



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/7632  
21<sup>st</sup> September, 2024

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 2023 – 24  
for Operation of Refinery**

We are enclosing herewith the Environmental Statement (Form - V) for the year 2023-24 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*  
M.S. Sudarsan  
Chief General Manager (Health, Safety and Environment)

*Mar*  
*TH*  
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 2024 for Refinery**

#### **PART-A**

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

Mundkur Shyamprasad Kamath  
Managing Director (MD)  
Mangalore Refinery and Petrochemicals Limited (MRPL),  
Kuthethoor Post, via Katipalla, Mangalore – 575 030

- (ii) Industry category

Red Category (Code: 1004)

- (iii) Processing Capacity:

18.2 Million Metric Tons per Annum (MMTPA) of Crude Oil Refining

- (iv) Year of Establishment:

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

- (v) Date of the Last Environmental Statement: 26<sup>th</sup> September 2023

#### **PART - B**

#### **Water and Raw Material Consumption**

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

|                      |   |       |                   |   |      |
|----------------------|---|-------|-------------------|---|------|
| Cooling Water        | : | 31855 | Fire water        | : | 5340 |
| Process and DM Water | : | 28584 | Washing/Quenching | : | 535  |
| Domestic             | : | 1799  | Greenbelt         | : | 1536 |

| Name of Products  | Water consumption* per unit of crude oil   |  |
|---|--|--|
|   | During the previous Financial Year (2022-2023)   | During the current Financial Year (2023-2024)  |
| 1. LPG<br>2. Naphtha<br>3. Motor Spirit<br>4. Kerosene<br>5. ATF<br>6. Diesel<br>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<br>9. Sulphur<br>10. Mixed Xylene<br>11. Pet Coke<br>12. Polypropylene<br>13. VGO<br>14. Fuel & Loss | 0.92 m <sup>3</sup> /MT of crude oil processed   | 0.75 m <sup>3</sup> /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 |   |                                       |                                       |                     |                     |
|-----------------------|-------------------|--|---|---------------------------------------|---------------------------------------|---------------------|---------------------|
| Crude Oil             | 1. LPG            | During the Previous Financial Year (2022-2023) | During the current Financial Year (2023-2024) |                                       |                                       |                     |                     |
|                       | 2. Naphtha        |  |   |                                       |                                       |                     |                     |
|                       | 3. Motor Spirit   | 1.12   | 1.12  |                                       |                                       |                     |                     |
|                       | 4. Kerosene       |  |   |                                       |                                       |                     |                     |
|                       | 5. ATF            |  |   |                                       |                                       |                     |                     |
|                       | 6. Diesel         |  |   |                                       |                                       |                     |                     |
|                       | 7. Fuel Oil       |  |   | (Net Crude Oil Processed = 17.13 MMT) | (Net Crude Oil Processed = 16.58 MMT) |                     |                     |
|                       | 8. Bitumen        |  |   |                                       |                                       |                     |                     |
|                       | 9. Sulphur        |  |   |                                       |                                       |                     |                     |
|                       | 10. Mixed Xylene  |  |   |                                       |                                       |                     |                     |
|                       | 11. Pet Coke      |  |   |                                       |                                       | Output = 15.23 MMT) | Output = 14.77 MMT) |
|                       | 12. Polypropylene |  |   |                                       |                                       |                     |                     |
|                       | 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 |   |
| <b>(a) Water</b> | Oil & Grease                                 | 29.7             | Oil & Grease   | 2.2    | 5         | -   |
|                  | BOD  | 126.8            | BOD  | 9.4    | 15        | -   |
|                  | COD  | 984.5            | COD  | 73     | 125       | -   |
|                  | TSS  | 151              | TSS  | 11     | 20        | -   |
|                  | Phenol                                       | 3.37             | Phenol   | 0.25   | 0.35      | -   |
|                  | Sulphide (as S)                              | 4.35             | Sulphide (as S)                                      | 0.32   | 0.50      | -   |
|                  | Ammonia (as N)                               | 144              | Ammonia (as N)                                       | 10.68  | 15        | -   |
|                  | TKN  | 203.6            | TKN  | 15.10  | 40        | -   |
| <b>(b) Air</b>   | SOx  | <b>Actual</b>    | 43700  | -      |           | -   |
|                  |  | <b>CFO limit</b> | 57000  |        |           |   |

