



इंडियन ऑयल कॉर्पोरेशन लिमिटेड

गुजरात रिफ़ाइनरीज़, डाकघर : जवाहरनगर

जिला : वडोदरा, गुजरात - 391 320

Indian Oil Corporation Limited

Gujarat Refineries, P.O. Jawaharnagar,

Dist. : Vadodara, Gujarat - 391 320

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Website : www.iocl.com



रिफ़ाइनरीज़ प्रभाग
Refineries Division

Ref: JR/HSE/GPCB/FORM-V/2023-24

Date: 30.09.2024

The Unit Head, Vadodara,
Gujarat Pollution Control Board,
Paryavaran Bhavan,
Sector 10-A,
Gandhinagar - 382 010.

Sub: Environment Statement for the year 2023-24(PCB ID 21967)

Dear Sir,

Pleased find enclosed, the Environment Statement of Gujarat Refinery for the financial year ending 31st March 2024. The report has been compiled as per Form-V of Central Pollution Control Board.

Thanking you,

Yours faithfully,


(B.B. Makwana)

Deputy General Manager (HSE)
Gujarat Refinery

Encl: As above.

CC: The Regional Officer

Gujarat Pollution Control Board
GERI Compound, Race Course
Vadodara-390007.


B.B. MAKWANA
उप महाप्रबंधक (एच, एस & ई)
Dy. General Manager (H, S & E)
गुजरात रिफ़ाइनरी, आई.ओ.सी.एल., वडोदरा
Gujarat Refinery, IOCL, Vadodara

पंजीकृत कार्यालय : जी-9, अली यावर जंग मार्ग, बान्द्रा (पूर्व) मुम्बई - 400 051 महाराष्ट्र (भारत)

Regd. Office : G-9, Ali Yavar Jung Marg, Bandra (East) Mumbai - 400 051 Maharashtra (India)

CIN-L 23201 MH1959 GOI 011388

FORM – V
(See Rule 14)

From:

Gujarat Refinery
Indian Oil Corporation Limited
PO : Jawaharnagar
Vadodara – 391 320
Gujarat

To,

Gujarat Pollution Control Board
Paryavaran Bhavan
Sector 10-A
Gandhinagar – 382 010.

Environmental statement for the financial year ending on 31st Mar'24.

PART – A

i.	Name & address of the owner/ Occupation of the industry, Operation or process.	Shri Rahul Prashant Executive Director & Refinery Head Gujarat Refinery PO: Jawaharnagar Vadodara – 391 320
ii.	Industry category	Primary
iii.	Production capacity	13.7 Million Metric tons of crude oil per annum.
iv.	Year of establishment	1965
v.	Date of the last Environmental Statement submitted.	27 th Sep'23

PART – B

(1) Water and Raw Material Consumption					
		2021-22	2022-23	2023-24	
Sl No.	Description	Water consumption, m3/day	Water consumption, m3/day	Water consumption, m3/day	VMC STP Treated Water consumption, m3/day
1	Process/Service	5796	4640	4711	4123
2	Cooling	8216	9132	6662	3738
3	Domestic (Refineries area only)	5016	5042	5681	0
4	DM Plant	8056	15000	7348	0
5	Fire water from freshwater	4942	5871	3355	4838
	TOTAL	32026	39685	27757	12699

Process water consumption per unit of crude processed		
2021-22	2022-23	2023-24
0.88 m3 per MT of crude processed	0.81 m3 per MT of crude processed	0.83 m3 per MT of crude processed

(2) Raw Material Consumption				
SN	Name of Raw material	2021-22, MT	2022-23, MT	2023-24, MT
1	Crude Oil	13474106	15566894	15202183
2	Methanol	10537	9808	9442
3	Benzene	47987	37457	60891
4	Ethanol	0	14633	15628

List of products are enclosed below:

Sl. No.	Name of the products	Yield (MT), (21-22)	Yield (MT) , (22-23)	Yield (MT), (23-24)
1.	Liquefied Petroleum Gas	434682.65	452421.2	467397
2.	Butene-I/Butene-II	0	0	0
3.	Benzene	0	0	0
4.	Toluene	0	0	0
5.	Naphtha	803091.284	964732	1227831
6.	MTBE	0	0	0
7.	Motor Spirit (MS)	2118056.71	2057020	2024375
8.	Food Grade Hexane (FGH)/Polymer Grade Hexane (PGH)	0	0	4737

9.	Motor Turpentine Oil (MTO)	84.185	0	0
10	Aviation Turbine Fuel (ATF)/ Superior Kerosene	551795	608942	704588
11	LABFS	72654.034	58212.16	404381
12	LAB	131197.074	97441.29	173047
13	HAB	0	4502	8175
14	Light Aluminum Rolling Oil (LARO)	0	0	0
15	PD Oil	0	0	0
16	IOC Residue 96	0	0	0
17	ISO-SOI-90	0	0	0
18	High Speed Diesel (HSD)	6137625.3	7520269	7184568
19	Light Diesel Oil (LDO)	124665.974	71968.94	50885
20	Low sulfur Heavy Stock (LSHS)	0	0	0
21	Furnace Oil	1291528.13	1331965	1341477
22	Bitumen	489619.98	483260	448620
23	Sulphur	115540.135	146401.1	135698
24	Pet Coke	566421.29	803702.5	781846
25	Poly medium	0	0	0
26	EBMS	0	123845	118486
27	DEF	0	1822.24	2275
28	Aviation Gasoline (Av-Gas)	0	551	491

PART – C

Pollutants discharged to environment / unit of output
(Parameters as specified in the consent issued)

- (1) Quantity of Treated water discharged to VECL in 2023-24: 1320960 M3
(2) Concentration of the Effluent discharged: Pls. refer below table-

Effluent Discharge-Quality				
Parameters	Unit	VECL Norms	Concentration of pollutants in discharge	Percentage of variation from prescribed standards with Reasons
pH	---	6.5-8.5	7.24	Always remained within prescribed limits for discharging in VECL.
Temp.	°C	40	28.50	
Colour (Pt. CO.)	Pt. co.unit	100	69.00	
T.S.S.	mg/l	100	13.50	
TDS	mg/l	5000	3618.00	
COD	mg/l	250	71.00	
BOD	mg/l	100	20.20	
O & G	mg/l	10	Nil	
Phenolic Comp	mg/l	1	Nil	
Cyanide	mg/l	0.2	Nil	
Fluoride	mg/l	1.5	1.01	

Sulfide	mg/l	2	0.02
NH ₃ - N	mg/l	50	Nil
Total Chromium	mg/l	2	0.66
Hexavalent Chromium-Cr ⁺⁶	mg/l	0.1	0.06
Copper	mg/l	3	Nil
Lead	mg/l	0.1	Nil
Nickel	mg/l	3	Nil
Zinc	mg/l	5	0.15
Mercury	mg/l	0.01	Nil
Cadmium	mg/l	2	Nil
Arsenic	mg/l	0.2	Nil
Chloride	mg/l	2000	1515.00
Sulphate	mg/l	1000	296.50
Insecticide / pesticide	mg/l	Absent	Absent
Bio-Assay Test	%	90.0% Survival of Fish after 96.0 hours	Pass

