

GRASIM/ ENV/ / 2023
September 29th, 2023

To
The Member Secretary,
Gujarat Pollution Control Board,
Paryavaran Bhavan, Sector 10 - A,
Gandhinagar – 382 043

R/606

Sub. : Submission of Environmental Statement Report for the Financial Year 2022-23

Respected Sir,

We are submitting herewith Environmental Statement Report of M/s. Grasim Industries Limited, Unit- Indian Rayon-Veraval for the Financial Year ending on 31st March, 2023 in the format of Form V prescribed under Rule 14 of Environment (Protection) Rule 1986.

Hope, you will find the same in order.

Thanking You,

Yours faithfully,

For Grasim Industries Limited; Unit – Indian Rayon, Vera

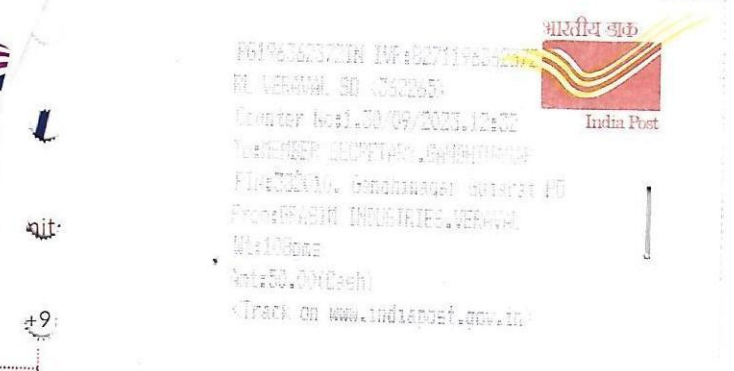
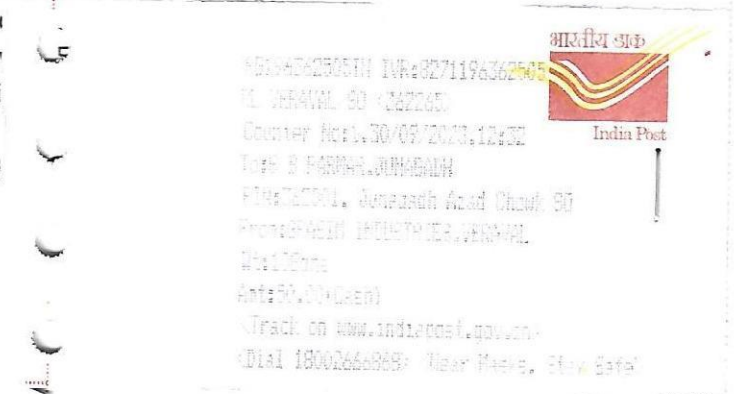
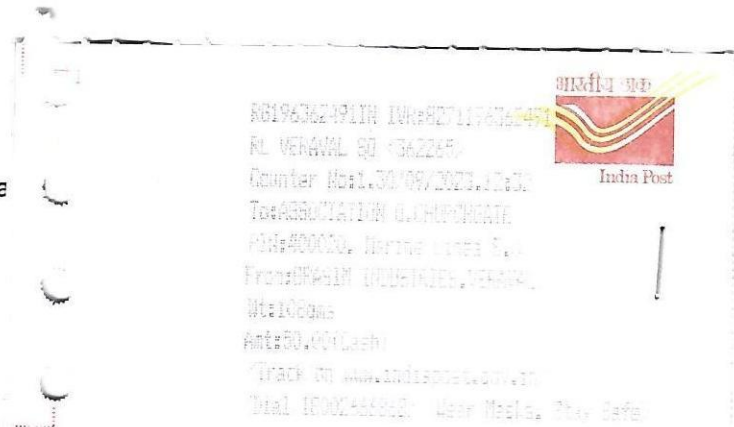
Shashank Pareek
Unit head

Cc:

The Regional Officer
Gujarat Pollution Control Board
Pankaj Vikas Bunglow,
Opposite Saint Annes Church,
Station Road Junagadh – 362 001