**PART-D**

**Hazardous Waste**

| Hazardous Waste Streams                     | Total Quantity Generated (MT)                    |  |
|---|--|--|
|   | During the current Financial year <b>2022-23</b> | During the current Financial year <b>2023-24</b> |
| <b>1. From process</b>                      |  |  |
| Spent Catalyst                              | 1534.77  | 1661.9   |
| Spent Clay                                  | 0  | 49.68  |
| Spent Carbon                                | 60.12  | 238.33   |
| Used/Spent Oil                              | 33.75  | 11.63  |
| <b>2. From Pollution Control Facilities</b> |  |  |
| ETP Sludge                                  | 5121.2   | 4869.2   |
| Crude Tank Bottom Sludge                    | 100.07   | 602.51   |

## **PART-E**

### **Solid Wastes**

| <b>Solid Wastes</b>                  | <b>Total Quantity Generated</b>                  |  |
|--------------------------------------|--|--|
|                                      | During the current Financial year <b>2022-23</b> | During the current Financial year (in MT) <b>2023-24</b> |
| a. From process                      |  |  |
| Discarded Containers (In MT)         | 312.956  | 292.39   |
| 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 resources, 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 is incorporated in the clinker matrix. Therefore, after the waste is co-processed, it becomes a part of the product.

During 2023-24, about 3336.3 MT of oily sludge is reprocessed in DCU while 2447.97 MT are Co-processed through SPCB authorized Cement Industries.

Around 602.51 MT of oily sludge generated during tank cleaning activity has been recycled through SPCB authorized recycler

#### **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 2023-24, around 905.3 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 27.25 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 Recycler.

Around 11.63 MT of used/spent oil is mixed with Crude oil and reprocessed in refinery.

### **4. Discarded Containers**

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

### **5. Activated Carbon**

During 2023-24, around 208.33 MT of Spent Activated Carbon has been disposed to SPCB authorized recyclers.

## **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 freshwater consumption.

Average effluent recycle rate = 477 m<sup>3</sup>/hr

ETP Maintenance Cost = INR 9.89 Cr.

Power Consumption Cost = INR 18.28 Cr.

Chemical Consumption Cost = INR 7.89 Cr.

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 6.34 Cr.

Power Consumption Cost = INR 39.66 Cr.

3. Water conservation: MRPL have implemented many water-saving measures. MRPL invested in water treatment and recycling technologies to reduce our water footprint.

In FY 2023-24, 68.6% of ETP feed flow was recycled and re-used in the refinery.

38,82,528 m<sup>3</sup> of desalinated water from plant was utilized in MRPL during FY 2023-24.

In addition to the de-salination plant, MRPL is utilizing Mangalore city treated sewage water to reduce our fresh river water conservation. In FY 2023-24 total Mangalore city treated sewage water utilized in the refinery is 60,12,092 m<sup>3</sup>.

