



ज़ावर माईन्स
पिन कोड - 313901
ज़िला - उदयपुर (राज.)

HINDUSTAN ZINC LIMITED
हिन्दुस्तान जिंक लिमिटेड

Telephone - (0294) 2726600, Fax-2726243

Zawar Mines
PIN Code – 313901
Dist - Udaipur (Raj.)

Ref.: - HZL/ZM/ENV/2020-21/

Date – 14.09.2020

By Registered

The Member Secretary
Rajasthan State Pollution Control Board
4- Institutional Area, Jhalana Dungri
JAIPUR-302004 (Raj)

Sub.: Environmental Statement for the year 2019-19 for Zawar Group of Mines

Ref: F(Mines)/Udaipur(Sarada)/53(1)/2016-2017/8193-8197 dated 28/12/2017
F(CPM)/Udaipur(Sarada)/2(I)/2017-2018/10088-10090 Dated 21/03/2018
Environment Clearance vide No – J-11015/259/2012-IA.II (M) dated 05.01.2017

Sir

Please find attached herewith the **Environmental Statement** for the year **2019-20** for **Zawar Group of Mines**

Thanking you

Yours Sincerely

Balwant Singh Rathore
(Director –Zawar, SBU)

Encl.: As above

- CC: 1. The Director, Ministry of Environment and Forests, Regional Office (Central Region), Kendriya Bhawan, 5th Floor, Sector "H", Aliganj, Lucknow – 226024,(U.P.)
2. The Regional Officer, Rajasthan State Pollution Control Board, F-470, Near UCCI Building, Madri Industrial Area, Udaipur-313003 (Raj.).
3. Office Copy (Env. Cell)

FORM – V(See Rule-14)
ENVIRONMENTAL STATEMENT FOR FINANCIAL YEAR ENDING ON 31st MARCH, 2020

PART – A

1	Name and Address of the Owner / Occupier of the Industry / Operation and Process	Sh. Sunil Duggal CEO & Whole Time Director Hindustan Zinc Limited, Yashad Bhawan, Udaipur-313001 (Raj)
2	Name and address of unit head	Sh. B.S. Rathore Director Hindustan Zinc Limited, Zawar Mines, Tehsil-Sarada, Dist- Udaipur- 313901 (Raj)
3	Industry category Primary (STC code) Secondary (STC code)	Red/Large Mining of lead-zinc minerals and ore processing NA
4	Production capacity	4.0 Mtpa of ore production & Its beneficiation
5	Year of establishment	Prior to 1950
6	Date of last environmental statement submitted	11.09.2019

PART – B

(i) Fresh water consumption (Average)

Parameters	m ³ /day	
	2018-19	2019-20
Year	2018-19	2019-20
Process	3103.29	3687.59
Domestic	4460.25	2227.36

Name of product	Process fresh water consumption per unit of product output	
	2018-19	2019-20
Lead - Zinc concentrate	0.39 m ³ /MT*	0.316 m ³ /MT*

Our product output is lead - zinc concentrate. Whereas water consumption shown as cubic meter per ton of ore treatment in beneficiation plant

(ii) Raw material consumption

Name of product	Name of raw material	Consumption of raw material per unit of output (gm/MT) *	
		2018-19	2019-20
Lead & Zinc Concentrate	Copper Sulphate	168	132.31
	MIBC + Frothosol	41	32.30
	Xanthate	19	27.52
	Sodium Cyanide	10	7.50
	Lime	3	0.535

*Raw material consumption is shown as grams per tonne of ore treatment

Production	2018-19 (MT)	2019-20 (MT)
Ore treatment	2895399	3292729
Total Concentrate	174954	231255.2

PART – C

POLLUTION DISCHARGED TO ENVIRONMENT/UNIT OF OUTPUT
(Parameters as specified in the consent issued)

SN	Pollutants	Quantity of pollutants discharged	Concentration of pollutants in discharge (mass/volume)	% age of variation from prescribed standards and reason
a	Water	Zero discharge status	No Discharge	Zero discharge is maintained as per the consent granted by the RSPCB.
b	Air dust emission from stack (SPM)			

Mochia Crusher		44.53 mg/Nm ³	70.31 % lesser than standard
Balaria Crusher	14.94	44.46 mg/Nm ³	70.36 % lesser than standard
DE-2 (Mill-2)	kg/day	52.78 mg/Nm ³	64.81% lesser than standard
DG Set		71 mg/Nm ³	5.33 % lesser than standard

**PART – D
HAZARDOUS WASTE**

[As specified under Hazardous Waste (Management, Handling & Transboundary Movement) Rules 2008]

Hazardous waste	Total quantity during the year (MT)	
	2018-19	2019-20
a. From Process		
Decontaminated drums sold	557 Nos. & 2.68 MT	495 Nos. & 2.1 MT
Oil Sludge	0	0
Used Oil sold	188.53 MT	184.93 MT
Scrap lead acid batteries sold	0	4 MT + 108 Nos.
b. From pollution control facility	Nil	Nil

**PART – E
SOLID WASTE**

SN		Total quantity during the year		
		2018-19	2019-20	
a	From process (Tailings)*	2720445 MT	3061474 MT	
b	From pollution control facility **	Nil	Nil	
c	1-Quantity recycled or reutilized	Nil	Nil	
	2-Solid	Nil	Nil	
	3-Disposed***			
	Oil Sludge	0	0	
	Used Oil sold	188.53 MT	184.93 MT	
	Scrap lead acid batteries sold	0	4 MT + 108 Nos.	

