Maharashtra, India  
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Hindalco Industries: Environmental Monitoring Report

JULY – SEPTEMBER 2016

|   |   |
|---|---|
| <b>Report no. :</b> MEEPL/ OCT0154/2016-17                | <b>Date:</b> 31 <sup>st</sup> October, 2016 |
| Sample described by customer: <b>Measurement of Noise</b> |   |
| Client Name: <b>Hindalco Industries Limited</b>           |   |
| Client Address: Lohardaga                                 |   |
| Postal Code: 835203                                       |   |
| State: Jharkhand  |   |
| Country: India  |   |
| Sample Description: <b>Measurement of Noise</b>           |   |
| Sampling Method: Instrumental, using Sound level Metter   |   |
| Data Collection Date: <b>22.09.2016</b>                   |   |
| Analyse Date: <b>22.09.2016</b>                           |   |

| Location/Identification      | Unit            | Limit (day) | Result | Limit (night) | Result | Dates      |
|------------------------------|-----------------|-------------|--------|---------------|--------|------------|
| Pakhar Mines<br>(115.13 ha.) | dB (A) $L_{eq}$ | 75          | 58.9   | 70            | 46.1   | 22.09.2016 |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE



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Hindalco Industries: Environmental Monitoring Report

JULY - SEPTEMBER 2016

|   |  |
|---|--|
| <b>Report no. : MEEPL/ OCT0155/2016-17</b>                | <b>Date: 31<sup>st</sup> October, 2016</b> |
| Sample described by customer: <b>Measurement of Noise</b> |  |
| Client Name: <b>Hindalco Industries Limited</b>           |  |
| Client Address: Lohardaga                                 |  |
| Postal Code: 835203                                       |  |
| State: Jharkhand  |  |
| Country: India  |  |
| Sample Description: <b>Measurement of Noise</b>           |  |
| Sampling Method: Instrumental, using Sound level Metter   |  |
| Data Collection Date: <b>22.09.2016</b>                   |  |
| Analyse Date: <b>22.09.2016</b>                           |  |

| Location/Identification                                | Unit          | Limit (day) | Result      | Limit (night) | Result      | Dates      |
|--|---------------|-------------|-------------|---------------|-------------|------------|
| Pakhar Mine<br>(109.507 ha. of Minerals<br>& Minerals) | dB (A)<br>Leq | 75          | <b>61.8</b> | 70            | <b>36.2</b> | 22.09/2016 |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





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Hindalco Industries: Environmental Monitoring Report

JULY – SEPTEMBER 2016

|   |  |
|---|--|
| <b>Report no. : MEEPL/ OCT0156/2016-17</b>                | <b>Date: 31<sup>st</sup> October, 2016</b> |
| Sample described by customer: <b>Measurement of Noise</b> |  |
| Client Name: Hindalco Industries Limited                  |  |
| Client Address: Lohardaga                                 |  |
| Postal Code: 835203                                       |  |
| State: Jharkhand  |  |
| Country: India  |  |
| Sample Description: Measurement of Noise                  |  |
| Sampling Method: Instrumental, using Sound level Metter   |  |
| Data Collection Date: <b>22.09.2016</b>                   |  |
| Analyse Date: <b>22.09.2016</b>                           |  |

| Location/Identification                       | Unit                   | Limit (day) | Result | Limit (night) | Result | Dates      |
|---|------------------------|-------------|--------|---------------|--------|------------|
| Pakhar Mine<br>(109.507 ha. of Yatri<br>Shed) | dB (A) L <sub>eq</sub> | 75          | 52.8   | 70            | 40.0   | 22.09.2016 |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE







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Hindalco Industries: Environmental Monitoring Report