4. Around 3336.3 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 (2024-25)**

| <b>Sr. No.</b> | <b>Description</b>  | <b>Cost<br/>INR in<br/>Lakh</b> |
|----------------|---|---------------------------------|
| 1              | Ambient Air Quality Manual Stack Monitoring by approved external agency               | 30.8                            |
| 2              | Environmental software and necessary hardware dispersion modelling                    | 4.0                             |
| 3              | Analysis Charges by statutory body  | 25.0                            |
| 4              | Workplace Monitoring- Hydrocarbon & Benzene   | 10.0                            |
| 5              | VOC Monitoring study  | 10.3                            |
| 6              | Noise Level Monitoring  | 4.7                             |
| 7              | Garden, Greenbelt Development & Maintenance and Vermi compost Maintenance in Refinery | 728.7                           |
| 8              | Disposal of Hazardous & Other Waste   | 549                             |
| 9              | Tackling of Oil Spill Crisis Manpower   | 26.0                            |
| 10             | Environmental Management system (ISO 14001: 2015) Certification & Consultancy Charges | 34.5                            |
| 11             | Operation & Maintenance cost of APMC pumping station                                  | 45.0                            |
| 12             | Annual Maintenance of Analyzer  | 41.99                           |
| 13             | Annual Maintenance of Gas Detectors   | 39.25                           |
| 14             | Data publishing on CPCP portal  | 1.2                             |
| 15             | Biogas Plant Operation & Maintenance  | 18.0                            |
| 16             | Operation & Maintenance of 130 KLD CISF Township STP                                  | 20.4                            |
| 17             | Public Liability Industrial Policy  | 33.64                           |
| 18             | Domestic solid waste management   | 46.00                           |
| 19             | Sea water quality monitoring studies (SPM, Chitrapura & DESAL area)                   | 29.75                           |
| 20             | Annual submarine pipeline   | 38.15                           |
| 21             | Carbon Foot Printing Study  | 9.0                             |
| 22             | Sustainability Reporting (ESG & BRSR)   | 15.0                            |
| 23             | Consent Fee   | 25                              |
| 24             | Community Awareness Program   | 5.0                             |
| 26             | Oil Spill Response  | 5.0                             |
| 27             | Plastic Waste Management Rules Compliance   | 37.5                            |
|                | <b>Total</b>  | <b>1832.88</b>                  |



**Part – I**

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

Expenditure details for Environmental Protection during 2023-24,

| <b>Sr. No.</b> | <b>Description</b>  | <b>Cost INR in Lakh</b> |
|----------------|---|-------------------------|
| 1              | Ambient Air Quality Monitoring by approved external agency  | 11.82                   |
| 2              | AERMOD Dispersion Modeling  | 0.32                    |
| 3              | Analysis Charges by statutory body  | 8.45                    |
| 4              | Manual Stack Monitoring by approved external agency   | 1.74                    |
| 5              | VOC Monitoring study/Noise Level Monitoring   | 5.6                     |
| 6              | EPR Service charges for collection & recycling  | 17.61                   |
| 7              | Garden, Greenbelt Development & Maintenance and Vermicompost Maintenance in Refinery  | 357                     |
| 8              | Compensatory Afforestation  | 3.35                    |
| 9              | Disposal of Hazardous & Other Waste   | 505.5                   |
| 10             | Tackling of Oil Spill Crisis Manpower   | 31.72                   |
| 11             | Environment Management system (ISO 14001: 2015) Certification & Consultancy Charges   | 32.07                   |
| 12             | Oil Spill Contingency Plan for SPM  | 6.2                     |
| 13             | Operation & Maintenance cost of APMC pumping station  | 42.21                   |
| 14             | Annual Maintenance of Analyser  | 61.20                   |
| 15             | Annual Maintenance of Gas Detectors   | 35.68                   |
| 16             | Data publishing on CPCP portal  | 17.00                   |
| 17             | Bio Plant Operation & Maintenance   | 16.43                   |
| 18             | Operation & Maintenance of 130 KLD CISF Township  | 20.6                    |
| 19             | Public Liability Industrial Policy  | 32.09                   |
| 20             | Domestic solid waste management   | 36.36                   |
| 21             | Sea water quality monitoring studies (SPM & Chitrapura area)  | 16.04                   |
| 22             | Annual submarine pipeline (Treated pipeline inspection including Side-Scan sonar, Echo- sounder Studies (2 submarine pipelines) | 35.78                   |
| 23             | Carbon Foot Printing Study  | 9.08                    |
| 24             | Consent Fee   | 79                      |
| 25             | ETP Maintenance Cost  | 989                     |
| 26             | ETP Power Consumption Cost  | 1828                    |
| 27             | ETP Chemical Consumption Cost   | 789                     |
| 28             | ETP -3 Effluent Discharge Pumping Cost  | 1826                    |
| 29             | SRU/SWS Maintenance Cost  | 634.9                   |
| 30             | SRU Power Consumption Cost  | 3966.7                  |
| 31             | Community Awareness Programme   | 5.0                     |
| 32             | Grid Analysis Study   | 79.01                   |
| 33             | EIA & RRA Study for Bio ATF Project   | 36.58                   |
| 34             | Total   | 11537.04                |