* Wet Tailing of beneficiation plant is being processed in Dry Tailing Plant to produce dry tailing of 12-15 % moisture content, which is stacked in Tailing Storage facility. Water is reclaimed from Dry Tailing plant and is pumped back to beneficiation plant for reuse.

** All the dust slurry transported to process plant and utilized.

*** Used/Spent oil & Scrap lead acid batteries sold to registered parties with MoEF / CPCB.

PART – F (Format)

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

- i. **Solid Waste**- The Solid Waste in form of tailings (Non-Hazardous) generated from beneficiation plant is- **3061474 MT** having following mineralogical composition

Particular	% Content
Total Lead	0.15 %
Total Zinc	0.25 – 0.35 %
Total Iron	4.00 %
Insoluble	30 %
Cadmium	0.002 %

Wet Tailing of beneficiation plant is being processed in Dry Tailing Plant to produce dry tailing of 12-15 % moisture content, which is stacked in Tailing Storage facility. Water is reclaimed from Dry Tailing plant and is pumped back to beneficiation plant for reuse.

- ii. **Waste rock**- Total generation – **497991 MT**

The waste rock does not contain any minerals and are inactive rocks. This waste is dumped in open stopes of mines and also used in strengthening and height rising of tailing dam.

- iii. **Used oil-** Used oil is recovered from the different machinery and heavy earth movers. Used oil is stored in drums and kept in the specified area for disposal to registered re-refiners with MoEF/CPCB
- iv. **Discarded Containers and bags-** Discarded containers of chemicals are stored in the earmarked place, decontamination before disposal to TSDF.

PART – G

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

Wet Tailing of beneficiation plant is being processed in Dry Tailing Plant to produce dry tailing of 12-15 % moisture content, which is stacked in Tailing Storage facility. Water is reclaimed from Dry Tailing plant and is pumped back to beneficiation plant for reuse. Water requirement is met out by our captive Tidi Dam. The water requirement for process plant is meet out by 80% reclaimed water of tailing dam and 20% by fresh water. The construction of tailing dam with bottom and inside walls lined with impervious soil is one of the pollution control measures for discharging of water. The reclaimed water is used in plant to reduce the fresh water consumption by about 60%. Therefore, the cost of production is reduced and also the natural resources are conserved.

PART – H

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

The following works were completed to improve the working environment.

- Wet drilling operations continued.
- Transportation of concentrates in tarpaulin covered trucks.



Tarpaulin covered truck

- De-dusting systems at both the secondary crushers at Beneficiation Plant (Mochia & Balaria crushers).
- Installation of water sprinklers at Baroi and Mochia Mine Stockpile.
- Installation of water spray nozzles at Coarse Ore Stockpiles and other transfer points at Beneficiation Plant.



Mochia Coarse Ore Stockpile



Balaria Coarse Ore Stockpile

Unit is certified for ISO-9001:2015(QMS), ISO-14001:2015 (EMS), ISO-45001:2018 and SA-8000:2014 (Social Accountability)

Any other particulars for improving the quality of the environment:

- 1. Air pollution control:** Dust extraction systems are in place at both the crushers. Water sprinkling on ore while transportation and prior to crushing. Monitoring twice a month of ambient air at 6 locations and stack emission from stacks of crushing section for suspended particulate matter.
- 2. Water pollution control:**
 - a. Quality of mine water and ground water in and around the mine complex is being monitored regularly.
 - b. Wet Tailing of beneficiation plant is being processed in Dry Tailing Plant to produce dry tailing of 12-15 % moisture content, which is stacked in Tailing Storage facility. Water is reclaimed from Dry Tailing plant and is pumped back to beneficiation plant for reuse.
 - c. Reclaim water reservoir of 2,000 m³ capacity is used to prevent processed water from mixing to natural water source.
- 3. Noise and Vibration control:** Sound level for mining equipment's, beneficiation plant is regularly monitored. Use of blasting software for blast design and improvement in fragmentation. Ground vibrations are monitored on regular basis.
- 4 Plantation:** Land acquired for mining activity is 483.23 hectares, out of this 170.85 hectares has been used for plantation purpose by planting approximately **373625 plants** up to 2019-20.

As part of Forest Compliance, we have done plantation in forest area of 225 ha. Through Forest Department

- 5 Expenditure:** Year wise expenditure are reported to MoEF and its Regional Office at Lucknow. Total expenses during 2019-20 is **Rs 5,20,88,469.**

6. Environmental awareness: IBM, Ajmer region organizes Mine Environment and Mineral Conservation Week. During celebration of the week, numbers of activities were carried out to increase environmental awareness among the employees. Some of the activities, which are done during the week, are posters, slogans and lectures competitions. Showing the environmental films in the plant as well as in township. Regular environmental training to shop floor workmen to create the awareness. Celebration of World Environment Day on **5th June 2019**. Competitions for employees and children were conducted. Display of short films for Environment and Water Conservation on TV through Cable network. Earth hour was celebrated on **22 April 2019** from 08.30 PM to 09.30 PM