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|   |   |
|---|---|
| <b>Report no. :</b> MEEPL/ OCT0157/2016-17                | <b>Date:</b> 31 <sup>st</sup> October, 2016 |
| Sample described by customer: <b>Measurement of Noise</b> |   |
| Client Name: Hindalco Industries Limited                  |   |
| Client Address: Lohardaga                                 |   |
| Postal Code: 835203                                       |   |
| State: Jharkhand  |   |
| Country: India  |   |
| Sample Description: <b>Measurement of Noise</b>           |   |
| Sampling Method: Instrumental, using Sound level Metter   |   |
| Data Collection Date: <b>22.09.2016</b>                   |   |
| Analyse Date: <b>22.09.2016</b>                           |   |

| Location/Identification      | Unit            | Limit (day) | Result | Limit (night) | Result | Dates      |
|------------------------------|-----------------|-------------|--------|---------------|--------|------------|
| Pakhar Quarry<br>(Near Shed) | dB (A) $L_{eq}$ | 75          | 50.9   | 70            | 41.4   | 22.09.2016 |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey

SENIOR EXECUTIVE





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Hindalco Industries: Environmental Monitoring Report

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|  |   |
|--|---|
| <b>Report no. :</b> MEEPL/ OCT0158/2016-17                     | <b>Date:</b> 31 <sup>st</sup> October, 2016 |
| Sample described by customer: <b>Measurement of Spot Noise</b> |   |
| Client Name: Hindalco Industries Limited                       |   |
| Client Address: Lohardaga                                      |   |
| Postal Code: 835203  |   |
| State: Jharkhand   |   |
| Country: India   |   |
| Sample Description: <b>Measurement of Spot Noise</b>           |   |
| Sampling Method: Instrumental, using Sound level Metter        |   |
| Data Collection Date: <b>22.09.2016</b>                        |   |
| Analyse Date: <b>22.09.2016</b>                                |   |

| Location/Identification | Unit            | Limit (day) | Result      | Dates      |
|-------------------------|-----------------|-------------|-------------|------------|
| Pakhar Mines            | dB (A) $L_{eq}$ | 75          | <b>62.1</b> | 22.09.2016 |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE



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Hindalco Industries: Environmental Monitoring Report

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|  |   |
|--|---|
| <b>Report no. :</b> MEEPL/ OCT0159/2016-17                     | <b>Date:</b> 31 <sup>st</sup> October, 2016 |
| Sample described by customer: <b>Measurement of Spot Noise</b> |   |
| Client Name: Hindalco Industries Limited                       |   |
| Client Address: Lohardaga                                      |   |
| Postal Code: 835203  |   |
| State: Jharkhand   |   |
| Country: India   |   |
| Sample Description: <b>Measurement of Spot Noise</b>           |   |
| Sampling Method: Instrumental, using Sound level Metter        |   |
| Data Collection Date: <b>22.09.2016</b>                        |   |
| Analyse Date: <b>22.09.2016</b>                                |   |

| Location/Identification  | Unit            | Limit (day) | Result | Dates      |
|--|-----------------|-------------|--------|------------|
| Pakhar Mines (109.507 ha. Of Minerals & Minerals)<br>Loading point near Dumper | dB (A) $L_{eq}$ | 75          | 68.5   | 22.09.2016 |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey

SENIOR EXECUTIVE





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Hindalco Industries: Environmental Monitoring Report

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|  |                                      |
|--|--------------------------------------|
| Report no: : MEEPL/ OCT0160/2016-17                      | Date: 31 <sup>st</sup> October, 2016 |
| Sample described by customer : DRINKING WATER-POTABILITY |                                      |
| Client Name: Hindalco Industries Limited                 |                                      |
| Client Address: Lohardaga                                |                                      |
| Postal Code: 835203                                      |                                      |
| State: Jharkhand   |                                      |
| Country: India   |                                      |
| Sample Type: DRINKING WATER-POTABILITY                   |                                      |
| Marks on Sample: Location: Near Canteen                  |                                      |
| Quantity: 5 L X 2 No. PVC Can                            |                                      |
| Sample collected on: 22.09.2016                          |                                      |
| Received: 22.09.2016                                     |                                      |
| Registered: 22.09.2016                                   |                                      |
| Test Start/End Date: 22.09.2016/24.09.2016               |                                      |

