

Nayara Energy/ENV/27398/Env Statement/2021-22/1118

24th Aug, 2022



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.2021-22

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, 2022.

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, 2022

Copy to: Regional Officer, Gujarat Pollution Control Board,
Sardar Patel Comm. Center,
Bedibandar Road, Rameshwar Nagar, Jamnagar – 361 008.

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E refinery@nayaraenergy.com

FORM – V

(See Rule 14)*

Date: 24.08.2022

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 – 2022

PART – A

(i) Name and address of the owner/ Occupier of the industry operation	:	Prasad Panicker Director & 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	:	23.09.2021

*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'21 to Mar'22)

Process	: 29383 (Source: Sea water feed to Desal plant)
Cooling purpose	: 23270 (Source: Sea water)
Domestic	: 9118 (Source: Narmada Water)

Name of Products		Process water consumption per unit of product output (m ³ / Tons of Products)	
		During the previous Financial year (2020-2021)	During the current financial year (2021-2022)
		(1)	(2)
(1)	LPG	0.75	0.55
(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 (2020-2021)	During the current financial year (2021-2022)
Crude Oil	LPG, Naphtha, MS, ATF, Kerosene, Diesel (HSD), FO, Sulfur, Bitumen, Pet coke	1.032	1.042

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 (MT) Generation			
Hazardous waste		During the last Financial year (2020-2021)	During the current Financial year (2021-2022)
(A) From Process Units			
1	Used Lubricating Oil (Liquid)	46	36
2	Discarded Empty Drums / Containers (Solid)(Nos)	16468	15277
3	Slop Oil(Liquid)	100753	69373
4	Oily Cotton Rags/ Oil contaminated waste (Solid)	15	23
5	Spent Catalyst From Various Units (Solid)	2529	271
6	Spent Resin (Solid)	22	0
7	Expired Hazardous Chemicals (Liquid)	6	0
8	Spent Carbon (Solid)	154	372

9	Insulated Copper Cable with PVC Sheathing (Solid)	0	1
10	Oily Sludge and BSW (Semi Solid)	0	1191
11	Waste coke (Heater Deposits)	11	22
12	Waste/ Residue containing oil	2612	2352
Total (Excluding Drums in Nos)		106148	73641
(B) From Pollution Control Facilities			
13	Oily Sludge from ETP (Semisolid)	7971	1453
Total		7971	1453

Total Quantity (MT) Disposed			
Hazardous Waste		During the last Financial year (2020-2021)	During the current Financial year (2021-2022)
(A) From Process Units			
1	Used Lubricating Oil (Liquid)	30	44.99
2	Discarded Empty Drums / Containers (Solid)(Nos)	17262	14743
3	Slop Oil(Liquid)	100753	69373
4	Oily Cotton Rags/ Oil contaminated waste (Solid)	22	14
5	Spent Catalyst From Various Units (Solid)	3880	577.34
6	Spent Resin (Solid)	11	15
7	Expired Hazardous Chemicals (Liquid)	0.970	0
8	Spent Carbon (Solid)	111	430
9	Insulated Copper Cable with PVC Sheathing (Solid)	0	0
10	Oily Sludge and BSW (Semi Solid)	0	1532.75
11	Waste coke (Heater Deposits)	0	20
12	Waste/ Residue containing oil	2657.07	2387.58
Total (Drums excluded as in Nos)		107465	74395
(B) From Pollution Control Facilities			
13	Oily Sludge from ETP (Semisolid)	8577	2504

(C) Mode of disposal			
1	QUANTITY REUSED/REUTILIZED WITHIN PLANT	108845	71877
2	QUANTITY SOLD TO AUTHORIZED RECYCLERS (DRUMS EXCLUDED AS IN NOS)	5973	2708
3	QUANTITY DISPOSED TO TSDF/ INCINERATION	565	311
4	QUANTITY COPROCESSED IN CEMENT INDUSTRY/ PREPROCESSED	659	2059

PART – E
SOLID WASTES

Total Quantity (MT) generation			
Non Hazardous Waste		During the last Financial year (2020-2021)	During the current Financial year (2021-2022)
(A) From Process Units			
1	SPENT FCC CATALYST	0	318.28
2	OFF SPECIFICATION BITUMEN	46.17	61
3	OFF SPECIFICATION FO	0	0
4	SPENT CERAMIC BALLS	0	0
5	SPENT ALUMINA BALLS	0	4.310
6	SPENT ALUMINA BALLS WITH MOLECULAR SIEVE	0	1.77
7	SPENT CHLORIGUARD	0	3.84
	Total	46.17	389.20
(B) From Pollution Control Facilities			
8	BIO SLUDGE	3784	3092

Total Quantity (MT) Disposed			
Non Hazardous Waste		During the last Financial year (2020-2021)	During the current Financial year (2021-2022)
(A) From Process Units			
1	SPENT FCC CATALYST	0	355.75
2	OFF SPECIFICATION BITUMEN	54.87	61.81
3	OFF SPECIFICATION FO	0	0
4	SPENT CERAMIC BALLS	0	0
5	SPENT ALUMINA BALLS	0	18.7
6	SPENT ALUMINA BALLS WITH MOLECULAR SIEVE	0	8.15
7	SPENT CHLORIGUARD	0	0
	Total	54.87	444.41
(B) From Pollution Control Facilities			
8	BIO SLUDGE	3784	3092

(C) Mode Of Disposal			
1	QUANTITY REUSED/REUTILIZED WITHIN PLANT(Sr. No.8)	3784	3092
2	QUANTITY SOLD TO RECYCLERS (Sr. No.1 to 7)	54.87	444.41
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 from ETP (Semi- Solid)	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 Warehouse	Sold to authorized actual users
11	Oily Sludge & BSW	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 Pollution control board authorized TSDF / Incineration facility
12	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.
13	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 waste water 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. Full qty. of treated water is being reused within 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 environment awareness amongst employee and surrounding community.