7 Water Conservation Measures: By deploying various water conservation measures Zawar Mines maintains Zero Effluent Discharge status. Following activities are being practiced and will be continued for monitoring and maintain zero discharge:

- Recycling of mine water for mining and beneficiation process.
- Wet Tailing of beneficiation plant is being processed in Dry Tailing Plant to produce dry tailing of 12-15 % moisture content, which is stacked in Tailing Storage facility. Water is reclaimed from Dry Tailing plant and is pumped back to beneficiation plant for reuse.
- Sewage Treatment Plants (300 KLD & 150 KLD) for domestic waste water. Treated water is recycled in Beneficiation plant, surface exploration drilling, plantation etc.
- 2,000 m³ Reservoir to collect and recycle the water.
- Zero discharge is being maintained.
- Regular monitoring of ground water. High Rate Thickener installed to improve water recovery.



High Rate Thickener



Recycling Water Pump House



2,000 m3 Capacity Water Reservoir



Sewage Treatment Plant

8 Awards: Mine Environment & Mineral Conservation Week was celebrated under the aegis of Indian Bureau of Mines. During the week-long celebrations, various activities like Speech competition, slogan writing, Essay writing, painting, self-written poem competition etc. are organized for employees & their families for creating awareness. Winners are conferred with awards. In the year **2019-20** all the four Mines of Zawar group participated and bagged various awards in underground mechanized category.

9 World Environment Day Celebration: World Environment Day was celebrated on **5th June 2019**. Various competitions were organized, and prizes were distributed to the winners. Plantation was also done by participants at designated site.

AMBIENT AIR QUALITY AT ZAWAR GROUP OF MINES

PM₁₀ IN AMBIENT AIR ZAWAR GROUP OF MINES (µg/m³) Limit for PM₁₀=100

Month	Mill Office	Mochia Mine	Balaria Mine	Admin Block	Zawarmala Mine	Baroi Mine
Apr-19	78.4	52	62	58.3	63.5	60.4
May-19	68.2	64	59.4	56.6	67.5	62.2
Jun-19	66.4	54.2	60.6	55.8	64.8	60.8
Jul-19	56.7	56.2	50.8	49.5	52.4	50.7
Aug-19	46.8	49.2	45.2	47.2	50.5	52.7
Sep-19	49.5	56.6	51.9	46.3	43	53.6
Oct-19	65.6	63.2	58.6	64.4	56.9	55.7
Nov-19	64.3	62.4	50.9	60.6	56.7	51
Dec-19	58.4	61.8	51.1	63.9	59.2	51.7
Jan-20	68.4	60.1	59.2	58.7	45.3	62.5
Feb-20	68.8	59.7	55	68.4	57.9	64.7
Mar-20	73.1	54.7	52.5	62.7	60.8	56.4

PM_{2.5} IN AMBIENT AIR ZAWAR GROUP OF MINES (µg/m³) Limit for PM_{2.5}=60

Month	Mill Office	Mochia Mine	Balaria Mine	Admin Block	Zawarmala Mine	Baroi Mine
Apr-19	47.8	31.6	37.9	34.4	36.4	35
May-19	41	38.2	35.9	33.8	40.9	38.8
Jun-19	38.7	32.5	36.4	33.6	38.7	35.7
Jul-19	33.6	32.9	30.2	28.1	30.3	30.1
Aug-19	27.5	28.8	26.9	28.5	31.7	31.8
Sep-19	29.3	35.1	32.4	27.9	25.5	31.8
Oct-19	40.2	38	35.2	38.8	34	33.2
Nov-19	35.2	36.9	29.6	37.1	34.2	31.1
Dec-19	35.6	38.5	29.8	38.8	34.6	30.1
Jan-20	42.5	35.9	34.3	33.1	28.7	37.7
Feb-20	42.5	37	32.7	42.5	34.5	38.1
Mar-20	44.9	32.3	31	36.9	36.6	34.9

SO₂ IN AMBIENT AIR ZAWAR GROUP OF MINES (µg/m³) Limit for SO₂=80

Month	Mill Office	Mochia Mine	Balaria Mine	Admin Block	Zawarmala Mine	Baroi Mine
Apr-19	13.5	6.9	8.9	8.2	8.3	7.8
May-19	10.3	8.9	7.6	7.7	9.3	8.4
Jun-19	11.5	7.1	7.5	7.5	8.9	7.9
Jul-19	7.9	7.8	6.8	7.3	7.5	6.2
Aug-19	6.2	6.8	6	6	6.9	7.3
Sep-19	6.8	9.5	7.9	6.3	6.2	7.6
Oct-19	10.5	10.1	9.3	10.5	7.9	8.4
Nov-19	7.5	8.5	6.4	6.9	6.9	6.4
Dec-19	8.9	8.3	6.3	8.7	7.3	6.3
Jan-20	8.4	8.3	7	7.4	6.0	7.9
Feb-20	8.9	7.8	6.8	9.7	7.7	7.3
Mar-20	8.2	6.5	6.3	8.1	8.1	6.8

