**BEFORE THE NATIONAL GREEN TRIBUNAL**

**(SOUTHERN ZONE BENCH)**

**Original Application No. 17 of 2021 (SZ)**
**With**
**Original Application No. 265 of 2017 (SZ)**

IN THE MATTER OF

Vipin Nath A. V. & Sinu C. Jacob ... Applicant(s)

Versus

M/s Bharat Petroleum Corporation Limited ... Respondents(s)

With

N.G. Soman, ... Applicant(s)

Versus

M/s Bharat Petroleum Corporation Limited ... Respondents(s)

**TYPED SET OF DOCUMENTS FILED BY THE**

**1ST RESPONDENT BPCL**

**M/s. King & Partridge**
**M.Vijayan**
**M.Kumaresan**
**Advocates for 1st Respondent- BPCL**
**MoB: 9942036873**

**BEFORE THE NATIONAL GREEN TRIBUNAL SITTING AT ERNAKULAM**

**(SOUTHERN ZONE BENCH)**

**Original Application No. 17 of 2021 (SZ)**
**With**
**Original Application No. 265 of 2017 (SZ)**

IN THE MATTER OF

Vipin Nath A. V. & Sinu C. Jacob ... Applicant(s)

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Certified that the documents filed in typed set are true copies of the originals.

Dated at Chennai on this 13th day of September 2021

**KING AND PARTRIDGE**

**COUNSEL FOR 1ST RESPONDENT- BPCL**

**ANNEXURE 1**

# SCIENTIFIC STUDY RELATED TO HEALTH & SAFETY OF RESIDENTS NEAR BPCL-KOCHI REFINERY, KERALA, INDIA

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**STUDY REPORT SUBMITTED BY**
**EXPERT COMMITTEE**

**GOVERNMENT OF KERALA**

**15th FEBRUARY, 2021**

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GO (ORD) No:669/2020/Industries, Thiruvananthapuram, Dated 20/08/2020

# INDEX

# FORMATION OF EXPERT COMMITTEE

Over the past few months, several petitions were brought to the notice of the Government of Kerala through various offices by residents near Kochi Refinery of Bharat Petroleum. The complaints were mainly on safety and health related issues owing to alleged pollution in the vicinity of the BPCL-Kochi Refinery and at its new project sites.

The Government Petitions Committee recommended the formation of a committee for the scientific study of health and safety of the residents living near BPCL Kochi Refinery. The Kerala LA Secretary vide letter No:21206/ Petition A1/ 2018 dated 01/10/2019 and MD, KSIDC vide letter No: KSIDC/INFRA/63/272 dated 24.07.2020 has also recommended for the formation of the committee.

The Government of Kerala considered these recommendations of the Petitions Committee, of Kerala Legislative Assembly and MD, KSIDC and vide *GO (Ord) No:669/2020/Industries, Thiruvananthapuram Dated 20/08/2020* ***(Annexure-1)*** formed the expert committee presided over by the Secretary (Industries).

**Members of the Expert Committee:**

The committee was constituted with the following members:

1. **Shri. APM Mohammed Hanish**, IAS, Principal Secretary (Industries), Government of Kerala (CHAIRMAN)
2. **Prof. Shiva Nagendra**, Professor, Civil Engineering Department, Indian Institute of Technology (IIT), Chennai
3. **Dr. R Venugopal**, IPESS, Deputy Chief Controller, Petroleum & Safety Organisation (PESO), Government of India
4. **Dr. T Mukundan**, Retd. Scientist-G, Associate Director (Materials), Naval, Physical & Oceanographic Laboratory (NPOL)
5. **Prof. Dr. V Sivanandan Achari**, Professor and Director, School of Environment Studies, Cochin University of Science & Technology (CUSAT).
6. **Shri. S Suhas,** IAS, District Collector, Ernakulam (Representative Revenue Department)
7. **Shri. Santosh Koshy Thomas**, Managing Director, Kerala Industrial Infrastructure Development Corporation (KINFRA)

# PROCEEDINGS

The committee decided to deliberate on the issues as per schedule below :

| | **Action** | **Date** |
|---|---|---|
| 1. | Kochi Refinery site visit & First sitting | 06 November 2020 |
| 2. | Second sitting at Kochi Refinery | 04 December 2020 |
| 3. | Third sitting at Kochi Refinery | 22 January 2021 |
| 4. | Draft Report submission | 01 February 2021 |
| 5. | Final Report submission | 15 February 2021 |

## FIRST SITTING OF EXPERT COMMITTEE: 06 NOVEMBER 2020

As part of the first review on 06$^{th}$November 2020, the Expert Committee visited Kochi Refinery for detailed onsite verification and deliberations with various stake holders of the Refinery to initiate the *Scientific Study of the Health and Safety of the Residents near Kochi Refinery.*

**Members present at the first sitting:**

1. **Shri APM Mohammed Hanish**, IAS, Principal Secretary (Industries), Government of Kerala (CHAIRMAN)
2. **Shri S Suhas,** IAS, District Collector, Ernakulam (Representative Revenue Dept)
3. **Shri Santosh Koshy Thomas**, Managing Director KINFRA

Further to travel restrictions, few members joined the review on video conference. They are:

4. **Dr. R Venugopal**, IPESS, Deputy Chief Controller, Petroleum & Safety Organisation (PESO), Government of India
5. **Prof Shiva Nagendra**, Professor, CIVIL Engineering Dept, Indian Institute of Technology (IIT), Chennai
6. **Dr. T Mukundan**, Retd. Scientist-G, Associate Director (Materials), Naval, Physical & Oceanographic Laboratory (NPOL)

7. **Prof. Dr. V Sivanandan Achari**, Professor and Director, School of Environment Studies, Cochin University of Science & Technology (CUSAT)

**BPCL Kochi Refinery was represented by team led by Head of Kochi Refinery:**

1. **Shri. MR Subramoni Iyer**, Chief General Manager (i/c) & Head of Kochi Refinery
2. **Shri. Suresh John,** Chief General Manager ( Engineering Projects & Contract Management)
3. **Shri. A N Sreeram**, Chief General Manager (Petchem)
4. **Shri. Kurian P Alapatt**, Chief General Manager (Human Resources)
5. **Shri. George Thomas**, General Manager (Public Relations &Administration)
6. **Shri. MK Ramachandran**, General Manager I/C (Health Safety & Environment)
7. **Shri. Sainath**, Deputy General Manager (HSE- Environment)

**Clarifications sought to BPCL Kochi Refinery :**

- Waste generated by KR
- Wind Data
- Air Quality Data
- VOC
- Distance
- Wind pattern
- Effluent quality
- Status of External Safety Audit
- Quantitative Risk Assessment

**The following reports were also called for:**

1. QRA report from M/s Bureau Veritas
2. MoEF Monitoring Report
3. PDPP Inspection Report by MoEF & CC, Integrated Regional Office Bengaluru
4. Hourly AAQMS report

Minutes of the meeting *is attached as* ***Annexure-2***

**SECOND SITTING OF EXPERTCOMMITTEE:04 DECEMBER 2020.**

The following members were present at the second sitting of the expert committee at BPCL Kochi Refinery, Kundannur Office:

1. **Shri. APM Mohammed Hanish**, IAS, Secretary (Industries), Government of Kerala (CHAIRMAN)
2. **Dr. R Venugopal**, IPESS, Deputy Chief Controller, Petroleum & Safety Organisation (PESO), Government of India
3. **Prof. Dr. V Sivanandan Achari,** Professor and Director, School of Environment Studies, Cochin University of Science & Technology (CUSAT)
4. **Shri. S Suhas,** IAS, District Collector, Ernakulam (Representative Revenue Department)
5. **Shri. Santosh Koshy Thomas**, Managing Director KINFRA

**The following members joined the meeting online:**

6. **Prof. Shiva Nagendra,** Professor, CIVIL Engineering Dept, Indian Institute of Technology (IIT), Chennai
7. **Dr. T. Mukundan**, Retd. Scientist-G, Associate Director (Materials), Naval, Physical & Oceanographic Laboratory (NPOL)

**Also present at the meeting were:**

8. **Shri. Jose Kurian**, Asst GM (KSIDC)
9. **Shri Suresh Kumar**, Deputy Collector (LA)

**Kochi Refinery was represented by the team led by Head of Kochi Refinery** :

1. **Shri MR Subramoni Iyer**, Chief General Manager (i/c) & Head (Kochi Refinery)
2. **Shri Suresh John**, Chief General Manager ( Engineering Projects & Contract Management)
3. **Shri. AN Sreeram,** Chief General Manager (Petchem)
4. **Shri. Chacko M Jose**, Chief General Manager (Operations)
5. **Shri. Kurian P Alapatt**, Chief General Manager (Human Resources)
6. **Shri. George Thomas,** General Manager (Public Relations &Administration)
7. **Shri. MK Ramachandran**, General Manager I/C (Health Safety & Environment)
8. **Shri. Sainath**, Deputy General Manager (HSE- Environment)

Minutes of the meeting attached as ***Annexure 3***

**THIRD & FINAL SITTING OF EXPERT COMMITTEE: 22 JANUARY 2021**

The following members were present at the third and final sitting of the committee at BPCL Office, Kundannur, Maradu**:**

1. **Shri. APM Mohammed Hanish**, **IAS**, Principal Secretary (Industries), Government of Kerala (CHAIRMAN)
2. **Dr. R Venugopal,** IPESS, Deputy Chief Controller, Petroleum & Safety Organisation (PESO), Government of India
3. **Shri. S Suhas,** IAS, District Collector, Ernakulam (Representative Revenue Department)
4. **Shri. Santosh Koshy** Thomas, Managing Director KINFRA

**The following members joined the meeting online:**

5. **Prof. Dr. V Sivanandan Achari**, Professor and Director, School of Environment Studies, Cochin University of Science & Technology (CUSAT)
6. **Prof. Shiva Nagendra**, Professor, CIVIL Engineering Dept, Indian Institute of Technology (IIT), Chennai
7. **Dr. T. Mukundan**, Retd. Scientist-G, Associate Director (Materials), Naval, Physical & Oceanographic Laboratory (NPOL)

**Also present at the meeting were:**

8. **Shri. Jose Kurian**, Asst GM (KSIDC)
9. **Shri Suresh Kumar**, Deputy Collector (LA)

**BPCL (Kochi Refinery) team was led by Executive Director of Kochi Refinery:**

10. **Shri Sanjay Khanna**, Executive Director ( Kochi Refinery)
11. **Shri Suresh John**, Chief General Manager (Projects Procurement)
12. **Shri Kurian P Alapatt**, Chief General Manager (Human Resources)
13. **Shri Sriram S**, Chief General Manager (Engg. Projects and Contracts Management)
14. **Shri George Thomas**, General Manager (Public Relations &Administration)
15. **Shri. MK Ramachandran**, General Manager I/C (Health Safety & Environment)
16. **Shri Ravi K**, General Manager (Reliability)
17. **Shri Sainath**, Deputy General Manager (HSE- Environment)

Minutes of the meeting attached as ***Annexure 4***

## SITE VISIT

The committee visited the Refinery Units including the new project sites on **06th November 2020** to assess the statutory compliances and verify the current situation of the Refinery vis-a-vis the concerns raised in the petitions. After the site visit, the Refinery Management Committee made a presentation about Kochi Refinery, the ongoing projects and the measures taken to mitigate **Health, Safety and Environment issues**. The detailed findings and observations are presented in Chapter 3.

# FINDINGS OF THE STUDY:

**BPCL KOCHI REFINERY**

Kochi Refinery, is a Petroleum Refinery of Bharat Petroleum Corporation Limited (BPCL), a Central Public Sector Undertaking, contributing to the State economy for over 5 decades from its inception in 1966, by ensuring the availability of petroleum fuels.

Presently, BPCL Kochi Refinery is at the centre of the petrochemical initiative of Government of Kerala (GoK) that envisages provision of feedstock for various units at the GoK's Petrochemical Park, a major *Make in India* project, which has the potential of transforming Ambalamugal as the petrochemical hub of South India.

Formerly known as Cochin Refineries Limited, Kochi Refinery was established in 1966 with a capacity of 50,000 barrels per day as a joint venture in collaboration with Phillips Petroleum Corporation, USA. Later renamed as Kochi Refineries Limited it was merged with Bharat Petroleum Corporation Limited (BPCL) in 2006. With a capacity of 310,000 barrels per day, Kochi Refinery is today the largest PSU refinery in India. It is Located at Ambalamugal, near Kochi. The product portfolio includes petrochemical feed-stocks and specialty products in addition to its range of fuels. Govt. of Kerala holds 0.83% stake in the company.

The products of this refinery include Liquefied Petroleum Gas, Naphtha, Motor Spirit, Kerosene, Aviation Turbine Fuel, High Speed Diesel and Asphalt. Specialty products for the domestic markets include Benzene, Toluene, Food Grade Hexane, Propylene, Special Boiling Point Spirit, Mineral Turpentine Oil, Sulphur, Petcoke and Hydrogen.

The Refinery is certified for its Integrated Management System (IMS) by M/s Bureau Veritas Certification for Quality Management System - ISO 9001:2015, Environment Management System - ISO 14001:2015 and Occupational Health & Safety Management System - ISO 45001:2018.

The Refinery has Crude Oil receipt facilities consisting of Single Point Mooring (SPM) and associated shore tank farm and is equipped to receive crude oil in

Very Large Crude Carriers (VLCCs). The refinery has facilities to evacuate products to the consuming centres through road, rail and ships through pipelines. All oil marketing companies in the area are fed from Kochi Refinery through pipelines. Kochi Refinery caters to the fuel demand of Kerala, parts of Tamil Nadu and Karnataka. The BPCL installation at Irumpanam is connected to the refinery via pipelines and is the major product distribution centre of the refinery. A 300 km long pipeline connects the refinery to various consumption points in Tamil Nadu such as Coimbatore and Karur. Pipeline facility is also available for supplying ATF to the terminal at Cochin International Airport.

With the availability of feedstock from the Petrochemical Units that are coming up at Kochi Refinery, the Kerala Government plans to set up a *Petrochemical Park* in the vicinity. The company embarked on petrochemical ventures following the recent expansion and modernization of the refinery at a cost of ₹16,500 Crores. KINFRA is setting up the *Petrochemical Park* where small/medium investors are expected to set up downstream industrial units.

The committee examined Health, Safety and Environment compliance of the Refinery and the findings are as given below:

## 1. STATUTORY COMPLIANCES

The committee verified the compliances to the statutory requirements from the regulatory authorities viz, PESO, F&B, CPCB, KSPCB, PNGRB and OISD norms related to health, safety and environment.

- Details of compliances, approvals and licenses is enclosed as ***Annexure 5***.
- Details of identification of HSE Hazards and mitigation measures adopted by the Refinery is enclosed as **Annexure -6**

## 2. INDUSTRY SPECIFIC IMPACT AND MANAGEMENT

### 2. 1 ENVIRONMENT

Potential sources for environmental impact associated with the operations of BPCL Kochi Refinery include the following:

a. Emissions to atmosphere
b. Handling and disposal of process water
c. Handling of hazardous materials and waste
d. Noise from machinery

#### 2.1 (a) Emissions to Atmosphere

**Flue Gases**

Flue gas emissions of $CO_2$, $NO_x$, $SO_x$ CO and Particulate Matter (PM) to the atmosphere during Petroleum refining results from the combustion of oil and gas in gas turbines, boilers, engines and process heaters for power, steam and heat generation. BPCL Kochi Refinery has taken earnest measures by installing combustion air pre-heaters to increase furnace efficiency, optimization of furnace operations, high thermal efficiency heater designs with control systems, prevention of condensation of exhaust gas on surface, regular cleaning of heating surface (soot blowing) for liquid fuel or mixed firing, stack monitoring, low $NO_x$ burners etc.

The committee observed that as per the directive of KSPCB, the refinery has installed ***Continuous Ambient Air Quality Monitoring Stations (CAAQMS)*** at various locations. The CAAQMS are linked to Kerala State Pollution Control Board and CPCB servers for real-time monitoring of data. The furnace stacks of the Refinery are also directly connected to the CPCB & KSPCB servers for real time monitoring. Further, manual sampling is also done through a third party agency and regular reports are sent to the statutory bodies. The CAAQMS reports for the last three months were detailed at the presentation made to the committee.

- The locations of the AAQMS in and around the refinery has been enclosed as ***Annexure-7***
- Annual summary report of the CAAQMS is attached as **Annexure-8**

**Venting and Flaring**

Venting and flaring are important operational and safety measures used in the refinery particularly during non-routine operational periods such as start up or shutdown, malfunction or upsets as a means of safely disposing of vapours/gases. Hydrocarbons are emitted from emergency process vents and safe valve discharges in BPCL Kochi Refinery, these are routed through the Knockout drums and are flared.

For planned start-up and shutdown flare-gas recovery system is used. During non-emergency, releases excess gas from the process vent is recovered or controlled and the volume of gas to be flared is minimized.

**Fugitive Emissions**

Fugitive emissions in BPCL Kochi Refinery occurs from leaking of piping, valves, connections, flanges, pump seals, floating roofs, storage tanks, gas conveyance systems, compressor seals, pressure relief valves. A structured leak-detection prevention and repair programme (LDAR) is practiced in Kochi Refinery based on systematic reviews of P & IDs, identifying streams and equipment. BPCL-Kochi Refinery is prioritizing their monitoring with vapour detection followed by maintenance/replacement of components as required. Fugitive emission valves and seal-less, canned pumps and VOC meters (fixed type) are installed in critical areas.

On examination of the daily average readings, it was observed that data from one of the CAAQMS station, had exceeded the annual average limits a few times in 2019, **though it met the norms as per the annual average limits specified by the KSPCB**. BPCL confirmed that internal inspections were carried out when it exceeded the limits, however no specific cause was identified for the deviation. No deviations are reported by the station in the year 2020.

BPCL has confirmed that monitoring would be continued in 2021 also. They would look for any deviations during the dry season period ending in May 2021 and in case of any reported deviation, a study will be conducted internally and suitable corrections would be carried out if required.

**Oxides of Sulphur ($SO_x$)**

The elemental Sulphur generated in the Refinery is recovered through a Sulphur Recovery Unit which has an efficiency of 99.9%. Sulphur Oxide ($SO_x$)

and $H_2S$ may be emitted from boilers, heaters and other process units such as SRU, FCCU, flares, waste water stripping units and uncondensable off-gas systems.

**Table:** Annual Average Air Quality Data From Designated Sampling Stations of BPCL, Kochi Refinery ( Year-2019)

| Parameter | $SO_2$ | $NO_x$ | CO | Benzene | NMHC | PM 10 | PM 2.5 |
|---|---|---|---|---|---|---|---|
| **Units** | **µg/m³** | **µg/m³** | **mg/m³** | **µg/m³** | **ppm** | **µg/m³** | **µg/m³** |
| **Limits** | **50.0** | **40.0** | **-** | **5.0** | **-** | **60.0** | **40.0** |
| DHDS | 44.6 | 25.7 | 1.4 | 0.6 | 0.4 | 62.9 | 32.1 |
| MO* | 12.15 | 30.69 | 0.83 | 0.58 | 0.74 | 68.21 | 35.25 |
| Colony | 6.29 | 22.83 | 0.68 | 0.33 | 1.70 | 54.99 | 30.99 |
| CCR | 5.92 | 13.69 | 0.74 | 0.00 | 0.39 | 43.51 | 13.89 |
| CISF Q* | 24.43 | 19.75 | 0.86 | 2.20 | 1.32 | 66.21 | 22.77 |

MO*(Marketing Office), CISF Q*(CISF Quarters)

BPCL Kochi Refinery has adopted recovery of sulphur from tail gases using high-efficiency SRUs and they have installed scrubbers with caustic soda and amine solution to treat flue gases. The monitoring of $SO_x$ in the Refinery premises reveals that the $SO_x$ levels are within the permissible limits.

**Particulate Matter**

In large sources of particulate matter emissions, such as FCCU catalyst regeneration sections, BPCL KR has installed high-efficiency air pollution control devices like:

- Electrostatic precipitators
- Primary/Secondary cyclones
- Tertiary stage separators
- Closed Coke Handling systems

With the above technologies BPCL KR is able to control particulate matter to the permissible daily limit of 60 micro gram / $m^3$ for PM 2.5 and 100 microgram / $m^3$ for PM 10.

The committee observed variations in PM 10 and PM 2.5 in the data provided by BPCL for CAAQMS located at the periphery of the refinery. BPCL representatives clarified that the particulate matter emissions at the

CAAQMS located at the periphery of the refinery **is primarily on account of the heavy traffic near this CAAQMS**. **General traffic and LPG vehicles plying in that area contribute to this during dry season. Vehicular traffic at project sites is also a contributor to this variation.**

As a measure to reduce the LPG truck transport movement in refinery area, BPCL has undertaken a project for laying a pipeline up to Palakkad LPG Terminal and the work is in progress. The project is expected to be completed by October 2021. To control particulate matter, other additional measures deployed by BPCL include increasing frequency of watering and cleaning of the Roads to minimize the dust generation from traffic in the refinery area.

**2.1 (b) Handling and Disposal of Process Water**

The refinery has segregated effluent collections, treatment and RO based recycling facility. It has four effluent treatment plants where the process water is treated to meet the norms. The details submitted were scrutinized by the Committee and was found to be meeting with MOEF&CC norms.

**2.1 (c) Handling of Hazardous Materials and Waste**

Refinery generates hazardous waste that includes spent catalysts and oily sludge. Hazardous wastes are disposed through recyclers or through KSPCB approved common Treatment, Storage and Disposal facility (TSDF).

**2.1 (d) Noise from Machinery**

The principle sources of noise in the Petroleum Refining facilities include large rotating machines such as compressors and turbines, pumps, electric motors, air coolers, blowers, fans and heaters. Noises may be generated during pressure release through flaring or steam valves. In most of the areas acoustic dampening hoods are provided to control noise within the permissible limits. Noise level is being monitored regularly by Kochi Refinery and is found to be within the permissible limits.

**Green Cover**

During the site visit, the Refinery team expressed that efforts to increase the green cover is continuing with each expansion and new project as per stipulations. It is observed that Kochi Refinery is maintaining the required green cover of 33 % of plant area as per the Environment Clearance guidelines. The Refinery has 243 acres of green cover that includes the 40 acres of land earmarked in PDPP Project, and approx. 50 acres of land is being developed inside the Refinery as part of the IREP project.

**Rainwater Harvesting Pond**

The Refinery at Kochi is spread over thousand five hundred acres. The refinery area includes a rainwater harvesting pond approximately 20 acres with a water storage capacity of 3.0 Lakh $M^3$ and an eco-park spread over approximately 6.0 Acres with a multitude of fully grown trees, rare herbs and plants that attract migratory birds. There are 3 butterfly parks in the Refinery. Environment initiatives of the Refinery include storage, use and reuse of water. The effluent treatment plants meet the MINAS standards.

- Measures adopted by the Refinery for protection of environment and monitoring programs is attached as **Annexure-9**

## 2.2 HEALTH

The committee examined the complaints received on health grounds in the recent past. It was observed that very few complaints were received and they could not be linked directly to the operations of the Refinery. The committee also referred to the studies done by the District Medical Officer based on the directions of the Kerala State Human Rights Commission in 2018. The report of this study did not highlight any health / respiratory issues on account of pollution from the refinery. The committee also examined the medical reports of the employees working inside the Refinery as per the Factories Act & Rules. No adverse health issues were observed in the reports.

- Measures adopted by Kochi Refinery for protection of health of stakeholders is attached as ***Annexure 10.***
- Community welfare and CSR activities pertaining to Health care initiatives by Kochi Refinery are enclosed as ***Annexure11.***

## 2.3 SAFETY

**Safety Measures Adopted in BPCL Kochi Refinery**

Safety aspect of BPCL Kochi Refinery are considered during design stage, meeting the international standards with respect to safe separation distance, process safety management, proper selection of material of construction, safety relief system, proper handling, storage and dispatch system.

**Emphasis is given for:**

- Process Hazard Analysis (QRA, RRA, HAZOP etc), Work permit system, hot work, incident reporting and investigation, work at height, confined space entry, energy isolation, scaffold safety, behavior based safety, management of change, job safety analysis, etc.
- Mutual aid scheme is implemented with nearby industries.
- Emergency Response and Disaster Management Plan (ERDMP) is also in place and is approved by PNGRB. Mock drills (both onsite and offsite) are conducted.
- Safety measures in the Refinery is looked after by a dedicated group of personnel and headed by a senior management executive in the rank of GM, who in turn reports to the top management executive.
- The Refinery has its own dedicated fire-fighting facilities which include equipment, a well-trained fire-fighting crew available 24X7 inside the plant. The firefighting facilities have been designed in accordance with the OISD STD-116.
- Fire-fighting facilities of Kochi Refinery is designed for fighting two simultaneous major fires anywhere in the complex.
- Hydraulic Platform for fire-fighting and rescue operations at heights.
- Mandatory Personal Protective Equipment are provided and used inside the Refinery
- Automatic fire-fighting systems installed in the refinery include:
    - Automatic Actuated Rim seal Detection & Suppression System for external floating roof tanks
    - Automatic Water Spray for Pressurized storages including LPG / Hydrogen, Automatic deluge water spray system,
    - High Volume Long Range (HVLR) monitor in other parts of the facilities.
- Evaluation of potential for vapour accumulation in storage tank and implementation of prevention and control techniques (example Nitrogen blanketing in Benzene and Naphtha tanks).
- Providing early warning system such as pressure monitoring of gas and liquid conveyance systems in addition to smoke and heat detection of fires.
- Portable Equipment like Portable Gas detectors, Explosive meter, Oxygen meter, Hand operated siren, Safe walk roof top ladder, emergency

lighting, portable mega phone, various leak plugging gadgets, oil dispersants and oil adsorbents, lifting jacks (for rescue of trapped workers), are available in the Refinery.

- Based on the Government Petitions Committee recommendation, BPCL conducted the **Quantitative Risk Assessment (QRA)** Study was conducted by an independent Agency, *M/s Bureau Veritas Industrial Services (India) Pvt. Ltd.*
- The findings of the study indicate that the risks associated with the Industry are within the acceptable range and is confined within the Refinery boundary only. The QRA Report is attached as ***Annexure -12***

The committee has observed that the criteria stipulated by Petroleum Safety Explosives Organization (PESO), Oil Industry Safety Directorate (OISD), Factories & Boilers and State and Central Pollution Control Boards have been complied by the Refinery. The committee also sought confirmation whether the Refinery has taken requisite statutory approvals /amendments before implementing any modifications / alterations. The Company affirmed the same. Safety distances mentioned in Petroleum Rules 2002 and OISD norms are maintained by the Refinery and the statutory authorities verified the same before granting the respective licenses under various statutes.