| Sl. No. | Parameters                               | Unit  | Result    | Acceptable Limit (IS 10500:2012) | Method reference                                  |
|---------|--|-------|-----------|----------------------------------|---|
| 1       | Colour                                   | Hazen | <1        | 5 Max                            | APHA 22 <sup>nd</sup> Ed. 2012, 2120-B, 2-6       |
| 2       | Odour                                    | --    | Agreeable | Agreeable                        | IS 3025 (Part 7): 1983, Reaffirmed 2006           |
| 3       | Taste                                    | --    | Agreeable | Agreeable                        | IS 3025 (Part 7): 1983, Reaffirmed 2006           |
| 4       | Turbidity                                | NTU   | 0.28      | 1 Max                            | APHA 22 <sup>nd</sup> Ed. 2012, 2130-B, 2-13      |
| 5       | pH                                       | --    | 7.0       | 6.5-8.5                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-H+-B, 4-92   |
| 6       | Free Chlorides (Residual)                | mg/l  | <0.05     | 0.2 min                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CI-G, 4-69   |
| 7       | Total Dissolved Solids                   | mg/l  | 85        | 500 max                          | IS 3025 (Part 16): 1984, Reaffirmed 2006          |
| 8       | Monochloramines                          | mg/l  | <0.05     | --                               | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CIG, 4-69    |
| 9       | Dichloramines                            | mg/l  | <0.05     | --                               | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CIG, 4-69    |
| 10      | Total hardness (as CaCO <sub>3</sub> )   | mg/l  | 64        | 200 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CIG, 4-69    |
| 11      | Alkalinity Total (as CaCO <sub>3</sub> ) | mg/l  | 68        | 200 max                          | IS 3025 (Part 237): 1986, Reaffirmed 2009         |
| 12      | Chloride (as Cl)                         | mg/l  | 9.1       | 250 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CI-b, 4-72   |
| 13      | Sulphate (as SO <sub>4</sub> )           | mg/l  | 4.8       | 200 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-so4-e, 4-190 |



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Hindalco Industries: Environmental Monitoring Report

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Continuation Sheet  
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| Report no: : MEEPL/ OCT0160/2016-17 |  |      |        |                                 | Date: 31 <sup>st</sup> October, 2016                           |
|-------------------------------------|--|------|--------|---------------------------------|--|
| Sl. No.                             | Parameters   | Unit | Result | Acceptable Limit (IS10500:2012) | Method reference   |
| 14                                  | Nitrate (as NO <sub>3</sub> )                            | mg/l | 1.02   | 45 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-NO <sub>3</sub> -E, 4-125 |
| 15                                  | Fluoride (as F)  | mg/l | 0.2    | 1 max                           | APHA 22 <sup>nd</sup> Ed. 2012, 4500-FB & D, 4-84, 4-87        |
| 16                                  | Boron (as B)   | mg/l | 0.07   | 0.5 max                         | APHA 22 <sup>nd</sup> Ed. 2012, 4500-BB, 4-25                  |
| 17                                  | Calcium (as Ca)  | mg/l | 18.5   | 75 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 3500-Ca-B, 3-67                |
| 18                                  | Magnesium (as Mg)  | mg/l | 5.1    | 30 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 3500-Mg-B, 3-84                |
| 19                                  | Ammonical Nitrogen/Total Ammonia                         | mg/l | <0.1   | --                              | APHA 22 <sup>nd</sup> Ed. 2012, 4500-NH <sub>3</sub> -F, 4-115 |
| 20                                  | Iron (as Fe)   | mg/l | 0.12   | 0.3 max                         | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 21                                  | Manganese (as Mn)  | mg/l | N.D    | 0.1 max                         | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 22                                  | Aluminium (as Al)  | mg/l | 0.01   | 0.03 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3500-Al-B, 3-61                |
| 23                                  | Cadmium (as Cd)  | mg/l | N.D    | 0.003 max                       | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 24                                  | Chromium Total (as Cr)                                   | mg/l | N.D    | 0.05 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 25                                  | Copper (as Cu)   | mg/l | N.D    | 0.05 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 26                                  | Lead (as Pb)   | mg/l | N.D    | 0.01 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 27                                  | Zinc (as Zn)   | mg/l | 0.13   | 5 max                           | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                   |
| 28                                  | Arsenic (as As)  | mg/l | 0.006  | 0.01 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3114-B, 3-38                   |
| 29                                  | Selenium (as Se)   | mg/l | N.D    | 0.001 max                       | APHA 22 <sup>nd</sup> Ed. 2012, 3112-B, 3-23                   |
| 30                                  | Mercury (as Hg)  | mg/l | N.D    | 0.01 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3114-B, 3-38                   |
| 31                                  | Nickel (as Ni)   | mg/l | <0.008 | 0.02 max                        | APHA 22 <sup>nd</sup> 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 22 <sup>nd</sup> Ed. 2012, 4500-CN.C & 4-39 & 4-44        |
| 34                                  | Anionic detergents as MBAS                               | mg/l | <0.1   | 0.2 max                         | APHA 22 <sup>nd</sup> Ed. 2012, 5540-C.C & 5-53                |
| 35                                  | Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH) | mg/l | N.D    | 0.001 max                       | APHA 22 <sup>nd</sup> Ed. 2012, 5530-B & C 5-4753              |
| 36                                  | Polynuclear aromatic hydrocarbons (PAH)                  | mg/l | N.D    | 0.0001 max                      | APHA 22 <sup>nd</sup> Ed. 2012, 6440, 6-93                     |
| 37                                  | Polychlorinated Biphenyls (PCBs)                         | mg/l | N.D    | 0.0005 max                      | USEPA Method 8082  |
| 38                                  | Sulphide (as S)  | mg/l | N.D    | 0.05 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 4500-S2-C 4-175 & F 4-178      |



