

ENVIRONMENT STATEMENT REPORT APRIL - 2016 TO MARCH - 2017



HINDALCO-INDUSTRIES LIMITED

(UNIT: MURI WORKS)

**VILLAGE - CHOTTA MURI, TEHSIL- SILLI,
DISTRICT - RANCHI - 835101 (JHARKHAND)**

FORM – V

(See Rule 14)

Environmental Statement for the financial year ending the 31st March 2017

Part – A

- | | | |
|------|--|---|
| i) | Name and address of the owner / occupier of the industry, operation or process | Mr. N.N Roy
Joint President – Works
Hindalco Industries Limited
Post – Chotamuri – 835101
Dist – Ranchi – (Jharkhand) |
| ii) | Industry category
Primary – (STC Code)
Secondary – (SIC Code) | PRIMARY |
| iii) | Production capacity – Units | 575 KTPA |
| iv) | Year of Establishment | Operation started from 1948 |
| v) | Date of the last environmental Statement submitted | 27.09.2016 |

Part – B

Water and Raw Material Consumption

(1) Water consumption m³/day

Process : 4570
Cooling : 1536
Domestic : 1263

Name of Products		Process water consumption per day (m ³ /day)	
		During the previous financial year 2015-16)	During the current financial year (2016-17)
1	Alumina	5569	5474

2. Raw Material consumption (2016-17) :

Name of Raw Materials*	Name of Product	Consumption of raw material per unit of output	
		During the previous financial year (2015 – 16)	During the current financial year (2016 – 17)
A Bauxite (as is t / t)	Alumina / Alumina Tri – hydrate	3.150	3.113
B Caustic Soda (kg/t) (as NaOH)		155.70	151.00
C Coal @3500 GCV) (t / t)		1.050	0.940
D Diesel (Lit / t)		0.540	0.940
E Furnace Oil (Lit / t)		75.62	73.70
F Lime (Kg / t)		50.07	34.90
G Filter Cloth (m ² / t)		0.012	0.011
H Synfloc (Kg / t)		1.144	1.051
I Crystal Growth Modifier (Kg / t)		0.003	0.00035
J Defoamer (Kg / t)		0.061	0.066
K Tray Flocculent (Kg / t)		0.000	0.037

- Industry may use codes if disclosing details of raw material would violate contractual obligations, otherwise all industries have to name the raw materials used.

Part – C

Pollution discharged to environment / unit of output (2016 – 2017)

(Parameter as specified in the consent issued)

Pollutants	Concentrations of pollutants in discharges (mass / volume)	Percentage of variation from prescribed standards with reasons
(a) Water	Mg / litre	Within stipulated limit
i. Suspended Solids	20.33	Within prescribed standards
ii. COD	165.67	Within prescribed standards
iii. Fluorides (as F)	1.625	Within prescribed standards
iv. Aluminium (as Al)	0.098	--
v. Iron (as Fe)	0.956	Within prescribed standards
vi. Mercury (as Hg)	<0.001	Within prescribed standards
vii. Silica (as SiO ₂)	25.458	--
viii. Vanadium (as V)	<0.1	Within prescribed standards
ix. Lead (as Pb)	<0.05	Within prescribed standards
x BOD	7.717	Within prescribed standards

Pollutants		Quantity of Pollutants discharged (mass/day)	Concentration of Pollutants discharge (mass / volume)	Percentage of variation from prescribed standards with reasons
(a) Air		Kg / day	Mg / Nm3	Within stipulated limit
Particulate Matter				
i.	Alumina Calciner # 1	Not in operation	Not in operation	-
ii.	Alumina Calciner # 2	Dismantled	Dismantled	-
iii.	New Alumina Calciner	100.19	31.38	Within prescribed standards
iv.	CFBC Boiler # 1	248.32	80.11	Within prescribed standards
v.	CFBC Boiler # 2	263.83	76.22	Within prescribed standards
vi.	CFBC Boiler # 3	248.07	81.50	Within prescribed standards

Part - D

Hazardous Wastes

(as specified under Hazardous Wastes (Management & Handling & Trans boundary Movement Rules 1989 / 2008)

Hazard waste is not generated either from process or from pollution control facilities. However, the following miscellaneous items unrelated to manufacturing process are recycled / sent to authorized recyclers / re-processors.

