



UAIL/ENV/2024-25/33

26<sup>th</sup> Sept 2024

To,

The Member Secretary  
State Pollution Control Board  
Paribesh Bhawan, A/118  
Nilakantha Nagar, Unit-VIII  
Bhubaneswar-751001

Subject: Submission of Environment statement for the financial year ending 31<sup>st</sup> March 2024 with respect to Utkal Alumina International Limited

Dear Sir,

We are enclosing herewith the Environment statement in Form-V for the financial year ending 31<sup>st</sup> March 2024 with respect to **Utkal Alumina International Limited**, Doraguda, Rayagada as per the rule 14 of Environment Protection Act, 1986 and rules made thereof.

This is for your kind information and necessary records please.

Thank you.

Yours faithfully,  
For **UTKAL ALUMINA INTERNATIONAL LIMITED**

A handwritten signature in blue ink, appearing to be "Rabi Narayan Mishra", with a horizontal line underneath.

**Rabi Narayan Mishra**  
Unit Head

Encl: As above

Copy to: Regional Officer, SPCB, Rayagada for kind information & record.

**FORM-V**  
(See rule 14)

**Environmental Statement for the Financial Year Ending 31<sup>st</sup> March 2024, of Utkal Alumina International Ltd.**

PART-A			
i. Name and address of the owner/ Occupier of the industry operation or process:		Mr. S. K. Mishra, Utkal Alumina International Limited Doraguda, Post: Kucheipadar- 765015, Rayagada	
ii. Industry category:		Primary	
iii. Production capacity:			
Alumina Refinery		2.67 MTPA	
CPP		3 x 30 MW	
iv. Year of establishment:		May, 2013	
v. Date of the last environmental statement submitted:		26th September 2023	
PART- B			
Water and Raw Material Consumption:			
Water consumption in m3/d			
Process:		7254	
Cooling:		1683	
Domestic		2687	
SI No.	Name of Products	Process water consumption per unit of output	
		During the current financial year 2022-23	During the current financial year 2023-24
1	Calcined Alumina  Power Generation	1.44 KL per ton. of Hydrate Production expressed as Alumina. (Process water includes both refinery and power plant cooling and excluding domestic consumption)	1.33 KL per ton. of Hydrate Production expressed as Alumina. (Process water includes both refinery and power plant cooling and excluding domestic consumption)

Raw material consumption			
Name of raw materials	Name of Products	Consumption of Raw material per unit of Output	
		During the previous financial year 2022-23	During the current financial year 2022-23
Bauxite Ore T/T	Calcined Alumina	2.94	2.94
Caustic Soda Kg/T		44.90	45.30
Lime Kg /T		17.81	19.50
Coal Kg /T		463.44	421.97
Fuel Oil- HFO			
For Calciner kg/T		67.94	68.435
For Boiler L/T		0.31	0.135
Synthetic Flocculent (Kg/T) of Hydrate Production as Alumina		0.404	0.371
* Specific Consumption are reported per MT of Hydrate as Al <sub>2</sub> O <sub>3</sub> produced.			
PART-C			
Pollution discharged to environment/unit of output			
Pollutants	Quantity of Pollutants discharged (mass/day)	Concentration of Pollutants discharged (mass/volume)	Percentage of variation from prescribed standards with reasons.
(A)Water:			
Water	No Discharge	No Discharge	Not applicable since Zero Discharge.
(B) Air Particulate Matter (PM)			
Boiler Stack	398.81 Kg/Day	CPP: 35.25 mg/Nm <sup>3</sup>	Well within the PCB prescribed standards 50 mg/Nm <sup>3</sup>
Calciner Stack	258.9 Kg/Day	Calciner: 21.92 mg/Nm <sup>3</sup>	Well within the PCB prescribed standards 50 mg/Nm <sup>3</sup>
Ambient Air		PM <sub>10</sub> (µg/m <sup>3</sup> ): 58.10	Well within the NAAQS 60 µg/m <sup>3</sup>