Association of
Resham Bhar
78 Veer Nari
Churchgate,
Mumbai – 4

R/607



Grasim Industries
(VFY – Fashion Yarn

Unit : Indian Rayon, Veraval - 362 266, Di

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FORM - V

[See Rule 14 of Environmental (Protection) Rules, 1986]

ENVIRONMENTAL STATEMENT FOR FINANCIAL YEAR ENDING THE 31st MARCH 2023

PART - A

1	Name and address of the owner/ occupier of the industry operation or process	Mr. Shashank Pareek Unit Head Grasim Industries Limited; Unit - Indian Rayon Junagadh - Veraval Road, Veraval - 362266
2	Industry category Primary: (STC Code) Secondary: (STC Code)	Red
3	Production Capacity	Details are attached as Annexure - I
4	Year of Establishment	1963
5	Date of the last Environmental Statement submitted	24 th September 2022

PART - B

Water and Raw Material Consumption

Sr. No.		Average Water Consumption, m ³ /day	
		During the Previous Financial Year (2021-22)	During the current Financial Year (2022-23)
1	Process	9305.43	9654.79
2	Cooling	2167.01	2248.38
3	Domestic	1274.72	1322.58
	TOTAL	12747.16	13225.75

Name of Products	Process Water Consumption per unit of product output, (m ³ /MT)	
	During the Previous Financial Year (2021-22)	During the current Financial Year (2022-23)
Viscose Filament Yarn (VFY)	134.33	141.45
Caustic Soda Plant (CSP)	3.85	3.93
Sulphuric Acid Plant (H ₂ SO ₄)	0.83	0.50
Carbon Di Sulphide (CS ₂)	7.44	5.07

* The above figure includes water consumption in Captive Power Plant.

Name of Raw Material	Name of Product	Consumption of Raw Material per Unit output	
		During the Previous Financial Year (2021-22)	During the current Financial Year (2022-23)
Wood Pulp	VFY	1.074	1.07
Caustic Soda	VFY	0.674	0.66
CS ₂	VFY	0.260	0.26
H ₂ SO ₄	VFY	1.032	1.05
Zinc	VFY	9.814	10.96
Sulphur	H ₂ SO ₄	0.330	0.33
Sulphur	CS ₂	0.903	0.93
Charcoal	CS ₂	0.368	0.37
Salt	Caustic	1.668	1.64

PART – C

Pollution discharged to environment/ unit of output. (Parameters as specified in the Consent issued) of output

Pollutants	Quantity of Pollutants Discharged (Mass/day)	Concentrations of Pollutants in Discharges (Mass/Volume)	Percentage of variation from Prescribed Standards with Reasons
(a) Water	(Details are attached as <u>Annexure- II</u>)		
(b) Air			

PART – D

As specified under Hazardous waste and Other Waste (Management, & Trans boundary Movement) Rules, 2016.

Sr. No.	Hazardous Waste	Total Quantity (MT)	
		During the Previous Financial Year (2021-22)	During the current Financial Year (2022-23)
1	From Process	(Details are attached as <u>Annexure - III</u>)	
2	From Pollution Control Facilities		

PART – E

(Solid wastes)

Sr. No.		Total Quantity	
		During the Previous Financial Year (2021-22)	During the current Financial Year (2022-23)
A	From Process	(Details are attached as <u>Annexure - III</u>)	
B	From pollution control facilities		
C	1. Quantity recycled or re-utilized within the unit		

2. Sold	
3. Disposed	

PART – F

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

(Details are attached as **Annexure-IV**)

PART – G

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

(Details are attached as **Annexure V - A & V - B**)

PART – H

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

(Details are attached as **Annexure-VI**)

PART – I

Any other particulars for improvement in the quality of the environment:

(Details are attached as **Annexure-VII**)

Date: 29.09.2023

Name : **Shashank Pareek**
Designation : **Unit Head**
Address : **Grasim Industries Limited; Unit - Indian
Rayon, Veraval - 362266**



