



**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 / Website :www.mrpl.co.in

L/MS/KSPCB/7005  
29<sup>th</sup> September, 2022

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 2021 – 22  
for Operation of Refinery**

We are enclosing herewith the Environmental Statement (Form - V) for the year 2021-22 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*  
*29.9.22*

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 31<sup>st</sup> March 2022 for Refinery**

**PART-A**

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

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

- (ii) Industry category

Red Category (Code: 1004)

- (iii) Processing Capacity:

16.6 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: 30<sup>th</sup> September 2021

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**PART -B**

**Water and Raw Material Consumption**

(i) Water consumption in m<sup>3</sup>/d

Process Water : 18613

Cooling Water : 22441

Domestic : 6258

Name of Products	Water consumption per unit of crude oil	
	During the previous Financial Year (2020-2021)	During the current Financial Year (2021-2022)
1. LPG and Fuel Gas 2. Naphtha 3. (a) Motor Spirit Domestic,- EURO III, IV, BS VI, MS 100 RON (b) Motor Spirit Export - MS95RON, MS92RON, MS97RON 4. Xylols + Aromatics 5. (a) ATF Domestic (b) ATF Export 6. Kerosene and Kerosene derivatives 7. a) Diesel Domestic - EURO-III, IV, BS VI b) Diesel Export - EURO III, IV, BSVI 8. Fuel Oil Domestic Fuel Oil Export, including Marine Fuel Oil, Marine Gas Oil 9. Bitumen and bitumen derivatives 10. Sulphur 11. Petroleum Coke 12. Polypropylene 13. Vacuum Gas Oil (VGO)	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	
	1.06 m <sup>3</sup> /MT of Crude Oil processed	0.99 m <sup>3</sup> /MT of Crude Oil processed

(ii) Raw material consumption

Name of raw materials	Name of Products	Consumption of raw material per unit of output

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Crude Oil	1 LPG and Fuel Gas 2 Naphtha 3 (a) Motor Spirit Domestic,-EURO III, IV, BS VI, MS 100 RON (b) Motor Spirit Export - MS95RON, MS92RON, MS97RON 4 Xylols + Aromatics 5 (a) ATF Domestic (b) ATF Export 6 Kerosene and Kerosene derivatives 7 a) Diesel Domestic - EURO-III, IV, BS VI b) Diesel Export - EURO III, IV, BSVI 8 Fuel Oil Domestic Fuel Oil Export, including Marine Fuel Oil, Marine Gas Oil 9 Bitumen and bitumen derivatives 10 Sulphur 11 Petroleum Coke 12 Polypropylene 13 Vacuum Gas Oil (VGO)	During the current Financial Year (2020-2021)	During the current Financial Year (2021-2022)
		1.14	1.12
		Output = 10.12 MMT)	Output = 13.41 MMT)

**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	
<b>(a) Water</b>	Oil & Grease	25	Oil & Grease	2.1	5.0	-
	BOD	111	BOD	9.3	15.0	-
	COD	888	COD	74	125	-
	TSS	105	TSS	8.8	20.0	-
	Phenol	2.7	Phenol	0.22	0.35	-
	Sulphide (as S)	3.6	Sulphide (as S)	0.31	0.50	-
	Ammonia (as N)	96.7	Ammonia (as N)	8.06	15.0	-
	TKN	131.7	TKN	10.9	40.0	-
<b>(b) Air</b>	SOx	Actual	51100	-		-
		CFO limit	57000			

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**PART-D**

**Hazardous Waste**

Hazardous Waste Streams	Total Quantity Generated (MT)	
	During the previous Financial year <b>2020-21</b>	During the current Financial year <b>2021-22</b>
<b>1. From process</b>		
Spent Catalyst	1579	1643.86
Spent Clay	230	180.57
Spent Carbon	-	-
Used/Spent Oil	35	54.11
<b>2. From Pollution Control Facilities</b>		
ETP Sludge	3037	3210

**PART-E**

**Solid Wastes**

Solid Wastes	Total Quantity Generated (Nos)	
	During the previous Financial year <b>2020-21</b>	During the current Financial year <b>2021-22</b>
<b>a. From process</b>		
Discarded Containers	10845	12231
<b>b. From pollution control facilities</b>	-	-
<b>c. Quantity Recycled within the unit</b>	-	-

**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 2021-22, about 2530 MT of oily sludge is reprocessed in DCU while 81.43 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 2021-22, around 751 MT of Spent Catalyst containing oxides of transition metals like Platinum, Cobalt, Molybdenum, Nickel, alumina, etc. is disposed to SPCB authorized recyclers

During 2021-22, around 209 MT of spent catalyst and around 184.2 MT spent clay is co-processed in SPCB authorized cement industry.

## 3. Used/Spent Oil

Around 7.31 MT of PPU Treated Waste While Oil, which is a mixture of Mineral oil, Triethyl Aluminum (pyrophoric), Isopropanol (flammable) and ATMER in varying compositions, was disposed through SPCB authorized incinerator.

Around 36.8 MT of used/spent oil is mixed with Crude oil and reprocessed in refinery.

## 4. Discarded Containers

19416 Nos. 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 = 533 m<sup>3</sup>/hr

ETP Maintenance Cost = INR 7.78 Cr.

Power Consumption Cost = INR 25.85Cr.

Chemical Consumption Cost = INR 7.24Cr.