**External Safety Audits:**

- PESO conducted **Safety Audit** of the Refinery in 2016 and the compliance has been submitted by BPCL. *Report attached as* ***Annexure -13***
- **Oil Industry Safety Directorate (OISD)** conducts audit every three years. OISD also conducts surprise safety checks in every year. Compliance reports are submitted regularly. *Report attached as* ***Annexure -14***
- The **Department of Factories and Boilers**, Govt. of Kerala conducts a priority inspection every year and recommendations are given to the refinery. Compliance reports are submitted regularly. *Report attached as* ***Annexure -15***
- **Internal Safety Audit** is carried out every year and the recommendations are implemented. Electrical and Non Electrical Safety audits and Fire audits are also carried out once in 3 years.
- **Compliances** of recommendations suggested by various statutory bodies are attached as **Annexure 16, 17 & 18**

Measures adopted by Kochi Refinery for ensuring safety of stakeholders is attached as **Annexure-19**

## 2.4. LAND ACQUISITION

Kochi Refinery has confirmed that land acquired so far has been for various developmental projects of Kochi Refinery on a need basis. The details of land acquisitions by Kochi Refinery are listed in ***Annexure 20***

Kochi Refinery has maintained natural boundaries. BPCL has submitted that they are not authorized to acquire land for any reason other than for approved projects and no new projects have been envisaged for BPCL at its Refinery at Kochi for the time being or in the near future.

The petitioners have repeatedly expressed that they are not against Kochi Refinery or against any expansion project of Kochi Refinery. The main concerns they have raised are on environment pollution and unsafe surroundings, due to lack of safety distance and green belt leading to difficulty of life and property, which they have explained as the premise for joint petitions for additional acquisition of an approximate area of 350 acres around the Refinery.

Google map of Refinery layout and infrastructure with boundary demarcations is attached as ***Annexure 21***

# CONCLUSION& RECOMMENDATIONS

The committee has studied the points raised in the petitions in detail and had made a site visit of Refinery facilities. The committee also examined the reports and submissions made by BPCL in compliance to various stipulations of statutory/regulatory bodies for environment clearances and licenses.

As a Public Sector Undertaking BPCL has to submit and publish regular reports of compliance to various State and Central Statutory Authorities. For the Refinery to operate, these compliances and approvals have to be repeated as part of renewal of all licenses periodically after inspections by statutory bodies. Kochi Refinery maintains the statutory compliances as stipulated by various regulatory bodies.

BPCL authorities have shared all information as required by the committee and facilitated the committee's site visit to ascertain the facts. Copy of all the approvals and reports have been furnished by BPCL and these are attached along with this report as follows:

| | **Content** | **Reference** |
|---|---|---|
| 1. | GO for formation of Expert Committee | ***Annexure-1*** |
| 2. | Minutes of the meeting of Expert Committee review at Kochi Refinery, 06 November 2020 | ***Annexure 2*** |
| 3. | Minutes of the meeting of Expert Committee review at Kochi Refinery, 04 December 2020 | ***Annexure 3*** |
| 4. | Minutes of the meeting of Expert Committee review at Kochi Refinery, 22 January 2021 | ***Annexure 4***. |
| 5. | Details of compliances, approvals and licenses | **Annexure -5** |
| 6. | Details of identification of HSE Hazards and mitigation measures adopted by the Refinery | ***Annexure-6*** |
| 7. | The locations of the AAQMS in and around the refinery | ***Annexure-7*** |
| 8. | Annual summary report of the CAAQMS | ***Annexure-8*** |
| 9. | Measures adopted by the Refinery for protection of environment and monitoring programs | ***Annexure -9*** |
| 10. | Measures adopted by Kochi Refinery for protection of health of stakeholders | ***Annexure 10.*** |
| 11. | Community welfare and CSR activities pertaining to Health care initiatives by Kochi Refinery | ***Annexure -11*** |
| 12. | The QRA Report | ***Annexure -12*** |

| | | |
|---|---|---|
| 13. | PESO Safety Audit Report | ***Annexure -13*** |
| 14. | Oil Industry Safety Directorate (OISD) audit *Report* | ***Annexure -14*** |
| 15. | Department Factories and Boilers, Govt. of Kerala priority inspection report | ***Annexure-15*** |
| 16. | Compliances of recommendations suggested by F&B | ***Annexure-16*** |
| 17. | Compliances of recommendations suggested by PESO | ***Annexure-17*** |
| 18. | Compliances of recommendations suggested by OISD | ***Annexure -18*** |
| 19. | Measures adopted by Kochi Refinery for ensuring safety of stakeholders | ***Annexure -19*** |
| 20. | The details of land acquisitions by Kochi Refinery | ***Annexure-20*** |
| 21. | Google map of Refinery layout and infrastructure with boundary demarcations | ***Annexure-21*** |

Statutory bodies such as PESO, F&B, CPCB and KSPCB have verified the safety distances to be maintained as stipulated by the Petroleum Rules 2002, OISD norms and Environment Act & Rules. Safety distances were regulated by the concerned statutory bodies and the licenses have been issued as per the statutes.

The petitioners have put up a demand for acquisition of approximately 350 acres of land around the periphery of the Refinery for green belt development maintaining a natural boundary with the Refinery. The petitioners have put up claims that does not tally with the existing conditions. Inside the Refinery, 33% of the plant area is required to be maintained as green cover and it is observed that Green Cover is maintained at more than the required area. For new projects under development, the green cover is being developed and maintained as per the EC guidelines. The company has submitted the reports showing the same.

**Recommendations**:

- Surrounding population (including all strata of society) has to be made aware of the safety precautions to be taken in the event of any mishap within the Refinery
- BPCL Refinery team and the District Administration has to join hands for conducting targeted mass awareness programmes for the general public.
- Minimize $SO_x$ emissions through desulphurization of fuels, to the extent feasible; or by directing the use of high-sulphur fuels to units equipped with $SO_x$ emission controls.
- Benzene vapour recovery system shall be installed at the benzene truck loading facilities.

- Flare management plan to be prepared and implemented considering the following :
    - Implementing source gas reduction measures to the maximum extent possible
    - Using efficient flare tips
    - Avoiding malfunctions of flare due to flame-off
    - Optimization of size and number of burner nozzles
    - Maximum flare combustion efficiency by controlling and optimizing flare fuel/steam flow-rates.
    - Minimizing flaring from purges and pilots without compromising safety through measures including the installation of purge gas reduction devices, flare gas recovery systems (mainly for continuous and predictable releases, Upstream knock-out drum, soft seat valve technology – as appropriate; conservation of pilots, use of inert purge gas and diversion of flows into the Refinery gas distribution network.)
    - Using a reliable pilot auto ignition system
    - Installing high integrity pressure protection systems - where appropriate- to reduce over pressure events and avoid / reduce flaring situations
    - Minimize flame lift (flash-off) and flame-lick (flash-back)
    - Minimizing liquid carry over and entrainment in the gas –flare stream with suitable separation systems
    - Implementing burner maintenance plan and replacement programme to ensure continuous maximum flare efficiency
    - Metering flare gas on a monthly basis in the interest of pollution evaluation mainly in terms of $CO_2$ and $SO_2$ as well as released heat which is an indirect estimation of Green House Gas (GHG) emissions.

  With the implementation of the above recommendations the concerns about **light and heat radiation effects** will be taken care of.

- It has been verified that the emission monitoring is conducted by trained individuals following suitable and appropriate monitoring and record keeping. **It is recommended that :**
    - Monitoring data should be analyzed and reviewed at regular intervals and compared with operating standards so that any necessary corrective actions can be taken by the BPCL management.

- In order to improve the management of fugitive emissions from the entire petroleum refinery applicability and implementation of Fence-line monitoring of Benzene concentration may be examined at the confined area in ARU / Aromatic Storage Tank area according to internationally recognized methodologies (such as USEPA 40, CFR 63, Sub-part CC- National emissions standards for hazardous air-pollutants from Petroleum Refineries).

All recommendations stipulated from time to time by various statutory bodies namely Petroleum Explosives and Safety Organization, Oil Industry Safety Directorate, Central & State Pollution Control Board, Factories & Boilers Department, Government of Kerala shall be complied by BPCL and all reports thereof to be submitted within stipulated timelines.

Based on the licenses issued and the verifications during periodic renewals, the health, safety and environment norms as applicable to a Refinery unit as per State and Central statutory stipulations have been met by BPCL Kochi Refinery. Committee recommends that these shall be continuously maintained by BPCL without any deviations for ongoing / future projects.

**APM Mohammed Haneesh, IAS,**
Principal Secretary (Industries),Government of Kerala

**Prof. Shiva Nagendra,**
ssor, Indian Institute of Technology, Chennai

**Dr. R Venugopal, IPESS,**
Dy. Chief Controller of Explosives, PESO, Kerala

**Dr. T Mukundan,**
Retd. Scientist-G,
iate Director (Materials), NPOL

**Prof. Dr. V Sivanandan Achari**
Professor & Director, School of Environment Studies, Cochin University of Science & Technology, Kochi