Production Capacity

Sr. No.	Name of Products	Quantity as per GPCB Consent MT/ Month	Average Actual Production in FY 2022-23 MT/ Month
1	Viscose Filament Yarn	1950	1705.99
2	Sodium Sulphate	2050	1024.59
3	Sulphuric Acid	3600	2681.00
4	Sodium Sulphide (100%)	100	42.33
5	Carbon di Sulphide	1000	521.25
6	Caustic Soda Lye (100%)	12000	6511.82
7	Chlorine (100%)	10560	4990.13
8	Hydrochloric Acid (100%)	1800	883.10
9	Sodium Hypo chlorite (100%)	3750	46.13
10	Compressed Hydrogen	650000 Nm ³	138630.33 Nm ³
11	Captive Power (Thermal)	54.5 MW	8340824.00 kWh

PART - C

Pollution Discharged to Environment per unit of output
(Parameters as specified in the Consent issued)

Sr. No.	Pollutants	Quantity of Pollutants Discharged (Kg/ day)	Concentration of pollutants in discharges (Mass/ volume) mg/l	% of variation from prescribed Standards with reasons.
A	Water Pollution			
1	B.O.D	510.84	54.2	The limits of various pollutants are quite lower than the specified limits.
2	C.O.D	1745.04	185.1	
3	Suspended solids	317.24	33.6	
4	Oil & Grease	27.50	2.9	
5	Zinc	9.32	1.0	
6	Bio-Assay test	100 % survival	100 % survival	

Note: 1. Values were calculated on the basis of around 9430.12 m³/day Effluent discharge.
2. Calculations have been done on Annual Average Concentration.

Sr. No.	Pollutants	Quantity of Pollutants Discharged (Kg/ day)	Concentration of pollutants in discharges (Mass/ volume) mg/l or ppm	% of variation from prescribed Standards with reasons.
B	Air Pollution			
1	Sulphur Di Oxide from both Acid Plant	25.78	0.29 Kg/Ton of 100% Acid Production	The limits of various pollutants are quite lower than the specified limits.
2	Carbon Di Sulphide from both Rayon Stack	7361.48	131.25 Kg/Ton of yarn Production	
3	Hydrogen Sulphide from both Rayon Stack	997.42	17.78 Kg/Ton of yarn Production	
4	Chlorine Stack	0.001	0.26 mg/m ³	
5	HCl Stack	0.082	3.80 mg/m ³	
6	Total Particulate matter form Boiler 1 & 2 (Old Power Plant)	54.604	40.8 mg/m ³	
7	SOx from Boiler - 1 & 2 of Old Power Plant	152.823	114 mg/m ³	
8	NOx from Boiler - 1 & 2 Old of Power Plant	8.932	6.67 mg/m ³	
9	Total Particulate matter from Boiler 3 (New Power Plant)	159.625	30.49 mg/m ³	
10	SOx from Boiler – 3	660.455	126 mg/m ³	
11	NOx from Boiler – 3	32.099	6.1 mg/m ³	
12	Total Particulate matter from Boiler 5 (New Power Plant)	125.115	23.9 mg/m ³	
13	SOx from Boiler – 5	305.170	58.3 mg/Nm ³	

14	NOx from Boiler – 5	23.128	4.4 mg/Nm3	
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Note: Calculations have been done on Annual Average Concentration.

Note: i) Boiler 4 is Dismantled and not in operation since the month of June 2022.

ii) Boiler 1 & 2 was not operational in the month of July 2022, September 2022, October 2022, January 2023, February 2023, March 2023.

Annexure-III

PART – D

Hazardous Waste - As specified under Hazardous and Other Waste (Management & Trans boundary Movement) Rules, 2016

Hazardous waste Quantity FY 21-22:

Sr.	Waste Name	FY 21-22	
		Generation	Disposal
		MT	MT
1	Sulphur Sludge	35.86	35.855
2	Resin	0	0
3	Vanadium Pentoxide	1.443	0
4	Used Oil/ Burnt Oil/ LDO Sludge	10.914	14.17
5	Discarded Container	48.89	48.17
6	E-Waste	4.95	8.44
7	Cellulose Waste + Oily Cotton Waste	16.794	0.85
8	Lead Scrap & Lead Acid Batteries	16.543	19.93

Hazardous waste Quantity FY 22-23:

Sr. No.	Waste Name	Category	Opening stock as on 01/04/2022	Generation	In house Usage	Disposal	Closing stock as on 31/03/2023
			MT	MT	MT	MT	MT
1	Sulphur Sludge	17.1	1.67	138.294	--	57.68	82.284
2	Used Oil/Burnt Oil/LDO	5.1	6.5	22.12	--	26.71	1.91
3	Discarded Drums	33.1	3.075	37.755	--	40.34	0.49
4	Cellulose Waste	23.1	20.919	38.471	--	51.61	7.78
5	Spent Catalyst	17.2	1.995	4.4	--	3.61	2.785
6	Spent Resin	35.2	0	0	--	0	0
7	Oily Cotton Waste	5.2	1.18	0.675	--	0	1.855

8	Exhaust Membrane	36.1	0.15	0.281	--	0	0.431
9	E-Waste	18	7.238	7.531	--	14.57	0.199
10	Lead Acid Battery plates and other Led Scrap not covered under Batteries Rules 2001	17	0	45.105	--	42.06	3.045
11	Brine Sludge	16.3	340.22	1575.05	--	1915.22	0.05
12	ETP Sludge	35.3	0	5066.49	--	2992.58	2073.91
13	Asbestos containing material & Asbestos Sheets	B1	25	8.966	--	29.47	4.496
14	Bag Filter Clothes	35.1	0	0	--	0	0
15	Glass Wool Insulation	S2 (Schedule other)	0.15	4.15	--	4.15	0.15
16	FRP Waste	--	22.266	40.53	--	0	62.796
17	Spent Acid	B-15 (Schedule II)	15.413	1823.612	374.12 (In ETP for PH Correction)	1438.64	26.265
18	RO Membrane	36.1	0	10.77	--	0	10.77

PART – E

Solid Wastes Quantity

Sr. No.	Waste Name	FY 21-22		FY 22-23	
		Generation	Disposal	Generation	Disposal
		MT	MT	MT	MT
1	Hard Mass	101.45	101.45	95.863	48.308
2	Deashing Charcoal	140.997	63.472	24.834	102.359
3	Fly Ash	27,174	27,174	25655	25625
4	Coal Ash	6518.85	6716.79	411	465.48
5	Viscose	39.64	39.64	40.43	40.43
6	Alkali Cellulose	3.96	3.96	12.58	12.58
7	Bed ash	4798.9	4674.97	5,270.52	4777.49

PART –F**Characteristics of Hazardous /Solid Waste**

Waste Name	pH	Moisture (%) at 105 degree C	Calorific Value (Kcal/kg)	Chloride (%)	Sulphur (%)
ETP Sludge	6.0	6.20	< 200	0.05	1.82
Brine Sludge	7.0	42.48	< 200	0.08	< 0.5
Sulphur Sludge	7.0	2.80	2729	0.10	98.46
Bag Filter Clothes	7.0	0.21	< 200	0.02	< 0.5
FRP Waste	6.0	2.33	3196	0.06	< 0.5
Asbestos Waste	6.0	2.66	< 200	0.01	< 0.5
Spent Catalyst	< 2.0	2.77	< 200	0.1	17.84

Solid Waste

S. No	Solid Waste	Composition	Percentage
1	Bed Ash	Moisture	16 -22
		Ash	68-78
		Fixed Carbon	04 -08
2	Fly Ash	Moisture	72
		Ash	25
		Fixed Carbon	3
3	Viscose	Cellulose	8.70-8.80
		Caustic Soda	5.7-5.80
		Moisture	85.5
4	Alkali Cellulose	Cellulose	33-34
		Caustic Soda	15-15.50
		Moisture	50.2
5	De-ashing Hard Mass	Sulphur	2-4
		Ash	36.1
		V.M.	17.2
		Fixed Carbon	46.7
6	De-ashing Charcoal	Moisture	7-24
		Sulphur	2 - 4
		Ash	5-9
		Fixed Carbon	83-96
		V.M	11-18

Disposal Practice

1. The above mentioned wastes are stored in the interim storage area having HDPE pipe along with the filter media with leachate collection System. The other wastes are stored in properly designated storage shed with proper segregation.