Hazardous Wastes Miscellaneous	Total Quantity (Kg)	
	During the previous financial year (2015-16)	During the current financial year (2016-17)
1. Used oil/ Spent oil /waste oils	0.180 KL	2.510 KL
2. Waste containing oils (lubricant drum)	2 Nos.	12 Nos.
3. Discarded Asbestos	Nil	Nil
4. Discarded containers	Nil	Nil
5. Lead Acid Battery	Nil	Nil

Part - E

Solid Wastes

Solid Wastes	Total Quantity (ton)	
	During the previous financial year (2015-16)	During the current financial year (2016-17)
a. From Process *** Fly ash from Power Plant	92377	109082
b. From Pollution control facilities Bauxite Residue (Red Mud)	525496	590970
c. 1. Quantity re-cycled or reutilized with the unit. 2. Sold. 3. Disposed.	Nil	1.Nil 2.Nil 3.Bauxite Residue disposed to ACC Chaibasa – 31398 MT

Fly ash generated is being used to brick manufacturing industries & entrepreneurs. Further, excess fly ash generated is being backfilled in abandoned coal mines at CCL Rajrappa colliery and abandoned void fillings.

Part - F

Please specify the characteristics (in terms of composition and quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes.

Solid Waste:

Residue left after digestion of Bauxite, called “Red Mud” is filtered under pressure by Pressure Filters up to a mud consistency of around 72-75 % solids. The Bauxite Residue (Red Mud) is transported by dumpers to own red mud pond by a process called DMS (Dry Mud Stacking). We have established Filter press project – Reduce caustic consumption with mud and reducing mud foot print with increased solids. We have initiated to dispose Bauxite Residue for further utilization in Cement application. We have dispatched approx. 31398 MT Bauxite Residue to ACC cement Chaibasa in year 2016-17 through Railway Rake.

Characteristics of Bauxite Residue (2016-17)

% SiO ₂	-	8.81
% Fe ₂ O ₃	-	41.07
% TiO ₂	-	14.77
% Al ₂ O ₃	-	16.60
% Na ₂ O	-	6.71

Part – G

Impact of the pollution abatement measures taken on conservation of natural resources and on the cost of production.

- a) New Technology of Gabion wall around the Red Mud pond has been adopted to enhance the life of the existing Red Mud pond with safe and secure environment friendly manner. The Gabion wall project work around the Red Mud pond is going on to enhance the life of the existing Red Mud Pond and which also helped for protection of soil erosion & reducing fugitive dust emission and protect the seepage during the monsoon season. Garland drain is being also constructed all along garland drain to avoid seepage water ingress to public land.
- b) We have Online Effluent Water Quality Monitoring Systems at our ETP and SSTP areas which are connected with JSPCB & CPCB sever through our reputed vendor.
- c) Augmentation of SSTP (Sludge & Sewage Treatment Plant) has been completed for better water quality. The treated water utilize in horticulture & mobile water tanker for Road water sprinkling purposes to reduce fresh water consumption.
- d) Second pressure filter technology adopted for Red Mud filtration which has helped in reducing soda content in Bauxite Residue and improving the life of Red Mud Pond. Safe Environment eco-friendly by reducing fugitive dust emission during transportation and at storage area.
- e) We have Environment monitoring lab within the plant for strengthening in house testing to facilitate close monitoring.
- f) We have Continuous Stack Emission Monitoring System (CSEMS) at CFBC stack and Boiler stack at CGPP and connectivity given to JSPCB as well as CPCB through recommended vendor M/S Forbes Marshall Pvt Ltd.
- g) We have Canteen effluent treatment plant facility. Quality of treated water is within the stipulated limits. Treated water is used in horticulture and sprinkling on all connecting roads for dust suppression through mobile tankers. Using the treated sewage in horticulture and in dust suppression has reduced the consumption of fresh water resulting less Water Cess payment.
- h) Resource conservation in each area of plant operation viz. Water conservation, Electrical Energy conservation, reduction in specific consumption of various raw materials used in process is a key focus in day-to-day operations.
- i) Conservation of Top Soil & Rehabilitation of abandoned mines. The fly ash generated is being utilized in bricks manufacturing. The private agencies and local entrepreneurs are taking Fly Ash for the purpose of low land filling etc. which is being supplied free of cost as per the guidelines issued by MoEF. The ash generated is mainly used in de-coaled mine pit void fillings at CCL, Rajrappa. Trees saplings were planted in De-coaled mines area where Fly ash has dumped by Hindalco, Muri. The saplings of trees like Bamboo, Sheesam, Mango, Guava, Gambhar and Neem have been planted.