**S Suhas IAS,**
District Collector, Ernakulam

**Santosh Koshy Thomas**
Managing Director, (KINFRA)

ANNEXURE 2

# Real Time Data Acquisition And Monitoring

**Site Name: BHARAT PETROLEUM CROPORATION LTD- KOCHI REFINERY**

**Report: Custom Report**

**From Date: 2021/03/01 00:00:00 To Date : 2021/04/01 12:00:24**

| Description | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|
| Prescribed Standards | 0 - 350 |
| Maximum Data | 10.72 |
| Minimum Data | 0.42 |
| Geometric Mean | 5.84 |
| Median | 4.49 |
| Standard Deviation | 2.79 |
| Maximum Value At Time | 2021-03-02 13 |
| Minimum Value At Time | 2021-03-25 17 |
| Valid Data Points | 753 |
| Total Data Points | 757 |
| Data Availability % | 99.47% |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 1 | 2021-03-01 00 | 10.41 |
| 2 | 2021-03-01 01 | 10.32 |
| 3 | 2021-03-01 02 | 9.68 |
| 4 | 2021-03-01 03 | 9.83 |
| 5 | 2021-03-01 04 | 9.58 |
| 6 | 2021-03-01 05 | 9.30 |
| 7 | 2021-03-01 06 | 8.90 |
| 8 | 2021-03-01 07 | 9.06 |
| 9 | 2021-03-01 08 | 9.16 |
| 10 | 2021-03-01 09 | 9.67 |
| 11 | 2021-03-01 10 | 9.75 |
| 12 | 2021-03-01 11 | 10.35 |
| 13 | 2021-03-01 12 | 10.49 |
| 14 | 2021-03-01 13 | 10.09 |
| 15 | 2021-03-01 14 | 10.57 |
| 16 | 2021-03-01 15 | 10.68 |
| 17 | 2021-03-01 16 | 10.34 |
| 18 | 2021-03-01 17 | 10.34 |
| 19 | 2021-03-01 18 | 10.27 |
| 20 | 2021-03-01 19 | 10.27 |
| 21 | 2021-03-01 20 | 10.24 |
| 22 | 2021-03-01 21 | 10.02 |
| 23 | 2021-03-01 22 | 10.37 |
| 24 | 2021-03-01 23 | 10.11 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 25 | 2021-03-02 00 | 10.14 |
| 26 | 2021-03-02 01 | 10.06 |
| 27 | 2021-03-02 02 | 9.90 |
| 28 | 2021-03-02 03 | 9.70 |
| 29 | 2021-03-02 04 | 9.14 |
| 30 | 2021-03-02 05 | 8.47 |
| 31 | 2021-03-02 06 | 8.54 |
| 32 | 2021-03-02 07 | 8.81 |
| 33 | 2021-03-02 08 | 9.25 |
| 34 | 2021-03-02 09 | 9.76 |
| 35 | 2021-03-02 10 | 10.51 |
| 36 | 2021-03-02 11 | 10.23 |
| 37 | 2021-03-02 12 | 10.27 |
| 38 | 2021-03-02 13 | 10.72 |
| 39 | 2021-03-02 14 | 10.25 |
| 40 | 2021-03-02 15 | 10.25 |
| 41 | 2021-03-02 16 | 9.77 |
| 42 | 2021-03-02 17 | 9.33 |
| 43 | 2021-03-02 18 | 9.73 |
| 44 | 2021-03-02 19 | 9.98 |
| 45 | 2021-03-02 20 | 9.98 |
| 46 | 2021-03-02 21 | 9.91 |
| 47 | 2021-03-02 22 | 9.12 |
| 48 | 2021-03-02 23 | 8.93 |
| 49 | 2021-03-03 00 | 9.01 |
| 50 | 2021-03-03 01 | 8.63 |
| 51 | 2021-03-03 02 | 8.49 |
| 52 | 2021-03-03 03 | 8.27 |
| 53 | 2021-03-03 04 | 8.32 |
| 54 | 2021-03-03 05 | 8.32 |
| 55 | 2021-03-03 06 | 8.35 |
| 56 | 2021-03-03 07 | 8.46 |
| 57 | 2021-03-03 08 | 8.76 |
| 58 | 2021-03-03 09 | 9.32 |
| 59 | 2021-03-03 10 | 9.59 |
| 60 | 2021-03-03 11 | 9.86 |
| 61 | 2021-03-03 12 | 9.25 |
| 62 | 2021-03-03 13 | 9.53 |
| 63 | 2021-03-03 14 | 9.88 |
| 64 | 2021-03-03 15 | 9.87 |
| 65 | 2021-03-03 16 | 9.48 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 66 | 2021-03-03 17 | 9.17 |
| 67 | 2021-03-03 18 | 8.91 |
| 68 | 2021-03-03 19 | 9.13 |
| 69 | 2021-03-03 20 | 9.10 |
| 70 | 2021-03-03 21 | 9.13 |
| 71 | 2021-03-03 22 | 9.12 |
| 72 | 2021-03-03 23 | 9.12 |
| 73 | 2021-03-04 00 | 8.95 |
| 74 | 2021-03-04 01 | 8.96 |
| 75 | 2021-03-04 02 | 8.74 |
| 76 | 2021-03-04 03 | 8.34 |
| 77 | 2021-03-04 04 | 7.72 |
| 78 | 2021-03-04 05 | 7.58 |
| 79 | 2021-03-04 06 | 7.42 |
| 80 | 2021-03-04 07 | 7.78 |
| 81 | 2021-03-04 08 | 8.33 |
| 82 | 2021-03-04 09 | 8.48 |
| 83 | 2021-03-04 10 | 9.16 |
| 84 | 2021-03-04 11 | 9.26 |
| 85 | 2021-03-04 12 | 9.64 |
| 86 | 2021-03-04 13 | 9.34 |
| 87 | 2021-03-04 14 | 8.60 |
| 88 | 2021-03-04 15 | 8.74 |
| 89 | 2021-03-04 16 | 8.70 |
| 90 | 2021-03-04 17 | 8.58 |
| 91 | 2021-03-04 18 | 8.64 |
| 92 | 2021-03-04 19 | 8.79 |
| 93 | 2021-03-04 20 | 8.57 |
| 94 | 2021-03-04 21 | 8.49 |
| 95 | 2021-03-04 22 | 8.09 |
| 96 | 2021-03-04 23 | 7.92 |
| 97 | 2021-03-05 00 | 8.14 |
| 98 | 2021-03-05 01 | 8.20 |
| 99 | 2021-03-05 02 | 8.08 |
| 100 | 2021-03-05 03 | 7.90 |
| 101 | 2021-03-05 04 | 7.85 |
| 102 | 2021-03-05 05 | 7.69 |
| 103 | 2021-03-05 06 | 7.64 |
| 104 | 2021-03-05 07 | 7.41 |
| 105 | 2021-03-05 08 | 7.88 |
| 106 | 2021-03-05 09 | 8.22 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 107 | 2021-03-05 10 | 8.51 |
| 108 | 2021-03-05 11 | 9.19 |
| 109 | 2021-03-05 12 | 8.95 |
| 110 | 2021-03-05 13 | 8.38 |
| 111 | 2021-03-05 14 | 8.14 |
| 112 | 2021-03-05 15 | 8.58 |
| 113 | 2021-03-05 16 | 8.69 |
| 114 | 2021-03-05 17 | 8.44 |
| 115 | 2021-03-05 18 | 8.49 |
| 116 | 2021-03-05 19 | 8.62 |
| 117 | 2021-03-05 20 | 8.86 |
| 118 | 2021-03-05 21 | 8.68 |
| 119 | 2021-03-05 22 | 8.36 |
| 120 | 2021-03-05 23 | 8.43 |
| 121 | 2021-03-06 00 | 8.28 |
| 122 | 2021-03-06 01 | 7.99 |
| 123 | 2021-03-06 02 | 7.82 |
| 124 | 2021-03-06 03 | 7.77 |
| 125 | 2021-03-06 04 | 7.61 |
| 126 | 2021-03-06 05 | 7.78 |
| 127 | 2021-03-06 06 | 8.01 |
| 128 | 2021-03-06 07 | 8.09 |
| 129 | 2021-03-06 08 | 8.32 |
| 130 | 2021-03-06 09 | 9.20 |
| 131 | 2021-03-06 10 | 8.90 |
| 132 | 2021-03-06 11 | 8.81 |
| 133 | 2021-03-06 12 | 8.98 |
| 134 | 2021-03-06 13 | 9.35 |
| 135 | 2021-03-06 14 | 9.11 |
| 136 | 2021-03-06 15 | 9.20 |
| 137 | 2021-03-06 16 | 9.35 |
| 138 | 2021-03-06 17 | 9.13 |
| 139 | 2021-03-06 18 | 9.04 |
| 140 | 2021-03-06 19 | 8.79 |
| 141 | 2021-03-06 20 | 8.69 |
| 142 | 2021-03-06 21 | 8.79 |
| 143 | 2021-03-06 22 | 8.79 |
| 144 | 2021-03-06 23 | 8.83 |
| 145 | 2021-03-07 00 | 8.64 |
| 146 | 2021-03-07 01 | 8.58 |
| 147 | 2021-03-07 02 | 8.40 |
| 148 | 2021-03-07 03 | 8.19 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 149 | 2021-03-07 04 | 8.33 |
| 150 | 2021-03-07 05 | 8.34 |
| 151 | 2021-03-07 06 | 8.23 |
| 152 | 2021-03-07 07 | 8.43 |
| 153 | 2021-03-07 08 | 8.68 |
| 154 | 2021-03-07 09 | 8.93 |
| 155 | 2021-03-07 10 | 9.52 |
| 156 | 2021-03-07 11 | 9.45 |
| 157 | 2021-03-07 12 | 9.25 |
| 158 | 2021-03-07 13 | 9.01 |
| 159 | 2021-03-07 14 | 8.89 |
| 160 | 2021-03-07 15 | 8.86 |
| 161 | 2021-03-07 16 | 9.05 |
| 162 | 2021-03-07 17 | 8.65 |
| 163 | 2021-03-07 18 | 8.42 |
| 164 | 2021-03-07 19 | 8.42 |
| 165 | 2021-03-07 20 | 8.23 |
| 166 | 2021-03-07 21 | 8.42 |
| 167 | 2021-03-07 22 | 8.36 |
| 168 | 2021-03-07 23 | 8.42 |
| 169 | 2021-03-08 00 | 8.39 |
| 170 | 2021-03-08 01 | 8.20 |
| 171 | 2021-03-08 02 | 8.00 |
| 172 | 2021-03-08 03 | 7.79 |
| 173 | 2021-03-08 04 | 7.83 |
| 174 | 2021-03-08 05 | 7.45 |
| 175 | 2021-03-08 06 | 7.31 |
| 176 | 2021-03-08 07 | 7.63 |
| 177 | 2021-03-08 08 | 7.85 |
| 178 | 2021-03-08 09 | 8.40 |
| 179 | 2021-03-08 10 | 8.27 |
| 180 | 2021-03-08 11 | 8.99 |
| 181 | 2021-03-08 12 | 8.32 |
| 182 | 2021-03-08 13 | 8.73 |
| 183 | 2021-03-08 14 | 8.68 |
| 184 | 2021-03-08 15 | 8.94 |
| 185 | 2021-03-08 16 | 8.54 |
| 186 | 2021-03-08 17 | 8.94 |
| 187 | 2021-03-08 18 | 8.69 |
| 188 | 2021-03-08 19 | 8.79 |
| 189 | 2021-03-08 20 | 8.36 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 190 | 2021-03-08 21 | 8.76 |
| 191 | 2021-03-08 22 | 8.54 |
| 192 | 2021-03-08 23 | 8.53 |
| 193 | 2021-03-09 00 | 8.45 |
| 194 | 2021-03-09 01 | 8.41 |
| 195 | 2021-03-09 02 | 8.36 |
| 196 | 2021-03-09 03 | 8.31 |
| 197 | 2021-03-09 04 | 7.99 |
| 198 | 2021-03-09 05 | 7.86 |
| 199 | 2021-03-09 06 | 7.85 |
| 200 | 2021-03-09 07 | 8.26 |
| 201 | 2021-03-09 08 | 8.47 |
| 202 | 2021-03-09 09 | 8.86 |
| 203 | 2021-03-09 10 | 8.78 |
| 204 | 2021-03-09 11 | 8.88 |
| 205 | 2021-03-09 12 | 9.80 |
| 206 | 2021-03-09 13 | 9.38 |
| 207 | 2021-03-09 14 | 9.19 |
| 208 | 2021-03-09 15 | 9.10 |
| 209 | 2021-03-09 16 | 8.87 |
| 210 | 2021-03-09 17 | 8.85 |
| 211 | 2021-03-09 18 | 8.49 |
| 212 | 2021-03-09 19 | 8.96 |
| 213 | 2021-03-09 20 | 9.26 |
| 214 | 2021-03-09 21 | 9.04 |
| 215 | 2021-03-09 22 | 8.92 |
| 216 | 2021-03-09 23 | 8.68 |
| 217 | 2021-03-10 00 | 8.50 |
| 218 | 2021-03-10 01 | 8.60 |
| 219 | 2021-03-10 02 | 8.66 |
| 220 | 2021-03-10 03 | 7.92 |
| 221 | 2021-03-10 04 | 8.09 |
| 222 | 2021-03-10 05 | 8.15 |
| 223 | 2021-03-10 06 | 8.19 |
| 224 | 2021-03-10 07 | 8.41 |
| 225 | 2021-03-10 08 | 9.10 |
| 226 | 2021-03-10 09 | 9.44 |
| 227 | 2021-03-10 10 | 9.52 |
| 228 | 2021-03-10 11 | 8.60 |
| 229 | 2021-03-10 12 | 9.59 |
| 230 | 2021-03-10 13 | 9.51 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 231 | 2021-03-10 14 | 9.64 |
| 232 | 2021-03-10 15 | 9.38 |
| 233 | 2021-03-10 16 | 9.37 |
| 234 | 2021-03-10 17 | 9.25 |
| 235 | 2021-03-10 18 | 9.13 |
| 236 | 2021-03-10 19 | 8.57 |
| 237 | 2021-03-10 20 | 8.64 |
| 238 | 2021-03-10 21 | 8.82 |
| 239 | 2021-03-10 22 | 9.10 |
| 240 | 2021-03-10 23 | 9.02 |
| 241 | 2021-03-11 00 | 9.37 |
| 242 | 2021-03-11 01 | 9.16 |
| 243 | 2021-03-11 02 | 8.62 |
| 244 | 2021-03-11 03 | 8.34 |
| 245 | 2021-03-11 04 | 8.35 |
| 246 | 2021-03-11 05 | 8.42 |
| 247 | 2021-03-11 06 | 8.21 |
| 248 | 2021-03-11 07 | 8.95 |
| 249 | 2021-03-11 08 | 9.37 |
| 250 | 2021-03-11 09 | 9.91 |
| 251 | 2021-03-11 10 | 9.93 |
| 252 | 2021-03-11 11 | 9.74 |
| 253 | 2021-03-11 12 | 9.67 |
| 254 | 2021-03-11 13 | 9.79 |
| 255 | 2021-03-11 14 | 8.43 |
| 256 | 2021-03-11 15 | 7.57 |
| 257 | 2021-03-11 16 | 5.84 |
| 258 | 2021-03-11 17 | 4.85 |
| 259 | 2021-03-11 18 | 4.44 |
| 260 | 2021-03-11 19 | 4.46 |
| 261 | 2021-03-11 20 | 4.85 |
| 262 | 2021-03-11 21 | 4.81 |
| 263 | 2021-03-11 22 | 4.74 |
| 264 | 2021-03-11 23 | 4.50 |
| 265 | 2021-03-12 00 | 4.22 |
| 266 | 2021-03-12 01 | 4.13 |
| 267 | 2021-03-12 02 | 4.37 |
| 268 | 2021-03-12 03 | 4.25 |
| 269 | 2021-03-12 04 | 4.27 |
| 270 | 2021-03-12 05 | 4.17 |
| 271 | 2021-03-12 06 | 4.34 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 272 | 2021-03-12 07 | 4.38 |
| 273 | 2021-03-12 08 | 4.62 |
| 274 | 2021-03-12 09 | 4.18 |
| 275 | 2021-03-12 10 | 3.31 |
| 276 | 2021-03-12 11 | 4.18 |
| 277 | 2021-03-12 12 | 4.36 |
| 278 | 2021-03-12 13 | 4.84 |
| 279 | 2021-03-12 14 | 5.44 |
| 280 | 2021-03-12 15 | 4.48 |
| 281 | 2021-03-12 16 | 4.17 |
| 282 | 2021-03-12 17 | 2.91 |
| 283 | 2021-03-12 18 | 2.42 |
| 284 | 2021-03-12 19 | 1.86 |
| 285 | 2021-03-12 20 | 1.82 |
| 286 | 2021-03-12 21 | 1.40 |
| 287 | 2021-03-12 22 | 1.49 |
| 288 | 2021-03-12 23 | 1.15 |
| 289 | 2021-03-13 00 | 1.27 |
| 290 | 2021-03-13 01 | 1.45 |
| 291 | 2021-03-13 02 | 1.51 |
| 292 | 2021-03-13 03 | 1.35 |
| 293 | 2021-03-13 04 | 1.48 |
| 294 | 2021-03-13 05 | 1.54 |
| 295 | 2021-03-13 06 | 1.84 |
| 296 | 2021-03-13 07 | 1.77 |
| 297 | 2021-03-13 08 | 2.05 |
| 298 | 2021-03-13 09 | 2.03 |
| 299 | 2021-03-13 10 | 2.15 |
| 300 | 2021-03-13 11 | 2.88 |
| 301 | 2021-03-13 12 | 2.96 |
| 302 | 2021-03-13 13 | 3.36 |
| 303 | 2021-03-13 14 | 3.44 |
| 304 | 2021-03-13 15 | 3.74 |
| 305 | 2021-03-13 16 | 3.59 |
| 306 | 2021-03-13 17 | 3.71 |
| 307 | 2021-03-13 18 | 3.60 |
| 308 | 2021-03-13 19 | 3.99 |
| 309 | 2021-03-13 20 | 4.05 |
| 310 | 2021-03-13 21 | 4.48 |
| 311 | 2021-03-13 22 | 4.23 |
| 312 | 2021-03-13 23 | 4.49 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 313 | 2021-03-14 00 | 4.44 |
| 314 | 2021-03-14 01 | 4.69 |
| 315 | 2021-03-14 02 | 4.29 |
| 316 | 2021-03-14 03 | 4.66 |
| 317 | 2021-03-14 04 | 4.38 |
| 318 | 2021-03-14 05 | 4.51 |
| 319 | 2021-03-14 06 | 4.24 |
| 320 | 2021-03-14 07 | 4.19 |
| 321 | 2021-03-14 08 | 4.38 |
| 322 | 2021-03-14 09 | 4.58 |
| 323 | 2021-03-14 10 | 4.46 |
| 324 | 2021-03-14 11 | 4.58 |
| 325 | 2021-03-14 12 | 4.73 |
| 326 | 2021-03-14 13 | 4.67 |
| 327 | 2021-03-14 14 | 4.59 |
| 328 | 2021-03-14 15 | 4.36 |
| 329 | 2021-03-14 16 | 4.36 |
| 330 | 2021-03-14 17 | 4.13 |
| 331 | 2021-03-14 18 | 4.23 |
| 332 | 2021-03-14 19 | 4.30 |
| 333 | 2021-03-14 20 | 4.36 |
| 334 | 2021-03-14 21 | 4.37 |
| 335 | 2021-03-14 22 | 4.26 |
| 336 | 2021-03-14 23 | 4.18 |
| 337 | 2021-03-15 00 | 4.29 |
| 338 | 2021-03-15 01 | 4.11 |
| 339 | 2021-03-15 02 | 4.26 |
| 340 | 2021-03-15 03 | 4.03 |
| 341 | 2021-03-15 04 | 4.36 |
| 342 | 2021-03-15 05 | 4.16 |
| 343 | 2021-03-15 06 | 4.18 |
| 344 | 2021-03-15 07 | 4.04 |
| 345 | 2021-03-15 08 | 4.09 |
| 346 | 2021-03-15 09 | 3.88 |
| 347 | 2021-03-15 10 | 4.05 |
| 348 | 2021-03-15 11 | 4.02 |
| 349 | 2021-03-15 12 | 4.18 |
| 350 | 2021-03-15 13 | 3.97 |
| 351 | 2021-03-15 14 | 4.21 |
| 352 | 2021-03-15 15 | 4.13 |
| 353 | 2021-03-15 16 | 4.13 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 354 | 2021-03-15 17 | 4.13 |
| 355 | 2021-03-15 18 | 4.17 |
| 356 | 2021-03-15 19 | 4.13 |
| 357 | 2021-03-15 20 | 4.05 |
| 358 | 2021-03-15 21 | 4.23 |
| 359 | 2021-03-15 22 | 4.31 |
| 360 | 2021-03-15 23 | 4.25 |
| 361 | 2021-03-16 00 | 4.18 |
| 362 | 2021-03-16 01 | 4.23 |
| 363 | 2021-03-16 02 | 4.19 |
| 364 | 2021-03-16 03 | 4.18 |
| 365 | 2021-03-16 04 | 3.92 |
| 366 | 2021-03-16 05 | 3.89 |
| 367 | 2021-03-16 06 | 3.84 |
| 368 | 2021-03-16 07 | 4.03 |
| 369 | 2021-03-16 08 | 3.93 |
| 370 | 2021-03-16 09 | 4.29 |
| 371 | 2021-03-16 10 | 4.14 |
| 372 | 2021-03-16 11 | 4.53 |
| 373 | 2021-03-16 12 | 4.26 |
| 374 | 2021-03-16 13 | 4.17 |
| 375 | 2021-03-16 14 | 4.04 |
| 376 | 2021-03-16 15 | 4.15 |
| 377 | 2021-03-16 16 | 4.02 |
| 378 | 2021-03-16 17 | 4.33 |
| 379 | 2021-03-16 18 | 4.03 |
| 380 | 2021-03-16 19 | 4.21 |
| 381 | 2021-03-16 20 | 4.15 |
| 382 | 2021-03-16 21 | 4.17 |
| 383 | 2021-03-16 22 | 4.12 |
| 384 | 2021-03-16 23 | 4.11 |
| 385 | 2021-03-17 00 | 4.05 |
| 386 | 2021-03-17 01 | 3.99 |
| 387 | 2021-03-17 02 | 3.89 |
| 388 | 2021-03-17 03 | 3.96 |
| 389 | 2021-03-17 04 | 4.01 |
| 390 | 2021-03-17 05 | 3.82 |
| 391 | 2021-03-17 06 | 4.12 |
| 392 | 2021-03-17 07 | 4.30 |
| 393 | 2021-03-17 08 | 4.49 |
| 394 | 2021-03-17 09 | 4.34 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 395 | 2021-03-17 10 | 4.49 |
| 396 | 2021-03-17 11 | 4.01 |
| 397 | 2021-03-17 12 | 4.12 |
| 398 | 2021-03-17 13 | 3.95 |
| 399 | 2021-03-17 14 | 3.83 |
| 400 | 2021-03-17 15 | 3.84 |
| 401 | 2021-03-17 16 | 4.23 |
| 402 | 2021-03-17 17 | 3.76 |
| 403 | 2021-03-17 18 | 4.10 |
| 404 | 2021-03-17 19 | 3.82 |
| 405 | 2021-03-17 20 | 4.12 |
| 406 | 2021-03-17 21 | 3.88 |
| 407 | 2021-03-17 22 | 4.04 |
| 408 | 2021-03-17 23 | 3.97 |
| 409 | 2021-03-18 00 | 3.98 |
| 410 | 2021-03-18 01 | 3.78 |
| 411 | 2021-03-18 02 | 3.95 |
| 412 | 2021-03-18 03 | 3.73 |
| 413 | 2021-03-18 04 | 3.75 |
| 414 | 2021-03-18 05 | 3.74 |
| 415 | 2021-03-18 06 | 3.51 |
| 416 | 2021-03-18 07 | 3.60 |
| 417 | 2021-03-18 08 | 3.85 |
| 418 | 2021-03-18 09 | 3.94 |
| 419 | 2021-03-18 10 | 3.90 |
| 420 | 2021-03-18 11 | 3.97 |
| 421 | 2021-03-18 12 | 4.22 |
| 422 | 2021-03-18 13 | 4.44 |
| 423 | 2021-03-18 14 | 3.97 |
| 424 | 2021-03-18 15 | 4.05 |
| 425 | 2021-03-18 16 | 4.06 |
| 426 | 2021-03-18 17 | 3.99 |
| 427 | 2021-03-18 18 | 3.92 |
| 428 | 2021-03-18 19 | 4.16 |
| 429 | 2021-03-18 20 | 4.10 |
| 430 | 2021-03-18 21 | 4.03 |
| 431 | 2021-03-18 22 | 3.75 |
| 432 | 2021-03-18 23 | 3.90 |
| 433 | 2021-03-19 00 | 3.02 |
| 434 | 2021-03-19 01 | 3.73 |
| 435 | 2021-03-19 02 | 3.51 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 436 | 2021-03-19 03 | 3.59 |
| 437 | 2021-03-19 04 | 3.29 |
| 438 | 2021-03-19 05 | 3.66 |
| 439 | 2021-03-19 06 | 3.49 |
| 440 | 2021-03-19 07 | 3.68 |
| 441 | 2021-03-19 08 | 3.79 |
| 442 | 2021-03-19 09 | 3.92 |
| 443 | 2021-03-19 10 | 3.97 |
| 444 | 2021-03-19 11 | 4.23 |
| 445 | 2021-03-19 12 | 3.76 |
| 446 | 2021-03-19 13 | 3.77 |
| 447 | 2021-03-19 14 | 3.56 |
| 448 | 2021-03-19 15 | 3.61 |
| 449 | 2021-03-19 16 | 3.60 |
| 450 | 2021-03-19 17 | 3.55 |
| 451 | 2021-03-19 18 | 3.65 |
| 452 | 2021-03-19 19 | 3.71 |
| 453 | 2021-03-19 20 | 3.55 |
| 454 | 2021-03-19 21 | 3.59 |
| 455 | 2021-03-19 22 | 3.48 |
| 456 | 2021-03-19 23 | 3.48 |
| 457 | 2021-03-20 00 | 3.38 |
| 458 | 2021-03-20 01 | 3.25 |
| 459 | 2021-03-20 02 | 3.38 |
| 460 | 2021-03-20 03 | 3.23 |
| 461 | 2021-03-20 04 | 3.63 |
| 462 | 2021-03-20 05 | 3.36 |
| 463 | 2021-03-20 06 | 3.49 |
| 464 | 2021-03-20 07 | 3.33 |
| 465 | 2021-03-20 08 | 3.68 |
| 466 | 2021-03-20 09 | 3.53 |
| 467 | 2021-03-20 10 | 3.73 |
| 468 | 2021-03-20 11 | 3.54 |
| 469 | 2021-03-20 12 | 3.73 |
| 470 | 2021-03-20 13 | 3.39 |
| 471 | 2021-03-20 14 | 3.37 |
| 472 | 2021-03-20 15 | 3.49 |
| 473 | 2021-03-20 16 | 3.24 |
| 474 | 2021-03-20 17 | 3.12 |
| 475 | 2021-03-20 18 | 3.37 |
| 476 | 2021-03-20 19 | 3.12 |
| 477 | 2021-03-20 20 | 3.21 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 478 | 2021-03-20 21 | 3.15 |
| 479 | 2021-03-20 22 | 3.47 |
| 480 | 2021-03-20 23 | 3.29 |
| 481 | 2021-03-21 00 | 3.19 |
| 482 | 2021-03-21 01 | 3.27 |
| 483 | 2021-03-21 02 | 3.14 |
| 484 | 2021-03-21 03 | 3.10 |
| 485 | 2021-03-21 04 | 2.88 |
| 486 | 2021-03-21 05 | 3.12 |
| 487 | 2021-03-21 06 | 3.27 |
| 488 | 2021-03-21 07 | 3.58 |
| 489 | 2021-03-21 08 | 3.56 |
| 490 | 2021-03-21 09 | 3.33 |
| 491 | 2021-03-21 10 | 3.35 |
| 492 | 2021-03-21 11 | 3.44 |
| 493 | 2021-03-21 12 | 3.31 |
| 494 | 2021-03-21 13 | 3.63 |
| 495 | 2021-03-21 14 | 3.54 |
| 496 | 2021-03-21 15 | 3.64 |
| 497 | 2021-03-21 16 | 3.39 |
| 498 | 2021-03-21 17 | 3.32 |
| 499 | 2021-03-21 18 | 3.25 |
| 500 | 2021-03-21 19 | 3.66 |
| 501 | 2021-03-21 20 | 3.34 |
| 502 | 2021-03-21 21 | 3.20 |
| 503 | 2021-03-21 22 | 3.52 |
| 504 | 2021-03-21 23 | 3.47 |
| 505 | 2021-03-22 00 | 3.21 |
| 506 | 2021-03-22 01 | 3.24 |
| 507 | 2021-03-22 02 | 3.28 |
| 508 | 2021-03-22 03 | 3.36 |
| 509 | 2021-03-22 04 | 3.00 |
| 510 | 2021-03-22 05 | 3.26 |
| 511 | 2021-03-22 06 | 3.28 |
| 512 | 2021-03-22 07 | 3.35 |
| 513 | 2021-03-22 08 | 3.21 |
| 514 | 2021-03-22 09 | 3.16 |
| 515 | 2021-03-22 10 | 3.43 |
| 516 | 2021-03-22 11 | 3.78 |
| 517 | 2021-03-22 12 | 3.64 |
| 518 | 2021-03-22 13 | 3.52 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 519 | 2021-03-22 14 | 3.69 |
| 520 | 2021-03-22 15 | 3.52 |
| 521 | 2021-03-22 16 | 3.44 |
| 522 | 2021-03-22 17 | 3.17 |
| 523 | 2021-03-22 18 | 3.55 |
| 524 | 2021-03-22 19 | 2.78 |
| 525 | 2021-03-22 20 | 3.37 |
| 526 | 2021-03-22 21 | 2.68 |
| 527 | 2021-03-22 22 | 3.49 |
| 528 | 2021-03-22 23 | 2.87 |
| 529 | 2021-03-23 00 | 3.55 |
| 530 | 2021-03-23 01 | 2.72 |
| 531 | 2021-03-23 02 | 3.25 |
| 532 | 2021-03-23 03 | 2.60 |
| 533 | 2021-03-23 04 | 3.06 |
| 534 | 2021-03-23 05 | 2.64 |
| 535 | 2021-03-23 06 | 3.13 |
| 536 | 2021-03-23 07 | 3.16 |
| 537 | 2021-03-23 08 | 3.65 |
| 538 | 2021-03-23 09 | 3.42 |
| 539 | 2021-03-23 10 | 3.36 |
| 540 | 2021-03-23 11 | 3.27 |
| 541 | 2021-03-23 12 | 3.32 |
| 542 | 2021-03-23 13 | 3.28 |
| 543 | 2021-03-23 14 | 3.31 |
| 544 | 2021-03-23 15 | 3.46 |
| 545 | 2021-03-23 16 | 3.21 |
| 546 | 2021-03-23 17 | 3.59 |
| 547 | 2021-03-23 18 | 3.24 |
| 548 | 2021-03-23 19 | 3.25 |
| 549 | 2021-03-23 20 | 2.92 |
| 550 | 2021-03-23 21 | 3.20 |
| 551 | 2021-03-23 22 | 2.83 |
| 552 | 2021-03-23 23 | 2.86 |
| 553 | 2021-03-24 00 | 2.60 |
| 554 | 2021-03-24 01 | 2.78 |
| 555 | 2021-03-24 02 | 2.39 |
| 556 | 2021-03-24 03 | 2.77 |
| 557 | 2021-03-24 04 | 2.23 |
| 558 | 2021-03-24 05 | 2.80 |
| 559 | 2021-03-24 06 | 2.28 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 560 | 2021-03-24 07 | 2.93 |
| 561 | 2021-03-24 08 | 2.47 |
| 562 | 2021-03-24 09 | 2.89 |
| 563 | 2021-03-24 10 | 2.50 |
| 564 | 2021-03-24 11 | 2.86 |
| 565 | 2021-03-24 12 | 2.59 |
| 566 | 2021-03-24 13 | 3.16 |
| 567 | 2021-03-24 14 | 2.82 |
| 568 | 2021-03-24 15 | 2.96 |
| 569 | 2021-03-24 16 | 2.68 |
| 570 | 2021-03-24 17 | 2.86 |
| 571 | 2021-03-24 18 | 2.59 |
| 572 | 2021-03-24 19 | 2.64 |
| 573 | 2021-03-24 20 | 2.45 |
| 574 | 2021-03-24 21 | 2.43 |
| 575 | 2021-03-24 22 | 2.50 |
| 576 | 2021-03-24 23 | 2.55 |
| 577 | 2021-03-25 00 | 2.49 |
| 578 | 2021-03-25 01 | 2.52 |
| 579 | 2021-03-25 02 | 2.75 |
| 580 | 2021-03-25 03 | 2.72 |
| 581 | 2021-03-25 04 | 2.76 |
| 582 | 2021-03-25 05 | 2.62 |
| 583 | 2021-03-25 06 | 2.88 |
| 584 | 2021-03-25 07 | 2.62 |
| 585 | 2021-03-25 08 | 3.21 |
| 586 | 2021-03-25 09 | 2.87 |
| 587 | 2021-03-25 10 | 3.39 |
| 588 | 2021-03-25 11 | 3.21 |
| 589 | 2021-03-25 12 | 3.46 |
| 590 | 2021-03-25 13 | 3.06 |
| 591 | 2021-03-25 14 | 3.39 |
| 592 | 2021-03-25 15 | 3.07 |
| 593 | 2021-03-25 16 | 2.81 |
| 594 | 2021-03-25 17 | 0.42 |
| 595 | 2021-03-25 18 | 2.07 |
| 596 | 2021-03-25 19 | 2.12 |
| 597 | 2021-03-25 20 | 2.23 |
| 598 | 2021-03-25 21 | 1.83 |
| 599 | 2021-03-25 22 | 2.00 |
| 600 | 2021-03-25 23 | 1.87 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 601 | 2021-03-26 00 | 1.75 |
| 602 | 2021-03-26 01 | 1.81 |
| 603 | 2021-03-26 02 | 1.95 |
| 604 | 2021-03-26 03 | 1.91 |
| 605 | 2021-03-26 04 | 1.97 |
| 606 | 2021-03-26 05 | 1.94 |
| 607 | 2021-03-26 06 | 2.03 |
| 608 | 2021-03-26 07 | 2.10 |
| 609 | 2021-03-26 08 | 2.15 |
| 610 | 2021-03-26 09 | 2.24 |
| 611 | 2021-03-26 10 | 2.12 |
| 612 | 2021-03-26 11 | 2.15 |
| 613 | 2021-03-26 12 | 1.59 |
| 614 | 2021-03-26 13 | 1.75 |
| 615 | 2021-03-26 14 | 1.38 |
| 616 | 2021-03-26 15 | 1.58 |
| 617 | 2021-03-26 16 | 1.59 |
| 618 | 2021-03-26 17 | 1.71 |
| 619 | 2021-03-26 18 | 1.40 |
| 620 | 2021-03-26 19 | 1.78 |
| 621 | 2021-03-26 20 | 1.66 |
| 622 | 2021-03-26 21 | 1.93 |
| 623 | 2021-03-26 22 | 1.61 |
| 624 | 2021-03-26 23 | 1.93 |
| 625 | 2021-03-27 00 | 1.60 |
| 626 | 2021-03-27 01 | 1.66 |
| 627 | 2021-03-27 02 | 1.52 |
| 628 | 2021-03-27 03 | 1.53 |
| 629 | 2021-03-27 04 | 1.66 |
| 630 | 2021-03-27 05 | 1.63 |
| 631 | 2021-03-27 06 | 1.71 |
| 632 | 2021-03-27 07 | 1.74 |
| 633 | 2021-03-27 08 | 1.81 |
| 634 | 2021-03-27 09 | 1.90 |
| 635 | 2021-03-27 10 | 1.89 |
| 636 | 2021-03-27 11 | 1.96 |
| 637 | 2021-03-27 12 | 1.71 |
| 638 | 2021-03-27 13 | 1.67 |
| 639 | 2021-03-27 14 | 1.62 |
| 640 | 2021-03-27 15 | 1.73 |
| 641 | 2021-03-27 16 | 1.61 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 642 | 2021-03-27 17 | 1.58 |
| 643 | 2021-03-27 18 | 1.79 |
| 644 | 2021-03-27 19 | 1.85 |
| 645 | 2021-03-27 20 | 2.14 |
| 646 | 2021-03-27 21 | 1.96 |
| 647 | 2021-03-27 22 | 2.05 |
| 648 | 2021-03-27 23 | 1.76 |
| 649 | 2021-03-28 00 | NA |
| 650 | 2021-03-28 01 | NA |
| 651 | 2021-03-28 02 | NA |
| 652 | 2021-03-28 03 | NA |
| 653 | 2021-03-28 04 | 2.60 |
| 654 | 2021-03-28 05 | 2.34 |
| 655 | 2021-03-28 06 | 2.54 |
| 656 | 2021-03-28 07 | 3.44 |
| 657 | 2021-03-28 08 | 4.95 |
| 658 | 2021-03-28 09 | 5.35 |
| 659 | 2021-03-28 10 | 6.03 |
| 660 | 2021-03-28 11 | 5.94 |
| 661 | 2021-03-28 12 | 6.26 |
| 662 | 2021-03-28 13 | 6.40 |
| 663 | 2021-03-28 14 | 6.61 |
| 664 | 2021-03-28 15 | 6.48 |
| 665 | 2021-03-28 16 | 6.34 |
| 666 | 2021-03-28 17 | 6.36 |
| 667 | 2021-03-28 18 | 6.31 |
| 668 | 2021-03-28 19 | 6.33 |
| 669 | 2021-03-28 20 | 6.85 |
| 670 | 2021-03-28 21 | 7.34 |
| 671 | 2021-03-28 22 | 7.48 |
| 672 | 2021-03-28 23 | 7.69 |
| 673 | 2021-03-29 00 | 7.61 |
| 674 | 2021-03-29 01 | 7.56 |
| 675 | 2021-03-29 02 | 7.41 |
| 676 | 2021-03-29 03 | 7.64 |
| 677 | 2021-03-29 04 | 7.84 |
| 678 | 2021-03-29 05 | 7.69 |
| 679 | 2021-03-29 06 | 7.49 |
| 680 | 2021-03-29 07 | 7.84 |
| 681 | 2021-03-29 08 | 7.81 |
| 682 | 2021-03-29 09 | 7.84 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 683 | 2021-03-29 10 | 7.62 |
| 684 | 2021-03-29 11 | 8.32 |
| 685 | 2021-03-29 12 | 8.25 |
| 686 | 2021-03-29 13 | 8.50 |
| 687 | 2021-03-29 14 | 8.17 |
| 688 | 2021-03-29 15 | 8.66 |
| 689 | 2021-03-29 16 | 8.40 |
| 690 | 2021-03-29 17 | 8.26 |
| 691 | 2021-03-29 18 | 8.09 |
| 692 | 2021-03-29 19 | 8.49 |
| 693 | 2021-03-29 20 | 8.14 |
| 694 | 2021-03-29 21 | 8.28 |
| 695 | 2021-03-29 22 | 8.41 |
| 696 | 2021-03-29 23 | 8.57 |
| 697 | 2021-03-30 00 | 8.50 |
| 698 | 2021-03-30 01 | 8.37 |
| 699 | 2021-03-30 02 | 7.94 |
| 700 | 2021-03-30 03 | 8.02 |
| 701 | 2021-03-30 04 | 8.19 |
| 702 | 2021-03-30 05 | 8.25 |
| 703 | 2021-03-30 06 | 8.20 |
| 704 | 2021-03-30 07 | 8.37 |
| 705 | 2021-03-30 08 | 8.41 |
| 706 | 2021-03-30 09 | 8.56 |
| 707 | 2021-03-30 10 | 8.60 |
| 708 | 2021-03-30 11 | 8.47 |
| 709 | 2021-03-30 12 | 8.44 |
| 710 | 2021-03-30 13 | 8.24 |
| 711 | 2021-03-30 14 | 8.28 |
| 712 | 2021-03-30 15 | 8.04 |
| 713 | 2021-03-30 16 | 8.31 |
| 714 | 2021-03-30 17 | 8.16 |
| 715 | 2021-03-30 18 | 8.46 |
| 716 | 2021-03-30 19 | 8.30 |
| 717 | 2021-03-30 20 | 8.42 |
| 718 | 2021-03-30 21 | 8.37 |
| 719 | 2021-03-30 22 | 8.46 |
| 720 | 2021-03-30 23 | 8.41 |
| 721 | 2021-03-31 00 | 8.50 |
| 722 | 2021-03-31 01 | 8.55 |
| 723 | 2021-03-31 02 | 8.84 |

| Sl No | Time | Stack_IREP_Process_6_IFLS_001_FCCU_Regenerator_Stack-NOx_U |
|---|---|---|
| 724 | 2021-03-31 03 | 8.81 |
| 725 | 2021-03-31 04 | 8.94 |
| 726 | 2021-03-31 05 | 8.81 |
| 727 | 2021-03-31 06 | 8.72 |
| 728 | 2021-03-31 07 | 8.60 |
| 729 | 2021-03-31 08 | 8.62 |
| 730 | 2021-03-31 09 | 8.30 |
| 731 | 2021-03-31 10 | 8.25 |
| 732 | 2021-03-31 11 | 8.26 |
| 733 | 2021-03-31 12 | 8.25 |
| 734 | 2021-03-31 13 | 8.16 |
| 735 | 2021-03-31 14 | 8.32 |
| 736 | 2021-03-31 15 | 8.41 |
| 737 | 2021-03-31 16 | 8.44 |
| 738 | 2021-03-31 17 | 8.43 |
| 739 | 2021-03-31 18 | 8.21 |
| 740 | 2021-03-31 19 | 8.30 |
| 741 | 2021-03-31 20 | 7.98 |
| 742 | 2021-03-31 21 | 8.35 |
| 743 | 2021-03-31 22 | 8.19 |
| 744 | 2021-03-31 23 | 8.42 |
| 745 | 2021-04-01 00 | 8.18 |
| 746 | 2021-04-01 01 | 8.48 |
| 747 | 2021-04-01 02 | 8.15 |
| 748 | 2021-04-01 03 | 8.19 |
| 749 | 2021-04-01 04 | 7.94 |
| 750 | 2021-04-01 05 | 8.05 |
| 751 | 2021-04-01 06 | 7.64 |
| 752 | 2021-04-01 07 | 7.91 |
| 753 | 2021-04-01 08 | 7.84 |
| 754 | 2021-04-01 09 | 8.14 |
| 755 | 2021-04-01 10 | 8.10 |
| 756 | 2021-04-01 11 | 8.22 |
| 757 | 2021-04-01 12 | 9.34 |

ANNEXURE 3

ENVIRODESIGNS
ECO LABS
(Food Quality / Water / Environmental Testing Lab)
In pursuit of quality

ISO 9001:2015, ISO 45001:2018 Certified organisation
Approved 'A' grade Lab by Kerala State Pollution Control Board
Accredited Lab by NABL as per ISO 17025:2017 (Cert No: TC-7114)
Recognised Lab by Ministry of Environment, Forests & Climate Change (Govt. of India) as per E (P) Act 1986

TC-7114

## IREP STACK EMISSION MONITORING REPORT FOR THE MONTH OF MARCH 2021



Report No.: EEL/LR/21/10500/195
Issue Date : April 05, 2021

Issued To:
M/s. Bharat Petroleum Corporation Ltd.
Kochi Refinery
Ambalamugal, Kochi.