2. We have obtained the membership of M/s. Safe Enviro Pvt. Ltd., Jambusar for disposal of cellulose waste, Spent catalyst and Cellulose waste.
3. We have obtained the membership of M/s Saurashtra Enviro Private Project Limited, Bhachau for disposing Sulphur sludge, Spent Catalyst, Spent Resin, Cellulose Waste and Oily Cotton Waste, Exhaust Membrane, Bag filter Cloth, FRP waste, RO Membrane.
4. We have obtained the membership of M/s. Eco care Infrastructure Pvt. Ltd for disposing ETP sludge, Brine sludge, Asbestos waste.
5. We have disposed E-waste, Used Oil/Burnt Oil, Lead Acid Battery plates, Spent Acid & discarded Containers to GPCB authorized recyclers.
6. As an adherence to circular economy, Total 43 % ETP sludge i.e. total 1304.5 MT out of 2992.58 MT has been send to the nearby cement plants in FY 23 and Total 53 % Cellulose waste i.e. total 27.58 MT cellulose waste out of 51.61 MT is sent to the cement industry to be used in the kiln for co-processing as alternative fuels (AFR) in FY 23.
7. VLTS (Vehicular location tracking system) with AIS-140 compliant GPS System has been implemented that is in line with circular issued on 3rd June, 2022 by Gujarat pollution control board pertaining to VLTS system to improve tractability of hazardous waste carrying vehicle.

PART – G

Table showing Impact of Pollution Abatement measures taken on Conservation of Natural Resources

Sr. No.	Particulars	Pollutant	Pollution Control System	Pollution Level		GPCB Level
				Before Pollution Control System	After Pollution Control System	
A Air Pollution Control						
1	Acid Plant (SCSA)	SO ₂	Alkali Scrubber	11 - 12 Kg/ MT of 100 % H ₂ SO ₄	1.2 - 1.9 Kg/ MT of 100 % H ₂ SO ₄	2 Kg/ MT of 100 % H ₂ SO ₄
2	Acid Plant (DCDA)	SO ₂	Alkali Scrubber	> 2 Kg/ MT of 100 % H ₂ SO ₄	1.2 - 1.8 Kg/ MT of 100 % H ₂ SO ₄	2 Kg/ MT of 100 % H ₂ SO ₄
3	Captive Power Plant (Boiler 3 and Boiler 5)	PM	4 field ESP / Filtration Column	58 g/Nm ³	<30 mg/Nm ³	50/30 mg/Nm ³
B Water Pollution Control						
1	Effluent Treatment Plant	pH	Lime preparation & auto dozing, Clarifier thickener, Centrifuge, Belt Press, sludge Drying beds Polyelectrolyte.	1.2 - 10.5	5.5 - 9.0	5.5 - 9.0
		S.S.		100 - 330 mg/L	30- 95 mg/L	100 mg/L
2	Sewage Treatment plant	BOD	Aeration tank, clarifier, Chlorination tank, pressure sand filter, activated carbon filter, Ultra Filtration	<20 mg/l	<5 mg/l	<30 mg/l
		TSS		20-30 mg/l	<20-30 mg/l	<100 mg/l

Note: i) Boiler 4 is Dismantled and not in operation since the month of June 2022.

ii) To control the particulate matter emission, Boiler no. 5 is equipped with 4 field Electrostatic Precipitator (ESP). Moreover, at Present Boiler no. 3 equipped with total four field ESP as the additional one number of ESP was installed in the month of January 2023.

From the above table, it is evident that the installation and operation of Pollution abatement measures have resulted in keeping pollutants level well within the limits specified by GPCB keeping the Environment clean.

