



मंगलूर रिफाइनरी एण्ड पेट्रोकेमिकल्स लिमिटेड
MANGALORE REFINERY AND PETROCHEMICALS LIMITED

अनुसूची 'अ' के अंतर्गत भारत सरकार का उद्यम, SCHEDULE 'A' GOVT. OF INDIA ENTERPRISE.
(ऑयल एण्ड नेचुरल गैस कॉर्पोरेशन लिमिटेड की सहायक कंपनी, A SUBSIDIARY OF OIL AND NATURAL GAS CORPORATION LIMITED)
आई.एस.ओ. 9001, 14001 एवं 50001 प्रमाणित कंपनी, AN ISO 9001, 14001 AND 50001 CERTIFIED COMPANY.
सीआईएन/CIN : L23209KA1988GOI008959 / वेबसाइट Website : www.mrpl.co.in

L/MS/KSPCB/7319
26th September, 2023

The Member Secretary
Karnataka Pollution Control Board
No. 49, Parisara Bhavan
Church Street
Bangalore – 560 001

Dear Sir,

**विषय SUB: - Submission of Environment Statement (Form-V) for the year 2022 – 23
for Operation of Refinery**

We are enclosing herewith the Environmental Statement (Form - V) for the year 2022-23
pertaining to Consent Order issued by the Board for Operation of Refinery.

धन्यवाद Thanking you,

Yours sincerely,

For Mangalore Refinery & Petrochemicals Limited,

*M.S. Sudarsan
27.9.2023*
M.S. Sudarsan
Chief General Manager (Health, Safety and Environment)

Encl: As above

Cc: EO, KSPCB, Mangalore

FORM - V

(See Rule - 14)

Environmental Statement for the financial year ending with 31st March 2023 for Refinery

PART-A

- (i) Name and address of the owner / occupier of the industry, operation or process:

Sanjay Varma
Managing Director (Additional Charge) & Director (Refinery)
Mangalore Refinery and Petrochemicals Limited,
Kuthethoor Post, via Katipalla, Mangalore - 575 030

- (ii) Industry category

Red Category (Code: 1004)

- (iii) Processing Capacity:

18.2 Million Metric Tons per Annum of Crude Oil Refining

- (iv) Year of Establishment:

Phase - I: 1996, Phase - II: 1999 and Phase - III: in 2012

- (v) Date of the Last Environmental Statement: 29th September 2022

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PART -B

Water and Raw Material Consumption

(i) Water consumption in m³/d

Process Water : 23867

Cooling Water : 19403

Domestic : 4770

Name of Products	Water consumption* per unit of crude oil	
	During the previous Financial Year (2021-2022)	During the current Financial Year (2022-2023)
1. LPG 2. Naphtha 3. Motor Spirit 4. Kerosene 5. ATF 6. Diesel 7. Fuel Oil	The product quantity will vary with the type of crude processed and hence the water consumption per unit of crude processed has been estimated and furnished	
8. Bitumen 9. Sulphur 10. Mixed Xylene 11. Pet Coke 12. Polypropylene 13. VGO 14. Fuel & Loss	0.99 m ³ /MT of Crude Oil processed	0.92m ³ /MT of crude oil processed

* Fresh water consumption

(ii) Raw material consumption

Name of raw materials	Name of Products	Consumption of raw material per unit of output	
		During the Previous Financial Year (2021-2022)	During the current Financial Year (2022-2023)
Crude Oil	1. LPG 2. Naphtha 3. Motor Spirit 4. Kerosene		

5.	ATF	1.12	1.12
6.	Diesel		
7.	Fuel Oil	(Net Crude Oil	(Net Crude Oil
8.	Bitumen	Processed =	Processed =
9.	Sulphur	15.02 MMT	17.13 MMT
10.	Mixed Xylene		
11.	Pet Coke	Output =	Output =
12.	Polypropylene	13.41 MMT)	15.23 MMT)
13.	VGO		
14.	Fuel & Loss		