Customer ref. : WO. No. 4600813223 dt 17.09.2019

Sampling done by : Lab field Technicians

**Sample Particulars: Stack Emission Sample**

Sampling source : Stack Emission

| Sl. No. | Stack Name | Date of Monitoring | Time of Monitoring | Lab Identification code | Sample receipt form Ref. No. with date | Sample receiving Date | Analysis starting Date | Analysis completion Date |
|---|---|---|---|---|---|---|---|---|
| 1 | PFCCU Regenerator | 04.03.21 | 11.00AM | S/03/025 | SRF/S/03/025 dt. 04.03.21 | 04.03.21 | 05.03.21 | 08.03.21 |
| 2 | SRU III Train A | 05.03.21 | 11.00AM | S/03/033 | SRF/S/03/033 dt. 06.03.21 | 05.03.21 | 06.03.21 | 08.03.21 |
| 3 | SRU III Train B | 05.03.21 | 1.00PM | S/03/034 | SRF/S/03/034 dt. 06.03.21 | 05.03.21 | 06.03.21 | 08.03.21 |
| 4 | CDU III | 08.03.21 | 12.00PM | S/03/043 | SRF/S/03/043 dt. 08.03.21 | 08.03.21 | 09.03.21 | 12.03.21 |
| 5 | PFCCU Heater | 08.03.21 | 2.00PM | S/03/044 | SRF/S/03/044 dt. 08.03.21 | 08.03.21 | 09.03.21 | 12.03.21 |
| 6 | DCU- 2 | 16.03.21 | 12.30PM | S/03/093 | SRF/S/03/093 dt. 16.03.21 | 16.03.21 | 17.03.21 | 20.03.21 |
| 7 | HRSG 4 | 23.03.21 | 12.00PM | S/03/147 | SRF/S/03/147 dt. 23.03.21 | 23.03.21 | 24.03.21 | 26.03.21 |
| 8 | VGO-HDT | 23.03.21 | 2.00PM | S/03/148 | SRF/S/03/148 dt. 23.03.21 | 23.03.21 | 24.03.21 | 26.03.21 |
| 9 | DHDT | 30.03.21 | 1.00PM | S/03/193 | SRF/S/03/193 dt. 30.03.21 | 30.03.21 | 31.03.21 | 03.04.21 |
| 10 | UB12 | 31.03.21 | 12.00PM | S/03/194 | SRF/S/03/194 dt. 31.03.21 | 31.03.21 | 01.04.21 | 05.04.21 |
| 11 | UB 13 | 31.03.21 | 2.30PM | S/03/195 | SRF/S/03/195 dt. 31.03.21 | 31.03.21 | 01.04.21 | 05.04.21 |

**Instruments used for Monitoring**

| |
|---|
| Stack Monitoring kit, Make: ECOTECH INSTRUMENTS, Model: ESS 100, ID No.: EEL/SMK/01 |
| Flue Gas Analyzer, Make : E-Instruments , Model : 1100-1, ID No.: EEL/FGA/01 |

ENVIRODESIGNS
ECO LABS
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Accredited Lab by NABL as per ISO 17025:2017 (Cert No: TC-7114)
Recognized Lab by Ministry of Environment, Forests & Climate Change (Govt. of India) as per E (P) Act 1986
TC-7114

## IREP STACK EMISSION MONITORING REPORT FOR THE MONTH OF MARCH 2021



Report No.: EEL/LR/21/10500/195

**Sample Particulars: Stack Emission Sample**

| Sl. No. | Stack Name | Date | Temp ($^0$C) | Flow rate ($Nm^3$/hr) Results | Flow rate ($Nm^3$/hr) Limit | PM ($mg/Nm^3$) | $SO_2$ ($mg/Nm^3$) | NOx ($mg/Nm^3$) | CO ($mg/Nm^3$) | (Ni+ V) ($mg/Nm^3$) | $H_2S$ ($mg/Nm^3$) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SRU III Train A | 05.03.21 | 171 | 92309 | 92500 | NA | 424.73 | 90.51 | 76.25 | NA | BDL |
| 2 | SRU III Train B | 05.03.21 | 160 | 91874 | 92500 | NA | 433.48 | 52.12 | 11.00 | NA | BDL |
| 3 | CDU III | 08.03.21 | 181 | 251766 | 254000 | 26.21 | 375.3 | 26.10 | 5.63 | BDL | BDL |
| 4 | DHDT | 30.03.21 | 181 | 58476 | 59000 | 24.13 | 96.01 | 37.80 | BDL | BDL | BDL |
| 5 | VGO-HDT | 23.03.21 | 165 | 54764 | 55000 | 27.14 | 25.8 | 20.73 | BDL | BDL | BDL |
| 6 | PFCCU Heater | 08.03.21 | 202 | 20872 | 22400 | 29.94 | 40.03 | 46.0 | 6.38 | 0.309 | BDL |
| 7 | PFCCU Regenerator | 04.03.21 | 136 | 176646 | 225250 | 24.27 | 67.32 | 33.44 | 26.25 | 0.309 | BDL |
| 8 | DCU- I | SHUT DOWN | | | | | | | | | |
| 9 | DCU -2 | 16.03.21 | 161 | 76862 | 80000 | 4.23 | 29.92 | 40.79 | BDL | 0.321 | BDL |
| 10 | HRSG 3 | SHUT DOWN | | | | | | | | | |
| 11 | HRSG 4 | 23.03.21 | 171 | 131587 | 1095907 | 28.14 | 277.73 | 110.01 | BDL | 0.310 | BDL |
| 12 | HRSG-5 | SHUT DOWN | | | | | | | | | |
| 13 | UB12 | 31.03.21 | 165 | 100201 | 246744 | 11.47 | 33.77 | 79.26 | BDL | BDL | BDL |
| 14 | UB 13 | 31.03.21 | 148 | 104714 | 246744 | 18.71 | 36 | 71.45 | 10.63 | BDL | BDL |
| Method used | | | IS: 11255 (Pt 3) - 2008,Reaff. 2013 | IS: 11255 (Pt 3) - 2008,Reaff. 2013 | | USEPA Method 5-1991 | USEPA Method 6-1991 | USEPA Method 7-1991 | USEPA Method 10-1991 | USEPA Method 29-1991 | USEPA Method 11-1991 |
| MDL | | | 5 | 50 | | 2 | 12 | 11 | 5 | 0.3 | 2 |

Note:- BDL- Below Detection Limit MDL- Minimum Detection Limit NA- Not Applicable

**Limits as per notification- GSR 186 (E) dt. 18.03.2008**

(a) $SO_2$ - 50 $mg/Nm^3$ for DCU-I & DCU-2, 850 $mg/Nm^3$ for all other stacks, For SRU III Train A & SRU III Train B these limits are not applicable.
(b) $NO_x$ - 250 $mg/Nm^3$ for DCU-I & DCU-2, SRU III Train A & SRU III Train B and 350 $mg/Nm^3$ for all other stacks
(c ) $H_2S$ - 10 $mg/Nm^3$ for SRU III Train A & SRU III Train B , For all other stacks this limit is not applicable.
(d) PM - 5 $mg/Nm^3$ for DCU-I & DCU-2, 50 $mg/Nm^3$ for all other stacks, For SRU III Train A & SRU III Train B these limits are not applicable.
(e) CO - 100 $mg/Nm^3$ for DCU-I& DCU-2, SRU III Train A & SRU III Train B, 300$mg/Nm^3$ for PFCCU Regenerator and 150 $mg/Nm^3$ for all other stacks
(f) Ni + V - 2 $mg/Nm^3$ for PFCCU Regenerator, 5 $mg/Nm^3$ for all other stacks, For SRU III Train A & SRU III Train B these limits are not applicable.

Susan Abraham
Quality Manager
**Authorized Signatory**

ENVIRODESIGNS ECO LABS

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TC-7114

## STACK EMISSION MONITORING REPORT FOR THE MONTH OF MARCH 2021



Report No.: EEL/LR/21/10497/192
Issue Date : April 05, 2021

Issued To:
M/s. Bharat Petroleum Corporation Ltd.
Kochi Refinery
Ambalamugal, Kochi.

Customer ref. : WO. No. 4600813223 dt 17.09.2019

Sampling done by : Lab field Technicians

**Sample Particulars: Stack Emission Sample**

Sampling source : Stack Emission

| Sl. No. | Stack Name | Date of Monitoring | Time of Monitoring | Lab Identification code | Sample receipt form Ref. No. with date | Sample receiving Date | Analysis starting Date | Analysis completion Date |
|---|---|---|---|---|---|---|---|---|
| 1 | **NH2/HH1** | 09.03.21 | 10.00AM | S/03/054 | SRF/S/03/054 dt.09.03.21 | 09.03.21 | 10.03.21 | 13.03.21 |
| 2 | **KH 1 B** | 09.03.21 | 1.00PM | S/03/055 | SRF/S/03/055 dt.09.03.21 | 09.03.21 | 10.03.21 | 13.03.21 |
| 3 | **DSX 002** | 11.03.21 | 12.00PM | S/03/062 | SRF/S/03/062 dt.11.03.21 | 11.03.21 | 12.03.21 | 15.03.21 |
| 4 | **CH21** | 12.03.21 | 11.00AM | S/03/069 | SRF/S/03/069 dt.12.03.21 | 12.03.21 | 13.03.21 | 16.03.21 |
| 5 | **CH22** | 12.03.21 | 12.30PM | S/03/070 | SRF/S/03/070 dt.12.03.21 | 12.03.21 | 13.03.21 | 16.03.21 |
| 6 | **CH 223** | 12.03.21 | 2.00PM | S/03/071 | SRF/S/03/071 dt.12.03.21 | 12.03.21 | 13.03.21 | 16.03.21 |
| 7 | **FH3/COB** | 17.03.21 | 11.00AM | S/03/101 | SRF/S/03/101 dt.17.03.21 | 17.03.21 | 18.03.21 | 22.03.21 |
| 8 | **BITUROX** | 17.03.21 | 12.30PM | S/03/102 | SRF/S/03/102 dt.17.03.21 | 17.03.21 | 18.03.21 | 22.03.21 |
| 9 | **FH1** | 17.03.21 | 2.00PM | S/03/103 | SRF/S/03/103 dt.17.03.21 | 17.03.21 | 18.03.21 | 22.03.21 |
| 11 | **UB 11** | 25.03.21 | 11.00AM | S/03/154 | SRF/S/03/154 dt.25.03.21 | 25.03.21 | 26.03.21 | 29.03.21 |
| 12 | **NHTCCR** | 25.03.21 | 1.00PM | S/03/155 | SRF/S/03/155 dt.25.03.21 | 25.03.21 | 26.03.21 | 29.03.21 |
| 13 | **CPP/HRSG** | 26.03.21 | 12.00PM | S/03/167 | SRF/S/03/167 dt.26.03.21 | 26.03.21 | 27.03.21 | 30.03.21 |
| 14 | **GT2 HRSG** | 26.03.21 | 2.30PM | S/03/168 | SRF/S/03/168 dt.26.03.21 | 26.03.21 | 27.03.21 | 30.03.21 |
| 15 | **VHH 02** | 29.03.21 | 12.00PM | S/03/185 | SRF/S/03/185 dt.29.03.21 | 29.03.21 | 30.03.21 | 01.04.21 |
| 16 | **DDH I** | 29.03.21 | 2.30PM | S/03/186 | SRF/S/03/186 dt.29.03.21 | 29.03.21 | 30.03.21 | 01.04.21 |
| 17 | **DSX-301** | 30.03.21 | 10.30AM | S/03/192 | SRF/S/03/192 dt.30.03.21 | 30.03.21 | 31.03.21 | 03.04.21 |

**Instruments used for Monitoring**

| |
|---|
| Stack Monitoring kit, Make: ECOTECH INSTRUMENTS, Model: ESS 100, ID No.: EEL/SMK/01 |
| Flue Gas Analyzer, Make : E-Instruments , Model : 1100-1, ID No.: EEL/FGA/01 |

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TC-7114

## STACK EMISSION MONITORING REPORT FOR THE MONTH OF MARCH 2021



Report No.: EEL/LR/21/10497/192

**Sample Particulars: Stack Emission Sample**

| Sl. No. | Stack Name | Date | Temp ($^0$C) | Flow rate ($Nm^3/hr$) Results | Flow rate ($Nm^3/hr$) Limit | PM ($mg/Nm^3$) | $SO_2$ ($mg/Nm^3$) | NOx ($mg/Nm^3$) | CO ($mg/Nm^3$) | (Ni+ V) ($mg/Nm^3$) | $H_2S$ ($mg/Nm^3$) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | KH 1 B | 09.03.21 | 181 | 22517 | 45000 | 42.95 | 482.72 | 52.54 | 7.63 | BDL | BDL |
| 2 | NH2/HH1 | 09.03.21 | 165 | 50215 | 102000 | 56.55 | 241.22 | 32.33 | 15.63 | BDL | BDL |
| 3 | FH1 | 17.03.21 | 151 | 24764 | 25000 | 26.98 | 485.7 | 45.32 | BDL | BDL | BDL |
| 4 | FH3/COB | 17.03.21 | 202 | 77814 | 150000 | 52.43 | 380.6 | 84.5 | BDL | BDL | BDL |
| 5 | UB10 | SHUT DOWN | | | | | | | | | |
| 6 | UB9 | SHUT DOWN | | | | | | | | | |
| 7 | DSX 002 | 11.03.21 | 208 | 29210 | 35000 | 48.88 | 796.37 | 92.12 | 8.63 | BDL | BDL |
| 8 | DHH11 | SHUT DOWN | | | | | | | | | |
| 9 | DDH 1 | 29.03.21 | 146 | 25472 | 27000 | 22.83 | 604.88 | 26.49 | 7.5 | BDL | BDL |
| 10 | CH21 | 12.03.21 | 202 | 79442 | 130000 | 22.51 | 435.72 | 32.51 | BDL | 0.322 | BDL |
| 11 | CH22 | 12.03.21 | 218 | 32424 | 35000 | 47.63 | 335.27 | 39.14 | BDL | 0.318 | BDL |
| 12 | UB7 | SHUT DOWN | | | | | | | | | |
| 13 | CPP/HRSG | 26.03.21 | 135 | 168907 | 277900 | 42.64 | 289.27 | 62.61 | 10.75 | 0.311 | BDL |
| 14 | BITUROX | 17.03.21 | 138 | 11437 | 22000 | 18.55 | 457.67 | 27.26 | BDL | BDL | BDL |
| 15 | CH 223 | 12.03.21 | 230 | 50414 | 51000 | 36.83 | 455.03 | 39.48 | BDL | 0.325 | BDL |
| 16 | GT2 HRSG | 26.03.21 | 148 | 122680 | 427000 | 34.71 | 104.39 | 48.1 | BDL | BDL | BDL |
| 17 | UB 11 | 25.03.21 | 160 | 57050 | 158000 | 22.12 | 361.23 | 59.77 | 15.43 | BDL | BDL |
| 18 | NHTCCR | 25.03.21 | 151 | 115786 | 118000 | 31.06 | 340.28 | 71.27 | 5.13 | BDL | BDL |
| 19 | VHH 02 | 29.03.21 | 181 | 52205 | 72000 | 30.44 | 583.13 | 34.67 | 13.75 | BDL | BDL |
| 20 | DSX-301 | 30.03.21 | 176 | 13799 | 22000 | 37.02 | 717.66 | 73.51 | 37.5 | BDL | BDL |
| 21 | UB8 | SHUT DOWN | | | | | | | | | |
| Method used | | | IS: 11255 (Pt 3) - 2008,Reaff. 2013 | IS: 11255 (Pt 3) - 2008,Reaff. 2013 | | USEPA Method 5-1991 | USEPA Method 6-1991 | USEPA Method 7-1991 | USEPA Method 10-1991 | USEPA Method 29-1991 | USEPA Method 11-1991 |
| MDL | | | 5 | 50 | | 2 | 12 | 11 | 5 | 0.3 | 2 |

Note:- BDL- Below Detection Limit MDL- Minimum Detection Limit

**Limits as per notification- GSR 186 (E) dt. 18.03.2008**

(a) **$SO_2$** - 1700 $mg/Nm^3$ for all stacks, For DSX002 & DSX-301 this limit is not applicable.

(b) **$NO_x$** - 350 $mg/Nm^3$ for DSX002 , 250 $mg/Nm^3$ for DSX-301 & 450 $mg/Nm^3$ for all other stacks.

(c ) **$H_2S$** - 15 $mg/Nm^3$ for DSX002 ,10 $mg/Nm^3$ for DSX-301 & For all other stacks, these limits are not applicable.

(d) **PM** - 100 $mg/Nm^3$ for all stacks, For DSX002 & DSX-301 this limit is not applicable.

(e) **CO** - 150 $mg/Nm^3$ for DSX002, 100 $mg/Nm^3$ for DSX-301, 400 $mg/Nm^3$ for FH3/COB & 200 $mg/Nm^3$ for all other stacks

(f) **Ni + V** - 5 $mg/Nm^3$ for all stacks

Susan Abraham
Quality Manager
**Authorized Signatory**

ANNEXURE 4

**BPCL-Kochi Refinery Laboratory Report**

Phenol results from March 1 to March 25th for Phenol in Outlet A

| Sample Date | Material Type | Component | Number Value mg/l |
|---|---|---|---|
| 3/1/2021 8:00:00 AM | OUTLET A | Phenol | 0.17 |
| 3/2/2021 8:00:00 AM | OUTLET A | Phenol | 0.17 |
| 3/3/2021 8:00:00 AM | OUTLET A | Phenol | 0.23 |
| 3/4/2021 8:00:00 AM | OUTLET A | Phenol | 0.21 |
| 3/5/2021 8:00:00 AM | OUTLET A | Phenol | 0.2 |
| 3/6/2021 8:00:00 AM | OUTLET A | Phenol | 0.18 |
| 3/7/2021 8:00:00 AM | OUTLET A | Phenol | 0.18 |
| 3/8/2021 8:00:00 AM | OUTLET A | Phenol | 0.12 |
| 3/9/2021 8:00:00 AM | OUTLET A | Phenol | 0.18 |
| 3/10/2021 8:00:00 AM | OUTLET A | Phenol | 0.19 |
| 3/11/2021 8:00:00 AM | OUTLET A | Phenol | 0.17 |
| 3/12/2021 8:00:00 AM | OUTLET A | Phenol | 0.21 |
| 3/13/2021 8:00:00 AM | OUTLET A | Phenol | 0.2 |
| 3/14/2021 8:00:00 AM | OUTLET A | Phenol | 0.23 |
| 3/15/2021 8:00:00 AM | OUTLET A | Phenol | 0.21 |
| 3/16/2021 8:00:00 AM | OUTLET A | Phenol | 0.2 |
| 3/17/2021 8:00:00 AM | OUTLET A | Phenol | 0.24 |
| 3/18/2021 8:00:00 AM | OUTLET A | Phenol | 0.2 |
| 3/19/2021 8:00:00 AM | OUTLET A | Phenol | 0.21 |
| 3/20/2021 8:00:00 AM | OUTLET A | Phenol | 0.2 |
| 3/21/2021 8:00:00 AM | OUTLET A | Phenol | 0.18 |
| 3/22/2021 8:00:00 AM | OUTLET A | Phenol | 0.23 |
| 3/23/2021 8:00:00 AM | OUTLET A | Phenol | 0.21 |
| 3/24/2021 8:00:00 AM | OUTLET A | Phenol | 0.19 |
| 3/25/2021 8:00:00 AM | OUTLET A | Phenol | 0.18 |

ANNEXURE 5

ENVIRODESIGNS
ECO LABS
(Food Quality / Water / Environmental Testing Lab)
In pursuit of quality

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Accredited Lab by NABL as per ISO 17025:2017 (Cert No: TC-7114)
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TC-7114

# TEST REPORT



Report No. : EEL/LR/21/10201/045
Issue Date : February 13, 2021

Issued To:
M/s. Bharat Petroleum Corporation Ltd.
Kochi Refinery
Ambalamugal, Kochi.

Customer ref.: WO. No. 4600813223 dt 17.09.2019
Sample receipt form Ref. No. : SRF/WW/02/045 dt. 09.02.2021
Sampling done by: Customer

**Sample Particulars: Effluent sample**

Sample receiving date: February 09, 2021
Analysis starting date: February 09, 2021
Quantity of sample received: 5L x 1
Packaging details : Plastic can
Tests required: For the parameters listed below,

Lab identification code: WW/02/045
Analysis completion date: February 13, 2021
Description of sample by the customer: Treated effluent sample (Outlet A)

SAMPLE TESTED AS RECEIVED

| Sl. No. | Parameters | Unit | Method | Result | Limits as per notification - GSR 186 (E) dt. 18.03.2008 |
|---|---|---|---|---|---|
| 1. | pH at 25$^0$C | -- | Cl.2 of IS 3025 (Pt 11):1983, Reaff. 2017 | 6.86 | 6 - 8.5 |
| 2. | Copper as Cu | mg/l | IS 3025(Pt 2):2004, Reaff. 2014 | BDL(MDL-0.01) | 1.0 |
| 3. | Nickel as Ni | mg/l | IS 3025(Pt 2):2004, Reaff. 2014 | BDL(MDL-0.01) | 1.0 |
| 4. | Mercury as Hg | mg/l | Cl. 5 of IS 3025 (Pt 48):1994, Reaff. 2014 | BDL(MDL-0.0005) | 0.01 |
| 5. | Cyanide as CN | mg/l | Cl. 2 of IS 3025(Pt 27):1986, Reaff. 2014 | BDL(MDL-0.005) | 0.2 |
| 6. | Lead as Pb | mg/l | IS 3025(Pt 2):2004, Reaff. 2014 | 0.008 | 0.1 |
| 7. | Zinc as Zn | mg/l | IS 3025(Pt 2):2004, Reaff. 2014 | 0.051 | 5.0 |
| 8. | Total Chromium as Cr | mg/l | IS 3025(Pt 2):2004, Reaff. 2014 | BDL(MDL-0.01) | 2.0 |
| 9. | Chromium as $Cr^{6+}$ | mg/l | Cl.6 of IS 3025 (Pt 52): 2003, Reaff. 2014 | BDL(MDL-0.03) | 0.1 |
| 10. | Total Kjeldhal Nitrogen as N | mg/l | Cl. 5.2 of IS 3025(Pt 34):1988, Reaff. 2014 | 19.96 | 40 |
| 11. | Ammonia(as total ammonia-N) | mg/l | Cl. 2.3 of IS 3025(Pt 34):1988, Reaff. 2014 | 12.20 | 15 |
| 12. | Chemical Oxygen Demand | mg/l | IS 3025(Pt58):2006, Reaff. 2017 | 36 | 125 |
| 13. | Biochemical Oxygen Demand @ 27°C for 3 days | mg/l | IS 3025(Pt 44):1993, Reaff. 2014 | 12 | 15 |
| 14. | Oil & Grease | mg/l | Cl. 5 of IS 3025 (Pt 39):1991, Reaff. 2014 | BDL(MDL-0.05) | 5.0 |
| 15. | Sulphide as S | mg/l | Cl. 3 of IS 3025(Pt 29):1986, Reaff. 2014 | BDL(MDL-0.02) | 0.5 |
| 16. | Phosphorous as P | mg/l | Cl. 4 of IS 3025 (Pt 31):1988, Reaff. 2014 | 0.05 | 3.0 |
| 17. | Total Suspended Solids | mg/l | IS 3025 (Pt 17):1984, Reaff. 2017 | 8.0 | 20 |
| 18. | Phenolic compounds as $C_6H_5OH$ | mg/l | Cl. 6 of IS 3025 (Pt 43):1992, Reaff. 2014 | BDL(MDL-0.0005) | 0.35 |
| 19. | Vanadium as V | mg/l | IS 3025(Pt 2):2004, Reaff. 2014 | BDL(MDL-0.02) | 0.2 |
| 20. | Benzene | µg/l | USEPA 8260 B :1996 | BDL (MDL - 10) | 100 |
| 21. | Benzo (a) pyrene | µg/l | USEPA 8270 C:1996 | BDL (MDL - 0.1) | 200 |

Note:- BDL: Below Detection Limit MDL: Minimum Detection Limit

Susan Abraham
Quality Manager
**Authorized Signatory**

ENVIRODESIGNS ECO LABS

ANNEXURE 6

BHARAT PETROLEUM CORPORATION LTD

**KOCHI REFINERY**

Post Bag No 2, AMBALAMUGAL - 682302

**REPORT OF ANALYSIS OF TREATED EFFLUENT ON 05.05.2021**

REF: CONSENT NO. PCB/H.O/EKM-2/ICO-R/03/2019

| SL NO. | Polluting parameters as mentioned in the conditions imposed under consent granted under Sec 25/26 of the water (prevention & control of pollution) | Unit | Maximum permissible limits or ranges allowed as per consent condition | Concentration range of parameters | |
|---|---|---|---|---|---|
| | | | | Outlet A | Chithrapuzha O/L |
| 1 | pH | | 6.0 - 8.5 | 7 | 7.3 |
| 2 | Suspended Solids | mg/l | 20 | 15 | 12 |
| 3 | B.O.D. 3 days at 27°C | mg/l | 15 | 9 | 8 |
| 4 | Phenolic compounds | mg/l | 0.35 | 0.13 | 0.11 |
| 5 | Sulfides (as S) | mg/l | 0.5 | 0.4 | 0.4 |
| 6 | Oil and Grease | mg/l | 5 | 3.2 | 2.8 |
| 7 | COD | mg/l | 125 | 33 | 31 |
| 8 | Cyanide | mg/l | 0.2 | <0.1 | <0.1 |
| 9 | Ammonia (as total Ammonia-N) | mg/l | 15 | 3.2 | 0.35 |

Signature

Name : Kuntavalla Subbarayudu

for General Manager (QC)

BPCL-KRL, Kochi refinery, Ambalamugal 682302

ANNEXURE 7


# COCHIN TEST HOUSE

ANALYTICAL SERVICES & TESTING LABORATORY

V i 78, Kollanpady, Murungeliparambu Road, Irumpanam P.O., Kochi - 682 309
Mob.: 9446332556, 9846551014, 9387381780. Tel. : 0484 - 2782672
E-mail: cochintesthouse1@gmail.com, info@cochintesthouse.in. Web : www.cochintesthouse.in

Laboratory Approved by Kerala State Pollution Control Board ('A' Grade)


## TEST REPORT



Report No : CTH/LR\21/NN/955 Issue Date: May 07,,202L

Name and Address of customer : M/S. BPCL KOCHI REFINERY, AMBALAMUGAL

Sample Drawn By : Cochin Test House

Particulars of the sample : Effluent Water

Satnple code : 21/NN/ess

Dffe of receipt of sample : 05.05.2021,

Dates of Analysis : 05.05.2021 = 07.05.2021

Description of the sample by the customer : CHITHRAPUZHA OUTLET

| Sl.No. | Parameters | Unit | Method | Result |
|---|---|---|---|---|
| 1 | pH@25°C | --- | Is : 3025 (Pt.11)-1983 | 7.11 |
| 2 | Suspended Solids | mg/l | IS : 3025 (Pt.17)-1984 | BDL(MDL - 2.0) |
| 3 | BOD,3 Days @ 27°C | mg/l | Is : 3025 (Pt.44)-1993 | BDL |
| 4 | COD | mg/l | IS : 3025 (Pt.58)-2006 | BDL(MDL - 10.0) |
| 5 | Oil & Grease | mg/l | IS : 3025 (Pt.39)-1991 | BDL(MDL - 4.0) |
| 6 | Ammoniacal Nitrogen | mg/l | IS : 3025 (Pt.34)-1988 | 3.0 |
| 7 | Total Nitrogen | mg/l | IS : 3025 (Pt.34)-1988 | 62.92 |
| 8 | Phenolic Compounds | mg/l | IS : 3025 (Pt.43) | BDL(MDL-0.001) |

BDL- Below Detection Limit, MDL-Minimum Detection Limit.

End of Report.

