

HZL/DSC/ENV/ES/2023/2

Date 22.09.2023

To,

✓ **The Member Secretary**  
**Rajasthan State Pollution Control Board**  
**4, Institutional Area**  
**Jhalana Doongri**  
**Jaipur-302004**

**File No. OGM/M-54**

Sub: Environmental Statement for the year 2022-23 for Lead Smelter, Dariba, Rajsamand.

Ref: Consent to Operate No: F(HDF)/Rajsamand(Railmagra)/6461(1)/2020-2021/4945-4947 dated 03.02.2021.

Sir,

With reference to above subject please find enclosed herewith the Environmental Statement for the financial year 2022-23 for Lead Smelter, Dariba, Rajsamand.

Thanking You,

For Hindustan Zinc Limited

Yours Faithfully



(Rajendra Agarwal)  
Head - Dariba Smelter Complex

Cc:

1. Regional Officer, RSPCB  
Old excise office building,  
Kalalwati, Rajnagar, Rajsamand, Pin code : 313324
2. The Deputy Director (S)/ Scientist- C  
Ministry of Environment Forests and Climate Changes,  
Integrated Regional Office, A-209 & 218, Aranya Bhawan,  
Jhalana Institutional area, Jaipur – 302004
3. O/C



**Hindustan Zinc Limited  
Dariba Smelter Complex**



**ENVIRONMENTAL STATEMENT FOR LEAD SMELTER  
(FINANCIAL YEAR ENDING MARCH 31<sup>ST</sup> 2023)**

**PREPARED & SUBMITTED BY**

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**Lead Smelter  
Dariba Smelter Complex  
Hindustan Zinc Limited  
P.O. - Dariba, District – Rajasmand  
Rajasthan - 313211**

## FORM-V

**Environmental Statement  
for the financial year ending the 31<sup>st</sup> March 2023**

**PART-A**

- i) Name and address of the owner/occupier of the industry operation or process : Arun Misra  
CEO  
M/s. Hindustan Zinc Limited  
Dariba Smelter Complex  
Hindustan Zinc Limited,  
P.O.- Dariba, Tehsil- Relmagra  
Dist. - Rajsamand  
Rajasthan – 313 211
- (ii) Industry category : Red/ Large  
Primary – (STC Code) : AAACH7354KST006  
Secondary- (SIC Code) : Not Applicable
- (iii) Production Capacity :  
Lead Cathode/Ingot : 125,000 TPA  
Lead alloy(Pb-Sb & Pb-Ca) : 50,000 TPA

***By-Products (in TPA)***

Sulphuric acid for Lead Smelter	:	1,32,000 TPA
Copper as Copper Concentrate/matte (equivalent metal) in Lead Smelter	:	900 TPA
Antimony as Antimony Concentrate (equivalent Metal)	:	850
Bismuth as Bismuth Concentrate (equivalent Metal)	:	16 TPA
Zinc Oxide Compound	:	20000 TPA
Lead Concentrate Oxide	:	5000 TPA
Anode Slime	:	4000 TPA
Silver	:	400 TPA
Year of Establishment	:	2011
(iv) Date of Last Environmental Statement Submitted	:	22.09.2022

## PART -B

## WATER AND RAW MATERIAL CONSUMPTION

(1) Water consumption (m<sup>3</sup> /d)\*

Boiler/Cooling	:	1529
Domestic	:	94
Industrial Process	:	315

\* Daily water consumption for Lead Plant (1, 25,000 TPA) including STP water

Name of Product		Process water consumption per unit of product output(cum/MT)	
		During the previous financial year	During the current financial year
		(1)	(2)
Lead Cathode/Ingot	With STP water	6.23	6.09
	Fresh Water (without STP water)	0.84	0.34

## (2) Raw material consumption

Name of raw material	Name of products	Consumption of raw material per unit of output MT	
		During the previous financial year	During the current financial year
Lead concentrate	Lead Cathode/Ingot	1.99	1.85
Coal for lead smelter		0.16	0.13
Coke for lead smelter		0.22	0.20
Lead Silver Compound*		Not Used	0.05
Battery/Lead scrap and secondary*		Not Used	Not Used
Lead dross and lead bearing waste		0.039	0.054
Lime Stone		0.137	0.133
Iron Ore		0.048	0.027