NO_x IN AMBIENT AIR ZAWAR GROUP OF MINES (µg/m³) Limit for NO_x=80

Month	Mill Office	Mochia Mine	Balaria Mine	Admin Block	Zawarmala Mine	Baroi Mine
Apr-19	20	8.3	12	13	10.7	10.6
May-19	15	12.6	9.8	11.4	11	10.3
Jun-19	15	8.4	9.3	9.9	11.5	10.6
Jul-19	9.1	8.4	7.5	9.2	8.9	7
Aug-19	6.6	7.3	6.8	6	7.5	8.5
Sep-19	8.4	12	9.3	7.2	6.6	8.8
Oct-19	15	14	11.6	16	9.5	10.1
Nov-19	16	15	10.9	12.5	10.5	11.3
Dec-19	19	15	11.5	17.5	13.8	12.9
Jan-20	19	15	11.5	17.5	13.8	12.9
Feb-20	16.2	14.6	11.7	17.2	13.4	13.4
Mar-20	14	11	9.9	15	15	11

CO IN AMBIENT AIR ZAWAR GROUP OF MINES (µg/m³) Limit for CO=2000

Month	Mill Office	Mochia Mine	Balaria Mine	Admin Block	Zawarmala Mine	Baroi Mine
Apr-19	1031	802	916	916	802	916
May-19	916	916	802	802	916	802
Jun-19	916	802	802	802	916	802
Jul-19	802	802	687	802	802	687
Aug-19	687	687	687	687	687	687

Sep-19	687	802	802	687	687	687
Oct-19	802	802	802	802	687	802
Nov-19	802	802	687	802	687	687
Dec-19	802	802	687	916	802	802
Jan-20	802	802	687	802	687	802
Feb-20	802	802	687	916	687	802
Mar-20	802	687	687	802	802	687

Pb IN AMBIENT AIR ZAWAR GROUP OF MINES ($\mu\text{g}/\text{m}^3$) Limit for Pb=1						
Month	Mill Office	Mochia Mine	Balaria Mine	Admin Block	Zawarmala Mine	Baroi Mine
Apr-19	0.53	0.22	0.43	0.26	0.32	0.26
May-19	0.39	0.35	0.26	0.22	0.33	0.3
Jun-19	0.35	0.2	0.24	0.2	0.31	0.28
Jul-19	0.19	0.21	0.13	0.14	0.13	0.15
Aug-19	<0.1	<0.1	<0.1	<0.1	0.13	0.15
Sep-19	0.16	0.2	0.14	<0.1	<0.1	0.16
Oct-19	0.43	0.28	0.22	0.28	0.16	0.19
Nov-19	0.35	0.25	0.11	0.3	0.15	0.12
Dec-19	0.31	0.28	0.12	0.35	0.23	0.13
Jan-20	0.37	0.28	0.25	0.25	0.11	0.31
Feb-20	0.44	0.38	0.21	0.49	0.27	0.35
Mar-20	0.49	0.26	0.17	0.41	0.31	0.3

STACK MONITORING AT ZAWAR GROUP OF MINES

All units are in mg/Nm^3

Month	Mochia Crusher Stack	Balaria Crusher Stack	DE - 2 (Mill - 2)	D.G. Set Stack			
	SPM	SPM	SPM	SPM	NO _x	CO	NMHC
Parameters	SPM	SPM	SPM	SPM	NO_x	CO	NMHC
Prescribed Limits by RSPCB	150	150	150	75	710	150	100
Apr-19	24.5	22.3	-	-	-	-	-
May-19	34.1	33.9	-	-	-	-	-
Jun-19	35.5	33.8	-	-	-	-	-
Jul-19	48.2	43.7	-	-	-	-	-
Aug-19	47.8	41.9	-	-	-	-	-
Sep-19	45.3	57.7	-	-	-	-	-
Oct-19	52.9	49.6	-	-	-	-	-
Nov-19	46.8	49.5	56.5	71	540	112	79
Dec-19	45.9	49.7	58.9	-	-	-	-
Jan-20	45.6	41.6	36.4	-	-	-	-
Feb-20	51.3	56.7	61.2	-	-	-	-
Mar-20	56.5	53.1	50.9	-	-	-	-

Ground Water wells quality at Zawar Group of Mines

May-19 (Except pH all values are in mg/lt.)

S.No.	Parameters (IS: 10500:2012		Zawarmata Hand pump	Zawarmata Well	Naka Well	Mahadev ki Nal Well	Tiger Well
		Acceptable	Permissible					
1	pH	6.5-8.5	No Relaxation	7.27	7.36	7.3	7.13	6.89
2	Chlorides	250	1000	85.98	81.98	75.98	77.98	91.98
3	TSS	-	-	<5	<5	<5	8	<5
4	Zinc	5	15	0.34	0.05	0.16	0.03	1.09
5	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
6	Iron	0.3	No Relaxation	0.13	0.07	0.22	0.23	0.25
7	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01
8	Cadmium	0.003	No Relaxation	<0.003	<0.003	<0.003	<0.003	<0.003
9	Cyanides	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01

Jul-19 (Except pH all values are in mg/lt.)