Verified By

Authorised Signatory
Chemical
COCHIN TEST HOUSE

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# COCHIN TEST HOUSE

ANALYTICAL SERVICES & TESTING LABORATORY

V / 78, Kollanpady, Murungeliparambu Road, Irumpanam P.O., Kochi- 682 309

Mob. : 9446332556, 9846551014, 9387381780. Tel. : 0484 - 2782612

E-mail; cochintesthouse1@gmail.com, info@cochintesthouse.in. Web : www.cochintesthouse.in

Laboratory Approved by Kerala State Pollution Control Board ('A' Grade)


## TEST REPORT



Report No : CTH/LR/2L/NN/954 Issue Date: May 07,2021

| | | |
|---|---|---|
| Name and Address of customer | : | M/S. BPCL KOCHI REFINERY, AMBALAMUGAL |
| Sample Drawn By | : | Cochin Test House |
| Particulars of the sample | : | Effluent Water |
| Sample code | : | 2L/NN/954 |
| Date of receipt of sample | : | 05.05.2021 |
| Dates of Analysis | : | 05.05.2021 - 07.05.2021 |
| Description of the sample by the customer | : | OUTLET A |

| Sl.No. | Parameters | Unit | Method | Result |
|---|---|---|---|---|
| 1 | pH@25°C | --- | IS : 3025 (Pt.11)-1983 | 6.79 |
| 2 | Suspended Solids | mg/l | IS : 3025 (Pt.17)-1984 | BDL(MDL - 2.0) |
| 3 | BOD, 3 Days @ 27°C | mg/l | IS : 3025 (Pt.44)-1993 | BDL |
| 4 | COD | mg/l | IS : 3025 (Pt.58)-2006 | BDL(MDL - 10.0) |
| 5 | Oil & Grease | mg/l | IS : 3025 (Pt.39)-1991 | BDL(MDL - 4.0) |
| 6 | Ammoniacal Nitrogen | mg/l | IS : 3025 (Pt.34)-1988 | 4.79 |
| 7 | Total Nitrogen | mg/l | IS : 3025 (Pt.34)-1988 | 7.19 |
| 8 | Phenolic Compounds | mg/l | IS : 3025 (Pt.43) | BDL(MDL-0.001) |

BDL- Below Detection Limit, MDL-Minimum Detection Limit.

End of Report.

Verified By

Authorised Signatory
Chemical
COCHIN TEST HOUSE

NOTE : This test results relate only to the sample submitted for analysis.

The test report shall not be reproduced except in full without the written approval of the laboratory

KERALA STATE POLLUTION CONTROL BOARD
DISTRICT OFFICE (ERNAKULAM –II), PERUMBAVOOR
PMC 20/733, Govt. Hospital- KSRTC Road, Near Kallunkal Auditorium, Perumbavoor-683 542
Telephone: 0484-2593747
E-mail: pcbdo2ekm@gmail.com
Website: www.keralapcb.nic.in

PCB/PBR/LAB/1/2013

Date: 23.06.2021

ANNEXURE 8

# ANALYSIS REPORT

Source : BPCL KOCHI REFINERY AMBALAMUGHAL
Sample Point: Chitrapuzha Outlet
Ref :
D.O.S : 05.05.2021
D.O. Rd : 06.05.2021
Collected by : AE4
Sample ID : BPCL II

| Sl.No. | Parameters | Unit | Value | Test Method | KSPCB Limit |
|---|---|---|---|---|---|
| 1 | pH | | 7.53 | APHA, 4500 $H^+$ B 22nd Edition 2012. | 6.0-8.5 |
| 2 | COD | mg/l | 56 | APHA,5220 B, 22nd Edition 2012 | 125 |
| 3 | SS | mg/l | BDL | APHA, 2540-D, 22nd Edition 2012 | 20 |
| 4 | Phosphates | mg/l | 0.1484 | APHA-4500 P-E 22nd Edition 2012 | 3.0 |
| 5 | Ammoniacal nitrogen | mg/l | 1.398 | APHA 4500-NH3-F, 22nd Edition 2012 | 15 |
| 6 | Oil and Grease | mg/l | BDL | APHA, 5520 B, 22nd Edition 2012 | 5.0 |
| 7 | Phenolic compounds | mg/l | BDL | APHA5530 C, 22nd Edition 2012 | 0.35 |

SARANYA DAS.K
ASSISTANT SCIENTIST

AS/AE4
25/6/21
4607

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Telephone: 0484-2593747
E-mail: pcbdo2ekm@gmail.com
Website: www.keralapcb.nic.in

PCB/PBR/LAB/1/2013

Date: 23.06.2021

# ANALYSIS REPORT

Source : BPCL KOCHI REFINERY AMBALAMUGHAL
Sample Point : Outlet A
Ref :
D.O.S : 05.05.2021
D.O. Rd : 06.05.2021
Collected by : AE4
Sample ID :BPCL 1

| Sl.No. | Parameters | Unit | Value | Test Method | KSPCB Limit |
|---|---|---|---|---|---|
| 1 | pH | | 7.93 | APHA, 4500 $H^+B$ 22nd Edition 2012. | 6.0-8.5 |
| 2 | COD | mg/l | 32 | APHA,5220B,22nd Edition 2012 | 125 |
| 3 | SS | mg/l | BDL | APHA, 2540-D, 22nd Edition 2012 | 20 |
| 4 | Phosphates | mg/l | 0.2306 | APHA-4500 P-E 22nd Edition 2012 | 3.0 |
| 5 | Ammoniacal nitrogen | mg/l | 1.759 | APHA 4500 NH3-F, 22nd Edition 2012 | 15 |
| 6 | Oil and Grease | mg/l | BDL | APHA, 5520 B, 22nd Edition 2012 | 5.0 |
| 7 | Phenolic compounds | mg/l | 0.009 | APHA,5530 C, 22nd Edition 2012 | 0.35 |

AS/AE4
25/6/21

5608

SARANYA DAS.K
ASSISTANT SCIENTIST

Perumbavoor-683542
23 JUN 2021

ANNEXURE 9



Regn. No. KERBIL/2012/45072
dated 5-9-2012 with RNI
Reg. No. KL/TV(N)/634/2015-17

# കേരള ഗസറ്റ്
# KERALA GAZETTE

## അസാധാരണം
## EXTRAORDINARY

**ആധികാരികമായി പ്രസിദ്ധപ്പെടുത്തുന്നത്**
**PUBLISHED BY AUTHORITY**

വാല്യം 4 / Vol. IV — തിരുവനന്തപുരം, വ്യാഴം / Thiruvananthapuram, Thursday — 2015 ആഗസ്റ്റ് 6 / 6th August 2015 — 1190 കർക്കടകം 21 / 21st Karkadakam 1190 — 1937 ശ്രാവണം 15 / 15th Sravana 1937 — നമ്പർ / No. 1840

## കേരള സർക്കാർ

വ്യവസായ (ബി) വകുപ്പ്

വിജ്ഞാപനം

സ. ഉ. (അച്ചടി) നമ്പർ 106/2015/വ്യവസായം. തിരുവനന്തപുരം, 2015 ജൂലൈ 23 / 1190 കർക്കടകം 7

എസ്. ആർ. ഒ. നമ്പർ 499/2015.—1999-ലെ കേരള വ്യവസായ ഏകജാലക ക്ലിയറൻസ് ബോർഡുകളും വ്യവസായ നഗരപ്രദേശവികസനവും ആക്റ്റിലെ (2000-ലെ 5) 2-ാം വകുപ്പ് (എഫ്) ഖണ്ഡവും 5-ാം വകുപ്പും പ്രകാരം നൽകപ്പെട്ട അധികാരങ്ങൾ വിനിയോഗിച്ചുകൊണ്ട്, കേരള സർക്കാർ, താഴെ പട്ടിക II-ൽ പറഞ്ഞിരിക്കുന്ന എറണാകുളം ജില്ലയിലെ കുന്നത്തുനാട് താലൂക്കിലെ പുത്തൻകുരിശ്, തിരുവാണിയൂർ എന്നീ വില്ലേജുകളിലെയും കണയന്നൂർ താലൂക്കിലെ തിരുവാങ്കുളം വില്ലേജിലെയും 51214.21 ആർ വിസ്തീർണ്ണമുള്ള ഭൂമിയെ സംസ്ഥാനത്തെ ഒരു വ്യവസായ പ്രദേശമായി ഇതിനാൽ പ്രഖ്യാപിക്കുകയും പ്രസ്തുത പ്രദേശത്തിന് ചെറുകിട

സർക്കാർ പ്രസ്സുകളുടെ ചുമതലയുണ്ടിനാൽ തിരുവനന്തപുരം ഗവൺമെന്റ് സെൻട്രൽ പ്രസ്സിൽ അച്ചടിച്ച് പ്രസിദ്ധീകരിച്ചത്. 2015.

വ്യവസായങ്ങളോ മറ്റു വ്യവസായ സംരംഭങ്ങളോ ആരംഭിക്കുന്നതിന് വിവിധ സംസ്ഥാന നിയമങ്ങൾ പ്രകാരം ആവശ്യമായിവരുന്ന വിവിധതരം ലൈസൻസുകൾ, ക്ലിയറൻസുകൾ അഥവാ സർട്ടിഫിക്കറ്റുകൾ വേഗത്തിൽ നൽകുന്നതിനായി പ്രസ്തുത പ്രദേശത്തിനുവേണ്ടി താഴെ പട്ടിക I-ൽ പറഞ്ഞിരിക്കുന്ന അംഗങ്ങളെ ഉൾപ്പെടുത്തി "ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് വ്യവസായ പ്രദേശ ഏകജാലക ക്ലിയറൻസ് ബോർഡ്" എന്ന പേരിൽ ഒരു ഏകജാലക ക്ലിയറൻസ് ബോർഡ് രൂപീകരിക്കുകയും ചെയ്യുന്നു, അതായത്:—

പട്ടിക-I

(എ) പ്രിൻസിപ്പൽ സെക്രട്ടറി, വ്യവസായ വകുപ്പ്;

(ബി) ജില്ലാ കളക്ടർ, എറണാകുളം;

(സി) എക്സിക്യൂട്ടീവ് ഡയറക്ടർ (കൊച്ചി റിഫൈനറി), ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ്, അമ്പലമുകൾ, കൊച്ചി;

(ഡി) ജനറൽ മാനേജർ (ഓപ്പറേഷൻസ്), ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ്, കൊച്ചി റിഫൈനറി, അമ്പലമുകൾ, കൊച്ചി (വ്യവസായ പ്രദേശത്തിന്റെ നിയുക്ത അധികാരസ്ഥൻ);

(ഇ) എൻവയോൺമെന്റൽ എഞ്ചിനീയർ, കേരള സംസ്ഥാന മലിനീകരണ നിയന്ത്രണ ബോർഡ്, എറണാകുളം;

(എഫ്) ജില്ലാ ഓഫീസർ, ഇലക്ട്രിക്കൽ ഇൻസ്പെക്ടറേറ്റ്, എറണാകുളം;

(ജി) ജില്ലാ ടൗൺ പ്ലാനർ, എറണാകുളം;

(എച്ച്) ജില്ലാ മെഡിക്കൽ ഓഫീസർ, ആരോഗ്യം, എറണാകുളം;

(ഐ) എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ, കേരള സംസ്ഥാന വൈദ്യുതി ബോർഡ് ലിമിറ്റഡ്, എറണാകുളം;

(ജെ) ജില്ലാ ഓഫീസർ, ഫാക്ടറീസ് ആന്റ് ബോയിലേഴ്സ് ഇൻസ്പെക്ടറേറ്റ്, എറണാകുളം;

(കെ) ഡിവിഷണൽ ഓഫീസർ, ഫയർ ആന്റ് റസ്ക്യൂ സർവ്വീസ്, എറണാകുളം;

(എൽ) ഡിവിഷണൽ ഫോറസ്റ്റ് ഓഫീസർ, എറണാകുളം ഡിവിഷൻ;

(എം) ജില്ലാ ലേബർ ഓഫീസർ, എറണാകുളം;

(എൻ) ഡെപ്യൂട്ടി കമ്മീഷണർ, കൊമേഴ്സ്യൽ ടാക്സസ് വകുപ്പ്, എറണാകുളം;

(ഒ) എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ, കേരള ജല അതോറിറ്റി, പബ്ലിക് ഹെൽത്ത് ഡിവിഷൻ, എറണാകുളം.

പ്രസ്തുത ആക്റ്റിന്റെ 5-ാം വകുപ്പ് (4)-ാം ഉപവകുപ്പ് പ്രകാരം വ്യവസായ വകുപ്പ് പ്രിൻസിപ്പൽ സെക്രട്ടറിയെ ബോർഡിന്റെ ചെയർമാനായും ജനറൽ മാനേജർ (ഓപ്പറേഷൻസ്), കൊച്ചി റിഫൈനറി, ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ്, അമ്പലമുകൾ, കൊച്ചി-യെ അതിന്റെ കൺവീനറായും കേരള സർക്കാർ ഇതിനാൽ നിയമിക്കുന്നു.

പട്ടിക-II

*ജില്ല*—എറണാകുളം.

*താലൂക്ക്*—കുന്നത്തുനാട്. *വില്ലേജ്*—പുത്തൻകുരിശ്.

| *ക്രമനമ്പർ* | *സർവ്വേ നമ്പർ* | *ഭൂവിസ്തൃതി (ആർ)* |
|---|---|---|
| (1) | (2) | (3) |
| **ബ്ലോക്ക് നമ്പർ—37.** | | |
| 1 | 206 | 25080.42 |
| | **ആകെ** | **25080.42** |
| **ബ്ലോക്ക് നമ്പർ—39.** | | |
| 1 | 112 | 15.95 |
| 2 | 113 | 73.46 |
| 3 | 121 | 1.24 |
| 4 | 122 | 0.22 |
| 5 | 123 | 2.20 |
| 6 | 126 | 6.00 |
| 7 | 128 | 133.50 |
| 8 | 129 | 155.04 |
| 9 | 130 | 282.45 |
| 10 | 131 | 258.30 |
| 11 | 132 | 304.86 |
| 12 | 133 | 143.60 |
| 13 | 134 | 227.25 |
| 14 | 135 | 143.08 |

| (1) | (2) | (3) |
|---|---|---|
| 15 | 136 | 78.40 |
| 16 | 137 | 42.30 |
| 17 | 138 | 372.45 |
| 18 | 144 | 231.20 |
| 19 | 145 | 221.70 |
| 20 | 146 | 136.30 |
| 21 | 147 | 223.80 |
| 22 | 148 | 221.75 |
| 23 | 151 | 29.60 |
| 24 | 157 | 35.72 |
| 25 | 158 | 354.75 |
| 26 | 159 | 156.45 |
| 27 | 160 | 260.53 |
| 28 | 161 | 125.66 |
| 29 | 164 | 143.99 |
| 30 | 167 | 22.00 |
| 31 | 168 | 25.50 |
| 32 | 173 | 27.25 |
| 33 | 174 | 375.34 |
| 34 | 175 | 12.30 |
| 35 | 176 | 158.40 |
| 36 | 177 | 125.50 |
| 37 | 180 | 12.00 |
| 38 | 185 | 71.80 |
| 39 | 186 | 253.13 |
| 40 | 187 | 66.60 |

| (1) | (2) | (3) |
|---|---|---|
| 41 | 188 | 186.70 |
| 42 | 189 | 157.58 |
| 43 | 190 | 161.48 |
| 44 | 191 | 123.15 |
| 45 | 192 | 123.50 |
| 46 | 193 | 203.80 |
| 47 | 194 | 190.35 |
| 48 | 195 | 308.15 |
| 49 | 196 | 253.20 |
| 50 | 197 | 297.25 |
| 51 | 201 | 335.40 |
| 52 | 203 | 2.63 |
| 53 | 207 | 279.59 |
| 54 | 208 | 60.56 |
| 55 | 209 | 341.60 |
| 56 | 210 | 428.66 |
| 57 | 211 | 136.33 |
| 58 | 212 | 6.91 |
| 59 | 214 | 54.60 |
| 60 | 215 | 63.74 |
| 61 | 231 | 293.30 |
| 62 | 232 | 245.60 |
| 63 | 233 | 201.60 |
| 64 | 234 | 394.33 |
| 65 | 235 | 206.05 |
| 66 | 236 | 274.50 |

| (1) | (2) | (3) |
|---|---|---|
| 67 | 240 | 596.90 |
| 68 | 241 | 187.15 |
| 69 | 242 | 347.22 |
| 70 | 243 | 395.29 |
| 71 | 244 | 309.31 |
| 72 | 245 | 63.85 |
| 73 | 247 | 18.92 |
| 74 | 248 | 152.23 |
| 75 | 249 | 220.55 |
| 76 | 250 | 186.16 |
| 77 | 251 | 223.45 |
| 78 | 252 | 425.55 |
| 79 | 253 | 231.20 |
| 80 | 254 | 244.90 |
| 81 | 255 | 729.50 |
| 82 | 256 | 926.93 |
| 83 | 257 | 255.71 |
| 84 | 258 | 444.40 |
| 85 | 259 | 516.42 |
| 86 | 260 | 0.10 |
| 87 | 261 | 2.42 |
| 88 | 262 | 4.36 |
| 89 | 263 | 13.28 |
| 90 | 311 | 149.05 |
| 91 | 312 | 24.70 |
| 92 | 313 | 47.16 |
| 93 | 314 | 108.35 |
| | ആകെ | 17687.19 |

താലൂക്ക്—കുന്നത്തുനാട്. വില്ലേജ്—തിരുവാണിയൂർ.

| ക്രമനമ്പർ | സർവ്വേ നമ്പർ | ഭൂവിസ്തൃതി (ആർ) |
|---|---|---|
| (1) | (2) | (3) |
| **ബ്ലോക്ക് നമ്പർ—39 & 40.** | | |
| 1 | 2 | 188.27 |
| 2 | 3 | 242.70 |
| 3 | 4 | 221.89 |
| 4 | 5 | 163.82 |
| 5 | 7 | 72.90 |
| 6 | 8 | 219.65 |
| 7 | 9 | 194.55 |
| 8 | 11 | 155.53 |
| 9 | 62 | 235.37 |
| 10 | 63 | 228.85 |
| 11 | 64 | 192.22 |
| 12 | 65 | 188.19 |
| 13 | 96 | 63.00 |
| 14 | 97 | 52.00 |
| 15 | 98 | 144.53 |
| 16 | 99 | 386.85 |
| 17 | 100 | 287.61 |
| 18 | 101 | 61.00 |
| 19 | 111 | 728.84 |
| 20 | 112 | 633.60 |

| (1) | (2) | (3) |
|---|---|---|
| 21 | 114 | 136.35 |
| 22 | 115 | 204.34 |
| 23 | 229 | 448.86 |
| 24 | 230 | 209.27 |
| 25 | 237 | 449.47 |
| 26 | 238 | 436.89 |
| 27 | 239 | 312.25 |
| | ആകെ | 6858.80 |

താലൂക്ക്—കണയന്നൂർ. വില്ലേജ്—തിരുവാങ്കുളം.

| ക്രമനമ്പർ | സർവ്വേ നമ്പർ | ഭൂവിസ്തൃതി (ആർ) |
|---|---|---|
| (1) | (2) | (3) |
| ബ്ലോക്ക് നമ്പർ—10. | | |
| 1 | 142 | 3.99 |
| 2 | 145 | 3.95 |
| 3 | 148 | 12.72 |
| 4 | 150 | 2.20 |
| 5 | 154 | 63.04 |
| 6 | 155 | 20.96 |
| 7 | 156 | 18.20 |
| 8 | 174 | 10.05 |

| (1) | (2) | | (3) |
|---|---|---|---|
| 9 | 175 | | 2.32 |
| 10 | 242 | | 219.00 |
| 11 | 243 | | 1231.37 |
| | | ആകെ | 1587.80 |
| | | ആകെ മൊത്തം | 51214.21 |

ഗവർണ്ണറുടെ ഉത്തരവിൻപ്രകാരം,

പി. എച്ച്. കുര്യൻ,

*എൻവൺമെന്റ് പ്രിൻസിപ്പൽ സെക്രട്ടറി.*

## വിശദീകരണക്കുറിപ്പ്

(ഇത് വിജ്ഞാപനത്തിന്റെ ഭാഗമാകുന്നതല്ല. എന്നാൽ അതിന്റെ പൊതുവായ ലക്ഷ്യം വെളിപ്പെടുത്താൻ ഉദ്ദേശിച്ചുകൊണ്ടുള്ളതാണ്.)

1999-ലെ കേരള വ്യവസായ ഏകജാലക ക്ലിയറൻസ് ബോർഡുകളും വ്യവസായ നഗരപ്രദേശവികസനവും ആക്റ്റിലെ (2000-ലെ 5) 2-ാം വകുപ്പ് (എഫ്) ഖണ്ഡവും 5-ാം വകുപ്പും പ്രകാരം സംസ്ഥാനത്തെ ഏതു പ്രദേശത്തേയും ഒരു വ്യവസായ പ്രദേശമായി പ്രഖ്യാപിക്കാവുന്നതും പ്രസ്തുത പ്രദേശത്തിനുവേണ്ടി ഏകജാലക ക്ലിയറൻസ് ബോർഡ് രൂപീകരിക്കാവുന്നതുമാണ്. എറണാകുളം ജില്ലയിലെ കുന്നത്തുനാട് താലൂക്കിലെ പുത്തൻകുരിശ്, തിരുവാണിയൂർ എന്നീ വില്ലേജുകളിലേയും കണയന്നൂർ താലൂക്കിലെ തിരുവാങ്കുളം വില്ലേജിലെയും 51214.21 ആർ ഭൂമി ഉൾപ്പെടുന്ന പ്രദേശത്തെ സംസ്ഥാനത്തെ ഒരു വ്യവസായ പ്രദേശമായി പ്രഖ്യാപിക്കാനും പ്രസ്തുത മേഖലയ്ക്കായി ഒരു വ്യവസായ പ്രദേശ ഏകജാലക ക്ലിയറൻസ് ബോർഡ് രൂപീകരിക്കാനും കേരള സർക്കാർ തീരുമാനിച്ചു.

മേൽപ്പറഞ്ഞ ലക്ഷ്യം നിറവേറ്റുന്നതിന് ഉദ്ദേശിച്ചുകൊണ്ടുള്ളതാണ് ഈ വിജ്ഞാപനം.

GOVERNMENT OF KERALA

**Industries (B) Department**

NOTIFICATION

G.O.(P) No.106/2015/ID. *Dated, Thiruvananthapuram, 23rd July, 2015*
*7th Karkadakam, 1190.*

**S. R. O. No. 499/2015.**—In exercise of the powers conferred by clause (f) of section 2 and section 5 of the Kerala Industrial Single Window Clearance Boards and Industrial Township Area Development Act, 1999 (5 of 2000) the Government of Kerala hereby declare an area of 51214.21 Ares of land as specified in Schedule II below at Puthencruz and Thiruvaniyoor Village of Kunnathunadu Taluk and Thiruvankulam Village of Kanayannur Taluk in Ernakulam District to be an Industrial area of the State and constitute a Single Window Clearance Board for the said area to be known as "Bharat Petroleum Corporation Limited Industrial Area Single Window Clearance Board" for the purpose of speedy issue of various licences, clearances or certificates required under the various State enactments for setting up of small scale industrial undertakings or industrial undertaking with the following members mentioned in the Schedule I below, namely:—

SCHEDULE I

(a) The Principal Secretary to Government, Industries Department;

(b) The District Collector, Ernakulam;

(c) The Executive Director (Kochi Refinery), Bharat Petroleum Corporation Limited, Ambalamughal, Kochi;

(d) The General Manager (Operations), Bharat Petroleum Corporation Limited, Kochi Refinery, Ambalamughal, Kochi (Designated Authority of the Industrial Area);

(e) The Environmental Engineer, Kerala State Pollution Control Board, Ernakulam;

(f) The District Officer, Electrical Inspectorate, Ernakulam;

(g) The District Town Planner, Ernakulam;

(h) The District Medical Officer (Health), Ernakulam;

(i) The Executive Engineer, Electrical Division, Kerala State Electricity Board Ltd., Ernakulam;

(j) The District Officer, Factories and Boilers Inspectorate, Ernakulam;

(k) The Divisional Officer, Fire and Rescue Service, Ernakulam;

(l) The Divisional Forest Officer, Ernakulam Division;

(m) The District Labour Officer, Ernakulam;

(n) The Deputy Commissioner, Commercial Taxes Department, Ernakulam;

(o) The Executive Engineer, Public Health Division, Kerala Water Authority, Ernakulam.

Under sub-section (4) of section 5 of the said Act, Government hereby appoint the Principal Secretary to Government, Industries Department as the Chairman of the Board and the General Manager (Operations), Kochi Refinery, Bharat Petroleum Corporation Limited, Ambalamughal, Kochi as its Convener.

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SCHEDULE II

*District*—Ernakulam.