	PM2.5( $\mu\text{g}/\text{m}^3$ ): 32.7	Well within the NAAQS of 40 $\mu\text{g}/\text{m}^3$
(Parameter as specified in the consent issued)		
<b>PART D</b>		
<b>HAZARDOUS WASTES</b>		
Hazardous Wastes	Total Quantity KG	
	During the previous financial year 2022-23	During the current financial year 2023-24
<b>HAZARDOUS WASTES: Authorization No. IND-IV-HW-931/9663/14-07-2021</b>		
<b>(a) Generation From process</b>		
Used oil (Stream 5.1)	65.31 KL	68.822 KL
Contaminated cotton rags of other cleaning materials (Stream 33.2)	200 Kg	570 Kg
Spent ion exchange resin (Stream 35.2)	0	0
Empty barrels contaminated with HW (Stream 33.1)	4556 KG	2970 Kg
Sludge containing oil during cleaning of oil storage tanks (Stream 3.2 & 3.3)	0	0
vi)Wastes or residues containing oil (Stream 5.2)	0	0
<b>(b) From pollution control facilities</b>		
<b>(1) Recycled/Sold Quantity</b>		
Used oil (Stream 5.1)	75.91 KL	56.22 KL
Contaminated cotton rags of other cleaning materials (Stream 33.2)	0	320 Kg
Spent ion exchange resin (Stream 35.2)	0	0
Empty barrels contaminated with HW (Stream 33.1)	6022 KG	2142 Kg
Sludge containing oil during cleaning of oil storage tanks (Stream 3.2 & 3.3)	0	0
vi)Wastes or residues containing oil (Stream 5.2)	0	0
<b>(2) From pollution control facilities</b>		
As specified under Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016.		
<b>PART- E</b>		
<b>SOLID WASTES.</b>		
Solid Wastes	Total Quantity	

	During the previous financial year (2022-23)	During the current financial year (2023-24)
<b>a. From process</b>		
Red mud	2810647 T as dry basis	2891321 as dry basis
Lime grit	10553 MT	11897 MT
<b>b. From Pollution Control</b>		
ESP Dust (Fly ash)	345096 MT	304622 MT
Bottom ash	60899 MT	53756 MT
<b>Quantity recycled or re- utilized within the unit.</b>		
Lime grit	0	0
ESP Dust (Fly ash)	107557 MT	198379 MT
Bottom ash	60899 MT	53757 MT
<b>Sold (supply to brick unit, mine backfilling &amp; Cement industry)</b>		
Lime grit	10481 MT	12100 MT
ESP Dust (Fly ash)	27330 MT (BMU)	39449 MT (BMU)
	129446 MT (Cement)	45022 (Cement)
Red Mud	59252 MT as dry basis	74956 MT as dry basis
<b>1. Disposed to Pond</b>		
Red Mud	2756268 MT as dry basis	2816365 MT as dry basis
ESP Dust	80761 MT	21772 MT
Lime grit	0	0

**PART - F**

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

**1. Red mud:** It is the residue generated during manufacture of alumina having the leachable caustic content in disposed liquor < 10 gpl expressed as Na<sub>2</sub>CO<sub>3</sub> in slurry condition with water and solids. The water is being removed by pressure filter and in semi-dry condition (>78% Solids) disposed in impervious pond known as the Red Mud Pond. The entire Red Mud Pond is divided into 4 pans, such as Pond A, Pond B, Pond C & Pond D. Out of these, Ponds-A & B are meant for Mud Storage, Pond C is meant for collection of Supernatant Liquor (SNL) from the pressure filter and mud storage ponds A & B. Pond D is meant for freshwater emergency storage. At present Pond A/B (Mud Storage) and Pond C (SNL) are in operation. The 1/3rd of the Pond-A Mud Storage Dam (Wet Zone) is lined with Clay along with 1.5 mm thick single layer HDPE liner. The other 2/3rd of the Pond-A Mud Storage Dam (Dry Zone) is lined with clay liner. The Pond-C (SNL pond) and Pond-B are fully lined with Clay along with 1.5 mm thick single layer HDPE liner. Pond-D is also lined with clay & 1.5mm HDPE liner & is currently having fresh water in it. The construction of Red Mud Pond is as per the design approved by SPCB; Odisha vide letter No.19306/1ND-IV-HW-931 dated 30.08.2012. Currently, Pond-A & Pond B has been converted for dry Red Mud Storage only.