S.No.	Parameters	IS : 10500:2012		Zawarmata Hand pump	Zawarmata Well	Naka Well	Mahadev ki Nal Well	Tiger Well
		Acceptable	Permissible					
1	pH	6.5-8.5	No Relaxation	7.61	7.42	7.81	7.75	7.49
2	Chlorides	250	1000	75.98	89.97	61.98	59.98	129.96
3	TSS	-	-	<5	<5	<5	6	<5
4	Zinc	5	15	<0.01	<0.01	<0.01	<0.01	<0.01
5	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
6	Iron	0.3	No Relaxation	0.62	0.08	0.15	0.05	0.39
7	Copper	0.05	1.5	<0.003	<0.003	<0.003	<0.003	<0.003
8	Cadmium	0.003	No Relaxation	0.1	<0.01	0.22	0.2	<0.01
9	Cyanides	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01

Sep-19 (Except pH all values are in mg/lt.)

S.No.	Parameters	IS : 10500:2012		Zawarmata Hand pump	Zawarmata Well	Naka Well	Mahadev ki Nal Well	Tiger Well
		Acceptable	Permissible					
1	pH	6.5-8.5	No Relaxation	6.82	7.21	7.48	7.09	6.9
2	Chlorides	250	1000	113.96	97.97	43.99	71.98	149.95
3	TSS	-	-	<5	<5	<5	7	<5
4	Zinc	5	15	<0.01	<0.01	<0.01	<0.01	<0.01
5	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
6	Iron	0.3	No Relaxation	1.19	0.08	0.1	0.18	0.25
7	Copper	0.05	1.5	<0.003	<0.003	<0.003	<0.003	<0.003
8	Cadmium	0.003	No Relaxation	0.37	<0.01	0.13	0.11	0.16
9	Cyanides	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01

Ground Water Quality at Zawar Group of Mines

Nov-19 (Except pH all values are in mg/lt.)

S.No.	Parameters (IS : 10500:2012		Zawarmata Hand pump	Zawarmata Well	Naka Well	Mahadev ki Nal Well	Tiger Well
		Acceptable	Permissible					
1	pH	6.5-8.5	No Relaxation	6.88	7.12	7.33	7.15	6.73
2	Chlorides	250	1000	57.99	75.98	57.98	83.97	111.96
3	TSS	-	-	<5	<5	<5	9	<5
4	Zinc	5	15	0.87	0.09	0.12	0.01	0.43
5	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
6	Iron	0.3	No Relaxation	0.21	<0.01	0.09	0.07	0.01
7	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01
8	Cadmium	0.003	No Relaxation	<0.003	<0.003	<0.003	<0.003	<0.003
9	Cyanides	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01

Jan-20 (Except pH all values are in mg/lt.)

S.No.	Parameters	IS : 10500:2012		Zawarmata Hand pump	Zawarmata Well	Naka Well	Mahadev ki Nal Well	Tiger Well
		Acceptable	Permissible					
1	pH	6.5-8.5	No Relaxation	7.08	7.14	7.45	6.81	6.97
2	Chlorides	250	1000	67.98	103.97	69.98	85.99	65.98
3	TSS	-	-	<5.0	<5.0	<5.0	10	<5.0
4	Zinc	5	15	0.43	0.05	0.03	0.03	0.05
5	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
6	Iron	0.3	No Relaxation	0.14	<0.01	0.04	0.05	0.01
7	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01
8	Cadmium	0.003	No Relaxation	<0.003	<0.003	<0.003	<0.003	<0.003
9	Cyanides	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01

Mar-20 (Except pH all values are in mg/lt.)

S.No.	Parameters	IS : 10500:2012		Zawarmata Hand pump	Zawarmata Well	Naka Well	Mahadev ki Nal Well	Tiger Well
		Acceptable	Permissible					
1	pH	6.5-8.5	No Relaxation	7.24	7.25	7.59	7.41	7.14
2	Chlorides	250	1000	73.98	107.97	79.98	85.97	71.98
3	TSS	-	-	<5.0	<5.0	<5.0	15	7
4	Zinc	5	15	0.25	<0.01	<0.01	0.03	<0.01
5	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
6	Iron	0.3	No Relaxation	0.13	<0.01	<0.01	0.05	0.01
7	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01
8	Cadmium	0.003	No Relaxation	<0.003	<0.003	<0.003	<0.003	<0.003
9	Cyanides	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01

6	Iron	0.3	No Relaxation	0.09	0.14	0.01	0.01	0.04	0.04
7	Copper	0.05	1.5	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
8	Cadmium	0.003	No Relaxation	0.06	0.03	0.31	0.08	0.18	0.16
9	Cyanides	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Piezometer Well Water Quality at Zawar Group of Mines

Nov-19 (Except pH all values are in mg/lit)

S.No.	Parameters	IS: 10500:2012		Near Bridge (Vala Patel House) (Pz - 01)	Near In front of Old Tailing Dam (Pz - 02)	Near Tailing Dam Pump House (Pz - 03)	Near Magazine Area (Pz - 04)	Near Below Tailing Pipe Lines (Pz - 05)	Near Way to Tailing Dam Road (Pz - 06)
		Acceptable	Permissible						
1	pH	6.5-8.5	No Relaxation	6.73	6.94	6.62	6.88	7.38	6.78
2	Chlorides	250	1000	85.97	61.98	63.99	77.98	47.99	31.99
3	TSS	-	-	<5	18	<5	<5	<5	12
4	Zinc	5	15	0.13	0.1	0.01	0.01	0.03	0.03
5	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
6	Iron	0.3	No Relaxation	0.07	0.03	0.22	0.06	0.09	0.11
7	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8	Cadmium	0.003	No Relaxation	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
9	Cyanides	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Jan-20 (Except pH all values are in mg/lit)