Quantity of Air emission

Air emissions from various furnace stacks for FY-2023-24 is as given below-

Sl.No.	Point Source (Furnace Stacks)	Emissions (Kg/Day)			
		SO _x	NO _x	PM	CO
1	FURNACE No.AU-1, F-1	133.28	29.69	2.28	7.64
2	FURNACE No. AU-1, F-2	30.44	6.78	0.51	1.76
3	FURNACE No.AU-1, F-3	19.55	4.36	0.37	1.10
4	FURNACE No.AU-1, F-4	20.61	4.59	0.39	1.16
5	FURNACE No.AU-1, F-5	37.47	8.34	0.64	2.15
6	FURNACE No.AU-2, F-1	113.47	138.72	12.02	13.93
7	FURNACE No.AU-2, F-2	20.94	25.59	2.21	2.59
8	FURNACE No.AU-2, F-3	14.06	17.18	1.50	1.73
9	FURNACE No.AU-2, F-4	13.75	16.81	1.46	1.68
10	FURNACE No.AU-2, F-5	25.33	30.96	2.69	3.12
11	FURNACE No.AU-3, F-1	24.22	73.22	5.50	6.37
12	FURNACE No.AU-3, F-2	0.00	0.00	0.00	0.00
13	FURNACE No.AU-3, F-3	2.72	0.43	1.34	7.96
14	AU-4, 712 F01 E	62.38	58.01	2.83	2.79
15	AU-4, 712 F-02	88.97	21.69	2.99	3.86
16	AU-4, 712 F-01 (W)	79.00	73.47	3.61	3.55
17	AU-V,05-FF-001	216.35	143.25	16.16	17.86
18	CRU, F-1	10.59	22.70	4.14	7.34
19	CRU, 21 F01	1.40	3.11	0.56	0.99
20	CRU, 21 F02	2.81	5.98	1.10	1.95

21	CRU, 22 F01	3.54	7.67	1.41	2.44
22	UDEX	-----	-----	-----	-----
23	VDU, 721 F01	332.58	107.80	2.48	16.28
24	VBU, 731 F01	14.80	12.01	4.13	7.40
25	BBU, F-1	7.68	27.36	18.72	4.32
26	BBU, F-2	12.96	23.04	11.52	4.08
27	FPU, 812 F01	155.88	54.72	5.98	5.58
28	FPU-03FF001	55.27	20.05	12.32	4.80
29	FCC-CHARGE HEATER	5.01	2.22	4.07	2.58
30	FCC-CO BOILER	20.94	50.42	66.27	13.77
31	FCC- GDS (Splitter reboiler) (0603 F-01)	-----	-----	-----	-----
32	FCC- GDS (HDS Heater) (0603 F-02)	-----	-----	-----	-----
33	HCU-06-FF-01/02	5.04	8.70	1.86	5.38
34	HCU-06-FF-03/04	59.02	38.75	4.38	6.43
35	DHDS, 1010-F01	2.28	17.78	1.75	4.70
36	DHDS (1010 F-02)	11.65	10.34	4.05	5.75
37	HGU-I, -FF-701	10.77	34.60	2.34	6.66
38	HGU-II 1011-F02	-----	-----	-----	-----
39	HGU II,1011-F-01	-----	-----	-----	-----
40	HGU-III-2092-F-01	41.32	60.99	2.77	16.73
41	HGU-III-2041-F-101	1.34	14.53	0.39	3.92
42	HGU-4 (Tubular Reformer) (0602 F-101)	5.04	11.04	13.68	15.60
43	HGU-4 (PDS) (0602 F-01)	1.92	58.56	5.52	59.76
44	ISOM	12.49	21.95	2.19	3.39
45	DHDT	9.97	0.72	1.77	5.72
46	New DHDT (Fractionator reboiler) (0601 F-02)	1.92	0.72	0.96	0.24
47	New DHDT (Combined Feed heater) (0601 F-01)	11.04	17.76	1.20	34.32
48	VGO-HDT	1.90	25.62	0.40	0.76
49	DCU-F-01	17.12	62.06	1.77	6.22
50	DCU-F-02	38.48	95.50	1.11	4.39
51	SRU-II	0.00	0.00	0.00	0.00
52	SRU-III	169.94	38.75	1.98	10.54
53	LAB, 2063 F-01/2071 F-01	11.22	5.93	7.34	8.32
54	LAB, 2061-F-01	2.29	4.69	0.30	0.90
55	MSQ-15-FF-01/15-FF-02/15-FF-03/15-FF-04	4.93	44.14	2.47	5.02
56	MSQ-14 FF 01	3.76	36.15	0.42	3.40
57	MSQ-15 FF05	7.89	33.03	0.51	1.83
58	MSQ-16 FF01	8.06	21.12	0.16	1.03
59	TPS STACK	415.15	738.44	152.18	42.67
60	HRSG-1	10.66	7.33	3.05	6.13
61	HRSG-2	9.05	195.66	3.02	23.02
62	HRSG-3	13.14	110.37	5.42	12.07
63	HRSG-4	2.92	7.71	4.08	15.04
64	HRSG-5	63.71	84.01	5.08	47.67
65	6th GT/ HRSG-6	33.63	74.02	2.52	106.82