Typical characteristics of Red Mud  
Red mud is alkaline in nature and is having pH of about 11 to 12.5. The typical chemical composition of the red mud is as given below.

LOI (%)	6.93	TiO <sub>2</sub> (%)	3.94
TA (%)	13.54	CaO (%)	1.84
THA (%)	4.33	Na <sub>2</sub> O (%)	2.78
T-SiO <sub>2</sub> (%)	6.35	P <sub>2</sub> O <sub>5</sub> (%)	0.22
Fe <sub>2</sub> O <sub>3</sub> (%)	61.35	V <sub>2</sub> O <sub>5</sub> (%)	0.11

The Mud Storage Dam also has a leachate drain under the HDPE Liner and connected to the lowest point outside the dyke in a collection pipe and the leachate water is being pumped back to the Pond -C for storage. The water and SNL so collected in Pond C is recycled and reused completely in the refinery for mud washing. During FY2023-24, total of 2891321 MT (as dry basis) Red Mud was generated and stored in the Pond-A & B and 74956 MT has been utilized in cement, Mine backfilling, road making etc.

**2. Ash:** It is being generated from coal fired boilers of CPP. The fly ash is being collected by ESPs and stored in ash silos and supplied to brick manufacturing units, Cement Industry and used for filling low lying areas and balance quantity was disposed in impervious ash pond by using high concentration slurry disposal (HCSD) technology (35:65- water & solids) to save water. 100% Bottom ash was used in low lying area for land development followed by mass plantation.

We have developed local entrepreneurship to establish fly ash brick manufacturing units in coordination with Regional Industrial Centre, Rayagada and now 20 nos. of brick manufacturing units are established. At the time of commission of the CPP in the year 2013, there was a single brick manufacturing unit and the ash supply to brick units was 8760 MT (5%) in FY 2014-15 and in FY 202, it has gone up to 39449 MT (17%). Efforts are being taken continuously for 100% ash utilization. Ash utilization for the period of the FY2023-24 is 94.0%.

Typical characteristics of Fly Ash  
PARAMETERS:

CaO (%)	3.93	Fe2O3 (%)	3.481
MgO (%)	0.798	SiO2 (%)	55.619
UBC (%)	2.19	P2O5 (%)	0.431
Na2O (%)	0.671	TiO2 (%)	1.74
K2O (%)	0.536	SO3 (%)	0.195
Al2O3	29.692	MnO	0.05

3. Lime grit: It is being generated during the preparation of Milk of Lime from quick lime. Out of total quantity 11897 MT of lime grit generated during the FY 2023-24, about 12100 MT was sold to brick manufacturing units.

Typical PARAMETERS	characteristics	of	Lime Grit
Available	CaO	%:	20-21
Moisture % :	23-24		

#### Hazardous Waste

7. Separate Hazardous waste storage shed has been constructed with spill containment pit facility for storage of Hazardous waste. The shed consists of internal drainage system to collect spillage of oil if any during handling of the used oil. The shed is provided with fire extinguishers and fenced to restrict unauthorized entry. All the hazardous waste is being collected and stored in the HW storage shed. The used oil was sold to authorized recyclers/re-processors as per Hazardous and Other Wastes (management and Transboundary Movement) Rules, 2016. The major Hazardous waste generated during the year 2023-24 was used oil of 68.822 KL.

#### PART

G

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

1. Disposal of red mud through pressure filters & ash by HCSD technology on impervious ponds has saved water consumption due to water recycle from the impervious ponds. The impervious surface of the ponds also protects from ground water contamination. Red Mud Filtration has helped in reducing water consumption as well as recovery of Alumina from Bauxite, thereby reducing Bauxite consumption & enhancing production capacity. This semi-dry disposal of Red Mud helps to reduce the land usage by improving the pond life.