## PART-C

**Pollution discharged to environment/ unit of output**  
(Parameter as specified in the consent issued)

Pollutants	Quantity of pollutants discharged (mass/day)	Concentration of pollutants in discharges (mass/volume)	Percentage of variation from prescribed standards
<b>a) Water</b>	Not Applicable as Zero Discharge is maintained.		
pH			
TDS			
DO			
Suspended Solids			
Oil and Grease			
Chromium as hexavalent			
Manganese			
Nickel			
Copper			
Zinc			
Cadmium			
Lead			
Mercury			
Cyanide			
<b>b) Air</b>			
	<b>Lead Plant</b>		
Particulate matter	33.01 mg/Nm <sup>3</sup>	30.05 mg/Nm <sup>3</sup>	-9%
SO <sub>2</sub>	139.46 mg/Nm <sup>3</sup>	171.19 mg/Nm <sup>3</sup>	23%
Acid Mist	36.97 mg/Nm <sup>3</sup>	39.68 mg/Nm <sup>3</sup>	7%
Lead (Pb)	3.61 mg/Nm <sup>3</sup>	3.65 mg/Nm <sup>3</sup>	1%



**PART-D**  
**Hazardous Waste**

As specified under Hazardous Wastes (Management, Handling & Transboundary Movement)  
Rules, 2016

As DSC is having common Hazardous waste authorization, which includes Zinc, Lead and CPP, so mentioned hazardous waste generation is for complete DSC location.

Hazardous Waste	Total Quantity Generation (Kg.)	
	During the previous financial year	During the current financial Year
<b>(a) From process</b>		
- Jarosite	187612000	177821000
- Purification Cake	4562200	4198000
- Anode Mud	1472800	1183000
- Cooler Cake	2938300	2518580
- Cobalt Cake	--	--
- Used /spent Oil	30200	54090
- Spent Catalyst (V2O5)	27900	26810
- Chemical Sludge (Salts)	1059900	1506660
- Discarded Containers/barrels/liners used for hazardous waste/Chemicals	1395 No.	134 no.
- Flue Gas Cleaning Residue	--	--
- Spent ion exchange resin containing Toxic metal	--	--
- Oil soaked filter	--	--
- Waste/residues containing oil	720	--
- Process Residue	11749700	18305360
<b>(b) From pollution control facilities</b>		
- Non-ferrous sludge from ETP and scrubbers (ETP Cake)	14895800	13961820



## PART-E

## SOLID WASTE

DSC has a common storage facility for storage of Scrap, which includes Zinc, Lead and CPP, so mentioned waste generated is for completed DSC location.

Solid Waste	Total Quantity Generation (Kg.)	
	During the previous financial year	During the current financial Year
<b>(a) From process</b>		
Metal Scrap	1890978	1599594
Wooden Scrap	119715	140355
Plastic Waste	34480	37800

Solid Waste generation specific to lead plant

Solid Waste	Total Quantity Generation (Kg.)	
	During the previous financial year	During the current financial Year
<b>(a) From process</b>		
Fuming Furnace Slag	75041559	78838890

## PART-F

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

## Details of Solid Wastes &amp; Its Disposal Method

Sr. No.	Name of waste	Quantity (MT)	Chemical Characteristics (%)	Mode of Treatment / Disposal
1	Jarosite	177821	Zn: 2.5 -5 Pb: 5-7 Fe: 25-31	Stabilization with lime & cement as Jarofix using patented Jarofix Technology (M/s Canadian Electrolytic Zinc), followed by disposal in Jarofix yard.
2	Non-ferrous sludge from ETP and scrubbers (ETP Cake)	13961.82	Zn: 1- 8 Cu: 0.01 – 0.02 Pb: 0.2 – 0.5	Disposal in captive SLF after stabilization.
3	Cooler Cake	2518.58	Zn: 0.5-1.5 Balance Gypsum	Disposal in captive SLF after stabilization.
4	Purification Cake	4198.00	Zn: 20 - 35 Cd: 8-10 Cu: 3-12	Sale to authorized recyclers registered with CPCB/ MoEF.
5	Anode Mud	1183.00	Mn: 30-45 Zn: 0.3 - 1 Pb: 5-8	Reuse/sale to authorized recyclers registered with CPCB/ MoEF and surplus disposal to captive SLF.
6	Used Oil/Spent Oil	54.09	--	Reuse/sale to authorized recyclers registered with CPCB/ MoEF.
7	Chemical Sludge (Salts)	1506.66	Sodium Salts (Na <sub>2</sub> SO <sub>4</sub> .10H <sub>2</sub> O etc)	Disposal in SLF
8	Spent Catalyst (V <sub>2</sub> O <sub>5</sub> )	26.81	V <sub>2</sub> O <sub>5</sub>	Disposal in SLF
9	Discarded Containers/barrels/liners used for hazardous	134 no.	--	Disposal in SLF

	waste/Chemicals			
10	Cobalt Cake	--	--	No Generation
11	Flue Gas Cleaning Residue	--	--	No Generation
12	Spent ion exchange resin containing Toxic metal	--	--	No Generation
13	Oil soaked filter	--	--	Incineration in TSDF
14	Waste/residues containing oil	--	--	Sale to registered recycler
15	Process Residue	18305.36	--	Reuse/sale to authorized recyclers registered with CPCB/ MoEF.
16	Fly Ash	65513.44	47234.32	Provided to Cement Manufacturers
			18279.12	Backfilling in mines
17	Bottom Ash	11617.32	11617.32	Provided to Brick manufactures
18	Metal Scrap	1599.59	--	Sent to recyclers
19	Wooden Scrap	140.36	--	Sent to recyclers
20	Plastic Waste	37.80	--	Sent to recyclers