*Taluk*—Kunnathunadu. *Village*—Puthencruz.

| *Sl. No.* | *Survey No.* | *Extent of land (in Ares)* |
|---|---|---|
| (1) | (2) | (3) |
| **Block No.—37** | | |
| 1 | 206 | 25080.42 |
| | **Total** | **25080.42** |
| **Block No.—39** | | |
| 1 | 112 | 15.95 |
| 2 | 113 | 73.46 |
| 3 | 121 | 1.24 |
| 4 | 122 | 0.22 |
| 5 | 123 | 2.20 |
| 6 | 126 | 6.00 |
| 7 | 128 | 133.50 |
| 8 | 129 | 155.04 |
| 9 | 130 | 282.45 |
| 10 | 131 | 258.30 |
| 11 | 132 | 304.86 |
| 12 | 133 | 143.60 |
| 13 | 134 | 227.25 |
| 14 | 135 | 143.08 |
| 15 | 136 | 78.40 |

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| (1) | (2) | (3) |
|---|---|---|
| 16 | 137 | 42.30 |
| 17 | 138 | 372.45 |
| 18 | 144 | 231.20 |
| 19 | 145 | 221.70 |
| 20 | 146 | 136.30 |
| 21 | 147 | 223.80 |
| 22 | 148 | 221.75 |
| 23 | 151 | 29.60 |
| 24 | 157 | 35.72 |
| 25 | 158 | 354.75 |
| 26 | 159 | 156.45 |
| 27 | 160 | 260.53 |
| 28 | 161 | 125.66 |
| 29 | 164 | 143.99 |
| 30 | 167 | 22.00 |
| 31 | 168 | 25.50 |
| 32 | 173 | 27.25 |
| 33 | 174 | 375.34 |
| 34 | 175 | 12.30 |
| 35 | 176 | 158.40 |
| 36 | 177 | 125.50 |
| 37 | 180 | 12.00 |
| 38 | 185 | 71.80 |
| 39 | 186 | 253.13 |
| 40 | 187 | 66.60 |
| 41 | 188 | 186.70 |
| 42 | 189 | 157.58 |

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| (1) | (2) | (3) |
|---|---|---|
| 43 | 190 | 161.48 |
| 44 | 191 | 123.15 |
| 45 | 192 | 123.50 |
| 46 | 193 | 203.80 |
| 47 | 194 | 190.35 |
| 48 | 195 | 308.15 |
| 49 | 196 | 253.20 |
| 50 | 197 | 297.25 |
| 51 | 201 | 335.40 |
| 52 | 203 | 2.63 |
| 53 | 207 | 279.59 |
| 54 | 208 | 60.56 |
| 55 | 209 | 341.60 |
| 56 | 210 | 428.66 |
| 57 | 211 | 136.33 |
| 58 | 212 | 6.91 |
| 59 | 214 | 54.60 |
| 60 | 215 | 63.74 |
| 61 | 231 | 293.30 |
| 62 | 232 | 245.60 |
| 63 | 233 | 201.60 |
| 64 | 234 | 394.33 |
| 65 | 235 | 206.05 |
| 66 | 236 | 274.50 |
| 67 | 240 | 596.90 |
| 68 | 241 | 187.15 |

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| (1) | (2) | (3) |
|---|---|---|
| 69 | 242 | 347.22 |
| 70 | 243 | 395.29 |
| 71 | 244 | 309.31 |
| 72 | 245 | 63.85 |
| 73 | 247 | 18.92 |
| 74 | 248 | 152.23 |
| 75 | 249 | 220.55 |
| 76 | 250 | 186.16 |
| 77 | 251 | 223.45 |
| 78 | 252 | 425.55 |
| 79 | 253 | 231.20 |
| 80 | 254 | 244.90 |
| 81 | 255 | 729.50 |
| 82 | 256 | 926.93 |
| 83 | 257 | 255.71 |
| 84 | 258 | 444.40 |
| 85 | 259 | 516.42 |
| 86 | 260 | 0.10 |
| 87 | 261 | 2.42 |
| 88 | 262 | 4.36 |
| 89 | 263 | 13.28 |
| 90 | 311 | 149.05 |

| (1) | (2) | (3) |
|---|---|---|
| 91 | 312 | 24.70 |
| 92 | 313 | 47.16 |
| 93 | 314 | 108.35 |
| | **Total** | **17687.19** |

*Taluk*—Kunnathunadu. *Village*—Thiruvaniyoor.

| *Sl. No.* | *Survey No.* | *Extent of land (in Ares)* |
|---|---|---|
| (1) | (2) | (3) |
| **Block No.—39 & 40** | | |
| 1 | 2 | 188.27 |
| 2 | 3 | 242.70 |
| 3 | 4 | 221.89 |
| 4 | 5 | 163.82 |
| 5 | 7 | 72.90 |
| 6 | 8 | 219.65 |
| 7 | 9 | 194.55 |
| 8 | 11 | 155.53 |
| 9 | 62 | 235.37 |
| 10 | 63 | 228.85 |
| 11 | 64 | 192.22 |
| 12 | 65 | 188.19 |
| 13 | 96 | 63.00 |

| (1) | (2) | (3) |
|---|---|---|
| 14 | 97 | 52.00 |
| 15 | 98 | 144.53 |
| 16 | 99 | 386.85 |
| 17 | 100 | 287.61 |
| 18 | 101 | 61.00 |
| 19 | 111 | 728.84 |
| 20 | 112 | 633.60 |
| 21 | 114 | 136.35 |
| 22 | 115 | 204.34 |
| 23 | 229 | 448.86 |
| 24 | 230 | 209.27 |
| 25 | 237 | 449.47 |
| 26 | 238 | 436.89 |
| 27 | 239 | 312.25 |
| | | **Total 6858.80** |

*Taluk*—Kanayannur. *Village*—Thiruvankulam

| *Sl. No.* | *Survey No.* | *Extent of land (in Ares)* |
|---|---|---|
| (1) | (2) | (3) |
| **Block No.—10** | | |
| 1 | 142 | 3.99 |
| 2 | 145 | 3.95 |
| 3 | 148 | 12.72 |
| 4 | 150 | 2.20 |
| 5 | 154 | 63.04 |

| (1) | (2) | | (3) |
|---|---|---|---|
| 6 | 155 | | 20.96 |
| 7 | 156 | | 18.20 |
| 8 | 174 | | 10.05 |
| 9 | 175 | | 2.32 |
| 10 | 242 | | 219.00 |
| 11 | 243 | | 1231.37 |
| | | **Total** | **1587.80** |
| | | **Grand Total** | **51214.21** |

By order of the Governor,

P. H. KURIAN,
*Principal Secretary to Government.*

**Explanatory Note**

(This does not form part of the notification, but is intended to indicate its general purport.)

As per clause (f) of section 2 and section 5 of the Kerala Industrial Single Window Clearance Boards and Industrial Township Area Development Act, 1999 (5 of 2000), Government may declare any area in the State to be an industrial area and constitute Single Window Clearance Board for the said area. Government have decided to declare the area of 51214.21 Ares of land in Puthencruz and Thiruvaniyoor Villages of Kunnathunadu Taluk and Thiruvankulam Village of Kanayannur Taluk in Ernakulam District to be an Industrial Area of the State and constitute a Single Window Clearance Board for the said area.

The notification is intended to achieve the above object.

ANNEXURE 10

**SCHEDULE**

(see rule 3(1) and 4(1))

Ambient Air Quality Standards in respect of Noise

| Area Code | Category of Area / Zone | Limits in dB(A) Leq* | |
|---|---|---|---|
| | | Day Time | Night Time |
| (A) | Industrial area | 75 | 70 |
| (B) | Commercial area | 65 | 55 |
| (C) | Residential area | 55 | 45 |
| (D) | Silence Zone | 50 | 40 |

Note:- 1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
3. Silence zone is an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority
4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

* dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A “decibel” is a unit in which noise is measured.

“A”, in dB(A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq: It is an energy mean of the noise level over a specified period.

ANNEXURE 11

**BHARAT PETROLEUM CORPORATION LIMITED**
**KOCHI REFINERY**

**HSE DEPARTMENT**

KR.HSE.SAFE.

02-05-2021

As per the direction from Joint Director, F&B, BPCL-KR, we are regularly monitoring the sound level near PDPP flare area and the surroundings.

The following are the readings noted from the different areas in and around PDPP project site.

| Date & Time (hrs.) | Area-1 (Near flare boundary wall at watch tower 7) | Area-2 (Near Retention pond) | Area-3 (behind canal near watch tower) | Area-4 (near adoorkara project gate) |
|---|---|---|---|---|
| 29/03/2021 15:30 to 16:30 | 57.5 | 53.7 | 50.4 | 49.5 |
| 30/03/2021 14:30 to 15:30 | 58.1 | 53.9 | 52.3 | 51.7 |
| 31/03/2021 13:30 to 14:30 | 54.3 | 52.5 | 51.6 | 49.8 |
| 01/04/2021 14:00 to 15:00 | 53.8 | 52.1 | 50.8 | 49.2 |
| 03/04/2021 14:00 to 15:00 | 54.4 | 51.9 | 50.3 | 51.6 |
| 05/04/2021 14:00 to 15:00 | 53.5 | 50.6 | 49.7 | 50.2 |
| 07/04/2021 10:00 to 11:00 | 54.9 | 54.1 | 52.8 | 53.7 |
| 08/04/2021 14:30 to 15:30 | 54.1 | 53.6 | 52.1 | 52.9 |
| 09/04/2021 13:30 to 14:30 | 53.7 | 53.2 | 51.6 | 52.1 |
| 12/04/2021 14:00 to 15:00 | 54.0 | 53.5 | 52.4 | 52.5 |

| | | | | |
|---|---|---|---|---|
| 13/04/2021<br>15:30 to 16:30 | 54.6 | 54.0 | 52.7 | 53.0 |
| 15/04/2021<br>13:45 to 14:45 | 51.1 | 52.9 | 49.0 | 51.5 |
| 16/04/2021<br>15:00 to 16:00 | 51.5 | 53.4 | 49.8 | 53.3 |
| 17/04/2021<br>10:00 to 11:00 | 50.2 | 49.5 | 48.3 | 49.7 |
| 19/04/2021<br>13:30 to 14:30 | 50.9 | 51.5 | 49.1 | 50.4 |
| 20/04/2021<br>11:00 to 12:00 | 50.6 | 49.8 | 48.6 | 47.2 |
| 21/04/2021<br>11:00 to 12:00 | 49.7 | 50.5 | 49.5 | 48.4 |
| 22/04/2021<br>14:00 to 15:00 | 48.6 | 50.9 | 49.1 | 49.5 |
| 23/04/2021<br>14:30 to 15:30 | 49.1 | 49.4 | 50.5 | 47.4 |
| 24/04/2021<br>11:00 to 12:00 | 49.5 | 50.2 | 48.9 | 46.3 |
| 26/04/2021<br>10:30 to 11:30 | 48.9 | 51.1 | 49.5 | 48.9 |
| 27/04/2021<br>11:00 to 12:00 | 50.4 | 48.9 | 47.7 | 46.5 |
| 28/04/2021<br>14:00 to 15:00 | 47.9 | 49.5 | 48.4 | 45.1 |
| 29/04/2021<br>14:00 to 15:00 | 49.2 | 48.2 | 49.3 | 46.8 |
| 30/04/2021<br>11:00 to 12:00 | 48.2 | 50.6 | 49.6 | 46.3 |

**BHARAT PETROLEUM CORPORATION LIMITED**
**KOCHI REFINERY**

**HSE DEPARTMENT**

KR.HSE.SAFE.

01-06-2021

As per the direction from Joint Director, F&B, BPCL-KR, we are regularly monitoring the sound level near PDPP flare area and the surroundings.

The following are the readings noted from the different areas in and around PDPP project site.

| Date & Time (hrs.) | Area-1 (Near flare boundary wall at watch tower 7) | Area-2 (Near Retention pond) | Area-3 (behind canal near watch tower) | Area-4 (near adoorkara project gate) |
|---|---|---|---|---|
| 03/05/2021 15:30 to 16:30 | 50.9 | 52.5 | 52.1 | 50.4 |
| 04/05/2021 10:00 to 11:00 | 51.2 | 51.9 | 50.5 | 49.8 |
| 05/05/2021 13:30 to 14:30 | 50.3 | 51.5 | 51.2 | 49.5 |
| 06/05/2021 15:30 to 16:30 | 50.8 | 50.1 | 49.8 | 49.0 |
| 07/05/2021 15:30 to 16:30 | 51.1 | 51.6 | 50.4 | 49.2 |
| 08/05/2021 10:00 to 11:00 | 51.5 | 49.8 | 49.0 | 48.9 |
| 10/05/2021 11:00 to 12:00 | 52.4 | 51.2 | 50.5 | 49.5 |
| 11/05/2021 11:00 to 12:00 | 51.8 | 50.5 | 49.7 | 48.2 |
| 12/05/2021 13:30 to 14:30 | 50.7 | 51.4 | 50.4 | 47.8 |
| 13/05/2021 10:30 to 11:30 | 49.1 | 49.9 | 48.5 | 47.5 |

| | | | | |
|---|---|---|---|---|
| 14/05/2021<br>15:30 to 16:30 | 48.6 | 50.5 | 49.3 | 46.8 |
| 17/05/2021<br>13:30 to 14:30 | 48.1 | 50.8 | 49.7 | 47.1 |
| 18/05/2021<br>11:30 to 12:30 | 49.2 | 49.7 | 48.6 | 46.5 |
| 19/05/2021<br>10:00 to 11:00 | 49.6 | 51.3 | 50.5 | 48.2 |
| 20/05/2021<br>13:30 to 14:30 | 47.9 | 50.6 | 49.8 | 46.6 |
| 22/05/2021<br>11:00 to 12:00 | 48.5 | 49.5 | 48.1 | 45.8 |
| 24/05/2021<br>15:30 to 16:30 | 46.8 | 50.3 | 49.3 | 45.5 |
| 25/05/2021<br>10:30 to 11:30 | 47.2 | 51.1 | 50.6 | 46.3 |
| 26/05/2021<br>15:30 to 16:30 | 48.1 | 49.7 | 49.2 | 47.5 |
| 27/05/2021<br>11:00 to 12:00 | 49.3 | 50.5 | 48.9 | 46.2 |
| 28/05/2021<br>14:00 to 15:00 | 48.6 | 48.5 | 47.5 | 45.1 |
| 29/05/2021<br>11:00 to 12:00 | 47.5 | 48.2 | 47.1 | 46.0 |
| 31/05/2021<br>14:00 to 15:00 | 46.9 | 47.5 | 46.5 | 45.6 |

**BHARAT PETROLEUM CORPORATION LIMITED**
**KOCHI REFINERY**

**HSE DEPARTMENT**

KR.HSE.SAFE.

30-06-2021

As per the direction from Joint Director, F&B, BPCL-KR, we are regularly monitoring the sound level near PDPP flare area and the surroundings.

The following are the readings noted from the different areas in and around PDPP project site.

| Date & Time (hrs.) | Area-1 (Near flare boundary wall at watch tower 7) | Area-2 (Near Retention pond) | Area-3 (behind canal near watch tower) | Area-4 (near adoorkara project gate) |
|---|---|---|---|---|
| 01/06/2021 14:00 to 15:00 | 48.2 | 50.4 | 49.3 | 46.5 |
| 02/06/2021 11:00 to 12:00 | 49.5 | 51.1 | 48.8 | 47.2 |
| 03/06/2021 13:30 to 14:30 | 49.1 | 49.5 | 48.5 | 46.7 |
| 04/06/2021 15:00 to 16:00 | 47.5 | 49.7 | 48.1 | 47.3 |
| 05/06/2021 15:30 to 16:30 | 48.3 | 48.6 | 47.5 | 45.9 |
| 07/06/2021 10:00 to 11:00 | 47.6 | 49.0 | 47.2 | 46.5 |
| 08/06/2021 10:30 to 11:30 | 48.5 | 47.2 | 46.6 | 45.1 |
| 09/06/2021 11:00 to 12:00 | 47.2 | 47.9 | 46.0 | 45.5 |
| 10/06/2021 14:00 to 15:00 | 46.9 | 50.2 | 49.4 | 47.2 |
| 11/06/2021 11:00 to 12:00 | 49.1 | 48.5 | 47.5 | 48.1 |
| 12/06/2021 15:30 to 16:30 | 48.4 | 50.5 | 49.3 | 46.8 |

| | | | | |
|---|---|---|---|---|
| 14/06/2021<br>10:30 to 11:30 | 48.9 | 51.1 | 50.5 | 47.2 |
| 15/06/2021<br>14:00 to 15:00 | 48.6 | 50.8 | 48.5 | 45.9 |
| 16/06/2021<br>13:30 to 14:30 | 50.2 | 51.3 | 49.8 | 48.0 |
| 17/06/2021<br>11:00 to 12:00 | 49.7 | 50.5 | 48.3 | 47.5 |
| 18/06/2021<br>11:00 to 12:00 | 48.9 | 50.2 | 48.5 | 47.1 |
| 19/06/2021<br>10:00 to 11:00 | 52.5 | 51.7 | 49.3 | 48.3 |
| 21/06/2021<br>14:30 to 15:30 | 48.4 | 50.6 | 49.5 | 46.9 |
| 22/06/2021<br>15:30 to 16:30 | 50.1 | 51.3 | 49.0 | 48.7 |
| 23/06/2021<br>10:00 to 11:00 | 50.5 | 51.8 | 48.8 | 47.4 |
| 24/06/2021<br>11:30 to 12:30 | 49.8 | 49.9 | 48.4 | 47.0 |
| 25/06/2021<br>14:00 to 15:00 | 53.5 | 50.7 | 47.3 | 46.5 |
| 26/06/2021<br>13:30 to 14:30 | 49.1 | 49.5 | 47.7 | 47.2 |
| 28/06/2021<br>11:00 to 12:00 | 51.4 | 50.5 | 49.5 | 48.5 |
| 27/06/2021<br>10:00 to 11:00 | 50.8 | 49.6 | 48.2 | 48.0 |
| 30/06/2021<br>15:30 to 16:30 | 51.1 | 50.8 | 48.5 | 48.3 |

ANNEXURE 12

# PDPP COMPLEX – MAJOR DISTANCES COMPLIANCE TABLE

| Distances of Facilities along the outer line from Boundary wall | | | | | |
|---|---|---|---|---|---|
| | **From** | **To** | **Minimum Safe distance as per OISD 118 (m)** | **Actual Distance Maintained (m)** | **Remarks** |
| 1 | Drum filling and Non Bulk storage (Class B & C) | Boundary wall | 15 | 26 | As per Petroleum rules 2002-6m min. |
| 2 | Cooling Tower | Boundary wall | 30 | 30.5 | Exceeding OISD req. |
| 3 | Tank Farm -4 | Boundary wall | 20 | 63 | Exceeding OISD req. |
| 4 | Oxo Alcohol Unit | Boundary wall | 60 | 60.5 | Exceeding OISD req. |
| 5 | Oxo Alcohol tank farm (3A & 3B) | Boundary wall | 20 | 24.3 | Exceeding OISD req. |
| 6 | Substation - Oxo | Boundary wall | 15 | 16.25 | Exceeding OISD req. |
| 7 | Acrylates (BA/2EHA) unit | Boundary wall | 60 | 68 | Exceeding OISD req. |
| 8 | Blast proof Control room | Boundary wall | 30 | 30.6 | Exceeding OISD req. |
| 9 | Tank Farm -1 | Boundary wall | 20 | 20 | Exceeding OISD req. |
| 10 | Tank Farm -2 | Boundary wall | 20 | 74 | Exceeding OISD req. |
| 11 | Chemical Warehouse | Boundary wall | 6 | 49 | Exceeding OISD req. |
| 12 | Flare stack | Boundary wall | 90 | 90 | Meeting OISD req. |

ANNEXURE 13

ഡോ. വി പി ജോയ് IAS
ചീഫ് സെക്രട്ടറി
Dr. V P JOY IAS
Chief Secretary

കേരള സർക്കാർ
തിരുവനന്തപുരം-695 001
Government of Kerala
Thiruvananthapuram-695 001

D.O.No.127/CS/2021/CSO

29th April, 2021

Dear Shri.

As you are aware, Kerala is experiencing second phase of COVID pandemic surge. The State is taking concerted efforts to manage the situation as of now. However, surges are expected in the coming weeks.

2. During the discussion with the Secretary, Petroleum and Natural Gas, Government of India, it was discussed that a 1000 oxygen bedded facility could be set up within the refinery premises by the Bharat Petroleum Corporation Limited (BPCL). BPCL can assist in generating Oxygen as per the requirement.

3. In this regard, I request your esteemed organization for setting up of 1000 oxygen beds within your campus under your CSR initiative, which is permitted vide order no.40-3/2020 DM-1 (A), dtd. 24.03.2020 of the Ministry of Corporate Affairs, Govt. of India. The State will provide required human resources to make it functional and provide care and support to the COVID positive patients. I also request to set up compressors for oxygen refilling arrangements.

Looking forward to early actions in this regard.

Yours sincerely,

Dr. V P Joy

Shri. K Padmakar
Chairman & Managing Director,
Bharat Bhavan, 4 & 6 Currimbhoy Road,
Ballard Estate, Mumbai -400001.

Cc:

Shri. Sanjay Khanna
Executive Director,
Kochi Refinery, BPCL.

ANNEXURE 14

# KERALA STATE POLLUTION CONTROL AWARD

KERALA

## Certificate of Merit

*issued to*

*Kochi Refineries Ltd., Ernakulam*

*on securing First place among Large scale industries in making substantial and sustained effort in pollution control in the year 2002*

WORLD ENVIRONMENT DAY
5th JUNE 2003

Paul Thachil
CHAIRMAN
KERALA STATE POLLUTION CONTROL BOARD

# KERALA STATE POLLUTION CONTROL AWARD


## Certificate of Special Appreciation

*awarded to*

*Kochi Refineries Ltd., Ernakulam*

*among large scale industries in the year 2003*

*for consistent effort & sustained performance in upkeeping the environment*

WORLD ENVIRONMENT DAY
5th JUNE 2004

Paul Thachil
CHAIRMAN
KERALA STATE POLLUTION CONTROL BOARD

# KERALA STATE POLLUTION CONTROL AWARD

KERALA

## Certificate of Excellence

*issued to*

*Bharat Petroleum Corporation Ltd. (Kochi Refineries Ltd.),*
*Ambalamugal, Ernakulam*
*on securing Excellence Award among large scale industries in making substantial and sustained effort in pollution control in the year 2006*

WORLD ENVIRONMENT DAY
5th JUNE 2007

G. Rajamohan
CHAIRMAN
KERALA STATE POLLUTION CONTROL BOARD

# STATE POLLUTION CONTROL AWARD - 2008

KERALA

## Certificate of Excellence

*Bharat Petroleum Corporation Ltd. (Kochi Refinery),*
*Ambalamugal, Ernakulam*
*among large scale industries in making*
*outstanding achievement in pollution control in the year 2007*

JEYAPRASAD S.D.
MEMBER SECRETARY

G. RAJAMOHAN
CHAIRMAN

KERALA STATE POLLUTION CONTROL BOARD

WORLD ENVIRONMENT DAY

5th JUNE 2008

# KERALA STATE POLLUTION CONTROL AWARD

KERALA

## Certificate of Merit

*issued to*

*Bharat Petroleum Corporation Ltd. (BPCL), Kochi Refinery, Ernakulam*

*on securing overall excellence in making substantial and sustained effort in pollution control in the year 2008.*

MEMBER SECRETARY
KERALA STATE POLLUTION CONTROL BOARD

WORLD ENVIRONMENT DAY
5th JUNE 2009

CHAIRMAN
KERALA STATE POLLUTION CONTROL BOARD

KERALA STATE POLLUTION CONTROL BOARD

KERALA

Certificate of Excellence

*issued to*

BPCL Kochin Refinery, Ernakulam

*among very large scale industries making substantial and sustained effort in pollution control in 2009*

Jeyaprasad S.D.
CHAIRMAN
KERALA STATE POLLUTION CONTROL BOARD

WORLD ENVIRONMENT DAY
5th June 2010

KERALA STATE POLLUTION CONTROL BOARD

Certificate of Merit

*issued to*

*BPCL- Kochi Refinery, Ernakulam*

*on securing Excellence position among Very Large Industries making substantial and sustained effort in pollution control in 2010*

WORLD ENVIRONMENT DAY
5th June 2011

K. SAJEEVAN
Chairman
Kerala State Pollution Control Board

KERALA

# KERALA STATE POLLUTION CONTROL BOARD

## Pollution Control Award - 2011

## Certificate Of Merit

issued to

**BPCL - KOCHI REFINERY, AMBALAMUGAL, ERNAKULAM**

on securing **First** position among **Very Large Scale Industries** in making substantial and sustained effort towards pollution control in the year 2011

Smt. P. MOLIKUTTY
Member Secretary

WORLD ENVIRONMENT DAY
5th JUNE, 2012

Sri. K.SAJEEVAN
Chairman

KERALA

# KERALA STATE POLLUTION CONTROL BOARD

## *Certificate of merit*

Awarded to

**BPCL – KOCHI REFINERY, AMBALAMUKAL, ERNAKULAM**

for securing Excellence position among Very Large Industries
for substantial and sustained efforts in pollution control in 2012

P. Molikutty
Member Secretary
KERALA STATE POLLUTION CONTROL BOARD

WORLD ENVIRONMENT DAY
5th June 2013

K. Sajeevan
Chairman
KERALA STATE POLLUTION CONTROL BOARD

KERALA STATE POLLUTION CONTROL BOARD

Certificate of Merit

*Issued to*

***Bharat Petroleum Corporation Limited Kochi Refinery, Ernakulam***

*on securing* ***Excellence*** *position among* ***Very Large Industries***

*for substantial and sustained efforts in pollution control*

*and for initiatives in environment protection in 2013*

P. Molikutty
Member Secretary

**World Environment Day**
5th June 2014

K. Sajeevan
Chairman

# KERALA STATE POLLUTION CONTROL BOARD

## Certificate of Merit

*Issued to*

***BPCL - Kochi Refinery, Ambalamugal , Kochi***

*on securing* ***Excellence*** *position in the category* ***Very Large Industry***

*for substantial and sustained efforts in pollution control*

*and for initiatives in environment protection in 2014*

World Environment Day 2015
**Seven Billion Dreams. One Planet. Consume with Care.**
June 5

K. Sajeevan
Chairman

# KERALA STATE POLLUTION CONTROL BOARD

## Certificate of Merit

*Issued to*

***BPCL - Kochi Refinery***
***Ambalamugal, Kochi***

*on securing **Excellence** position in the category **Very Large Industry***
*for substantial and sustained efforts in pollution control*
*and for initiatives in environment protection in 2015*

WORLD ENVIRONMENT DAY
5th June 2016

K. Sajeevan
Chairman

KERALA STATE POLLUTION CONTROL BOARD

Certificate of Merit

*Issued to*

***BPCL - Kochi Refinery***
***Ambalamugal, Kochi***

*on securing* ***Excellence*** *position in the category* ***Very Large Scale Industries***
*for substantial and sustained efforts in pollution control*
*and for initiatives in environment protection in 2016-17*

K. Sajeevan
Chairman

4th October 2017

KERALA STATE POLLUTION CONTROL BOARD

Certificate of Merit

*Issued to*

***BPCL - Kochi Refinery, P.B. No. 2***
***Ambalamugal, Kochi- 682302***

*on securing **Excellence** position in the category **Very Large Industries***
*for substantial and sustained efforts in pollution control*
*and for initiatives in environment protection in 2018*

BEAT PLASTIC POLLUTION | WORLD ENVIRONMENT DAY

5th June 2018

KERALA

K. Sajeevan
Chairman

WORLD ENVIRONMENT DAY

KERALA

Beat Air Pollution

# KERALA STATE POLLUTION CONTROL BOARD

## Award for

## Best Environmental Practice

*Issued to*

***BPCL Kochi Refinery, Ernakulam***

*In recognition of securing* ***Second*** *position in the sector* ***Industries*** *(Effluent generation > 5 MLD)*

*for substantial and sustained efforts in pollution control and*

*for initiatives in environmental protection in 2018.*

**Er. Sreekala S.**
**Member Secretary**

5th June 2019

Ajit Haridas

**Dr. Ajit Haridas**
Chairman

## Apex India Green Leaf 2019 Award for Environment Excellence


Bharat petroleum Kochi Refinery, the largest PSU refinery in India wins Apex India Green Leaf 2019 for Environment Excellence. The Platinum award in the Petroleum Refinery sector is in recognition of Kochi Refinery's overall performance as a caring green entity and in particular for the initiatives (a) Digitalization in environment – refinery wide emission model and online based hazardous material and waste management system (b) Environment treasures at the Refinery (c) Best environmental practices and (d) Green initiatives including - clean technology and ecology.