2. Lime grit is being supplied to ash brick manufacturing units, thereby saving natural resources

3. Utilization of ash has saved natural resources like land and topsoil. High Performance Milling System (HPS) is installed to improve coal milling system. This HPS enhance to minimize the Rejection loss and reduce the coal dust emission there by conserving natural resources.

4. Wastewater is being collected and reused by adopting "ZERO" discharge principle (ZLD) to reduce freshwater consumption thereby conserving natural resources. Our Fresh Water consumption is 1.33 KL/MT of Hydrate production.

5. Alumina dust from Bag filters and ESPs of Calciner is collected and being recycled to cooling cyclone which further reduces the FO consumption as it doesn't require preheating of alumina.

6. Rainwater from Refinery is being collected in Guard Pond through a separate storm water drain and process water is collected in another separate caustic drain in caustic pond. The entire water is completely reused in the process to reduce freshwater consumption. The storm water collected in the guard pond during the monsoon season is being allowed to discharge after meeting the prescribed norms as per the condition stipulated in consent to operate. Separate drainage system for storm water and process water has been provided. Storm water is being collected in Guard Pond. Process water including precipitated water of process area is being collected in caustic pond. The entire water of caustic pond is completely reused in the process to

reduce freshwater consumption. The Storm water collected in the guard pond during monsoon season is being allowed to discharge after treatment as per the condition stipulated in consent to operate.
7. E-Waste /Discarded batteries to recycle under EPR, Buy-Back-System and sale to Authorized Recycler.
8. A 400 Ltr. Capacity Composter Bin called Aerobin for Food Waste is in operation at Nuapada Guest House Canteen.
9. Water Task Force has been formed to conceptualize the ZLD of Refinery & Power Plant, Planning for Monsoon & Dry season, focus on reduction in freshwater consumption, Storm water management & Model water balance & necessary action to freeze it
10. Waste Task Force has been formed to Value for waste or waste to wealth, Ex. Circular Economy, Effort to deal with waste management, Plastic waste & E-waste are also to be effectively handled like Hazardous Waste and Waste Inventories. Used filter clothes, used rubber bushes etc. being sent to cement plants to utilize their heat value thereby reducing fuel consumption in cement manufacturing.
11. A cross functional Air Task Force team has been formed to implement global best practices to minimize air emissions, training to the operation, maintenance, and monitoring teams to update the know-how, maintenance, and calibration of air quality monitoring equipment, to check their efficacy for better management of air quality to attenuate its adverse impact on environment and human health,
12. An Energy management team is dedicatedly working for improving energy efficiency across the unit to comply with the BEE PAT requirements and benchmark the unit with the best in terms of specific energy consumption. Energy Audit is being carried out annually to find out energy loss if any, and its corrective & preventive measures being implemented to improve the machine level energy efficiency supported by cloud-based energy monitoring system.
<b>PART - H</b> <b>Additional measures/investment proposal for environmental protection including abatement of pollution, prevention of pollution.</b>
1. Blending of different mix of coal to optimize solid waste generation (ash) and thermal NOX is being done.
2. Water sprinkling arrangements were made at Red Mud Pond -A to control fugitive dust emissions during the summer season.
3. Sewage Treatment Plants (STPs) have been provided at Plant as well as townships for treatment of domestic wastewater. Treated water is being used for gardening and horticulture activities.
4. An environmental cell has been established for monitoring and implementation of safeguard measures for environmental parameters.
5. A network of drainage system has been provided to collect storm water and diverted to guard pond and reused in process.
6. The floors of process areas (caustic area) are made impervious and have been provided with drainage system with provision of sumps at various locations to collect the storm water as well as process water and connected to caustic pond for complete recirculation in process to reduce freshwater consumption and avoid ground water pollution.
7. All raw-material stack yards were made impervious to check leachate to ground.



