

Nayara Energy/ENV/27398/Env Statement/2024/1306

20th September 2024

To,
The Member Secretary,
Gujarat Pollution Control Board,
Paryavaran Bhawan,
Sector – 10 - A,
Gandhinagar – 382010

SUBJECT: SUBMISSION OF ENVIRONMENT STATEMENT (FORM – V) FOR F.Y.2023-24

XGN ID: 27398

Dear Sir,

As per provision of Rule – 14 of the Environment (Protection) Amendment Rules 1986, please find enclosed herewith Environmental Statement in Form – V for the financial year ending 31st March 2024.

This is for your information and record please.

Thanking you,

Yours faithfully,
For **Nayara Energy Limited,**



Authorized Signatory

Encl: Form – V for the financial year ending 31st March 2024

Copy to: Regional Officer, Gujarat Pollution Control Board, Sardar Patel Comm. Center, Bedibandar Road, Rameshwar Nagar, Jamnagar – 361008.

FORM – V
(See Rule 14)*

Date: 20.09.2024

From:
M/s Nayara Energy Limited
(Formerly Known as Essar Oil Limited)
Khambhalia P.O.
P. O. Box No. 24
Dist.: Devbhumi Dwarka
Gujarat-361305

To,
The Member Secretary
Gujarat Pollution Control Board
Paryavaran Bhavan
Sector-10A
Gandhinagar - 382010

Environmental Statement for the financial year ending 31st March – 2024

PART – A

- | | | |
|--|---|---|
| (i) Name and address of the owner/
Occupier of the industry operation | : | Amar Kumar
Head of Refinery
Khambhalia P.O.
P. O. Box No. 24
Dist.: Devbhumi Dwarka
Gujarat-361305 |
| (ii) Industry
Primary – (STC Code)
Secondary – (SIC Code) | : | --- |
| (iii) Production Capacity Units | : | 21 Million Metric Tons per Annum (MMTPA) |
| (iv) Year of Establishment | : | 2006 |
| (v) Date of the last Environmental
Statement submitted | : | 21.09.2023 |

*Submission of Environmental Statement is in accordance with the provisions of Rule-14 of the Environment (Protection) Amendment Rules, 1993 of the Environment (Protection) Act, 1986 (29 of 1986) published vide Notification dated 22/04/1993 G.S.R. 386 (E) in the Gazette of India-Extraordinary- Part – II Section 3 Subsection (i), No.155 dated 28-04-1993 by the Ministry of Environment and Forests, Government of India; read with the Notification dated 13-3-1993 G. S. R. 329 (E), of the Gazette of India – Extraordinary Part – II Section – 3 subsection (i) No.120 dated 13-3-1993

“Every person carrying on an industry, operation or process requiring consent under Section-25 of the Water (Prevention & Control of Pollution) Act, 1974 (6 of 1974) or under Section-21 of the Air (Prevention & Control of Pollution) Act, 1981 (14 of 1981) or both or authorization under the Hazardous Wastes (Management and Handling) Rules, 1989 published under the Environment (Protection) Act, 1986 (29 of 1986) shall submit an Environmental Statement for the financial year ending the 31st March in Form V to the concerned State Pollution Control Board on or before the Thirtieth day of September every year, beginning 1993.”

PART – B

Water and Raw Material Consumption

- (1) Water Consumption (M³/day) (Period: Apr'23 to Mar'24)
- Process : 15417
 - Cooling purpose : 35190
 - Domestic : 11747

Name of Products	Process water consumption per unit of product output (m ³ / Tons of Products)	
	During the previous Financial year (2022-2023)	During the current financial year (2023-2024)
	(1)	(2)

(1) LPG	}	0.24	0.29
(2) Kerosene + ATF			
(3) Naphtha/MS/Gasoline			
(4) Diesel (HSD)			

- (5) FO
- (6) Sulfur
- (7) Bitumen
- (8) Pet coke

(ii) Raw material consumption

Name of raw Material	Name of Product	Consumption of raw material per unit of output (Crude processed Tons / Tons of Total Products)	
		During the previous Financial year (2022-2023)	During the current financial year (2023-2024)
Crude Oil	LPG, Naphtha, MS, ATF, Kerosene, Diesel (HSD), FO, Sulfur, Bitumen, Pet coke	1.046	1.04

PART – C

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

Pollutants	Quantity of Pollutants Discharged (Mass/day)	Concentration of Pollutants Discharged (mass/volume)	Percentage of variation from prescribed standards with reason
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Please Refer Annexure – 1 for Part-C

Note: - Major part of treated wastewater is fed to Reverse Osmosis (RO) plant and remaining quantity is reused as fire water makeup / service water / cooling tower make-up / in Irrigation for greenbelt within the refinery premises.