Details of Pollutants into the Environment and Pollution Control Technology Adopted

Sr. No.	Pollutants	Pollution Control Technology /System Adopted
1	Water (Outlet Effluent)	
a.	pH	Auto Control Valves for addition of milk of lime/ dilute Sulphuric Acid to maintain the effluent quality in the range of pH 5.5 to 9.0 and online pH recorder at the outlet of the treated effluent to measure the pH on continuous basis.
b.	Suspended Solid & Zinc	Effluent Treatment System consisting of 2 No. of Clarifier for removal of Suspended Solids, System to add Polyelectrolyte for maintaining effective settling of Suspended Solids, 2 Nos. of Zinc Clarifiers for removal of Zinc and 5 No. Centrifuge /Belt Press for dewatering of Sludge.
c.	Color ,COD & BOD	By adding Coagulants & Flocculants in Mixing Chamber
2	Air (Stack)	
a.	PM, RSPM & SPM	Cyclone Separators, Bag Filters, Electrostatic precipitators, Filtration Columns, Opacity meters and Dust Suppression System with Air fog Nozzles. Online Continuous Emission Analyzer have been installed for parameter PM and data has been transmitted to GPCB/CPCB.
b.	So _x & No _x	Lime dosing system and CFBC boilers to maintain low combustion temp in the furnace. Online Continuous Emission Analyzer have been installed for parameter SO ₂ & NO _x and data has been transmitted to GPCB/CPCB.
c.	CS ₂ and H ₂ S	Alkali Scrubber for recovery of H ₂ S and CS ₂ emission and generation of Sodium Sulphide as salable by-product in CS ₂ Plant and H ₂ S and CS ₂ emissions control by continuous supply of humidified air through Air Washers and exhausting dilute gases through 2 Nos. of Process Stacks. Online Continuous Emission Analyzer have been installed for parameter CS ₂ & H ₂ S.
d.	Chlorine and HCl	Multistage Alkali Scrubber for recovery of Waste/ Chlorinated Gases as Sodium Hypochlorite by product in Caustic Soda Plant and Bubble Cap tray followed by

		packed bed scrubber with DM water. On – line Chlorine monitors at 24 locations hooked with DCS. Online Continuous Emission Analyzer have been installed for parameter HCl & Cl ₂ and data has been transmitted to GPCB/CPCB.
e.	SO ₂	Alkali Scrubber for removal of traces of SO ₂ emission from Sulphuric Acid Plant. Online Continuous Emission Analyzer have been installed for parameter SO ₂ .

Annexure – V- B

Impact of the Pollution Abatement measures taken on the Cost of Production for the FY 2022-23

Sr. No	Items	Cost (All figures in Lacs)
1	Total cost of installation of various water and Air Pollution Control Equipment.	8739.43
2	Interest on Investment (9.5 % per Year)	830.25
3	Depreciation @ 10.0 % per year.	873.93
4	Total operational cost of various Pollution Control Equipment/ Year.	1818.11
5	Total expenses / Year (Operating Cost + Interest + Depreciation)	3522.30
6	Total Viscose Filament Yarn Production during the year ended 31 st March 2023	20471.92
7	Total expenses per ton of Yarn	Rs. 17,205.52 /- per Ton of Yarn

PART – H

Additional Measures/ Investment Proposed for Environmental Protection including Abatement of
Pollution, Prevention of Pollution

It is ensured that Effluent Treatment Plant and other Pollution Control facilities are effectively operated round the clock. Further, we have taken additional preventive measures. The brief of the System is stated below:

1. A comprehensive Environment Audit is being carried out by M/s. Darshan Institute of Engineering & Technology, Rajkot, in last Financial Year. The recommendations of the auditors are implemented.
2. A comprehensive Marine Audit is being carried out by M/s. National Institute of Oceanography, Mumbai annually.
3. Quarterly monitoring of our unit is being carried out by the M/s. Kadam Environmental Consultants.
4. We have adopted Aditya Birla Sustainability Framework for Safety System in VFY, CSP & CPP as the part of which we have:
 - Implemented 14 Safety Sustainability Standards to maintain and improve workplace safety culture.
 - Implemented Process Safety Management System to prevent process incidents and to prevent unexpected releases of toxic, reactive or flammable liquids and gases from processes of highly hazardous processes.
5. Indian Rayon has Approached towards Business Excellence for improving the systems and standards through ISO-9001-2015, ISO-14001-2015, ISO-45001-2018, ISO-50001-2011 & SA-8000-2014.
6. Polyelectrolyte dosing is done in Clarifiers to ensure zinc levels in effluent.
7. Sulphur recovery system is working to reduce Sulphur sludge.
8. Use of High-quality lime started to reduce lime and lime sludge.
9. Dry fog-based Dust suppression system (114 Nos.) Nozzles provided in Coal Handling plant to control of sub-micron particle of dust and also water sprinkler provided in Coal yard to suppress coal dust.
10. To improve the ambient air quality, 26 nos. of Rain Guns are provided for suppression of Coal Dust in Coal Storage & Handling Unit.