PART – D

HAZARDOUS WASTES

As specified under hazardous wastes (management and handling) Rules, 1989

1. Total quantity of waste generated category wise				2021-22	2022-23	2023-24
Sl No.	Description of the waste	Unit of Measure ment (UOM)	Type of waste with category as per Schedules I, II and III of these rules	Total quantity of Generation	Total quantity of Generation	Total quantity of Generation
1	Residual oily Sludge	MT	4.1	8008.31	1407.61	5779.3
2	Spent catalyst	MT	4.2	323.97	666.4	748.7
3	Slop Oil	MT	4.3	67727	67628	77405
4	Spent Resin	MT	35.2	40.18	5.3	52.8
5	Spent carbon	MT	36.2	25	189.47	24
6	Old and used drums	Nos.	33.1	14602	22725	16927
7	Used oil	MT	5.1	35.72	12.012	6.237
8	Insulation (other waste)	MT	Non-Hazardous	50	250	300
9	Other waste (Contaminated HCL waste)	MT	4.1	-----	-----	5.8

PART – E

Sl.No.	Solid wastes generation/Disposal	2021-22	2022-23	2023-24
		(MT)	(MT)	(MT)
a	From Process	Nil	Nil	Nil
b	From Pollution Control Facility (Bio-Sludge)	5256	4743	6093
c1	Quantity recycled or reutilized within unit	Nil	Nil	Nil
c2	Sold (bio-sludge)	Nil	Nil	Nil
c3	Solid (bio-sludge) Disposed (in green belts as manure)	5256	4743	6093

PART – F

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

1. Oily Wastes:

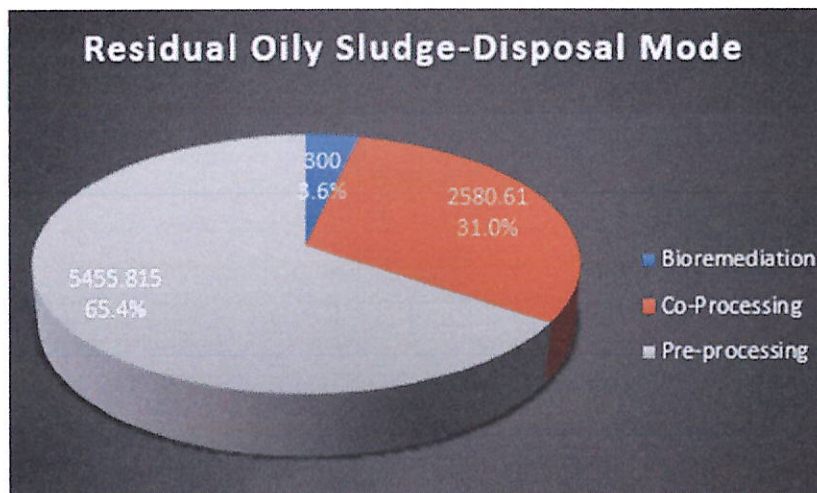
Characteristics of residual oily sludge are tabulated below:

Parameters	Unit	ETP Residual Oily sludge
pH	pH	6.70
Oil & Grease	Gm/Kg.	28.25
% Total Solids	%	57.39
% Total Volatile Solids	%	84.27
Amm. Nitrogen	Gm/Kg.	Nil
Iron	Gm/Kg.	Nil
Zinc	Gm/Kg.	Nil
Copper	Gm/Kg.	Nil
Cadmium	Gm/Kg.	Nil
Cyanide	Gm/Kg.	Nil
Nickel	Gm/Kg.	Nil
Lead	Gm/Kg.	0.04
Mercury	Gm/Kg.	Nil
Arsenic	Gm/Kg.	Nil
T Chromium	Gm/Kg.	0.06

Presently M/s Arham Oil-Gas Products and Services Pvt. Ltd. has been engaged for processing of oily sludge for recovery of oil. A sludge processing Unit (SPU) is installed by the Vendor which process oily sludge on continuous basis. SPU basically uses decanter which separates Oil, Water and sludge. Oily sludge after heating with steam is fed to unit and some solvent like slop oil is added for better mixing. Gujarat Refinery has residual Oily waste which is treated in the refinery premises by bioremediation. It is bacteriological treatment with bacteria developed by IOCL, R&D. In this process, oily waste is converted into harmless components like CO₂, Water and fatty acid. Presently confined space fast bioremediation is taking place in bioreactor.

This residual sludge after oil recovery is bio remediated in confined space bio reactor. Apart from confined space bio-remediation, Gujarat refinery have been carrying out the disposal of residual oily sludge through SPCB authorized co-processors and pre-processors for processing the waste in an eco-friendly way. Residual oily sludge was disposed to M/s Ambuja Cements Limited & M/s Recycling Solutions Private Limited during Financial Year-2023-24. **A total of 8036.40 MT of residual oily sludge was disposed through co-processors/pre-processors of Hazardous waste.**

Following is the disposal of the residual oily sludge through various disposal methods for the year 2023-24.

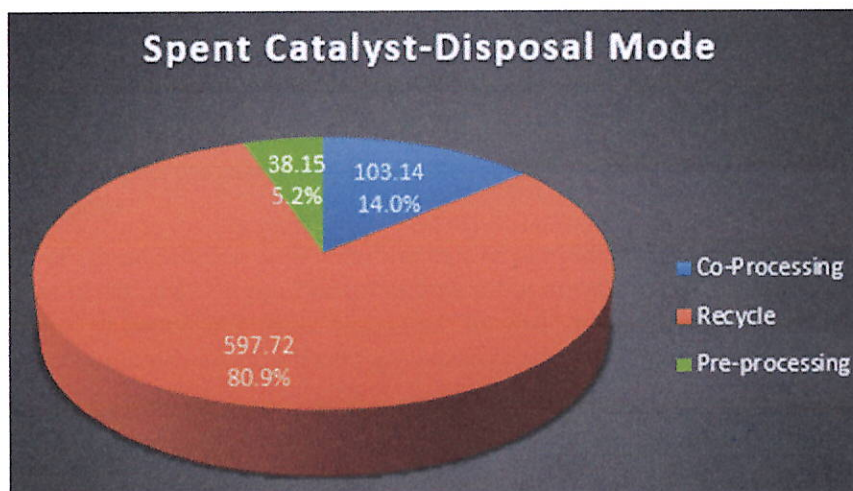


2. Spent catalyst:

Spent catalyst is generated from various refinery processes due to its deactivation. Authorization is obtained from Gujarat Pollution Control Board to dispose the spent catalysts to the secured landfill approved by GPCB, through auction to registered Re-cyclers, through incineration facilities approved by GPCB and through SPCB approved Co-processors/Pre-processors.

Gujarat refinery has started the disposal through Co-processors from April 2022 onwards.