S.No.	Parameters	IS : 10500:2012		Near Bridge (Vala Patel House) (Pz - 01)	Near In front of Old Tailing Dam (Pz - 02)	Near Tailing Dam Pump House (Pz - 03)	Near Magazine Area (Pz - 04)	Near Below Tailing Pipe Lines (Pz - 05)	Near Way to Tailing Dam Road (Pz - 06)
		Acceptable	Permissible						
1	pH	6.5-8.5	No Relaxation	6.80	6.75	7.28	6.80	7.96	7.12
2	Chlorides	250	1000	64	71	95	78.8	32.5	67.1
3	TSS	-	-	-	-	-	-	-	-
4	Zinc	5	15	0.14	0.14	0.09	0.08	0.03	0.08
5	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
6	Iron	0.3	No Relaxation	0.01	<0.01	0.05	0.05	0.05	0.06
7	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8	Cadmium	0.003	No Relaxation	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
9	Cyanides	0.05	No Relaxation	-	-	-	-	-	-
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	-	-	-	-	-	-
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Feb-20 (Except pH all values are in mg/lit)

S.No.	Parameters	IS: 10500:2012		Near Bridge (Vala Patel House)	Near In front of Old Tailing Dam	Near Tailing Dam Pump House(Pz - 03)	Near Magazine Area(Pz - 04)	Near Below Tailing Pipe Lines(Pz - 05)	Near Way to Tailing Dam Road(Pz - 06)
		Acceptable	Permissible						

				(Pz 01) -	(Pz 02) -				
1	pH	6.5-8.5	No Relaxation	6.72	6.92	7.34	6.54	7.88	7.25
2	Chlorides	250	1000	72	76.2	104	82.20	35.1	74.5
3	TSS	-	-	-	-	-	-	-	-
4	Zinc	5	15	0.11	0.16	0.071	0.076	0.036	0.087
5	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
6	Iron	0.3	No Relaxation	0.03	<0.01	0.06	0.06	0.06	0.068
7	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8	Cadmium	0.003	No Relaxation	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
9	Cyanides	0.05	No Relaxation	-	-	-	-	-	-
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	-	-	-	-	-	-
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

S.No.	Piezometers	Jun - 19 (m)	Sep - 19 (m)	Dec - 19 (m)	Jan - 20 (m)	Feb - 20 (m)
1.	Near Bridge (Vala Patel House) (Pz - 01)	2.33	0	0.89	0.98	1.57
2.	Near In front of Old Tailing Dam (Pz - 02)	5.3	1.63	5.7	6.74	7.21
3.	Near Tailing Dam Pump House (Pz - 03)	4.85	0.91	2.33	3.02	2.78
4.	Near Magazine Area (Pz - 04)	6.31	2.85	5.95	5.98	6.45
5.	Near Below Tailing Pipe Lines (Pz - 05)	7.32	1.06	4.77	4.83	4.98
6.	Near Way to Tailing Dam Road (Pz - 06)	3.14	0.12	1.75	1.25	1.79

S.No.	Wells in the area	Jun -19 (m)	Sep -19 (m)	Dec -19 (m)	Jan - 20 (m)	Feb - 20 (m)
1.	Zawarmata Well	6.36	2.39	3.5	3.47	3.86
2.	Naka Well	3	2	2.5	3.9	4.38
3.	Mahadev ki Nal Well	3.03	0	1	0.73	1.11

ANALYSIS OF MINE WATER AT ZAWAR GROUP OF MINES

Except pH all values are in ppm.

1. Mochia Mine Water

Parameters	Effluent Standards as per IS:2490	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
pH	5.5-9.0	8.2	8.3	8.1	8.2	8.3	8.2	8.2	8.3	8.4	8.3	8.2	8.2
Alkalinity	-	225	227	222	190	226	220	180	190	248	216	176	202
Chlorides	1000	153	168	158	166	172	170	156	160	128	160	136	157
Hardness	-	1092	1150	790	780	810	800	436	500	536	756	1176	1008
Total Solids	2200	1413	1585	1480	1480	1471	1165	1641	852	1068	1341	1434	1382
Total D.S.	2100	1331	1499	1392	1392	1391	1081	1564	771	984	1254	1350	1298
Total S.S.	100	82	86	88	88	80	84	77	81	84	87	84	84
Sulphates	1000	760	866	880	830	700	680	525	510	678	495	610	527
Zinc	5.0	0.4	0.3	0.2	0.22	0.18	0.14	0.16	0.3	0.16	0.24	0.98	0.46
Lead	0.10	0.01	0.07	0.05	0.05	0.07	0.02	0.09	0.08	0.09	0.08	0.09	0.08
Iron	3.0	0.18	0.2	0.12	0.2	0.09	0.12	0.18	0.3	0.18	0.05	0.08	0.06
Copper	3.0	0.02	0.03	0.01	0.03	0.01	0.01	0.01	0.04	0.01	0.03	0.02	0.01
Cadmium	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cyanide	0.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Manganese	-	0.18	0.20	0.06	0.14	0.08	0.04	0.06	0.1	0.05	0.03	0.02	0.04