PART-C

Pollution discharged to Environment/unit of output

Pollutants	Quantity of Pollutants discharged (mass/day)		Concentration of Pollutants discharged (mass/volume)			Percentage of variation from prescribed standards with reasons.
	kg/day		mg/l			
	Parameter	Actual	Parameter	Actual	CFO limit	
(a) Water	Oil & Grease	33	Oil & Grease	2.02	5.0	-
	BOD	152	BOD	9.3	15.0	-
	COD	1124	COD	68.6	125	-
	TSS	112	TSS	6.88	20.0	-
	Phenol	3.46	Phenol	0.21	0.35	-
	Sulphide (as S)	5.12	Sulphide (as S)	0.31	0.50	-
	Ammonia (as N)	86	Ammonia (as N)	5.26	15.0	-
	TKN	121	TKN	7.39	40.0	-
(b) Air	SOx	Actual	57000	-		-
		CFO limit	57000			

PART-D

Hazardous Waste

Hazardous Waste Streams	Total Quantity Generated (MT)	
	During the current Financial year 2021-22	During the current Financial year 2022-23
1. From process		
Spent Catalyst	1643.86	1534.77

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Spent Clay	180.57	0
Spent Carbon	-	60.12
Used/Spent Oil	54.11	33.75
2. From Pollution Control Facilities		
ETP Sludge	3210	533.1

PART-E

Solid Wastes

Solid Wastes	Total Quantity Generated	
	During the current Financial year 2021-22	During the current Financial year(in MT) 2022-23
a. From process		
Discarded Containers (In MT)	97.848	312.956
b. From pollution control facilities	-	-
c. Quantity Recycled within the unit	-	-

PART-F

Characteristics and disposal of Hazardous and Solid Waste

1. Oily Sludge

For the purpose of recovery of resource, oily sludge generated in Effluent Treatment Plants (ETP) is thickened & centrifuged, producing sludge containing only 3-5% oil, which is stored in HDPE lined impervious sludge pits. This oily sludge is either reprocessed in our Delayed Coker Unit (DCU) where it gets converted to valuable products or sent for Co-processing in SPCB Authorized Cement Industry.

Co-processing leaves no residue as the incombustible, inorganic content of the waste materials are incorporated in the clinker matrix. Therefore, after the waste is co-processed, it becomes a part of the product.

During 2022-23, about 4588.1 MT of oily sludge is reprocessed in DCU while 1273.01 MT are Co-processed through SPCB authorized Cement Industries.

2. Spent Catalyst

During the refining operations, impurities such as heavy metals, sand, coke, etc. from the feed get deposited on the catalyst surface and thus reduces its activity level. After sufficient reduction in the activity of the catalyst it is subjected to in-situ/ex-situ

regeneration depending upon the viability. Over the course of time catalyst regeneration becomes infeasible and such catalyst is termed as "Spent Catalyst", which needs to be disposed.

During 2022-23, around 367.65 MT of Spent Catalyst containing oxides of transition metals like Platinum, Cobalt, Molybdenum, Nickel, alumina, etc. is disposed to SPCB authorized recyclers

3. Used/Spent Oil

Around 14.89 MT of PPU Treated Waste While Oil, which is a mixture of Mineral oil, Tri-ethyl Aluminum (pyrophoric), Isopropanol (flammable) and ATMER in varying compositions, was disposed through SPCB authorized incinerator.

Around 18.86 MT of used/spent oil is mixed with Crude oil and reprocessed in refinery.

4. Discarded Containers

312.956 MT of discarded containers were disposed to SPCB authorized recyclers/reusers.

Part - G

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

1. All 3 Effluent Treatment Plants were operated 24x7 to meet the Pollutant limit/load for treated effluent prescribed by Karnataka State Pollution Control Board (KSPCB) and recycle the treated effluent thereby reducing the fresh water consumption.

Average effluent recycle rate = 494 m³/hr

ETP Maintenance Cost = INR 8.02 Cr.

Power Consumption Cost = INR 16.52 Cr.

Chemical Consumption Cost = INR 8.68 Cr.