Following is the disposal of the spent catalyst through various disposal methods for the year 2023-24-



3. Bio-sludge:

At present, bio-sludge is dried in sludge drying beds after centrifuging. This dried bio-sludge is used as manure in green belt. Characteristics of bio-sludge are tabulated below:

Parameters	Unit	Biological Sludge
pH	pH	6.15
Oil & Grease	Gm/Kg.	1.45
% Total Solids	%	44.46
% Total Volatile Solids	%	32.05
Amm. Nitrogen	Gm/Kg.	0.865
Iron	Gm/Kg.	0.025
Zinc	Gm/Kg.	0.041
Copper	Gm/Kg.	0.068
Cadmium	Gm/Kg.	Nil
Cyanide	Gm/Kg.	Nil
Nickel	Gm/Kg.	Nil
Lead	Gm/Kg.	Nil
Mercury	Gm/Kg.	Nil
Arsenic	Gm/Kg.	Nil
T Chromium	Gm/Kg.	Nil

PART – G

(Impact of the pollution control measures on conservation of natural resources and consequently on the cost of production)

1. Treated effluent from CETP is mostly recycled in Cooling Towers and in RO plant. After commissioning of RO Plant, CETP treated water is diverted to RO Plant and Cooling Towers. Permeate from RO is used in DM plants and the remaining in cooling towers and fire-water network. RO Reject is discharged via VECL maintaining the VECL inlet norms. . The reuse from RO Plant is around 88% and the remaining 12 %(120-150 m3/hr) is discharged via VECL maintaining the VECL inlet norms.
2. Replacement of Ultra-Filtration (UF) membranes was carried out in Reverse Osmosis (RO) plant involving a cost of INR .6.65 Crores. The replacement has improved the quality of permeate water in RO plant due to which DM plant regenerations and Cooling Towers Blowdowns has been reduced and subsequently waste effluent generation has also gone down.
3. Gujarat Refinery has adopted the latest environmentally friendly disposal methods for various hazardous waste generated in refinery operations such as co-processing, pre-processing, and recycling. All the conditions of Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016 are being complied with by Gujarat Refinery.
4. Residual Oily sludge (oil < 10%) of 8036.40 MT has been disposed through Co-processor M/s Ambuja Cements Limited and Pre-processor-M/s Recycling Solutions Pvt. Ltd. during FY-2023-24 costing INR 7.45 crores. With this initiative, Gujarat refinery ensures the Conservation of natural resources along with environment safe disposal of the hazardous waste.
5. Hazardous wastes like Spent catalyst, spent resin, spent carbon etc. generated from various process inside refinery is being disposed through co-processors/pre-processors which is used as

an alternate fuel by the cement industry and thereby ensuring complete disposal of the waste. By this, Gujarat refinery ensures the Conservation of natural resources along with environment safe disposal of the hazardous waste. Work-order was awarded to M/s Ambuja cements Limited at a cost of INR 2.92 Crores (excluding taxes) for a period of two years (Feb-2022 – Jan-2024). Work order has been awarded to M/s Recycling Solutions Private Limited at a cost of INR 46.02 Lacs (excluding taxes) in Jan-2024 for a period of three (03) years.