## RNBQA Excellence in Crisis Awards 2020


- Bharat petroleum Kochi Refinery, the largest PSU refinery in India has won the prestigious Excellence in Crisis award 2020 instituted by IMC Ramkrishna Bajaj National Quality Award (RNBQA) Trust. The Meritorious award is in recognition of Kochi refinery's collaborative effort as "Crisis Innovators" in managing the unique shutdown during the COVID-19 pandemic while also operating the Refinery non-stop for uninterrupted supply of petroleum products.

- The innovation : Remote SuperVision of Catalyst Replacement at VGO-HDS and DHDS Reactors at Kochi Refinery. Our sincere thanks to all consultants and vendors for the outstanding support for seeing this mission through. Mr. Murali Madhavan P, Executive Director (Kochi Refinery) acknowledged the award in the virtual Award Ceremony that took place on 30 October 2020

## ASSOCHAM Innovators Excellence Awards 2020


- ASSOCHAM Innovators' Excellence Awards 2020 under the category 'Innovation in Environment and Sustainability' for the "Digital Twin Refinery Emission Model" developed by Kochi Refinery was presented to Bharat Petroleum by ASSOCHAM at a virtual ceremony presided over by Prof Ashutosh Sharma, Secretary, Department of Science and Technology, Govt. of India.

- The ASSOCHAM's ENNOVATE INDIA 2020, showcases, ASSOCHAM Innovators Excellence Awards 2020 with an aim to reward and recognize the best innovations, and showcase them as shining examples to embolden and inspire others. Kochi Refinery implemented the digital twin concept as an innovative approach for real-time emission and efficiency monitoring and data acquisition. Process Emission Model, an industry first from Kochi Refinery is a powerful tool for quantitative emission and efficiency calculations. It has been developed on Aspen Hysys platform runs on Aspen Online. Shri. Murali Madhavan P, Executive Director (Kochi Refinery) acknowledged the award on behalf of Bharat Petroleum at the virtual ceremony on 27 September 2020

## Best Corporate Citizen Award for BPCL Kochi Refinery 2019

- BPCL Kochi Refinery has won the NIPM Kerala Best Corporate Citizen Award for the third consecutive year. Mr George Thomas, General Manager (PR & Admn), Mr Vineeth M Varghese, Chief Manager (PR & CSR), Mrs Ancy Johnson, Senior Manager (PR & LW) alongwith the CSR team received the trophy from Mr S Suhas IAS, District Collector, Ernakulam at a function held at Kochi on 22 September 2019.

- BPCL Kochi Refinery competed among large companies having a minimum CSR budget above Rs.100 lakhs. The National Institute of Personnel Management (Kerala Chapter) instituted the award for identifying and recognizing the efforts of companies in integrating and internalizing Corporate Social Responsibility into their core business operations. Major CSR projects based on our thrust areas were showcased before the jury alongwith a summary of the CSR activities including the involvement of the CSR Volunteers club during FY 2018-19. This year BPCL KR shares the first prize with Cochin Shipyard Ltd.

## BPCL bags KMA CSR Award 2018


- Bharat Petroleum has bagged the KMA CSR Award 2018 for "Child & Elderly Care" and runners up for "Environment & Greenery" in Public Sector.

- The CSR awards instituted by the Kerala Management Association (KMA) were distributed at the KMA CSR conclave in Kochi on 6 July 2018. Shri. Babu Joseph, Chief General Manager (Maintenance), Shri. George Thomas, General Manager (PR & Admn), Shri. Vineeth M Varghese, Senior Manager (PR & Admn), Ms Ancy Johnson, Manager (PR & LW) along with the CSR team received the trophies and certificates from Shri. Kochouseph Chittilappilly, Chairman and CEO, V-Guard Industries Ltd and a revered philanthropist.

- BPCL received the recognition in "Child & Elderly Care" for the support extended for facility enhancement and supplementary nutrition at 52 Anganwadis (play schools) in the neighbourhood. As part of facility enhancement, five anganwadis in Vadavucode Puthencruz Grama Panchayat were renovated with improved ambience and caring space for children . Under the Anganwadi Nutrition Programme, milk and eggs are being provided to children in the age group 3 to 6 years and adolescent girls in all 52 Anganwadis in Vadavucode Puthencruz Grama Panchayat and Thiruvaniyoor Grama Panchayat where Kochi Refinery is situated.

- Support has also been extended for the purchase of books and book shelves for the Adolescent Girls Clubs (AG Clubs) functioning in these Anganwadis. Books on health, nutrition, well-being, happiness and success have been provided to inspire the young readers.

- BPCL was also adjudged the first runner-up in the category "Environment & Greenery" for the Green Pilgrimage project. This was an exclusive project to promote use of organic colours instead of chemical at the annual ritual of Erumely Pettathullal among Sabarimala devotees who arrive in thousands during the festival. The green pilgrimage was conceptualised with the aim of protecting River Pampa where devotees take the holy dip before the sacred darshan every year.

- Earlier at the conclave, Shri. George Thomas, GM (PR& Admin) presented the Green CSR Initiatives of KR. The stall set up by BPCL and SDI (Kochi), highlighted the CSR initiatives of Kochi Refinery to delegates from Corporate, PSUs, Private companies and NGOs in South India. This accolade for CSR follows soon after the NIPM Best Corporate Citizen Award that BPCL bagged in June 2018.

# Kochi Refinery wins State Pollution Control Award 2018

- BPCL Kochi Refinery has won State Pollution Control Excellence Award instituted by Kerala State Pollution Control Board (KSPCB). Kochi Refinery has achieved this award for the 12th consecutive year for pollution control measures in the category of very large industries.

- Mr. Prasad K Panicker, Executive Director (Kochi Refinery), Mr. Damien Gracious, Chief General Manager (HSE), Mr. ES Anilkumar and Mr. KG Aji received the award on behalf of BPCL Kochi Refinery from Hon'ble Chief Minister of Kerala Mr. Pinarayi Vijayan at a function held at Thiruvananthapuram on 7 June 2018.

- Mr. K Muraleedharan MLA, Mr. K Sajeevan, Chairman, Kerala State Pollution Control Board (KSPCB), Mr. TA Thankappan, Member Secretary (IC), KSPCB and Dr. TN Seema, Vice Chairperson, Haritha Keralam Mission were also present.

## BPCL Kochi Refinery bags NIPM Kerala Best Corporate Citizen Award 2018


- BPCL Kochi Refinery has bagged the NIPM Kerala Best Corporate Citizen Award for the second consecutive year.

- Mr Jayesh Shah, Executive Director (HR), Mr George Thomas, General Manager (PR & Admn) and Mr.Vineeth M Varghese, SM (PR & Admin) along with the CSR team received the trophy and certificate from Mr. APM Mohammed Hanish IAS, Managing Director, Kochi Metro Rail Ltd in Kochi on 23 June 2018. BPCL Kochi Refinery competed among large companies having a minimum CSR budget above Rs.100 lakhs.

- The National Institute of Personnel Management (Kerala Chapter) instituted the award for identifying and recognizing the efforts of companies in integrating and internalizing Corporate Social Responsibility into their core business operations.

- Earlier BPCL Kochi Refinery presented the various CSR initiatives undertaken during FY 2017-18 on 18 June 2018. Five major CSR projects based on our thrust areas were showcased before the jury along with a summary of all the CSR activities including the contributions of the CSR Volunteers club of Kochi Refinery that has a wide representation from among employees and family members. Ms Ancy Johnson, Manager (PR & LW) and CSR Team members Ms. Elizabeth Davis and Mr. PA Mohammed Nizar made the presentation.

## Rajbhasha Rolling Trophy for BPCL Kochi Refinery 2017-18

- BPCL Kochi Refinery has won the prestigious Rajbhasha Rolling Trophy for the year 2016-17 (First Prize), instituted by Kochi Town Official Language Implementation Committee (PSUs) for the best Official Language performance among the Public Sector Undertakings located in Kochi

- Mr P S Ramachandran, Executive Director (Projects), KR received the Trophy from Shri G Muraleedharan ITS, PGMT, BSNL, Kochi and Smt. Girija V R, Sr. Manager (OL), KR received the certificate from Shri A K Choudhury, Director, CIFNET in a function held at BSNL Bhavan, Ernakulam on 12.03.2018. Dr. Susmitha Bhattacharya, Asst. Director (Implementation), Regional Implementation Office, Kochi and Shri Sreenivasa Rao, Dy. General Manager, National Insurance Co. Ltd. were also present.

- Kochi Refinery also won the overall Championship Trophy for scoring highest points in the Joint Hindi Week celebrations-2017 organised under the auspices of Kochi Town Official Language Implementation Committee (PSUs).

- Employees from 36 PSUs situated in Kochi participated in the competitions.

- Mr P S Ramachandran, Executive Director (Projects) & KR team received the trophy from Shri G Muraleedharan ITS, PGMT, BSNL, Kochi.

## KMA Excellence Award 2017

- Kochi Refinery has bagged the "KMA Excellence Award 2017" for its GREEN INITIATIVES. Mr. Damien Gracious, Chief General Manager (HSE), Mr. C Sainath, DGM (Environment) and Mr. Mathew P Thomas, DGM (Power & Utilities) received the award from Ambassador Dr. Deepak Vohra, Special Advisor to Prime Minister, Lesotho and Guinea-Bissau and Special Advisor to Ladakh Autonomous Hill Development Councils, Leh and Kargil at the Annual Awards function of the Kerala Management Association (KMA) on 5 June 2017.
- Mr. Prasad K Panicker, Executive Director (I/C), Kochi Refinery and Past President, KMA, spoke at the function. Sustaining the various environment care initiatives implemented over the years has helped BPCL Kochi Refinery distinguish itself as an environment friendly company.
- At Kochi Refinery, energising environment is a commitment we deliver everyday. From rejuvenating fresh water lakes to recycling waste paper; from solar power plants to biogas plants; from reduction in fuel consumption to reduction in water consumption, from air ambient quality systems to oil spill combat facilities, from de-sulphurisation of fuels to sewage treatment plants, each and every activity implemented here has environment as the prime focus. KR's most recent initiative is the Butterfly Park, which is home to quite a few rare species. KR is also taking the environment care initiatives beyond the immediate community through ENCON Clubs in schools and colleges across Kerala.
- The KMA is a pioneer management association, that has been playing a pivotal role in the promotion and propagation of contemporary management principles and practices in Kerala since 1957. This award for continued excellence in Environment care, has definitely made World Environment Day 2017, special for Kochi Refinery.
- Kudos to KR team on yet another accolade for environment care!

## NIB AWARD 2015-16


BPCL has won the Silver Award in the Best House Journal category in the NiB awards 2016 instituted by the press club Ernakulam and Public Relations Council of India, Kerala Chapter. Mr George Thomas, Chief Manager ( Estates& Administration ) and Mr Vineeth M Varghese, Manager ( Public Relations ) received the award from Mr. V K Ebrahimkunju, Hon'ble Minister for Public Works at a function held at Kochi on 20 February.

## Kerala State Pollution Control Excellence Award 2015-16

- Bharat Petroleum Corporation Limited Kochi Refinery has won the Kerala State Pollution Control Board Excellence Award for the year 2015. We received the Excellence Award in the category of very large Industry for substantial and sustained efforts in Pollution Control and for initiatives in environmental protection for the ninth consecutive year.

- Mr Murali Madhavan, General Manager (Oil Movement and Storage) and Mr Mathew P Thomas, Chief Manager (Energy & Environment) received the the Award from Smt K K Shylaja Teacher, Honb'le Minister for Health, Social Justice and Pollution Control at a function held at Kannur to commemorate the World Environment Day.

## Safety Accolades for BPCL Kochi Refinery 2015-16

- BPCL Kochi Refinery bagged the Outstanding safety Performance Award Instituted by National Safety Council- Kerala Chapter under the category of very large industries. The award was received by KR team headed by Mr PK Thampi, General Manager (Technical) and Mr. Damien Gracious KD, DGM (Fire& Safety) from Mr P Pramod, Director of Factories & Boilers Department, Government of Kerala during Safety Day Celebration held at Productivity House, Ernakulam on 4 March

- BPCL Kochi Refinery also bagged another award for Excellence in Safety Management. Ms. MS Mythily, Member Secretary, Kerala State Pollution Control Board distributed the award. Mr. PK Thampi, GM (Technical) received the award on behalf of Kochi Refinery. Mr Roshan Shihab PM, Chief Manager (F& S) and JHSSEC members were also present.

## Kochi Refinery Wins CPT Award 2015-16

Kochi Refinery won Business Award for the Business House that Handled Highest Cargo through Cochin Port Trust in the financial year 2015- 2016. Mr P Murali Madhavan, General Manager ( OM& S ) received the award from from Mr Paul Antony, IAS , then Chairman of Cochin Port Day 2016 at Kochi on 26 May.

## KR Finance Brings In Awards 2015-16


- BPCL Kochi Refinery Finance has triumphed in the All India Finance Meet 2016 held at Bengaluru on 13 August bringing home three prestigious awards. KR has won the coveted Chairman's Award for Best Business Partner recognizing excellence in Finance function in the Corporation.

- Kochi Refinery has also won the Excellence Award in Accounting & Compliance and has come runner-up in Excellence in Governance. The finance team led by Mr PK Suresh, General Manager (Finance) and Mr Pius Mathew, Deputy General Manager (Project Finance) received the awards. Mr Balasubramanian P, Director (Finance) and Mr R Ramachandran, Director (Refineries) were also present during the award ceremony.

## Commendation for EMC 2014-15

- Kerala State Energy Conversation Commendation Certificate 2015 in category of Large scale Energy Consumers in the State of Kerala during year 2014 – 15 was presented to BPCL KR by the Department of power, Government of Kerala through the Energy Management Centre – Kerala.

- Mr. Thampi P K, General Mnager (Technical ) and Mr Madhu K M Manager (E & E) received the award from Shri Aryadan Muhammed, Honourable Minister for Power, Government of Kerala, on National Energy Consevation Day, 14 December 2015 at Thiruvanathapuram. Mr Sivasankar M, IAS, Secretary, Power Department, Government of Kerala, Mr Manoharan T M, Chairman, KSERC and Damodaran V k, Founder Director, EMC Kerala were also present in the function.

## Top Importer of Cochin for the year 2015


BPCL has been awarded the second Top Importer of Cochin for the year 2015 by Cochin Customs. Mr PK Suresh, General Manager (Finance) received the award from Hon'ble Government of Kerala. Mr. P Sathasivam at a function held in connection with '' International Customs Day" on 27 January at Merchant Navy Club, Willingdom Island, Cochin.

## Certificate of Excellence for outstanding achievement in pollution control by Kerala State Pollution Control Board 2013-14

- We have been receiving Excellence award from the State Pollution Control Board for the last consecutive 7 years
- "Green Manufacturing Excellence Award 2014" in the category of Mega Large Businesses in India in a survey by M/s Frost & Sullivan for the year 2014
- Safety Award 2013 for the meritorious performance in the field of Safety, in Category-A among very large industries, from Factories & Boilers Department- Govt. of Kerala.
- Runner-up award from National Safety Council - Kerala chapter, for outstanding safety performance among very large size chemical industries.

## 2009

Selected as Best Public Sector Undertaking and awarded first price in Large Factories (Petroleum) category by Department of Factories & Boilers, Government of Kerala. Also, the refinery has secured awards for the following:

- Best Safety Committee (First Prize)
- Best Safety Officer (First Prize - Mr. A.K. Das)
- Best Safety Worker (First Prize - Mr. N.R. Rajeev)

- Outstanding Safety Performance Award (First Prize - Large Size Chemical Industries) by Safety Council of India, Kerala Chapter

- Excellence Award for outstanding performance in pollution control by Kerala State Pollution Control Board under very large Industries category

- Received OHSAS 18001-2007 Certification on 18th Jan., 2010

- Kerala State Energy Conservation Award, Commendation Certificate by Energy Management Centre, Kerala

- Gold Award in Petroleum Refinery sector for Safety Management by Greentech Foundation

- Safety Innovation Award in the Oil & Mining Sector (Refinery) from Institution of Engineers India, New Delhi

## 2008

- Best Public Sector Undertaking and awarded first price in the Chemical and Petroleum Category under Large Factories by Department of Factories & Boilers, Government of Kerala. Also, the refinery has secured awards for the following:
    - Best Safety Committee
    - Second Best Occupational Health Centre
    - Second Best Safety Officer
    - Second Best Workman
- First Prize in Refinery Sector for the National Energy Conservation Award by Bureau of Energy Efficiency, Ministry of Power
- State level award for Energy Conservation by Energy Management Centre, Govt. of Kerala.
- Certificate of Excellence for outstanding achievement in pollution control by Kerala State Pollution Control Board

**2007**

- Kerala State Pollution Control Board's Award for outstanding achievement in pollution control performance among large scale industries
- Gold Award in Petroleum Refinery Sector for outstanding achievement in safety management from Green Tech Foundation>
- Safety Innovation Award from Institution of Engineers India, New Delhi
- Award by National Safety Council of India, Kerala Chapter for the following:
  - Outstanding Safety Performance
  - Best Safety Committee
    Excellence in Safety Management

## 2006

- 7th Annual Green-tech Environment Excellence Gold Award in Petroleum Refining sector by Green Tech Foundation, New Delhi
- Outstanding Safety Performance Award - Runner up prize in large scale industries by National Safety Council, Kerala Chapter
- Best Performance Award for the Safety Committee by National Safety Council
- Award of Excellence from Kerala State Pollution Control Board for substantial performance and sustained efforts in pollution control activities

○

ANNEXURE 15

F. No. J-11011/26/2013- IA II (I)
**Government of India**
**Ministry of Environment, Forests and Climate Change**
**(I.A. Division)**

Indira Paryavaran Bhawan
Aliganj, Jorbagh Road,
New Delhi -110003

**E-mail : lk.bokolia@nic.in**
**Telefax : 011: 24695313**
Date: 12th May, 2015

To,

Shri George Paul (Dy. General Manager)
M/s BPCL-Kochi Refinery.
Post Bag No. 2 Ernakulam District
Ambalamugal -682 302, Kerala

**E-mail: georgepaul@bharatpetroleum.in ; Fax No.: 0484-2822006**

**Subject: Propylene Derivatives Petrochemical Project (PDPP) at Village Puthencruz/Thiruvankulam, Tehsil Kunnathanadu, District Ernakulam, Kerala by M/s BPCL-Kochi Refinery- Environmental Clearance reg.**

**Ref. : Your letter no. BPCL-KR-PC7 dated 9th January, 2012.**

Sir,

This has reference to your letter dated 9th January, 2012 alongwith project documents including Form 1, Prefeasibility Report, Draft Terms of References, EIA/EMP report, Public Hearing report and your subsequent letter no. 26-PT-54 dated 19th March, 2015 on the above mentioned subject.

2.0 The Ministry of Environment, Forests and Climate Change has examined the application. It is noted that the proposal is for setting up of Propylene Derivatives Petrochemical Project (PDPP) at Village Puthencruz/Thiruvankulam, Tehsil Kunnathanadu, District Ernakulam, Kerala. Total cost of the project is Rs. 4588 Crore. Plant area is 132.4 Acres of which area earmarked for greenbelt is 40 acres. Polymer grade propylene (250 TMT) will be supplied by the BPCL-Kochi Refinery after implementation of the integrated refinery expansion project (IREP) at Kochi, Kerala. Chitrapuza River (1.0 Km), Panar (1.6 Km) and KaitapuzhaKoyal (5.7 Km) are located within 10 Km distance. It is reported that no national park/wildlife sanctuary/reserve/protected forests are locatedwithin 10 km distance. Following products will be manufactured:

| **Products:** | | |
|---|---|---|
| Ester Grade Acrylic Acid | : | 47,000 Metric Tonnes per Annum |
| Butyl Acrylate | : | 180,000 Metric Tonnes per Annum |
| 2 Ethyl Hexyl Acrylate | : | 10,000 Metric Tonnes per Annum |
| Normal Butanol | : | 38,000 Metric Tonnes per Annum |
| 2 Ethyl Hexanol | : | 47,000 Metric Tonnes per Annum |

| | | |
|---|---|---|
| Iso Butanol | : | 7,000 Metric Tonnes per Annum |
| | | |
| **Plant Capacities:** | | |
| Acrylic Acid Unit | : | 160,000 Metric Tonnes per Annum |
| Acrylate Unit | : | 190,000 Metric Tonnes per Annum |
| Oxo Alcohols Unit | : | 212,000 Metric Tonnes per Annum |

3.0 Off gases and other waste gases generated from the process units will be routed to waste incineration unit for treatment. Low NOx burners will be provided. Online analyzers / Gas monitors will be provided to monitor emissions / leaks. Smokeless flare of adequate height will be provided for safe disposal of gases during emergencies. Total $SO_2$ emissions from PDPP will be 43.4 Kg/hr. Total $SO_2$ emissions after implementation of PDPP alongwith the existing Integrated Refinery Expansion Project (IREP) of Kochi Refinery will be 1561.4 Kg/hr. It is reported that total fresh water requirement from Pariyar River will be 493 m3/hr. for which BPCL – Kochi Refinery has consent from the Govt. of Kerala for drawing water from Periyar River upto 3083.3 $m^3$/hr. Effluent generation will be 35 m3/hr from process, 102.3 m3/hr from cooling tower blow down and 203 m3/hr from condensate. Low COD effluent from process will be treated in combine effluent treatment plant of IREP. High COD effluent will be routed to waste incinerator. Cooling tower blow down will be treated in RO. DM plant and treated effluent will be recycled /reused for cooling tower make up. Condensate will be reused in the IREP project of Refinery. Domestic sewage will be treated in sewage treatment plant (STP). Rain water from PDPP complex will be routed to an oil water separator and will be reused. Oxidation catalyst, Feed purification absorbent and Polymer residue will be sent to the Authorized recycler/re-processors.

4.0 All petro-chemical complexes are listed at S.N. 5(c) under category 'A' and appraised at Central level.

5.0 Public hearing/consultation was conducted by the State Pollution Control Board on 23rd December, 2014.

6.0 The proposal was considered by the Expert Appraisal Committee (Industry) in its meetings held during 5th-7th March, 2013, 28th to 30th April 2014 and 17th-19th February, 2015 respectively. Project Proponent and the EIA Consultant namely Engineers India Ltd., have presented EIA / EMP report as per the TOR. EAC has found the EIA / EMP Report and additional information to be satisfactory and in full consonance with the presented TORs. The Committee recommended the proposal for environmental clearance.

7.0 Based on the information submitted by the project proponent, the Ministry of Environment and Forests hereby accords environmental clearance to above project under the provisions of EIA Notification dated 14th September 2006, subject to the compliance of the following Specific and General Conditions:

**A. SPECIFIC CONDITIONS :**

i. M/s BPCL shall comply with new standards/norms for Oil Refinery Industry and petrochemical industry notified under the Environment (Protection) Rules, 1986.

ii. Continuous on-line stack monitoring for $SO_2$, NOx and CO of all the stacks shall be carried out. Low NOx burners shall be installed.

iii. The emission standards prescribed by the MoEF under Environment (Protection) Act for petrochemical industry shall be strictly followed. At no time, the emission levels shall go beyond the prescribed standards. In the event of failure of any pollution control system adopted by the unit, the respective unit shall not be restarted until the control measures are rectified to achieve the desired efficiency. Stack emissions shall be monitored regularly.

iv. Leak Detection and Repair programme shall be prepared and implemented to control HC/VOC emissions. Focus shall be given to prevent fugitive emissions for which preventive maintenance of pumps, valves, pipelines are required. Proper maintenance of mechanical seals of pumps and valves shall be given. A preventive maintenance schedule for each unit shall be prepared and adhered to. Fugitive emissions of HC from product storage tank yards etc. must be regularly monitored. Sensors for detecting HC leakage shall be provided at strategic locations.

v. Total $SO_2$ emissions after implementation of PDPP including IREP shall not exceed 1561.4 Kg/hr.

vi. Continuous monitoring system for VOCs at all important places/areas shall be ensured. When monitoring results indicate above the permissible limits, effective measures shall be taken immediately.

vii. Ambient air quality monitoring stations, [$PM_{10}$, $PM_{2.5}$, $SO_2$, NOx, $H_2S$, mercaptan, non-methane-HC and Benzene] shall be set up in the complex in consultation with Kerala State Pollution Control Board, based on occurrence of maximum ground level concentration and down-wind direction of wind. The monitoring network must be decided based on modeling exercise to represent short term GLCs.

viii. Ambient air quality data shall be collected as per NAAQES standards notified by the Ministry on 16th November, 2009 and trend analysis w.r.t past monitoring results shall also be carried out. Adequate measures based on the trend analysis shall be taken to improve the ambient air quality in the project area.

ix. The gaseous emissions from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution. Besides, acoustic enclosure /silencer shall be installed wherever noise levels exceed the limit.

x. Total fresh water requirement from Kochi Refinery for PDPP shall not exceed 493 $m^3$/hr and prior permission shall be obtained from the concerned agency. No ground water shall be used.

xi. Industrial effluent shall be treated in the effluent treatment plant. Treated effluent shall be recycled/reused in the existing cooling tower. As proposed, high COD effluent shall be incinerated. Water quality of treated effluent shall be monitored regularly. Online water monitoring system shall be installed for important parameters.

xii. Oil catchers/oil traps shall be provided at all possible locations in rain/ storm water drainage system inside the factory premises.

xiii. Incinerator designed shall be as per CPCB guidelines.

xiv. The Company should strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 *as* amended in October, 1994 and January, 2000. Hazardous waste should be disposed of as per Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008 and amended time to time.

xv. Proper oil spillage prevention management plan shall be prepared to avoid spillage/leakage of oil/petroleum products and ensure regular monitoring.

xvi. The company shall strictly follow all the recommendation mentioned in the Charter on Corporate Responsibility for Environmental Protection (CREP).

xvii. To prevent fire and explosion at oil and gas facility, potential ignition sources shall be kept to a minimum and adequate separation distance between potential ignition sources and flammable materials shall be in place.

xviii. All the recommendations mentioned in the rapid risk assessment report, disaster management plan and safety guidelines shall be implemented.

xix. All the issues raised and commitment made during the public hearing/consultation meeting held on 23rd December, 2014 shall be satisfactorily implemented. Accordingly, provision of budget to be kept.

xx. At least 2 % of the total cost of the project should be earmarked towards the Enterprise Social Commitment (ESC) based on local needs and action plan with financial and physical breakup/details should be prepared and submitted to the Ministry's Regional Office at Bangalore. Implementation of such program should be ensured accordingly in a time bound manner.

xxi. Green belt shall be developed at least in 40 acres of land in and around the plant premises to mitigate the effects of fugitive emissions all around the plant as per the CPCB guidelines in consultation with DFO. Thick greenbelt with suitable plant species shall be developed around unit. Selection of plant species shall be as per the CPCB guidelines.

xxii. Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, Safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

**B. GENERAL CONDITIONS:**

i. The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board (SPCB), State Government and any other statutory authority.

ii. No further expansion or modification in the project shall be carried out without prior approval of the Ministry of Environment & Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.

iii. The project authorities must strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 2000 as amended subsequently. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire Safety Inspectorate etc. must be obtained, wherever applicable.

iv. The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime).

v. A separate Environmental Management Cell equipped with full fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions.

vi. Adequate funds shall be earmarked towards capital cost and recurring cost/annum for environment pollution control measures and shall be used to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government alongwith the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purposes.

vii. The Regional Office of this Ministry/Central Pollution Control Board/State Pollution Control Board will monitor the stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.

viii. A copy of clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parishad / Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions / representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent.

ix. The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; $PM_{10}$, $PM_{2.5}$, $SO_2$, NOx, HC (Methane & Non-methane), VOCs (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.

x. The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB. The Regional Office of this Ministry / CPCB / SPCB shall monitor the stipulated conditions.

xi. The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company alongwith the status of compliance of environmental conditions and shall also be sent to the respective Regional Offices of the MOEF by e-mail.

xii. The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry of Environment and Forests at http:/envfor.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the Regional office.

xiii. Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.