PART – D
HAZARDOUS WASTES

As specified under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

Total Quantity (KG) Generation			
Hazardous waste		During the last Financial year (2022-2023)	During the current financial year (2023-2024)
(A) From Process Units			
1	Used Lubricating Oil (Liquid)	129000	30000
2	Discarded Empty Drums / Containers (Solid)	193000	190000
3	Slop Oil(Liquid)	78702000	103900000
4	Oily Cotton Rags/ Oil contaminated waste (Solid)	21000	29000
5	Spent Catalyst From Various Units (Solid)	2943000	28000
6	Spent Resin (Solid)	0	0
7	Expired Hazardous Chemicals (Liquid)	0	0
8	Spent Carbon (Solid)	197000	118000
9	Insulated Copper Cable with PVC Sheathing (Solid)	5000	26000
10	Oily Sludge and BSW (Semi Solid)	225000	24880
11	Waste coke (Heater Deposits)	54000	8000
12	Waste/ Residue containing oil	3031000	3078000
Total		85500000	107431880
(B) From Pollution Control Facilities			
13	Oily Sludge from ETP (Semisolid)	2052000	1803000
Total		2052000	1803000

Total Quantity (KG) Disposed			
Hazardous Waste		During the last financial year (2022-2023)	During the current financial year (2023-2024)
(A) From Process Units			
1	Used Lubricating Oil (Liquid)	140000	44000
2	Discarded Empty Drums / Containers (Solid)	193000	190000
3	Slop Oil(Liquid)	78702000	103900000
4	Oily Cotton Rags/ Oil contaminated waste (Solid)	27000	10000

5	Spent Catalyst From Various Units (Solid)	2904000	28000
6	Spent Resin (Solid)	0	0
7	Expired Hazardous Chemicals (Liquid)	17500	0
8	Spent Carbon (Solid)	193000	91000
9	Insulated Copper Cable with PVC Sheathing (Solid)	0	31000
10	Oily Sludge and BSW (Semi Solid)	210000	41000
11	Waste coke (Heater Deposits)	68000	8000
12	Waste/ Residue containing oil	2586000	2712000
Total		85040500	107055000
(B) From Pollution Control Facilities			
13	Oily Sludge from ETP (Semisolid)	1475000	2205000

(C) Mode of disposal			
1	QUANTITY REUSED/REUTILIZED WITHIN PLANT	80177000	106105000
2	QUANTITY SOLD TO AUTHORIZED RECYCLERS (DRUMS EXCLUDED AS IN NOS)	5542000	2838000
3	QUANTITY DISPOSED TO TSDF/ INCINERATION	0	0
4	QUANTITY COPROCESSED IN CEMENT INDUSTRY/ PREPROCESSED	796500	317000

PART – E
SOLID WASTES

Total Quantity (KG) generation			
Non-Hazardous Waste		During the last Financial year (2022-2023)	During the current Financial year (2023-2024)
(A) From Process Units			
1	SPENT FCC CATALYST	257390	47970
2	OFF SPECIFICATION BITUMEN	78850	41380
3	OFF SPECIFICATION FO	0	0
4	SPENT CERAMIC BALLS	3630	231400
5	SPENT ALUMINA BALLS	0	0
6	SPENT ALUMINA BALLS WITH MOLECULAR SIEVE	0	24520
7	SPENT CHLORIGUARD	296820	10240
	Total	636690	355510
(B) From Pollution Control Facilities			
8	BIO SLUDGE	1711000	1968000

Total Quantity (KG) Disposed			
Non-Hazardous Waste		During the last financial year (2022-2023)	During the current financial year (2023-2024)
(A) From Process Units			
1	SPENT FCC CATALYST	442500	60560
2	OFF SPECIFICATION BITUMEN	96890	35540
3	OFF SPECIFICATION FO	0	0
4	SPENT CERAMIC BALLS	59660	230390
5	SPENT ALUMINA BALLS	0	0
6	SPENT ALUMINA BALLS WITH MOLECULAR SIEVE	0	0
7	SPENT CHLORIGUARD	267210	81030
Total		866260	407520
(B) From Pollution Control Facilities			
8	BIO SLUDGE	1711000	1968000

(C) Mode Of Disposal			
1	QUANTITY REUSED/REUTILIZED WITHIN PLANT(Sr. No.8)	1711000	1968000
2	QUANTITY SOLD TO RECYCLERS (Sr. No.1 to 7)	866260	407520
3	QUANTITY DISPOSED TO TSDF/ INCINERATION	0	0
4	QUANTITY COPROCESSED IN CEMENT INDUSTRY(Sr. No.1)	0	0