- j) We have started to dispatch Bauxite Residue (Red Mud) to ACC Cement Plant through Railway Rake.
- k) Utilization of Red Mud Pond water in plant process as replacement of fresh water.
- l) Green Belt development by Hydro seeding technique developed in USA.
- m) Installation and commissioning of SO_x & NO_x analyzer in progress to comply with CPCB/JSPCB norms.

Part - H

Additional measures / investment proposal for environmental protection including abatement of Pollution, Prevention of pollution.

- a) Plant has undergone expansion of Alumina Refinery capacity from nominal capacity of 125 KT to 575 KT annual production. Latest energy efficient technologies were adopted both for process and pollution control. This year 2016-17 around Rs.2.78 Crore has been invested for controlling & monitoring of environmental protection and Energy reduction projects.
- b) Greenery development includes red mud pond dyke and factory boundaries / peripheries. Plantation in and around plant and colony as well as stretches of roadside and old abandoned panel is carried out in full swing. Till now we have planted approximately 65000 numbers of trees like Neem, Sisham, Jatropha and Babool along with herbs and shrubs in our plant premises which covered approx.78.11 hectare of total area and ensuring better survival rate. To further strengthen greenery, we have also identified various areas in Red Mud Pond, Colony & inside the plant for further trees plantation. Total estimated around 22.4 Lacs in this year 2016-17 for gardens cleaning, maintenance and plantation. Green Belt development by Hydro seeding technique developed by USA at Red Mud Pond area started for trial.
- c) The electro static precipitator in new CFBC boilers is commissioned along with online continuous emission monitoring system (supplied by Teledyne Instruments U.S.A) in the month of July 07. The electro static precipitator in New Alumina (CFBC) calciner is commissioned along with online continuous emission monitoring system (supplied by Forbes Marshall) in the month of Mar'08. Total expenditure cost for the project is Rs.20 crores.
- d) A process ETP has been installed and commissioned at an expenditure cost of Rs.5 crores in Jan'2009 to treat the effluent water. The treated water is being reused in our plant process as per norms. A new scheme to re-use the treated water in process is installed and commissioned at an expenditure cost of Rs.40 lacs in the month of Oct'09. This is a major step towards water conservation which saves almost fresh water intake by 120 M³ / hr and the revenue saving of Rs.10.3 lacs. This year 2015-16 total cost for ETP / SSTP Maint. & Operation approx.25.4 Lacs.
- e) Geo coir grass matt covering is being applied to the slopes / dykes of Red Mud Pond No.2 to protect the slopes / dyke from soil erosion and to arrest any seepage from the ponds at an expenditure of Rs.30 lacs.

- f) Second pressure filter has been commissioned for Bauxite Residue filtration, Which has helped in reducing soda content in red mud and improving the life of Red Mud Pond and also helped to reduce fine mud dust particles? Total expenses occurred approx.8 crore.
- g) The slopes / dykes of Red Mud Pond No.3 are given a slope of 1:2.5 by earth filling to protect the slopes / dykes from erosion and to give stability to the slope / dykes. We have planned to execute a new technology called controlled modular column (CMC) in RMP area which will increase its life and will eliminate the requirement of new Red Mud pond for next 10 years. This technology is recommended by CBRI, Roorkee after a series of studies and soil analysis of the existing area in last one year considering all environment aspects. As explained above about the new CMC technology, in addition to that CBRI had also suggested to build a **Gabion and Reinforce soil wall** all around the existing embankment to increase the width of the embankment and hence the strength in a environment friendly manner done with an expenditure cost of Rs.50 crores.
- h) Seeing the acute shortage / crisis of water in the river in our area we have planned to initiate a lot of water saving projects for conservation of water and reduction of fresh water intake.
- i. Use of treated waste water from SSTP for plantation in abandoned Red Mud Pond No.2 replacing fresh water at an expenditure of Rs.72 lacs.
 - ii. Use of Boiler blow down as replacement of fresh water for Cooling Tower make up at an expenditure of Rs.12 lacs.
 - iii. Used of treated waste water on the road by mobile tanker & in the plant for gardening purposes total cost is around .Rs 14.5 lacs in 2016-17.
- i) Expenditure of Rs 63 lacs for condensate management and utilization of condensate as a replacement to fresh water.
- j) The total cost of the strengthening of dust suppression system in Bauxite and Coal yard around Rs. 2.0 lacs (2016-17).
- k) The total cost of the strengthening of dust suppression at RMP side area around Rs. 6.0 lacs (2016-17).
- l) This yea 2016-17 the total estimate cost for fly ash moistening is around Rs. 5.5 lacs.
- m) The total estimated cost for of both ESP maintenance as well as Calciner & Boiler stack around Rs. 6.8 lacs.
- n) Total estimated cost in this year for periodic audit as EMS ISO, I4001, 2004 Rs. 2.40 lacs.
- o) Last year we completed augmentation of SSTP for better water quality the total estimated cost around 10 lacs.