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Hindalco Industries: Environmental Monitoring Report

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Continuation Sheet  
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| Report no: : MEEPL/OCT0160/2016-17 |                     |           | Date: 31 <sup>st</sup> October, 2016 |                                  |   |
|------------------------------------|---------------------|-----------|--------------------------------------|----------------------------------|---|
| Sl. No.                            | Parameters          | Unit      | Result                               | Acceptable Limit (IS 10500:2012) | Method Reference  |
| <b>Microbiological Analysis</b>    |                     |           |                                      |                                  |   |
| 1                                  | Total Colliforms    | MPN/100mL | N.D                                  | <1.1                             | APHA 22 <sup>nd</sup> Ed. 2012, 9221-B & C, 9-66, 9-69 and 9-67 |
| 2                                  | E-Coli              | MPN/100mL | N.D                                  | Absent                           | APHA 22 <sup>nd</sup> Ed. 2012, 9221-B & C, 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                                 | Σ-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 508-1995   |
| 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                                 | Methoyl 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   |
| Remarks: N.D- Not Detected         |                     |           |                                      |                                  |   |

Conclusion : The Physical & Chemical Analysis report indicates that the water is not contaminated and potable.

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PRODUCTION, MINED OUT, BACKFILLED, PRODUCTION AND OVERBURDEN REMOVAL FROM APR-16 to SEP-16