2. Balaria Mine Water

Parameters	Effluent Standards as per IS:2490	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
pH	5.5-9.0	8.2	8.3	8.2	8.2	8.1	8.1	8.2	8.1	8.4	8.3	8.1	8.1
Alkalinity	-	188	190	184	180	200	198	236	234	256	250	184	200
Chlorides	1000	127	120	122	118	124	126	160	158	124	130	128	126
Hardness	-	754	640	700	700	760	770	1012	1000	616	880	864	984
Total Solids	2200	1268	1555	1446	1446	1454	1465	1665	1455	1466	1445	1429	1268
Total D.S.	2100	1189	1473	1362	1362	1373	1383	1590	1374	1384	1365	1349	1189
Total S.S.	100	79	82	84	84	81	82	75	81	82	80	80	79
Sulphates	1000	540	550	540	504	512	526	560	550	277	440	493	432
Zinc	5.0	0.18	0.11	0.20	0.16	0.12	0.14	0.32	0.3	0.12	0.1	0.99	0.64
Lead	0.10	0.05	0.07	0.06	0.04	0.06	0.05	0.05	0.07	0.09	0.08	0.09	0.06
Iron	3.0	0.11	0.08	0.12	0.16	0.09	0.07	0.1	0.14	0.13	0.12	0.07	0.06
Copper	3.0	0.02	0.03	0.01	0.02	0.01	0.01	0.01	0.04	0.01	0.03	0.01	0.01
Cadmium	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cyanide	0.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Manganese	-	0.12	0.14	0.08	0.04	0.08	0.06	0.05	0.1	0.08	0.07	0.05	0.07

3. Zawarmala Mine Water

Parameters	Effluent Standards as per IS:2490	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
pH	5.5-9.0	8.2	8.3	8.2	8.1	8.2	8.2	8.4	8.3	8.4	8.2	8.3	8.1
Alkalinity	-	178	180	172	164	160	166	184	182	164	176	200	184
Chlorides	1000	157	162	166	160	172	170	136	132	152	136	108	130
Hardness	-	762	673	760	700	698	690	912	900	716	624	500	616

Total Solids	2200	1036	1117	1335	1335	1348	1035	1501	922	1306	1036	1268	1117
Total D.S.	2100	954	1035	1253	1253	1263	953	1429	841	1220	954	1180	1035
Total S.S.	100	82	82	82	82	85	82	72	81	86	82	88	82
Sulphates	1000	542	562	560	570	576	588	503	490	250	405	457	381
Zinc	5.0	0.34	0.40	0.30	0.28	0.3	0.24	0.4	0.45	0.25	0.09	0.05	0.08
Lead	0.10	0.05	0.03	0.04	0.06	0.08	0.05	0.08	0.07	0.09	0.09	0.03	0.06
Iron	3.0	0.2	0.24	0.14	0.16	0.18	0.1	0.09	0.2	0.27	0.14	0.04	0.09
Copper	3.0	0.02	0.03	0.01	0.01	0.02	0.01	BDL	0.04	0.01	0.02	0.03	0.01
Cadmium	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cyanide	0.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Manganese	-	0.2	0.09	0.06	0.08	0.05	0.04	0.07	0.09	0.02	0.08	0.05	0.04

4. Baroi Mine Water

Parameters	Effluent Standards as per IS:2490	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
pH	5.5-9.0	8.1	8.2	8.3	8.3	8.2	8.2	8.3	8.3	8.4	8.2	8.2	8.1
Alkalinity	-	184	180	182	196	206	200	180	196	156	164	160	168
Chlorides	1000	150	158	154	150	156	152	160	158	96	128	124	125
Hardness	-	970	915	800	770	700	688	460	560	604	592	556	626
Total Solids	2200	1368	1200	1440	1440	1199	1380	1305	983	1178	1368	1045	1191
Total D.S.	2100	1284	1128	1360	1361	1127	1302	1233	901	1088	1284	970	1127
Total S.S.	100	84	72	80	79	72	78	72	82	90	84	75	64
Sulphates	1000	718	780	750	610	648	636	315	420	524	445	400	401
Zinc	5.0	0.16	0.12	0.18	0.28	0.14	0.10	0.08	0.22	0.08	0.07	0.35	0.3
Lead	0.10	0.08	0.06	0.08	0.05	0.08	0.07	0.09	0.06	0.09	0.07	0.09	0.07
Iron	3.0	0.14	0.1	0.06	0.08	0.02	0.01	0.14	0.16	0.14	0.04	0.05	0.04
Copper	3.0	0.01	0.02	0.02	0.01	0.02	0.02	0.01	0.04	0.02	0.03	0.01	0.02
Cadmium	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cyanide	0.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Manganese	-	0.16	0.14	0.04	0.08	0.1	0.04	0.02	0.09	0.02	0.03	0.08	0.07

Analysis of Tailing Dam Reclaim Water

Zawar Group of Mines

Except pH all values are in ppm.