PART – F

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

Brief on storage & disposal of hazardous wastes are given below:

Sr. No.	Type of waste	Method of Storage	Method of disposal
1.	Oily Sludge & BSW	Oily sludge is stored in Reinforced Cement concrete (RCC) pits lined with 1.5 mm thick HDPE liner & connected to leachate collection sump which is finally connected to ETP where leachate is treated.	Reprocessing at Delayed Coker Unit of Refinery (In-house) / Co-processing in Cement Industries
2	Used Lubricating Oil (Liquid)	The waste is packed in closed MS drums of 200 Kgs and placed in storage facility having HDPE liner, Reinforced Cement Concrete (RCC) floor, covered at the top & having Leachate collection and treatment facility.	Sold to authorized actual users
3	Discarded Empty Drums / Containers (Solid)	Stored in the storage facility having Reinforced Cement Concrete (RCC) floor and covered at the top.	Sold to authorized actual users
4	Slop Oil (Liquid)	Slop oil generated is collected in slop oil Tanks.	In-house recycling / reprocessing
5	Oily Rags / Oil Contaminated Cotton Waste (Solid)	The oil contaminated cotton waste / rags are stored in MS drums/ bags and are stored in the storage facility having Reinforced Cement concrete (RCC) floor and covered at the top.	Sent for Co-processing in Cement Industries
6	Spent Catalyst from various Units (Solid)	Packed in 200 lit MS Drums, closed from top with lid & ring and then stored in the storage facility having Reinforced Cement concrete (RCC) floor and covered at the top.	Sold to authorized actual users
7	Spent Resin (Solid)	The waste is packed in closed MS drums of 200 Kg and storage facility having HDPE lined, Reinforced Cement concrete (RCC) floor, covered at the top.	Sent for co-processing.
8	Expired Hazardous Chemicals (Liquid)	The waste is packed in closed MS drums of 200 Kg and stored in the storage facility having HDPE liner, Reinforced Cement concrete (RCC) floor, covered at the top & having leachate collection and treatment facility.	Sent to actual users.

9	Spent Carbon (Solid)	The waste is packed in closed MS drums of 200 Kg and storage facility having HDPE lined, Reinforced Cement concrete (RCC) floor, covered at the top.	Sent for co-processing
10	Insulated Copper Cable with PVC Sheathing (Solid)	At MMC	Sold to authorized actual users
11	Waste coke (Heater Deposits)	The waste is packed jumbo bags and stored in storage facility having HDPE lined, Reinforced Cement concrete (RCC) floor, covered at the top.	Sent to cement industry for co-processing.
12	Waste/residue containing oil	The waste is packed in closed MS drums of 200 Kg and storage facility having HDPE lined, Reinforced Cement concrete (RCC) floor, covered at the top.	Sent to authorized actual users

Brief on storage & disposal of solid wastes are given below:

Sr. No.	Type of waste	Method of storage	Method of disposal
1.	Spent FCC Catalyst	The waste is packed in 1 MT Jumbo bags; filled bags are stored inside shed having RCC floor lined with HDPE liner.	Sold to Recycler
2.	Off Specification Bitumen	Waste is packed into 200 kg capacity MS drums; these drums are stored inside a shed having RCC floor lined with HDPE liner.	Sold to Recycler
3.	Spent Ceramic Balls	Waste is packed into 200 kg capacity MS drums; these drums are stored inside a shed having RCC floor lined with HDPE liner.	Sold to Recycler
4.	Bio Sludge	Collected in 3 MT capacity trolley in Loose form	Used internally in greenbelt

PART – G

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

Pollution control measures adopted and their impacts on natural resources given are as under:

MAJOR FACILITIES / SYSTEMS ADOPTED AS POLLUTION CONTROL MEASURES:

- ✓ Installed Effluent Treatment Plant with capacity of 1000 m³/hr - consisting of primary, secondary, and tertiary treatment.
- ✓ Recycling of treated effluent as RO feed/fire water make up / service water / cooling water make – up in refinery.
- ✓ Use of Low sulfur fuel – Natural gas, Refinery Fuel Gas and Fuel Oil is used in all the furnaces / heaters to minimize SO₂ emission.
- ✓ To control H₂S emission from refinery process, Sulfur Recovery Unit (SRU) with Low Temperature Shell Claus off Gas Treating Units (LT SCOT) has been installed.
- ✓ Heaters / furnaces are equipped with Low NO_x burners to minimize NO_x emission.
- ✓ Floating roof storage tanks have been provided for storage of hydrocarbon like Crude, Naphtha, SKO, ATF, Gasoline, Diesel, and Reformate to reduce VOC emission.
- ✓ Provided Closed Blow Down (CBD) system for all the process units to minimize VOC emission from the operations.
- ✓ Regular monitoring of stacks emissions & ambient air quality as well as VOCs (Volatile Organic Compounds) through portable monitor is carried out once a month.
- ✓ Provided high efficiency cyclone separators for control of particulate emission from Fluidized Catalytic Cracker Unit (FCCU).
- ✓ Installed primary treatment units (at source) with provision of oil recovery from the effluent generated from the process units / loading areas / utility areas / storage areas etc. before the effluent is taken to central wastewater treatment unit.
- ✓ Provided flares with feature of smoke free operation for the emergency release (combustion / burning) of hydrocarbons from any process unit in case of tripping of unit as an emergency safety devise.
- ✓ Emission Free - Electrically powered Golf Carts and Fuel Free - Bicycles are used in the refinery.
- ✓ Installed online Hydrocarbon and Temperature monitoring sensors in sea water return line.

The impact of these measures:

1. Recovery of Sulfur from tail gases has increased to 99.9%.
2. Treated water is being reused within the refinery.

PART – H

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

- (i) Installed Continuous Ambient Air Quality Monitoring Stations at two locations and hooked up with Central Pollution Control Board, Delhi.
- (ii) Continuous Emission Monitoring System for stack emission has been hooked up with CPCB server.
- (iii) Continuous Effluent Quality Monitoring System hooked up with CPCB server.
- (iv) Installed LED display board at main gate for displaying online data of ambient air quality, stack emission, effluent quality monitoring, Hazardous waste inventory.
- (v) Implemented Leak Detection and Repair Program
- (vi) Celebrated World Environment Day and carried out other activities for increasing environmental awareness amongst employees. 803 Nos. saplings planted in 1 ha area Opp. EPGL during World Environment Day-2023 with Social Forestry Division, Forest Dept. Dist: Devbhumi Dwarka.
- (vii) 100 ha mangrove plantation carried out in consultation with Marine National Park, Forest Dept, Jamnagar.

PART – I

Any other particulars for improving the quality of the environment:

- ✓ Disposed Spent ZnO Catalyst by selling it to State Pollution Control Board authorized recycler.
- ✓ Oily sludge reprocessing in Delayed Coker Unit and utilization within refinery.
- ✓ Co processing of Oily Cotton Rags, Oily Filter Cartridge, Spent Resin, Heater deposits and Spent Carbon in M/s Digvijay Cement, Sikka.

PART-C

POLLUTION DISCHARGED TO ENVIRONMENT /UNIT OF OUTPUT

(1) TREATED WASTEWATER:

Sr. No.	Parameter	UOM	Concentration pollutants (annual avg.)*	Permissible Limit as per GPCB CC&A	Percentage of variation from prescribed standards with reason	Concentration on Quantum	Quantum Limit as per GPCB CC&A	Percentage of variation from prescribed standards with reason	
						Kg / 1000 Tons of crude processed	Kg / 1000 Tons of crude processed		
1	pH		7.31	8.5	NA	-	NA	NA	
2	Oil & Grease	mg/l	2.00	5	All Parameters are well within prescribed GPCB limit	0.73	2.00	All Parameters are well within prescribed GPCB limit	
3	Phenolic Compounds	mg/l	0.10	0.35		0.04	0.14		
4	Sulphide	mg/l	0.19	0.5		0.07	0.20		
5	COD	mg/l	76.74	125		27.91	50.00		
6	BOD	mg/l	11.92	15		4.33	6.00		
7	TSS	mg/l	16.00	20		5.82	8.00		
8	Ammonical Nitrogen	mg/l	2.00	15		0.73	6.00		
9	Cyanide	mg/l	0.05	0.2		0.02	0.08		
10	Phosphorus	mg/l	0.02	3		0.01	1.20		
11	Total Chromium as Cr	mg/l	0.05	2		0.02	0.80		
12	Lead as Pb	mg/l	0.01	0.1		0.004	0.04		
13	Mercury as Hg	mg/l	0.00	0.01		0.0004	0.004		
14	Zinc as Zn	mg/l	0.05	5		0.02	2.00		
15	Nickel as Ni	mg/l	0.016	1		0.01	0.40		
16	Copper as Cu	mg/l	0.075	1		0.03	0.400		
17	Vanadium as V	mg/l	0.01	0.2		0.004	0.80		
18	TKN	mg/l	2.00	40		0.73	16.00		
19	Hexavalent Chromium	mg/l	0.05	0.1		0.02	0.04		
20	Benzene	µg/l	0.00	0.1		0.0004	0.04		
21	Benzo(a)pyrene	µg/l	0.00	0.2		0.0004	0.08		
22	Flow Rate (annual Avg.)	m ³ /Hr	841.39	1058					

Note: Mode of Disposal - Major part of treated wastewater is fed to RO plant and remaining quantity is used as fire water make-up / service water make-up / horticulture

*Source of data: Monthly monitoring carried out by third party.