- p) Expenditure of Rs 1.20 Crores (Approx) for recovery of garland drain water to mini pond at Red Mud 3 # 4 use for replacement of fresh water

Part - I

Any other particulars for improving the quality of the environment.

- a) Local villagers are being trained on various methods of farming, vermicompost manufacture and other activities to develop greenery.
- b) We have SSTP capacity 400 m³ / day & ETP with capacity 200 m³ / hr. The treated water of SSTP is being used for gardening, plantation and dust suppression purposes. The treated water of ETP is being reused in plant process to replacement of fresh water for both. The total expenses incurred for SSTP & ETP for Operation & Maintenance in this year 2016-17 is Rs.40 lacs. (Approx).
- c) The total estimate cost for online stack emission connectivity to CPCB sever is around 2.0 lacs in this year 2016-17.
- d) Various community development programmes on Water conservation / Rain water harvesting to keep water clean and use by construction of wells, tube wells and small dams for agriculture purpose are being imparted. Doctors are visited the nearby villages and give medical treatment and provided awareness training. People are being made aware day by day and are being educated on different water conservation steps.
- e) Villagers are being made aware of the different kind of environmental developments and protection knows how.
- f) Tree plantation within the company premises is being carried out regularly. Greenery exists all around. Total no of plants surviving as on date is 63500 (approx.) During the year 2007 more than 12000 saplings have been planted around the dyke of red mud pond and over the abandoned red mud pond. Till Aug. 2008 more than 32000 plants and different variety of plant species have been planted all along the periphery of plant, colony and abandoned red mud pond. In the year 2011-12 we have planted approx 3000.

In this year total cost invested Rs. 22.1 Lacs for Greenery maintenance & development inside & outside of plant approximately? This year we have planted approximately 2000. Trees Ashok, Neem, Sisham, survival rate is 90% as measured.

- g) Dust Suppression System in abandoned Red Mud Pond has been revamped. Additional dust suppression arrangement has been installed at the expenditure of Rs.16.71 lacs. Additional measures are being taken to make the system more effective. The Estimate Expenditure for implementation of the scheme to control air pollution - DSS System Rs.37.1 lacs. All together for RMP & Fly Ash dumping area in FY'17.

- h) Effective 3rd May 01 the unit has been certified for Environment Management System ISO 14001 by internationally reputed certifying organization Det Norske Veritas (DNV- Gel Pvt Ltd). Total estimated cost for periodic audit approximately 2.0 lacs. We have started working on integrated management system also.
- i) A hydrological study has been done in this year too by ISM, Dhanbad. Total cost expenditure for this study was around Rs. 5.2 lacs.
- j) The progress of the Gabion wall for embankment strengthening and capacity increase is going on.
- k) S.K. Mitra and Associates, Kolkata a reputed civil and structural engineering consultant was awarded the job for carrying out the study of Red Mud Pond Dykes towards the river side. Field job and soil investigation has been completed and report has been submitted. The investigation reveals there is no threat to the dyke on the river side.
- l) To strengthen the presently adopted preventive measures by the company, a study was conducted through IIT Kharagpur, to evaluate the present dyke strength and recommended the measures if any to reinforce the dyke. IIT Kharagpur has opined that the dykes can withstand the Red Mud dump height up to 20 mtrs from the Dyke level.
- m) A garland drain with a pit and pump for collection of seepage along the river side of RMP#3 & #4 and the northern side of RMP#3 has been constructed to recover alkaline seepage back to pond.
- n) The ESP for the new power plant is operational and is designed for 100 mg/Nm³ SPM. Continuous emission monitoring system is installed for the stack monitoring. Emission from New Power Plant is within norms under normal operating condition. We have installed Continuous Emission Monitoring System (CEMS) the online monitoring data is connected with JSPCB server as well as CPCB server through recommended vendor Forbes Marshall Pvt Ltd.