SN	Parameters	Effluent Standards as per IS:2490	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
1	pH	5.5-9.0	-	7.79	-	7.87	-	6.89	-	7.08	-
2	Chlorides	-	-	115.97	-	97.97	-	59.98	-	79.98	-
3	TSS	100	-	20	-	24	-	25	-	32	-
4	Oil and Grease	10	-	<5	-	<5	-	<5	-	<5	-
5	BOD 3 days at 27°C	30	-	12	-	8	-	10	-	13	-
6	COD	250	-	152	-	140	-	125	-	142	-
7	Zinc	5	-	2.05	-	1.64	-	1.74	-	1.11	-
8	Lead	0.1	-	<0.01	-	<0.01	-	<0.01	-	<0.01	-
9	Iron	3	-	0.42	-	0.04	-	0.13	-	0.09	-
10	Copper	3	-	<0.01	-	<0.01	-	<0.01	-	<0.01	-
11	Cadmium	2	-	<0.003	-	<0.003	-	<0.003	-	<0.003	-
12	Cyanides	0.2	-	<0.01	-	<0.01	-	<0.01	-	<0.01	-
13	Nickel	3	-	<0.01	-	<0.01	-	<0.01	-	<0.01	-
14	Cobalt	-	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
15	Chromium	2	-	<0.01	-	<0.01	-	<0.01	-	<0.01	-

SN	Parameters	Effluent Standards as per IS:2490	Jan-20	Feb-20	Mar-20
1	pH	5.5-9.0	7.13	-	7.35
2	Chlorides	-	81.98	-	91.98
3	TSS	100	11	-	7
4	Oil and Grease	10	<5.0	-	<5.0
5	BOD 3 days at 27°C	30	8	-	10
6	COD	250	40	-	53
7	Zinc	5	1.13	-	1.08
8	Lead	0.1	<0.01	-	<0.01
9	Iron	3	0.08	-	0.12
10	Copper	3	<0.01	-	<0.01
11	Cadmium	2	<0.003	-	<0.003
12	Cyanides	0.2	<0.01	-	<0.01
13	Nickel	3	<0.01	-	<0.01
14	Cobalt	-	<0.05	-	<0.05
15	Chromium	2	<0.01	-	<0.01

HINDUSTAN ZINC LIMITED
Ashok Nagar STP Analysis Report for 2019-20

Except pH all value are in mg/lit

Parameters	Limits	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
pH	5.5-9.0	-	6.99	-	7.71	-	7.27	-	7.11	-	7.48	7.13	7.35
Total Suspended Solids	100	-	9	-	13	-	11	-	73	-	46	39	37
Oil & Grease	10	-	<5	-	<5	-	<5	-	<5	-	<5.0	<5.0	<5.0
Biochemical Oxygen Demand (3 days at 27 °C)	30	-	13	-	20	-	17	-	19	-	22	19	20
Chemical Oxygen Demand	250	-	138	-	212	-	195	-	148	-	143	135	160
Total Residual Chlorine	1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	<0.1
Total Kjeldahl Nitrogen (as N)	100	-	10	-	24	-	14	-	20	-	17	13	25
Ammoniacal Nitrogen (as N)	50	-	5	-	10	-	6	-	9	-	8	7	13
Sulphide (as S)	2	-	0.4	-	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
Nitrate Nitrogen	10	-	5.22	-	4.89	-	3.66	-	3.8	-	4.2	4.9	4.5
Chlorides	1000	-	183.96	-	161.97	-	152.98	-	162.97	-	155.97	153.9	163.96
Sulphates	1000	-	155.7	-	126.40	-	114.6	-	152.9	-	268.3	341.2	287.5

Ram Nagar STP Analysis Report for 2019-20

Except pH all value are in mg/lit

Parameters	Limits	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
pH	5.5-9.0	-	7.43	-	7.62	-	7.23	-	7.23	-	7.18	7.42	7.4
Total Suspended Solids	100	-	16	-	28	-	22	-	34	-	52	62	26
Oil & Grease	10	-	<5	-	<5	-	<5	-	<5	-	<5.0	<5.0	<5.0
Biochemical Oxygen Demand (3 days at 27°C)	30	-	16	-	18	-	16	-	14	-	26	21	18
Chemical Oxygen Demand	250	-	158	-	196	-	167	-	119	-	220	160	100
Total Residual Chlorine	1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	<0.1
Total kjeldahl	100	-	13	-	16	-	11	-	15	-	23	18	18

Nitrogen(as N)													
Ammoniacal Nitrogen (as N)	50	-	5	-	7	-	5	-	8	-	12	7	10
Sulphide (as S)	2	-	0.4	-	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
Nitrate Nitrogen	10	-	6.1	-	5.8	-	5.1	-	4.5	-	6.2	4.7	4.9
Chlorides	1000	-	131.96	-	126.98	-	126.98	-	129.97	-	169.96	183.9	177.96
Sulphates	1000	-	175.2	-	132.30	-	145.70	-	133	-	325	287.9	310

AMBIENT NOISE MONITORING AT ZAWAR GROUP OF MINES				
Stations/Month	Apr-19		Oct - 19	
	Day	Night	Day	Night
Mill Office	69.8	65.8	70.5	63.9
Mochia Mine	60.1	51.6	59.6	52.3
Balaria Mine	60.9	55.7	61.4	55.9
Administrative Block	62.5	53.6	63.1	54.2
Zawar Mala Mine	62.3	57.4	59.2	53.9
Baroi Mine	64.2	59.3	63.8	58.8
Main Store	63.9	51.9	68.8	53.6
Filter House	70.5	65.6	69.9	66.4
Community Centre	56.4	50.1	60.4	53.5
Guest House	62.3	49.4	61.7	47.6
Permissible Limit	75	70	75	70