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.
- ✓ Spent Ni-Co-Mo catalyst sold to authorize recyclers for recovery of metals.
- ✓ 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.

(Signature of a person carrying out an industry,
operation or process)



Date: 24.08.2022

Name: Prasad Panicker
Designation: Director & Head Refinery



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		6.74	8.5	NA	NA	NA	NA
2	Oil & Grease	mg/l	2.00	5	All Parameters are well within prescribed GPCB limit	0.66	2.00	All Parameters are well within prescribed GPCB limit
3	Phenolic Compounds	mg/l	0.10	0.35		0.03	0.14	
4	Sulphide	mg/l	0.38	0.5		0.13	0.20	
5	COD	mg/l	51.53	125		16.99	50.00	
6	BOD	mg/l	10.68	15		3.52	6.00	
7	TSS	mg/l	15.00	20		5.06	8.00	
8	Ammonical Nitrogen	mg/l	2.00	15		0.66	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		0.00	0.04	
13	Mercury as Hg	mg/l	0.00	0.01		0.00	0.004	
14	Zinc as Zn	mg/l	0.05	5		0.02	2.00	
15	Nickel as Ni	mg/l	0.031	1		0.01	0.40	
16	Copper as Cu	mg/l	0.079	1		0.03	0.400	
17	Vanadium as V	mg/l	0.01	0.2		0.00	0.80	
18	TKN	mg/l	2.00	40		0.66	16.00	
19	Hexavalent Chromium	mg/l	0.05	0.1		0.02	0.04	
20	Benzene	µg/l	0.00	0.1		0.00	0.04	
21	Benzo(a)pyrene	µg/l	0.00	0.2		0.00	0.08	
22	Flow Rate (annual Avg.)	m ³ /Hr	759.24	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/VDU	FO+FG	PM	mg/Nm ³	30	100	All Parameters are well within prescribed GPCB limit
		SO ₂	mg/Nm ³	154	1700	
		NO _x	mg/Nm ³	88	450	
		CO	mg/Nm ³	27	200	
CDU - II	FO+FG	PM	mg/Nm ³	32	100	
		SO ₂	mg/Nm ³	148	1700	
		NO _x	mg/Nm ³	97	450	
		CO	mg/Nm ³	24	200	
NHT/CCR	FG	PM	mg/Nm ³	BDL	10	
		SO ₂	mg/Nm ³	13	50	
		NO _x	mg/Nm ³	62	350	
		CO	mg/Nm ³	30	150	
DHDS	FG	PM	mg/Nm ³	3	10	
		SO ₂	mg/Nm ³	18	50	
		NO _x	mg/Nm ³	89	350	
		CO	mg/Nm ³	20	150	
SRU	No Fuel	H ₂ S	mg/Nm ³	1	15	
		NO _x	mg/Nm ³	116	350	
		CO	mg/Nm ³	26	150	
FCC Heater	FG	PM	mg/Nm ³	BDL	10	
		SO ₂	mg/Nm ³	7	50	
		NO _x	mg/Nm ³	83	350	
		CO	mg/Nm ³	16	150	
FCC Regenerator	No Fuel	PM	mg/Nm ³	41	100	
		SO ₂	mg/Nm ³	39	1700	
		NO _x	mg/Nm ³	87	450	
		CO	mg/Nm ³	45	400	
HMU - 1	FG	PM	mg/Nm ³	BDL	10	
		SO ₂	mg/Nm ³	7	50	
		NO _x	mg/Nm ³	60	350	
		CO	mg/Nm ³	17	150	

DHDT	FO+FG	PM	mg/Nm ³	4	100	All Parameters are well within prescribed GPCB limit
		SO ₂	mg/Nm ³	29	1700	
		NO _x	mg/Nm ³	71	450	
		CO	mg/Nm ³	27	200	
VGOMHC	FO+FG	PM	mg/Nm ³	3	100	
		SO ₂	mg/Nm ³	18	1700	
		NO _x	mg/Nm ³	48	450	
		CO	mg/Nm ³	14	200	
DCU - 1	FG	PM	mg/Nm ³	BDL	10	
		SO ₂	mg/Nm ³	15	50	
		NO _x	mg/Nm ³	59	350	
		CO	mg/Nm ³	17	150	
DCU - 2	FG	PM	mg/Nm ³	BDL	10	
		SO ₂	mg/Nm ³	13	50	
		NO _x	mg/Nm ³	61	350	
		CO	mg/Nm ³	14	150	
DCU - 3	FG	PM	mg/Nm ³	BDL	10	
		SO ₂	mg/Nm ³	12	50	
		NO _x	mg/Nm ³	66	350	
		CO	mg/Nm ³	22	150	
SRU - 1	No Fuel	H ₂ S	mg/Nm ³	1	15	
		NO _x	mg/Nm ³	103	350	
		CO	mg/Nm ³	29	150	
HMU-II	FG	PM	mg/Nm ³	1	10	
		SO ₂	mg/Nm ³	6	50	
		NO _x	mg/Nm ³	68	350	
		CO	mg/Nm ³	20	150	
SRU - 2	No Fuel	H ₂ S	mg/Nm ³	1	15	
		NO _x	mg/Nm ³	93	350	
		CO	mg/Nm ³	30	150	

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

FO: Fuel oil

FG: Fuel gas