11. Extension of the Coal Yard Shed has been accomplished.
12. Disposal of exhausted lead batteries, Bio-medical & e-waste to Authorized re-cyclers.
13. Disposal of Used oil, Burnt Oil, LDO sludge, & discarded Containers to authorized re-cyclers.
14. Industry has obtained the membership of M/s. Safe Enviro Pvt. Ltd., Jambusar for disposal of cellulose waste, Spent catalyst and Cellulose waste.
15. Industry has obtained the membership of M/s Saurashtra Enviro Private Project Limited, Bhachau for disposing Sulphur sludge, Spent Resin and Oily Cotton Waste, Exhaust Membrane, Bag filter Cloth, FRP waste, RO Membrane.
16. Industry has obtained the membership of M/s. Eco care Infrastructure Pvt. Ltd for disposing ETP sludge, Brine sludge, Asbestos waste.
17. Industry has also taken Membership of M/s Girnar Bio-Medical Waste Services, Junagadh for environment friendly disposal of Bio-Medical Waste.
18. We have reduced Chlorine inventory at site by 70 MT as per guideline of World Chlorine Council by direct pumping of liquid Chlorine in tonners which resulted in to increase in Plant Safety. The vehicles carrying chlorine and hydrogen have been installed with GPS (Global Positioning System) Tracking System to stop accidents due to speed or to avoid any environmental release in the atmosphere.
19. We have also installed 42 Nos. of Chlorine Sensors in our Caustic Soda Plant which are interconnected to the Distributed Control System through which whole lot of manufacturing process are carried out.
20. 13 Nos. of hydrogen sensors are hooked up with DCS for onsite monitoring around the hydrogen handling area of caustic soda plant.
21. Periodical Review of EMS including Compliance of Environmental Laws through Periodic Management Review & monthly EHS inspection of all the sections throughout the Plant Premises.
22. Safety Audit by external agency M/s Naik & Associates, Surat in February 2023 as it is conducted in alternate years.
23. In this financial year, Industry has implemented Seven Nos. of Energy Conservation Schemes in Caustic Soda Plant with total investment of Rs. 1694 Lacs with an Electricity Saving 36.82 Lakhs KWH.
24. In this financial year, Industry has implemented Power Plant Ten Nos. of Energy Conservation Schemes in Power Plant with total investment of Rs. 7048 Lacs which resulted in savings of 20.41 Lacs KWH.

25. In this financial year, Industry has implemented Nineteen Nos. of Energy Conservation Schemes in Rayon Plant with total investment of Rs. 178.18 Lacs with Conservation of 19.94 lac KWH.
26. Industry has conducted a Stratification Study to ensure all the locations for its Continuous Ambient Air Quality Monitoring Stations are apt as per the location and layout of the plant.