6. Disposal of insulation waste is being done through the techniques of co-processing/pre-processing. Work order has been awarded to M/s Green Gene Enviro Protection & Infrastructure Private Limited (M/s GGEPIIL) at a cost of INR 2.10 Crores (excluding taxes) in Jan-2024 for a period of three (03) years. With this initiative, Gujarat refinery ensures the Conservation of natural resources along with environment safe disposal of the waste generated.
7. Bioremediation of oily sludge by cultured bacteria developed by IOCL (R&D) is being done continuously. This eco-friendly disposal of oily waste solved the long pending disposal problem. Bioreactor for fast confined space bioremediation is presently being used for bioremediation of oily sludge.
8. Spent Caustic Treatment Plant with state-of-the-art technology was set up in Gujarat Refinery CETP, where reactive sulfide is converted into less harmful soluble sulfate by wet-air-oxidation process. This facility has reduced the generation of chemical waste in the Gujarat Refinery.
9. To improve the efficiency of water treatment, Bio-Tower media replacement was undertaken at a cost of INR 15.96 Crores and plastic recycled with authorized plastic recycler M/s ARS.
10. For removal of H₂S from the fuel source itself, Refinery has set up amine treating units for fuel gas. MDEA is being used for absorbing H₂S from the fuel gas. H₂S from the rich amine is being stripped off in amine regenerator. A sulfur recovery unit uses off gas from amine regeneration unit as feed and converts gaseous H₂S into liquid elemental sulfur, thereby reducing SO₂ emission from the refinery.
11. Side entry mixers and jet mixers have been installed in crude oil tanks for reduction of tank bottom sludge in the crude oil. The oily sludge of crude oil tanks is being treated in Sludge Processing Unit (SPU) installed by Sludge processing agencies where the oil extracted from bottom sludge is reused & processed in Refinery and the solid waste after oil recovery is disposed through co-processors/pre-processors.
12. Loss prevention and energy conservation measures:
 - Gujarat Refinery has implemented various energy saving schemes by initiative drive for reduction of fuel and loss which directly impact on reduction of GHG emission. Various energy conservation schemes implemented during FY-2023-24 inside Gujarat Refinery has resulted in saving of 12,328 SRFTs (37,146 MT CO₂e).
 - Installation of combustion control system in furnaces for reduction of excess air in order to increase the efficiency of furnaces which in turn reduces fuel consumption.
 - All lighter product tanks are provided with floating roofs to minimize the evaporation loss. Lighter product tanks have also been provided with Secondary seals.
 - By optimum utilization of Hydrogen generation capacity and consumption, one Hydrogen Generation unit was stopped resulting in saving of 12000 SRFT.

- By optimum utilization of HRSG steam generation capacity and consumption of HP/MP steam, one Boiler was stopped.
- 28 nos. of process related scheme jobs were executed in FY-2023-24 for Loss prevention and energy conservation measures.
- Gujarat Refinery has carried out 100% replacement of fluorescent tube lights / incandescent lamps / other old conventional lighting with LED lights inside battery area which has resulted in power savings and better illumination levels at workplace and other areas.
- **Reduction of fugitive emissions:**
 - **VOC Leak detection Monitoring:** Leak Detection monitoring of VOC s is being done every month at Gujarat Refinery. The identified leaks in process units are detected and attended at the utmost priority.
 - **Rim-Seal Fire Protection System:** Rim seal fire protection system has been introduced in total 63 nos. of Class-A tanks at Gujarat Refinery.
 - **Secondary Seal provision in Class-A and LPG pumps:** Double mechanical seal provision in all class-A and LPG pumps in various process units to ensure seal failure which in turn eliminated fugitive emissions.
- **Flare Gas Recovery System (FGRS):** Flare gas recovery system is in place at Gujarat Refinery which helps in optimizing flaring operation and thereby reducing the overall emissions. The maximum capacity of the FGRS installed is 2000 NM3/HR.

PART – H

(Additional investment proposal for environmental protection including abatement of pollution) scheme approved / job in progress:

- 1) Water footprint Reduction – In line with, Government of Gujarat policy for Reuse of Treated Wastewater, MoU has been signed with Vadodara Municipal Corporation (VMC) for VMC Rajivnagar STP treated water reuse (40 MLD) in Gujarat Refinery for industrial use to minimize freshwater consumption and conserve natural resources. Project is being implemented in two phases i.e. pre-commissioning stage with 21 MLD capacity under phase-I and further 19 MLD addition with upcoming Gujarat Refinery Projects.
PHASE-I activities have been completed and taken in service from Oct-2023.
- 2) In order to minimize the effluent discharge through VECL, RO Reject is utilized in Pet Coke yard for Dust Suppression System (DSS). Approximately 200-250 m³/day in the non-monsoon period is being to be utilized through this scheme.
- 3) VOC LDAR programme is in practice to reduce VOC emissions from the refinery processes.
- 4) To control and minimize the fugitive emissions, VOC system of around 20 crores is proposed for all primary units in CETP and the GR/GRE influent Sump. The fugitive emissions shall be routed to Activated Carbon Filter and the clean air from filter shall be vented out in atmosphere.
- 5) Consumption of Natural gas is being maximized at Gujarat Refinery on a regular basis through real time monitoring of performance and other operational parameters of various process and power generation units. Since it is a cleaner form of fuel which in turn reduces the overall GHG emissions.