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2. Sulphur Recovery Units were run continuously to control the SO<sub>x</sub> emissions from the refinery below stipulated limit of 57 MTPD.  
SRU/SWS Maintenance Cost = INR 13.9 Cr.  
Power Consumption Cost = INR 37.86 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 6587079 m<sup>3</sup> in fresh water consumption.
4. Around 2530 MT of Oily Sludge generated in the ETPs was reprocessed in DCU where it gets converted to valuable products.

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**Part - H**  
**Additional measures/investment proposal for environmental protection including abatement of pollution (2022-23)**

Sr. No.	Description	Cost INR in Lakh
1	Sea water quality monitoring studies (SPM, Chitrapura & Desalination area)	29.90
2	Monthly analysis of treated effluent / Storm water drain samples / Borewell samples	30
3	Annual submarine pipeline (Treated pipeline inspection including Side-Scan sonar, Echo- sounder Studies ( 2 submarine pipelines)	32.45
4	Ambient Air Quality Monitoring in and around Refinery	28
5	VOC Monitoring for entire Refinery	10.77
6	Manual Monitoring of Stacks as per CPCB	10
7	Work Place Monitoring	15
8	Sampling, Analysis of TE,GW,SW and Stack	2
9	SRU tail gas heaters 1/2/3 (3 nos of stack): SOx/NOx/CO analyzers ( 9 nos)	10
10	Oil Spill Crisis Management	8.13
11	Hazardous & Other Waste Disposal	472.46
12	Noise Level survey around refinery	7.32
13	Greenbelt Development including in Pilikula Nisarga Dhama	15.50
14	Studies on Hazardous Waste	10
15	Carbon Foot Printing Study	7.5
16	Development of Bio-Diversity Park at Marshy Land	320
17	Vermi Compost	73.25
18	CPCB Data Publishing through external agency	3.54
19	ETP-3 D.G set Maintenance	4.04
20	Annual Maintainance of Analyser	100.19
21	Annual Maintainance of Gas Detectors	53.69
22	Knowledge Lens Remote Calibration Panel, Ex Rating For Sox, Nox & CO	5.65
23	Bio Plant Operation & Maintenance	16.52
24	Operation & Maintenance of 130 KLD CISF Township	21.02
25	Public Liability Industrial Policy	1.94
26	Domestic solid waste management	42.9
27	Grid Analysis study in surrounding Area	98.766
28	Feasibility Study- Utilization Of Treated Effluent For Gardening	16.5
29	Consent Fee	341.5468
30	Various statutory Fees	0.5
	Total	1789.07

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**Part - I**

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

**Expenditure details for Environmental Protection during 2021-22,**

<b>Sr. No.</b>	<b>Description</b>	<b>Cost INR in Lakh</b>
1	Ambient Air Quality Monitoring by approved external agency	12.20
2	Analysis Charges by statutory body	11.85
3	Manual Stack Monitoring by approved external agency	1.05
4	VOC Monitoring study	9.10
5	Noise Level Monitoring	4.79
6	Greenbelt Development & Maintenance	194.00
7	Compensatory Afforestation	55.00
8	Vermi Compost facilities	30.47
9	Disposal of Hazardous & Other Waste	115.50
10	Tackling of Oil Spill Crisis Manpower	33.00
11	Environmnet Management system (ISO 14001: 2015) Certification & Consultancy Charges	19.98
12	CPCB Data Publishing through external agency	3.54
13	ETP-3 D.G set Maintenance	4.04
14	Operation & Maintenance cost of APMC pumping station	46.50
15	Annual Maintainance of Analyser	100.19
16	Annual Maintainance of Gas Detectors	53.69
17	Knowledge Lens Remote Calibration Panel, Ex Rating For Sox, Nox & CO	5.65
18	Bio Plant Operation & Maintenance	16.52
19	Operation & Maintenance of 130 KLD CISF Township	21.02
20	Public Liability Industrial Policy	1.94
21	Domestic solid waste management	42.90
22	Sea water quality monitoring studies (SPM & Chitrapura area)	19.92
23	Annual submarine pipeline (Treated pipeline inspection including Side-Scan sonar, Echo- sounder Studies ( 2 submarine pipelines)	32.45
24	Carbon Foot Printing Study	6.5
25	Consent Fee	1,066.19
26	ETP Maintenance Cost	778
27	Power Consumption Cost	2585
28	Chemical Consumption Cost	724
29	ETP -3 Effluent Discharge Pumping Cost	144
30	SRU/SWS Maintenance Cost	1390
31	SRU Power Consumption Cost	3786
	Total	11314.98

**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<sub>x</sub>, NO<sub>x</sub>, 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.

**Greenbelt Development:**

1. 963 nos tree saplings planted in refinery and township
2. Construction activity for 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

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4. Pilikula 30 acres Phase-2 green belt- 2000 nos tree saplings plantations & maintenance activity under progress.
5. Green belt development in 25 acres at Bengre near Tannirbhavi sea shore - 2000 nos tree saplings plantations & maintenance activity under progress.

**Award recognitions:**

1. Best Safe Industry award under oil industry category. (State level)
2. Safe Operation, Maintenance & reliable boiler under Cogen Boiler category. (State level)
3. MRPL Awarded "FIRST Prize" on PRSI National Award-2021 for "Innovation in Marketing Strategies during Covid times.
4. FICCI Award 2020- First Prize in Outstanding Leadership Award for establishing coastal Karnataka as a Strategic Energy Security Region of India.
5. PRSI National Award – 1st Prize in Innovation in Marketing Strategies in Corona Times.

*M S Sudarshan*  
*29.9.22*  
*for* **Signature of the occupier**