| NAME OF THE MINES                      | MINING LEASE AREA<br>(In HA) | MINED OUT AREA<br>(In HA) | BACK FILLED AREA<br>(in HA) | PRODUCTION<br>(In MT) | OVERBURDEN<br>(In Cu.M) |
|--|------------------------------|---------------------------|-----------------------------|-----------------------|-------------------------|
| Shrengdag Bauxite Mines                | 155.81                       | 2.90                      | 2.81                        | 137435.00             | 420085.00               |
| Gurdari Bauxite Mines                  | 584.19                       | 5.40                      | 5.10                        | 169330.00             | 279253.00               |
| Jalim & Sanai                          | 12.14                        | 0.51                      | 0.20                        | 24170.00              | 26587.00                |
| Serangdag                              | 140.06                       | 0.00                      | 0.00                        | 0.00                  | 0.00                    |
| Pakhar Buxite Mines                    | 115.13                       | 3.01                      | 3.57                        | 130110.00             | 166727.48               |
| Pakhar Buxite Mines                    | 8.09                         | 0.00                      | 0.00                        | 0.00                  | 0.00                    |
| Kujam-I                                | 80.87                        | 2.47                      | 2.47                        | 86870.00              | 101222.20               |
| Kujam-II                               | 157.38                       | 4.18                      | 4.33                        | 150150.00             | 197828.91               |
| Amtipani                               | 190.95                       | 4.99                      | 3.19                        | 114005.00             | 135519.46               |
| Chiro-Kukud                            | 152.57                       | 1.41                      | 1.21                        | 40415.00              | 94780.30                |
| Orsa Bauxite Mines                     | 196.36                       | 0.00                      | 0.00                        | 0.00                  | 0.00                    |
| Hisri New                              | 14.55                        | 0.73                      | 0.54                        | 36358.00              | 25610.00                |
| Bhusar                                 | 65.31                        | 0.00                      | 0.00                        | 0.00                  | 0.00                    |
| Bagru                                  | 75.41                        | 0.00                      | 0.00                        | 0.00                  | 0.00                    |
| <b>Minerals &amp; Minerals Limited</b> |                              |                           |                             |                       |                         |
| Pakhar Buxite Mines                    | 109.51                       | 3.45                      | 4.06                        | 154100.00             | 196818.79               |
| Pakhar Buxite Mines                    | 15.58                        | 0.00                      | 0.00                        | 0.00                  | 0.00                    |
| Bimarla Bauxite Mines                  | 134.37                       | 2.71                      | 1.25                        | 52675.00              | 63084.44                |

**Monitored water level (FY 2016-17)**

| Location (Mines)   | Elevation (Mtr) | Well type | Monsoon   |            | Post Monsoon |            |
|--|-----------------|-----------|-----------|------------|--------------|------------|
|  |                 |           | Inside ML | Outside ML | Inside ML    | Outside ML |
| Bagru Plateau (Hisri new, Bagru & Bhusar )   | 905             | Open Well |           | 21.32      |              | 22.70      |
|  | 910             | Open Well |           | 24.38      |              | 24.56      |
|  | 915             | Open Well |           | 29.00      |              | 28.43      |
|  | 903             | Open Well |           | 22.81      |              | 33.15      |
|  | 909             | Open Well |           | 20.15      |              | 28.72      |
|  | 1000            | Open Well |           | 24.93      |              | 22.65      |
| Pakhar Gr. Of Mines<br>(115.13,109.507,15.58,8.0)                                      | 1083            | Hand Pump | 35.35     |            | 31.60        |            |
| Sherengdag Plateau<br>(Serangdag 155.81 ha,<br>Sherengdag 140.06 Ha,<br>Jalim & Sanai) | 1027            | Open Well |           | 25.80      |              | 28.40      |
|  | 1094            | Hand Pump | 41.74     |            | 39.55        |            |
|  | 1081            | Hand Pump | 39.60     |            | 31.30        |            |
|  | 1055            | Hand Pump | 33.00     |            | 27.50        |            |
|  | 1066            | Hand Pump | 27.75     |            | 26.25        |            |
| Gurdari  | 1045            | Hand Pump | 29.30     |            | 27.70        |            |
|  | 1061            | Hand Pump | 28.30     |            | 24.90        |            |
|  | 1059            | Hand Pump | 38.10     |            | 36.15        |            |
|  | 1075            | Hand Pump | 27.90     |            | 26.75        |            |
|  | 1075            | Hand Pump | 28.30     |            | 29.30        |            |
| Kujam I, Kujam II &<br>Amtipani Mines  | 1040            | Open Well |           | 33.90      |              | 21.85      |
|  | 1041            | Open Well |           | 33.65      |              | 24.80      |
|  | 1064            | Hand Pump | 31.50     |            | 28.60        |            |
|  | 1052            | Hand Pump | 22.35     |            |              | 21.05      |
| Chiro Kukud  | 1148            | Hand Pump | 33.40     |            | 28.30        |            |
|  | 1151            | Hand Pump | 37.60     |            | 31.80        |            |
|  | 1084            | Hand Pump | 34.20     |            | 33.15        |            |