- 6) Solar power generation is one of the remarkable achievements of Gujarat Refinery in reduction of GHG emissions. Total solar power generation in FY-2023-24 was 14531.16 MWH.
- 7) For the year 2023-24, 306 trees were planted in and around Gujarat Refinery to sequester the carbon dioxide generated from refinery processes along with the existing green canopy of around 2,15,000 trees.
- 8) Environment Protection measures for existing Refinery and upcoming projects
 - a. Hydrogen Dispensing Facility at Koyali
 - b. ZLD facility for upcoming LuPech(Lubes & Petrochemical) at Refinery/Oxo-alcohol(Dumad) plants.
 - c. New flare having a height of 176 meter
 - d. Multi-cyclone separator/bag filter for upcoming boiler
 - e. Low NOx burners for all furnaces
 - f. 2 new CAAQMS under upcoming LuPech(Lubes & Petrochemical) plants
 - g. Rainwater harvesting from roof tops of buildings.
 - h. Green Belt development with Miyawaki technique.
 - i. Existing ETP modernization with additional state of art technology adding various analyzers, improved bio treatment etc.
 - j. Additional SRU plant
 - k. ETP tertiary treatment media replacement

PART – I

(Any other particulars for improving the quality of the environment)

- 1) Environment Management System at Gujarat Refinery is at par with international standard. For effective environment management system, refinery declared an environment policy, which aims to comply & excel the statutory limit and norms of pollution control & prevention.

The efforts of the refinery towards environment management system is recognized by reputed third party M/s VEXIL Business Process Services Pvt. Ltd. In every one year, surveillance audit is conducted to verify whether the system meets the standard. Gujarat Refinery has been recertified for ISO 45001: 2018, ISO-14001:2015 & ISO-9001:2015. It is valid up to 30th Jan-2026, which will be further revalidated.
- 2) Verification of GHG emissions reported for FY-2022-23 & FY-2023-24 by Gujarat Refinery was conducted by M/s KBS Certification Services Ltd. as per ISO-14064-1:2018. Gujarat Refinery has been successfully issued the GHG Verification certificates for the reported GHG emissions for FY-2023-24.
- 3) Gujarat Refinery recognizes the importance of a structured and comprehensive mechanism to ensure that the refinery activities and products do not cause adverse effects on the environment. Thus, yearly environment audit is being conducted by GPCB approved schedule –I auditors. The Environment Audit for 2023-24 was carried out by DharmSinh Desai University, Nadiad, Gujarat.

- 4) World Environment Day, Energy conservation fortnight was celebrated with involving employees, contract labors and nearby villagers to inculcate awareness towards Environment and energy conservation.
- 5) Gujarat Refinery has whole heartedly supported "**Mission LiFE**"- a mass movement of Environmental Conscious Lifestyle through various evbents/competitions/training programmes as per MoPNG directions. Various events were organized under the campaign such as Display of LiFE logos at various prominent locations for mass awareness, Nukkad Natak event organized in Township, drawing /poster making competitions for school students, Training programmes on energy management, environment management, stress management etc.
- 6) Swachhta Pakhwada under Swachh Bharat Mission is being observed at Gujarat Refinery every year for awareness among employees, contract workers, nearby schools and nearby areas. Various events are organized for awareness and participation at various levels.



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