8. An in-house nursery spreading over an area of five acres having capacity of 2.0 lakh saplings and Seed Collection from Local Forest to developed indigenous Species. Development of Saplings at our in-house nursery for Afforestation program. 60000 No's of sapling developed for green belt development activities
9. Greenbelts have been developed in & around plant peripheral & infrastructural areas, roadsides and vacant areas. 52500 nos. of saplings have been planted during the year 2023-24
10. State of the Art technology, Red Mud Filtration (RMF) unit is in continuous operation. This unit helps in reducing the caustic soda content in the red mud and increases 75-80% solids instead of 55-60%, which is being then disposed through the HCSD technology. This semi-dry disposal improves the life of the Red Mud Pond as well as reduce the risk of ground water contamination and the dyke failure due to earth movement as in case of wet ponding. The semi-dry cake of the red mud is easier to handle and is proven for its utilization in Cement kilns as a raw material resource.
11. Vacuum cleaner system has been provided for improvement in housekeeping & dust free working environment in operation area.
12. Operation of a 5 MW solar power plant to generate renewable power and in-house utilization, thereby conserving natural resources and environment.
13. Separate drainage system with Settling Pond provision for both Bauxite and Coal Yard is place.
14. Covered shed for Bauxite stacking yard completed
15. Van Mahotsav Week, World Environment day, World Earth day etc have been observed to spread awareness of forest conservation and to save environment.
<b>PART – I</b> <b>Any other particulars for improving the quality of the environment</b>
1. UAIL is accredited for ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018 with the IMS certification valid till 2024.
2. Utkal is accredited for ISO 50001 :2018 of Energy Management System by M/S. Lloyd's Register.
3. Environmental information w.r.t Air, Water, Haz, Wastes & Haz. Chemical are displayed at the main gate for public review.
4. Six numbers of rainwater harvesting, and ground water recharge pits were developed in the Nuapada Township. Rooftop Rainwater from the Township buildings is captured from the roof catchments. The water so collected is getting filtered through the filtration tank before being allowed for ground water recharge. In addition to the ground water recharging, this initiative also helps in complying with the EC and CTO conditions for Rainwater Harvesting.
5. Our unit operates on a ZLD philosophy. All the Alkaline Wastewater generated from different operational areas of the refinery is being collected in a special designed RCC lined caustic pond and being reused in the same process. A separate guard pond is in operation to collect the surface runoff and utilization of the collected water in the process. pH meters have been installed at different locations of the input drainage network leading to the Guard Pond to monitor and control the quality of the runoff. in order to continuously monitor the quality of the water at the outlet of the Guard Pond, flow meter, IP Camera and pH meters have been installed and connected to the central DCS. Both the 'P camera and the Flow meter have also been connected to OSPCB & CPCB

6. Air Pollution control devices such as ESPs, dry fog system, bag filters, Vacuum Cleaner and wet scrubbers have been installed at all suggested locations to control any dust emission.
7. Wagon tippler & dry fog system have been provided for coal unloading and closed conveying system has been provided for coal transport. All the bauxite conveying systems have been covered with water sprinkling system at transfer points.
8. High jet water spraying system have been provided at bauxite and coal stockpile areas to check fugitive emission.
9. Water sprinkling is being done on roads regularly to suppress fugitive dust emission.
10. As a responsible corporate, continuous emission monitoring system (CEMS) has been installed with RT-DAS facility to transmit the real time data to OSPCB & CPCB.
11. Four Nos. of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) have been installed and the real time AAQ data is being transmitted to OSPCB server through RT-DAS.
12. A Sustainability team has been engaged to support best practices in utilizing wastes, water conservation measures, cleaner technology, and emission abatement method etc. Group level reporting of environmental data has been carried out by adopting international standards & systems such as GRI-G4 through online compliance Manager Tool, BRC, KPI etc. This is being also assured by a Third-party data assurance organization and published as the sustainability report every year.

Date: 26.09.2024



**Rabi Narayan Mishra**  
Unit Head