### **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>2</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 daily 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 2166 MT has been given in FY 2023-24.

**Greenbelt Development:**

1. 6545 nos. of tree saplings planted in Refinery and township.

To enhance the local environment, contribute to sustainability efforts and improve air quality, a total of 6,545 tree saplings have been planted across the refinery and township areas. This green initiative not only helps in offsetting carbon emissions but also supports biodiversity and creates a healthier living and working environment for residents and employees alike.

2. Pilikula 20 acres Phase-1 green belt - Maintenance of 2000 nos plants is under progress:

In the Phase-1 afforestation project of development of the 20-acre green belt at Pilikula , maintenance activities are currently underway for 2,000 plants. This effort is crucial to establishing a thriving green belt that will contribute to environmental sustainability, enhance biodiversity, and provide scenic and ecological benefit to the area.

3. Pilikula 30 acres Phase-2 green belt- Maintenance of 2000 nos plants is under progress:

In the ongoing Phase-2 afforestation project of development of the 30-acre green belt at Pilikula, maintenance work for 2,000 plants is actively in progress. The maintenance efforts are aimed at ensuring the healthy growth and establishment of the plants, which is crucial for the success of the green belt.

4. Green belt development in 25 acres at Bengre near Tannirbhavi sea shore - Maintenance of 4000 nos plants is under progress.

Green belt development is underway on a 25-acre site at Bengre, near the Tannirbhavi seashore, with maintenance activities currently focused on 4,000 plants. This project aims to create a lush, resilient green area that will enhance the local environment and contribute to coastal ecosystem stability. By fostering a diverse and thriving green belt, this initiative seeks to improve air quality, provide habitat for local wildlife, and offer recreational and aesthetic benefits to the community while also contributing to coastal erosion control and overall ecological balance.

5. Vermicompost units are operational - Total Quantity in Kg harvested in FY 2023-24 was 35886 kg.

Three vermicomposting units are currently operational, and during the fiscal year 2023-24, a total of 35,886 kilograms of vermicompost have been harvested. These units are designed to transform organic waste

into high-quality compost through the action of earthworms, a process that enriches soil and supports sustainable agricultural practices. This output not only helps in recycling organic waste but also supports environmental sustainability by reducing landfill waste and promoting the use of natural fertilizers in organizations agricultural and landscaping applications.

**Award recognitions:**

1. The company has been recognized as the "Global Water Management and Conservation Company of the Year 2023" by the Global Energy and Environment Foundation.
2. The company has been conferred with a Platinum award, Grow Care India Sustainability Award 2023 & Occupational Health & Safety Award 2023.
3. The company has received prestigious EEF Global Water Management Company of the year award 2023 from the Shri Kaushal Kishore, Minister for Housing and Urban Affairs of India on 25 August 2023, at New Delhi.
4. The company has awarded the prestigious Greentech EHS Award 2023 for its commitment to sustainability and environmental stewardship. The Greentech Award is given to businesses that demonstrate a commitment to reducing their environmental impact and promoting sustainability.

*M S Sreedharan*  
for **Signature of the occupier**