2) STACK EMISSIONS:

Stacks attached to	Fuel used	Pollutants	Concentration of pollutants discharged(mass/volume)		Prescribed Standards of Pollutants (mass / volume) (mg/Nm ³)	Percentage of variation from prescribed standards with reason
			Unit	Results		
CDU	FO+FG	PM	mg/Nm ³	26	100	All Parameters are well within prescribed GPCB limit
		SO ₂	mg/Nm ³	137	1700	
		NO _x	mg/Nm ³	73	450	
		CO	mg/Nm ³	29	200	
VDU	FO+FG	PM	mg/Nm ³	32	100	
		SO ₂	mg/Nm ³	318	1700	
		NO _x	mg/Nm ³	52	450	
		CO	mg/Nm ³	37	200	
CDU - II	FO+FG	PM	mg/Nm ³	16	100	
		SO ₂	mg/Nm ³	394	1700	
		NO _x	mg/Nm ³	84	450	
		CO	mg/Nm ³	17	200	
NHT/CCR	FG	PM	mg/Nm ³	5	10	
		SO ₂	mg/Nm ³	9	50	
		NO _x	mg/Nm ³	38	350	
		CO	mg/Nm ³	14	150	
DHDS	FG	PM	mg/Nm ³	2	10	
		SO ₂	mg/Nm ³	7	50	
		NO _x	mg/Nm ³	31	350	
		CO	mg/Nm ³	29	150	
SRU	No Fuel	H ₂ S	mg/Nm ³	BDL	15	
		NO _x	mg/Nm ³	115	350	
		CO	mg/Nm ³	37	150	
FCC Heater	FG	PM	mg/Nm ³	2	10	
		SO ₂	mg/Nm ³	5	50	
		NO _x	mg/Nm ³	60	350	

		CO	mg/Nm ³	27	150	All Parameters are well within prescribed GPCB limit
FCC Regenerator	No Fuel	PM	mg/Nm ³	37	100	
		SO ₂	mg/Nm ³	58	1700	
		NO _x	mg/Nm ³	85	450	
		CO	mg/Nm ³	88	400	
		PM	mg/Nm ³	2	10	
HMU - 1	FG	SO ₂	mg/Nm ³	4	50	
		NO _x	mg/Nm ³	17	350	
		CO	mg/Nm ³	7	150	
		PM	mg/Nm ³	4	100	
DHDT	FO+FG	SO ₂	mg/Nm ³	18	1700	
		NO _x	mg/Nm ³	39	450	
		CO	mg/Nm ³	7	200	
		PM	mg/Nm ³	6	100	
VGOMHC	FO+FG	SO ₂	mg/Nm ³	21	1700	
		NO _x	mg/Nm ³	27	450	
		CO	mg/Nm ³	14	200	
		PM	mg/Nm ³	3	10	
DCU - 1	FG	SO ₂	mg/Nm ³	9	50	
		NO _x	mg/Nm ³	34	350	
		CO	mg/Nm ³	10	150	
		PM	mg/Nm ³	4	10	
DCU - 2	FG	SO ₂	mg/Nm ³	8	50	
		NO _x	mg/Nm ³	32	350	
		CO	mg/Nm ³	6	150	
		PM	mg/Nm ³	3	10	
DCU - 3	FG	SO ₂	mg/Nm ³	8	50	
		NO _x	mg/Nm ³	39	350	
		CO	mg/Nm ³	9	150	
		H ₂ S	mg/Nm ³	BDL	15	
SRU - 1	No Fuel	NO _x	mg/Nm ³	65	350	

		CO	mg/Nm ³	30	150	
HMU-II	FG	PM	mg/Nm ³	2	10	
		SO ₂	mg/Nm ³	6	50	
		NO _x	mg/Nm ³	20	350	
		CO	mg/Nm ³	8	150	
SRU - 2	No Fuel	H ₂ S	mg/Nm ³	BDL	15	
		NO _x	mg/Nm ³	45	350	
		CO	mg/Nm ³	21	150	

*Source of data: Monthly monitoring carried out by third party.

FO: Fuel oil

FG: Fuel gas