2. Sulphur Recovery Units were run continuously to control the SO_x emissions from the refinery below stipulated limit of 57 MTPD.

SRU/SWS Maintenance Cost = INR 12.35 Cr.

Power Consumption Cost = INR 32.84 Cr.

3. Tertiary treated sewage supplied by city Municipal Corporation is polished by passing to Reverse Osmosis (RO) plant and consumed in the cooling towers and DM plant. This resulted in a reduction of 61,09,556 m³ in fresh water consumption.

4. In order to conserve river water for domestic and general public purpose and to reduce fresh water intake for industrial usage, MRPL has commissioned a

Desalination plant at Thanirbhavi site, Mangalore. This resulted in a reduction of 21,92,386 m³ in fresh water consumption

5. Around 4588.1 MT of Oily Sludge generated in the ETPs was reprocessed in DCU where it gets converted to valuable products.

Part - H
Additional measures/investment proposal for environmental protection including abatement of pollution (2023-24)

Sr. No.	Description	Cost INR in Lakh
1	Ambient Air Quality Manual Stack Monitoring by approved external agency	22
2	Environmental software and necessary hardware dispersion modelling	0.5
3	Analysis Charges by statutory body	18.3
4	Work Place Monitoring- Hydrocarbon & Benzene	3.99
5	VOC Monitoring study	16.5
6	Noise Level Monitoring	9.69
7	Greenbelt Development in Refinery	506.48
8	Compensatory Afforestation	25
9	Disposal of Hazardous & Other Waste	629.99
10	Tackling of Oil Spill Crisis Manpower	35
11	Environmnet Management system (ISO 14001: 2015) Certification & Consultancy Charges	30.65
12	Phase-3 D.G set Maintenance	5.79
13	Operation & Maintenance cost of APMC pumping station	15.42
14	Annual Maintainance of Analyser	74.52
15	Annual Maintainance of Gas Detectors	26.46
16	Data publishing on CPCP portal	18
17	Bio Gas Plant Operation & Maintenance	18.4
18	Operation & Maintenance of 130 KLD CISF Township STP	25.4
19	Public Liability Industrial Policy	32.09
20	Domestic solid waste management	36.36
21	Sea water quality monitoring studies (SPM & Chitrapura area)	18.76
22	Annual submarine pipeline (Treated pipeline inspection including Side-Scan sonar, Echo- sounder Studies (2 submarine pipelines)	35.4
23	Carbon Foot Printing Study	8.43
24	Sustainability Reporting (ESG & BRSR)	8.75
25	Consent Fee	81.25
26	Community Awareness Programme	13
27	Oil Spill Reseponse	2.49
28	Plastic Waste Management Rules Complainece	47.0
29	Grid Analysis Study	75.9
30	Total	1841.52

Part - I

Any other particulars in respect of environmental protection including abatement of pollution

Expenditure details for Environmental Protection during 2022-23,

Sr. No.	Description	Cost INR in Lakh
1	Ambient Air Quality Monitoring by approved external agency	15.88
2	AERMOD Dispersion Modeling	2.02
3	Analysis Charges by statutory body	18.3
4	Manual Stack Monitoring by approved external agency	1.38
5	VOC Monitoring study	9.10
6	Noise Level Monitoring	6.5
7	Greenbelt Development in Refinery	499.55
8	Compensatory Afforestation	6.92
9	Vermi Compost facilities	49.34
10	Disposal of Hazardous & Other Waste	214.15
11	Tackling of Oil Spill Crisis Manpower	33.14
12	Environment Management system (ISO 14001: 2015) Certification & Consultancy Charges	31.11
13	Oil Spill Contingency Plan for SPM	3.71
14	Phase-3 D.G set Maintenance	5.79
15	Operation & Maintenance cost of APMC pumping station	34.69
16	Annual Maintenance of Analyser	74.52
17	Annual Maintenance of Gas Detectors	32.18
18	Data publishing on CPCP portal	11.25
19	Bio Plant Operation & Maintenance	15.6
20	Operation & Maintenance of 130 KLD CISF Township	25.4
21	Public Liability Industrial Policy	30.88
22	Domestic solid waste management	42.9
23	Sea water quality monitoring studies (SPM & Chitrapura area)	19.92
24	Annual submarine pipeline (Treated pipeline inspection including Side-Scan sonar, Echo- sounder Studies (2 submarine pipelines)	32.45
25	Carbon Foot Printing Study	6.49
26	Consent Fee	8.008
27	ETP Maintenance Cost	802
28	ETP Power Consumption Cost	1652
29	ETP Chemical Consumption Cost	868
30	ETP -3 Effluent Discharge Pumping Cost	33.64
31	SRU/SWS Maintenance Cost	1235
32	SRU Power Consumption Cost	3284
33	Community Awareness Programme	3.58
34	Grid Analysis Study	19.75
35	Environment Impact Assessment study	25.84
	Total	9143.368