Part – I

Any other particulars for improving the Quality of the Environment

1. Effluent generated from different processes in company is treated in Effluent Treatment Plant to meet stipulated standards before discharge from factory outlet through Marine Pipeline with diffuser system into deep sea.
2. Industry has Installed Sewage Treatment Plant capacity of 500 m³/day and used as source of make-up Water for cooling Towers & Plantation. The Ultra filtration of capacity 50 m³/hr has been installed in last financial year for better quality of the treated sewage.
3. Industry has well equipped online continuous monitoring system to encapsulate pollutant concentration, emanates from processes.
4. To control the particulate matter emission, Boiler no. 5 is equipped with 4 field Electrostatic Precipitator (ESP). Moreover, at Present Boiler no. 3 equipped with total four field ESP as the additional one number of ESP was installed in the month of January 2023.
5. As an adherence to circular economy, Total 43 % ETP sludge i.e. total 1304.5 MT out of 2992.58 MT has been send to the nearby cement plants in FY 23 and Total 53 % Cellulose waste i.e. total 27.58 MT cellulose waste out of 51.61 MT is sent to the cement industry to be used in the kiln for co-processing as alternative fuels (AFR) in FY 23.
6. **Online Continuous Effluent Monitoring System:**
 - Latest version of CPCB approved, Online Continuous Effluent Monitoring System for pH, TSS, Temperature & Flow have been installed in our ETP and the online data has been transmitted to GPCB/CPCB server since 19.08.2015.
 - We have installed TOC Meter for treated effluent water.
7. **Online Continuous Emission Monitoring System:**
 - Latest version CPCB approved, Continuous Emission Monitoring System for Parameter Cl₂, HCl were installed in Chlor-Alkali Plant and monitoring results has been transmitted to GPCB & CPCB server since 21.05.2015 and 12.08.2015 respectively.
 - Online Continuous Emission Monitoring System for parameter Particulate matter has been installed in Power Plant and data is being transmitted to GPCB & CPCB server since 19.08.2015.
 - Online continuous Emission Monitoring system for Parameter PM, SO₂, NO_x has been installed and data transmission to GPCB/CPCB has been carried out.

- Online Continuous Emission Monitoring System for parameter SO₂ has been installed for both Sulphuric Acid Plant.
 - Online Continuous Emission Monitoring System for parameter CS₂ & H₂S in Rayon Plant has been installed.
8. Three No. of Online Continuous Ambient Air Quality Monitoring Systems have been installed.
 9. Industry is regularly analyzing the treated effluent water samples for the Bioassay Test to maintain Marine Ecology.
 10. Indian Rayon lays high emphasis on Environmental improvement program like tree planting in its premises & surrounding areas. It has improved aesthetic beauty in all areas & also working as good interceptor for fugitive dust & noise. Greenbelt has been developed to cover more than 33.5% of the total area of the existing project. Regular monitoring regarding the health of trees is being carried out to maintain good survival rate. Jan Seva Trust has received Certificate from Social Forestry Department (Govt. of Gujarat) for actively participating in People Awareness towards Tree Plantation Campaign taken by the Govt. at the Taluka Level. Also patches of gardens are developed inside of the plant premises wherever the open space is available to improve the plant beautification.
 11. "Earth day - 22nd April, Environment day - 5th June" are celebrated with enthusiasm in which Elocution, Essay Writing, Poster making and slogan competition pertaining to Environment is held for employee and School Students.
 12. Business Excellence is used as a tool for better housekeeping, good maintenance practice and assist in control of pollution. Also, we have implemented 5" S' Programme in all the departments of the factory which is useful in minimizing waste.
 13. Regular monitoring of ambient air quality by recognized third party Auditor and in-house monitoring.
 14. The industry has installed 3 Nos. of H₂S sensors & 6 Nos. of CS₂ sensors within CS₂ Plant to indicate the work zone concentration of CS₂ & H₂S gas. At Sulphur acid plant, total 6 Nos. SO₂ sensors has been installed for monitoring.
 15. We are regularly carrying out monitoring of GHG emissions and keeping track of our carbon footprint.
 16. The quantity of Fly Ash generated from Power Plant is around 70-80 MT/day. We are also providing 100% fly ash to Group Cement Plant, Ambuja Cement & Sidhee Cement Ltd.
 17. Indian Rayon has been awarded the prestigious Golden Peacock Environment Management Award 2014 by Institute of Directors, New Delhi for outstanding achievement in Environment

Management. We have also received National Award for Prevention of Pollution titled - The Rajiv Gandhi Environment Award for Prevention of Pollution 2008-2009.

18. Indian Rayon has been awarded with "Energy Efficient Unit" for Financial Year 22-23 by Confederation of Indian Industry (CII) for Best Energy Efficient Unit that is received in month of September 2022. Moreover, Our VFY business has been awarded with the ICC Award 2022 for "Excellence in Energy Conservation and Management" by Indian Chemical Council at an event held at Taj Mahal Palace, Mumbai in September, 2023.