## Waste Generation specific to Lead Plant

Sr. No.	Name of waste	Quantity Generated (MT)	Quantity used	Disposal Method
16	Fuming Furnace Slag	78838.89	--	Provided to Cement Manufacturers



**PART-G****Impact of the pollution abatement measures taken on conservation of natural resources and on the cost of production.**

Our aim is to preserve the long- term health of the natural environment affected by our operations. We set and achieve targets that promote efficient use of resources and include the reduction and prevention pollution.

**Air Environment****Control of SO<sub>2</sub> Emissions in Acid Plant**

During operation of the smelter complex, the main emission sources are SO<sub>2</sub> from stack attached to Sulphuric Acid Plant. SO<sub>2</sub> emission is restricted to 1.5 kg/tone of acid and acid mist is controlled below 50 mg/Nm<sup>3</sup> which conform to the stipulated regulatory norms. Adequate stack height (105-m.) has been provided. TGT Plant has been provided for scrubbing of SO<sub>2</sub> in tailing gas. SO<sub>2</sub> is scrubbed with the help of calcine into ZnSO<sub>4</sub>.

**Water Environment**

We have a long-term approach to water management that aims to improve our performance, recognize the significance of water, and contribute to sustainable water management. We understand its importance and adopt best practices for making the judicious use of water and conserve it.

Effluent generated from the Dariba Smelter complex is treated in Effluent Treatment Plant (ETP) of capacity 9000 m<sup>3</sup>/day along with 8850 m<sup>3</sup>/day capacity of RO plant

The effluents generated from gas cleaning plant, sulphuric acid plant, anode and cathode washing, DM plant, cooling towers and power plant are treated to neutralize the acidity and to precipitate and remove metallic elements.

Treated water is reused/ recycled in processes. Multiple Effect Evaporator (MEE) and Solar Evaporation Ponds have been provided to treat RO reject water to ensure Zero Effluent Discharge from the plant premises.

Sewage collected from the plant is collected in septic tanks followed by soak pits. Sewage collected from residential colony is treated in Sewage Treatment Plant (STP) established in the colony itself.

Storm water ponds of adequate capacity have been constructed inside the plant premises for storing the drain water for further treatment in the ETP. It is used in the monsoon in conserving the rain water for further use in the plant.

### **Waste Management**

We focus on a '4R' waste strategy - Reduce, Recycle, Reuse and Reclaim and 'Eco-friendly' disposal of process residues. The solid wastes generated from the Lead smelter are given in 'Part F' of the environmental statement.

Slag Yard with thick clay liner has been constructed in the plant premises for the proper disposal of the waste for preventing the deterioration of the land and water environment.

### **Noise**

In the Smelter noise is generated from waste heat recovery boiler, fans, compressors, and blowers. All equipments in the Smelter have been designed /operated to have a noise level in line with the regulatory requirements. Necessary acoustic enclosures have been provided to limit noise levels within the norms.

## **PART-H**

**Additional measures/investment proposal for environment protection including abatement of pollution /prevention of pollution.**

### **Green belt Development**

Implementation of afforestation program is of paramount importance for Dariba Smelter Complex. In the financial years 2009-2022, 281870 nos. of saplings have been planted successfully. Drip irrigation facility has been provided to all the plant saplings.

- Dust capturing efficiency;
- Plant's growth;
- Canopy cover; and
- Origin of plant
- Arid Climatic conditions

## **PART-I**

**Any other particular for improving the quality of the environment.**

### **Environmental Monitoring**

Regular monitoring of important and crucial environmental parameters is of immense importance to assess the status of environment during plants operation. With the knowledge of baseline conditions, the monitoring program can serve as an indicator for any deterioration in environmental conditions due to operation of the plants and suitable preventive steps could be taken in time to safeguard the environment. Monitoring is as important as that of control of pollution since the efficiency of control measures can only be determined by monitoring. A

full-fledged environmental laboratory has been set up for regular monitoring of environmental parameters, inside and outside the plant.

The environmental attributes being monitored are as given below:

- Air Pollution and Meteorological Aspects
- Water and Wastewater Quality
- Noise Levels
- Soil Quality