Salient features of Environmental Monitoring Program:

1. Ambient Air Quality is being monitored at 10 locations in and around the refinery complex for all the parameters stipulated in MoEF Notification, 2009.
2. Continuous Ambient Air Quality Monitoring Stations are installed at 2 locations inside the Refinery for monitoring.
3. Online analyzers are installed in refinery flue gas stacks for monitoring SO_x, NO_x, CO & PM.
4. Manual Stack monitoring and VOC emission survey is being carried out by NABL accredited external agency as per the MoEF Notification, 2008.
5. MRPL has an ISO 17025:2005 certified laboratory where the quality of the treated effluent is analyzed in every shift against the 21 parameters prescribed in the Consent Conditions. In addition there are online analyzers installed to monitor the parameters such as pH, BOD, COD, TSS and Flow rate. The quality of treated effluent is also analyzed every month by the State Pollution Control Board and every 15 days by external agency.
6. Ground and surface water quality is being monitored in and around refinery complex by KSPCB on monthly basis.
7. Annual Submarine pipeline inspection carried out by M/s. National Institute of Oceanography (NIO) to check the healthiness of the discharge pipeline inside the Sea.
8. Quality of sea water around the marine discharge point of treated effluent is monitored every 15 days by M/s. College of Fisheries and Single Point Mooring (SPM) area by M/s. Central Marine Fisheries Research Institute (CMFRI) annually.
9. Noise monitoring is being carried out once in six months unit wise and on the boundary walls of the refinery on monthly basis to ascertain the prevalent noise levels as per the CPCB and OSHA guidelines, identify the noise generation sources and if required, take suitable measures to mitigate the noise generation.
10. Wind Speed, Wind direction, Temperature, Relative Humidity and Rainfall are monitored daily with the installed Meteorological station.
11. As per the plastic waste management rules 2022 EPR target of 1305 MT achieved in FY 2022-23 , certificate has been uploaded on CPCB portal.

Greenbelt Development:

1. 2231 nos tree saplings planted in refinery and township.

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2. Development of Bio Diversity Park in 41 Acres Marshy land is in progress.
3. Pilikula 20 acres Phase-1 green belt - Maintenance of 2000 nos plants is under progress.
4. Pilikula 30 acres Phase-2 green belt- Maintenance of 2000 nos plants is under progress
5. Green belt development in 25 acres at Bengre near Tannirbhavi sea shore - Maintenance of 4000 nos plants is under progress.
6. Two additional vermicompost units commissioned to manage organic waste - Total Quantity in Kg harvested in Fy-2022-23 -15138 kg.

Award recognitions:

1. Gold award by Federation of Indian Chambers of Commerce & Industry for excellence in Industrial Disaster Risk Management.
2. First prize in Karnataka State Level Safety award 2023.
3. MRPL Aromatic complex bagged "Karnataka State Level Safety Award 2023" in the Petrochemical industries category, by Department of Factories & Boiler.
4. MRPL bagged the prestigious award "The EEF (Energy and Environment Foundation) Global Water Management and Conservation Company of the Year 2022".
5. MRPL won "Greentech Intl. EHS Award 2023" for best practices in EHS.

M S Sudarshan
27.9.23
for **Signature of the occupier**

AD