8.0 The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

9.0 The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

10.0 The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention &. Control of Water Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008 and the Public Liability Insurance Act, 1991 along with their amendments and rules.

11.0 Environment Clearance is issued to M/s BPCL-Kochi Refinery for Propylene Derivatives Petrochemical Project (PDPP) at Village Puthencruz/Thiruvankulam, Tehsil Kunnathanadu, District Ernakulam, Kerala.

**(Lalit Bokolia)**
**Additional Director)**

Copy to :-

1. Principal Secretary, Department of Environment & Forest, Govt. of Kerala, Secretariat Annex Building, Room – 604, C Block, 6th Floor, Government Secretariat, Thiruvanathapuram.
2. Chairman, Kerala State Pollution Control Board, Pattom P.O., Thiruvananthapuram
3. Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, Delhi - 110032.
4. The Chief Conservator of Forests, Regional Office (Southern Zone, Bangalore) Kendriya Sadan, 4th Floor, E&F Wing, II Block Koramangala, Banglore-560034.
5. Monitoring Cell, Ministry of Environment, Forests and Climate Change, Indira Paryavaran Bhawan, Jor Bagh, New Delhi-110003.
6. Guard File/Record File.

**(Lalit Bokolia)**
**Additional Director**

भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड
भारत सरकार का उपक्रम
कोच्चि रिफ़ाइनरी

BHARAT PETROLEUM CORPORATION LIMITED
A Govt. of India Enterprise
Kochi Refinery

ANNEXURE 16

**KR.PET.5.EC**

**31st May 2021**

**Ministry of Environment, Forests and Climate Change**
**Regional Office (Southern Zone)**
**Kendriya Sadan, 4th Floor, E&F Wings, 17th main road**
**Koramangala –II Block, Bangalore – 560 034.**

**Kind Attn: Shri. E Thirunavukkarasu – Scientist D**

**Sub: HYCR of stipulated Environmental Conditions for the period October 2020 to March 2021.**

**Ref: MoEF&CC letter no. J-11011/26/2013-IA II (I) dated 12th May, 2015 granting Environmental Clearance for Propylene Derivatives Petrochemical Project (PDPP) by Bharat Petroleum Corporation Limited, Kochi Refinery, Ambalamugal, Ernakulam District, Kerala:**

Respected Sir,

With reference to the above referred EC letter, please find enclosed the Half Yearly Compliance Report (HYCR) for the period 1st October 2020 to 31st March 2021 on various conditions laid down by MoEF&CC along with applicable annexures/updates.

Encl: Half yearly compliance report for the period October 2020 to March 2021

Thanking you,
Very truly yours
For BPCL Kochi Refinery

SREERAM A N
Chief General Manager (Project Technical & Petchem)

Copy to:

1. The Member Secretary (Industry –II)

Ministry of Environment, Forests and Climate Change (MoEF&CC)
Indira Gandhi Paryavaran Bhavan, Jorbagh Road,New Delhi, 110003

2. The Member Secretary
Central Pollution Control Board
Parivesh Bhawan, CBD-cum-Office Complex
East Arjun Nagar
Delhi – 110 032.

3. The Member Secretary
Kerala Pollution Control Board
Plamoodu Junction
Pattom (PO),
Thiruvananthapuram – 695 004

4. The Environmental Engineer,
Kerala State Pollution Control Board
District Office -2, Perumbavoor, Ernakulam.

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Note : As per directive from Ministry of Environment Forest & Climate Change (MOEF&CC) siting notification published in Extraordinary Gazette No: 5845 dated 28th November 2018, regarding amendment to the EIA notification of 2006, **hard copies of attached HYCR is not being submitted and only soft copies are being submitted via email.**

| S.No.as per Env.Ltr.No. J-11011/26/2013-IA-II I), Dtd.: 12/05/2015 | COMMENTS | Compliance Status |
|---|---|---|
| | **SPECIFIC CONDITIONS** | |
| I | M/s BPCL shall comply with new standards/norms for Oil Refinery Industry and petrochemical industry notified under the Environment (Protection) Rules, 1986. | The project / facility is complying with applicable standards and norms for Oil Refinery Industry and petrochemical industry notified under the Environment (Protection) Rules, 1986.<br><br>The facility is currently understartup phase, two process units have started operation, continuous run and stabilization is yet to achieve, and third process unit startup is planned during June 2021.<br><br>Stabilization& continuous operation of the complex is targeted to be achieved in a phased manner during the period June - Aug 2021. |
| ii | Continuous on-line stack monitoring for $SO_2$ $NO_X$ and CO of all the stacks shall be carried out. Low $NO_x$burners shall be installed. | There are no fired heaters or fired boilers in the project facility, Waste Incinerators installed in the complex are having low $NO_x$.burners.<br><br>Stack analyzers are commissioned, calibrated and ensured to be in working condition, Continuous on-line stack monitoring is ensured. |
| iii | The emission standards prescribed by the MoEF under Environment (Protection) Act for petrochemical industry shall be strictly followed. At no time, the emission levels shall | There are no fired process heaters /fired boilers in the PDPP Project. Two (2) Nos. of waste incinerators installed in the facility are designed to consume clean fuels like vaporized LPG/LNG. |

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| | go beyond the prescribed standards. In the event of failure of any pollution control system adopted by the unit, the respective unit shall not be restarted until the control measures are rectified to achieve the desired efficiency. Stack emissions shall be monitored regularly. | The incinerators are operating complying with the prescribed emission standards. Stack emissions are also monitored regularly. |
| iv | Leak Detection and Repair program shall be prepared and implemented to control HC/VOC emissions. Focus shall be given to prevent fugitive emissions for which preventive maintenance of pumps, valves pipelines are required. Proper maintenance of mechanical seals of pumps and valves shall be given. A preventive maintenance schedule for each unit shall be prepared and adhered to. Fugitive emissions of HC from product storage tank yards etc. must be regularly monitored. Sensors for detecting HC leakage shall be provided at strategic locations. | Detailed leak detection and repair program for monitoring and repair of VOC leak points, leak detection and repair survey are already identified; the frequency of monitoring of leaks and schedule of repairs of leak will be as per CPCB guidelines for LDAR program/OISD 224 guidelines.<br><br>Plant-wise PM check schedule for the periodic health check-up of the Rotary Equipment is prepared.<br><br>All storage tank breathing vents are routed to incinerator as per design. Gas detectors are already provided at strategic locations.<br><br>In order to reduce fugitive emissions of volatile organic compounds from the complex.<br>1.Sealless canned pumps are installed in organic liquid services<br>2. Special gland packing material provided in valves to reduce fugitive VOC emissions from glands.<br><br>Hydrocarbon, toxic gases and VOC detectors are installed in the complex. Total number of 351 gas detectors and 8 VOC detectors are available in the complex. |
| v | Total $SO_2$ emissions after implementation of PDPP including IREP SHALL NOT EXCEED | The fuel for firing in Incinerators is vaporized LPG/LNG having very low sulfur content. |

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| | 1561.4 Kg/hr. | The SO2 emissions after implementation of PDPP including IREP is not exceeding 1561.4 kg/hr. |
| vi | Continuous monitoring system for VOCs at all important places/areas shall be ensured. When monitoring results indicate above the permissible limits, effective measures shall be taken immediately. | Photo ionization detectors (fixed VOC meters) installed at eight (8) important locations in and around the PDPP units/other facilities for continuous monitoring of VOCs. These detector readings are being monitored and generation of alarm is configured in case of detection at ppm level. |
| vii | Ambient air quality monitoring stations ($PM_{10}$,$PM_{2.5}$,$SO_2$, $NO_x$, $H_2S$, mercaptan, non-methane-HC and Benzene) shall be set up in the complex in consultation with Kerala State Pollution Control Board, based on occurrence of maximum ground level concentration and down-wind direction of wind. The monitoring network must be decided based on modeling exercise to represent short term GLCs. | One AAQMS STATION for continuous monitoring of SO2, NO-NO2, NOX,NH3,CO,OZONE,HC,H2S,MERCAPTAN,BTX,VOC,PM 10 (SPM), PM 2.5 (RSPM) and meteorological data etc.is already installed and powered ON at the location approved by Kerala State Pollution Control Board.<br><br>Continuous monitoring is ensured. Air quality is ensured to be complying with NAAQES standards.<br><br>The same is being connected to display board which is positioned facing PWD (public) road for visibility. |
| viii | Ambient air quality data shall be collected as per NAAQES standards notified by the Ministry on 16th November, 2009 and trend analysis w.r.t. past monitoring results shall also be carried out. Adequate measures based on the trend analysis shall be taken to improve the ambient air quality in the project area. | Ambient air quality data monitoring has started from new AAQMS installed in the complex along with existing AAQMS stations available around the refinery. Air quality is ensured to be complying with NAAQES standards. |

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| ix | The gaseous emission from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution.<br>Besides, acoustic enclosure/silencer shall be installed wherever noise levels exceed the limit. | Complied.<br><br>Gaseous emissions from DG sets are designed to be dispersed through stack heights as per CPCB standards.<br><br>Acoustic enclosure is installed for DG set. |
| X | Total fresh water requirement from Kochi Refinery for PDPP shall not exceed 493 $m^3$/hr and prior permission shall be obtained from the concerned agency. No ground water shall be used. | The total fresh water requirement will be less than 493 $m^3$/hr which is within the total sanctioned quantity of 3083.3 $m^3$/hr for integrated refinery complex by Govt. of Kerala.<br><br>The actual consumption for the complex is within the limit, complete compliance data will be available after stabilization of the facility, when units operate at design capacity. |
| xi | Industrial effluent shall be treated in the effluent treatment plant. Treated effluent shall be recycled/reused in the existing cooling tower. As proposed, high COD effluent shall be incinerated. Water quality of treated effluent shall be monitored regularly. Online water monitoring system shall be installed for important parameters. | Industrial effluents are incinerated or treated in ETP before final disposal through existing outlets. Also online water monitoring facility available at existing refinery effluent outlet. |
| xii | Oil catchers/oil traps shall be provided at all possible locations in rain/storm water drainage | Oil catchers/oil traps provided at necessary locations. Also rain /storm water outlet from each area is routed to retention pond, where |

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| | system inside the factory premises. | quality of water is analyzed and ensured before routing to outlet. |
| xiii | Incinerator designed shall be as per CPCB guidelines. | Two numbers of incinerators installed within the PDPP complex ensure final effluent /emission quality as per CPCB guidelines. |
| xiv | The Company should strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended in October, 1994 and January, 2000. Hazardous waste should be disposed of as per Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008 and amended time to time. | Disposal of Hazardous waste ensured complying to hazardous waste rules 2008. |
| Xv | Proper oil spillage prevention management plan shall be prepared to avoid spillage/leakage of oil/petroleum products and ensure regular monitoring. | Oil spillage prevention is taken care at the design stage itself. adequate facilities are maintained to prevent and contain oil spillage / storm water contamination for PDPP complex |
| Xvi | The company shall strictly follow all the recommendation mentioned in the Charter on Corporate Responsibility for Environmental Protection (CREP). | Complied to the points mentioned in CREP that is applicable for PDPP project |
| xvii | To prevent fire and explosion of oil and gas facility, potential ignition sources shall be kept to a minimum and adequate separation | PDPP facility is designed as per OISD &PESO guidelines and the facilities satisfy separation distances as specified by OISD standards 118 /other applicable and relevant conditions of Petroleum rules. |

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| | distance between potential ignition sources and flammable materials shall be in place. | PESO approval for commissioning of process units and related facilities are obtained, PESO storage license for all applicable products and intermediates obtained based on completion and site inspection by PESO/OISD officials. |
| xviii | All the recommendations mentioned in the rapid risk assessment report, disaster management plan and safety guidelines shall be implemented. Accordingly, provision of budget to be kept. | All recommendations mentioned in rapid risk assessment report implemented. Quantitative risk assessment also conducted and all recommendations implemented at applicable stages of project.<br><br>Emergency Response and Disaster Management Plan prepared including scenarios identified during risk assessment report. |
| Xix | All the issues raised and commitment made during the public hearing/consultation meeting held on 23rd December 2014 shall be satisfactorily implemented. Accordingly, provision of budget to be kept. | BPCL-KR has complied with commitment made during the public hearing/consultation meeting held on 23rd December 2014.<br><br>Status/closing comments on Public Hearing commitments was already submitted to MoEF&CC, RO along with previous HYCR (for the period April 2020- September 2020). |
| xx | At least 2% of the total cost of the project should be earmarked towards the Enterprise Social Commitment (ESC) based on local needs and action plan with financial and physical breakup / details should be prepared and submitted to the Ministry's Regional Office at Bangalore. Implementation of such program should be ensured accordingly in a time bound manner. | Action plan prepared and already submitted along with the previous compliance report (for the period April 2020- September 2020). Being implemented in consultation with local authorities/ Govt. departments/ administration based on requirements.<br><br>Status of ESC spending is attached as **Annexure 1.** |

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| xxi | Green belt shall be developed at least in 40 acres of land in and around the plant premises to mitigate the effects of fugitive emissions all around the plant as per the CPCB guidelines in consultation with DFO. Thick greenbelt with suitable plant species shall be developed around unit. Selection of plant species shall be as per the CPCB guidelines. | Green belt development completed for the project. Details are attached as **Annexure 2.** |
| xxii | Provision shall be made for the housing of construction labor within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project. | All necessary infrastructures, labor camps, medical facilities arranged during construction, precommissioning activities. |
| **GENERAL CONDITIONS** | | |
| i | The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board (SPCB), State Government and any other statutory authority. | BPCL-KR is adhering to the stipulations made by KSPCB, State Govt. and other statutory bodies.<br><br>Consent to Operate obtained from KERALA -SPCB Consent No: PCB/HO/EKM-2/ICO/09/2019 - Dated 20-08-2019 |
| ii | No further expansion or modification in the project shall be carried out without prior approval of the Ministry of Environment &Forests. In case of | Complied. |

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| | deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any. | |
| iii | The project authorities must strictly comply with the rules and regulations under manufacture, Storage and import of Hazardous Chemical Rules, 2000 as amended subsequently. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire Safety Inspectorate etc. must be obtained, wherever applicable. | For PDPP project, BPCL-KR has obtained all necessary approvals from Kerala Factories& Boilers, Chief Controller of Explosives, Fire Safety Inspectorate etc. wherever required. BPCL-KR will comply with the rules and regulations under manufacture, Storage and import of Hazardous Chemical Rules, 2000.<br><br>PESO prior approval was obtained for overall plot plan, overall area classification, fire water layout, equipment layout of individual facilities inside the complex vide. Letter P 5(2)496 /Refinery - dated 07-12-2016<br><br>Process units commissioning approval obtained from PESO vide following letters, P 5(2)496 /Refinery II dated 04-08-2020, P 5(2)496 /Refinery II dated 16-12-2020, and P 5(2) 496 /Refinery II dated 28-01-2020<br><br>PESO License for storage was obtained as applicable under Storage License numbers P/HQ/KL/15/1336 (P485172) & P/HQ/KL/15/1337 (P485168).<br><br>Kerala Factories and Boilers had accorded permit to construct the facility vide. Permit number 109/2019Doc No.T3/10811/2019/F&B/R Dis, Dated 08-05-2019 |

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| | | After completion, Factory license was amended by Kerala Factories and Boilers including PDPP project facilities. Amendment of factory license including PDPP project, Permit No.109/2019; Amendment letter dated 16-Sept-2020.<br><br>NOC was obtained from Kerala Fire and Rescue department for the facility.D1-7904/2016 - Dtd.14.12.2018 from Regional fire office Ernakulam, Kerala. |
| iv | The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time). | The overall noise level are limited at the fence as prescribed under EPA rules/ SPCB advisory.<br><br>Noise control measures including acoustic hoods and silencers, enclosures on all sources of noise generation are installed as per design of the facility.<br><br>Regular monitoring of Noise levels at boundary areas conducted by dedicated team to ensure the same. |
| V | A separate Environmental Management Cell equipped with full-fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions. | BPCL-KR is having a separate Environment Management section to carry out environmental management and monitoring functions. We have well equipped Centralized Quality Control Laboratory for PDPP project related monitoring activities. |
| vi | Adequate funds shall be earmarked towards capital cost and recurring cost/annum for environment pollution control measures and shall | BPCL-KR has earmarked adequate funds for environment pollution control measures. The funds are utilized / planned for installing, operating and maintaining |

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| | be used to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purposes. | 1. Conventional and Submerged type, liquid and gaseous waste incinerators online to meet final effluent quality.<br><br>2. AAQMS station and monitoring facilities online<br><br>3. VOC meters for continuous monitoring of<br><br>4. LDAR program for operation phase of the complex.<br><br>Greenbelt development and maintenance activities are also ensured. |
| vii | The Regional Office of this Ministry/Central Pollution Control Board/State Pollution Control Board will monitor the stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly. | Six monthly compliance reports being submitted by BPCL-KR at stipulated interval. |
| viii | A copy of clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parishad/Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the Company by the proponent. | BPCL-KR has complied with this condition. Copies of clearance letter was sent to all local bodies. |
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| | | |
|---|---|---|
| ix | The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; PM10, PM2.5, SO2, NOx, HC (Methane of Non-methane), VOCs (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain. | Six monthly compliance reports being submitted without fail by BPCL-KR after receipt of the Environmental Clearance for the PDPP project. The same being sent to the Regional Office of MoEFCC and also uploaded in the BPCL website.<br><br>The criteria pollutant levels namely; PM10, PM2.5, SO2, NOx, HC, VOCs being monitored utilizing a combination of<br>- 350 Nos. of HC/Hydrogen /other detectors installed and continuously monitored in the complex.<br>- 8 Nos. of Photo ionization detectors installed for continuous VOC detection<br>- AAQMS station at location approved by KSPCB.<br>Display of ambient air quality at a convenient location near the main gate of the company in the public domain is being arranged before continuous run of facility is established. |
| x | The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB. The Regional Office of this Ministry/CPCB/SPCB shall monitor the stipulated conditions. | Six monthly compliance reports were submitted by BPCL-KR after receipt of the Environmental Clearance for the PDPP project. The same was sent to the Regional Office of MoEF&CC and uploaded in the BPCL website. |
| xi | The environmental statement for each financial year ending 31st March in Form-V as is mandated | BPCL-KR will comply. Environment statement will be submitted |

| | | |
|---|---|---|
| | to be submitted by the Project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Offices of the MOEF by e-mail. | once, facility operation is stabilized to generate continuous operating data. |
| xii | The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at website of the Ministry of Environment and Forests at http:/envfor.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and the copy of the same shall be forwarded to the Regional Office. | BPCL-KR has complied with this condition. |
| xiii | Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work. | Investment clearance from Board obtained on 03.12.2014 and land development started subsequently.<br>Currently the project is startup phase. |

**Enterprise Social Commitment (ESC)- Schemes completed/under progress**

**Propylene Derivatives Petrochemical Project (PDPP) – BPCL Kochi Refinery**

**Status as on April 2021**

| Area of spending | Schemes | Amount (Rs. Crore) | Remarks |
|---|---|---|---|
| Infrastructure Development | Construction of road to residential area near PDPP and rerouting the canal | 25.15 | Completed |
| | Rejuvenation of Ponds and canals near refinery/PDPP site | 0.73 | Continues |
| | Rural road development (near refinery/PDPP site) | 2.36 | Continues |
| | Support for indoor stadium for local public at Kunnathunadu Grama panchayat | 0.39 | Continues |
| | Support for the construction of crematorium in Poothrikka Grama Panchayat | 0.50 | Continues |
| | Setting up of Cyber Dome for social media and internet monitoring at Kochi by Kerala Police | 1.00 | Completed |
| | Support for construction of new building for Library in Thiruvaniyoor Grama Panchayat | 0.23 | In progress |
| | Rehabilitation of residents (Urban Poor) at Vennalappara | 0.57 | Continues |
| Health, Nutrition & Hygiene | COVID related sanitization works in the area and related jobs | 0.17 | Completed |
| | Provision of food and provisions for nearby areas and colonies during lock down period | 0.20 | Completed |
| | Medical camp at various locations | 0.08 | Completed |
| Education | Construction of toilets in schools in Thiruvaniyoor Grama Panchayat | 0.60 | Completed |
| | Swachh Vidyalaya in Vadavucode Puthencruz Grama Panchayat | 0.56 | Completed |
| | Swachh Vidyalaya in Tripunithura Municipality | 0.27 | Continues |
| | Construction of new school building for Irumpanam Lower Primary Schools - Tripunithura Municipality | 0.39 | Continues. |
| | *Vidyadhanam*proj - one time scholarship scheme for children of Kochi city | 0.50 | Completed |
| | Infrastructure development at Govt Schools | 0.28 | Completed |
| Skill development | Safety Training vehicle for Factories & Boilers (to create safety awareness among children and industrial workers) | 0.68 | Continues. |
| **Total** | | **34.66** | |

# ANNEXURE -2

## Green Belt Development compliance status

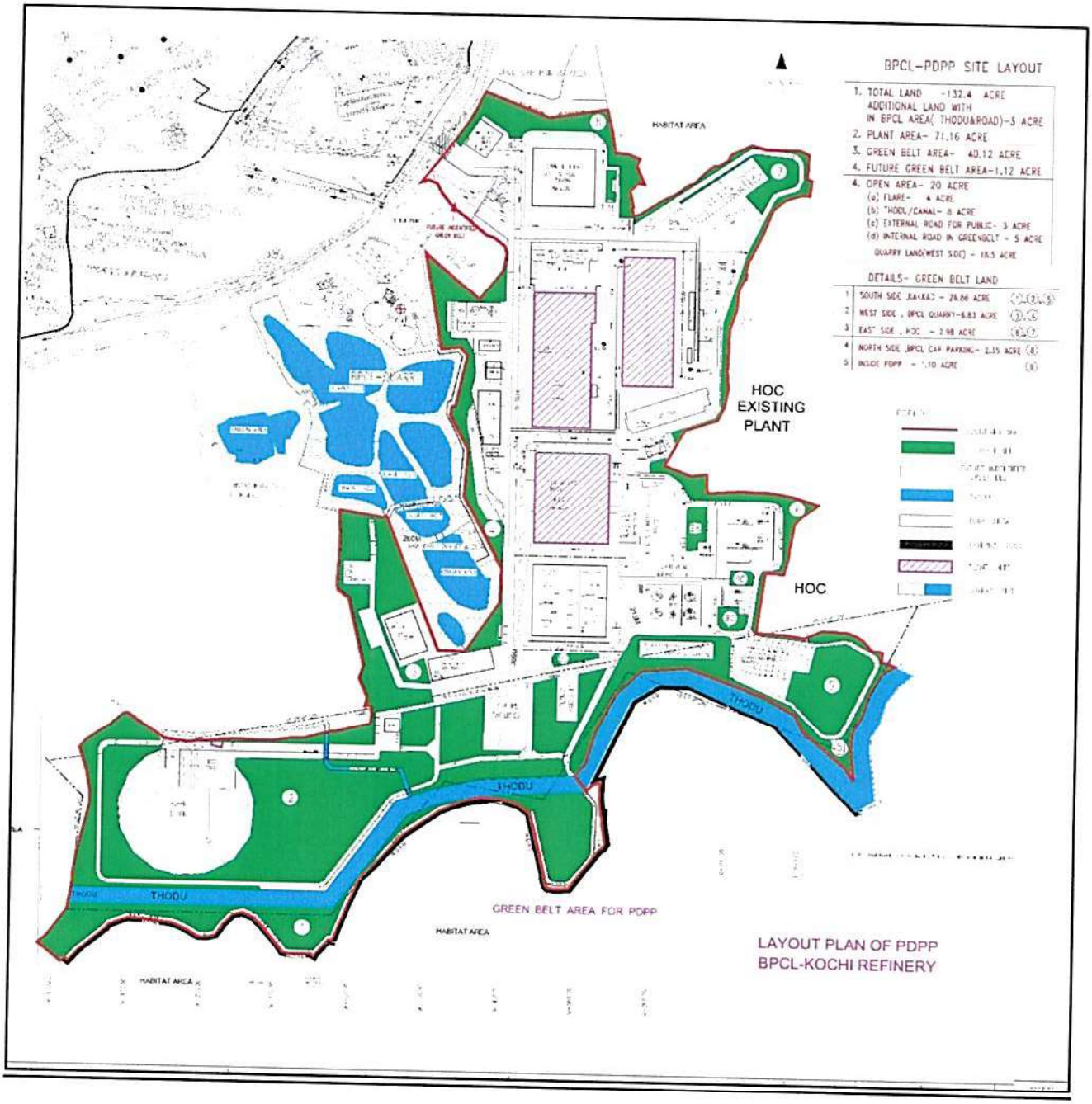
As per the EC conditions, Green belt to be developed at least in 40 Acres of land in and around the plant premises. The latest compliance status of Green belt development – PDPP Project is provided below.

| **Green Belt details** | | **Status ( April 2021)** | |
|---|---|---|---|
| Green belt area requirement | | Specific condition xxi of EC clearance letter- 40 Acres | |
| Green belt compliance status | | **40 Acres greenbelt development was completed on 31.03.2021.** | |
| Details of plantations | | **Total saplings : 25768** Nos. of saplings | |
| Details of plant species | | Identified in consultation with Dr. Induchoodan, Retd. Deputy Conservator of Forests at Kerala forest Department | |
| **SL. No** | **Year (FY)** | **No. of trees survived** | **Area of green belt developed** |
| 1 | 2017-2018 | 510 | 0.91 ACRES |
| 2 | 2018-2019 | 2519 | 1.84 ACRES |
| 3 | 2019-2020 | 697 | 1.33 ACRES |
| 4 | 2020-2021 | 22042 | 36.02 ACRES |
| **TOTAL** | | **25768** | **40.1 ACRES** |

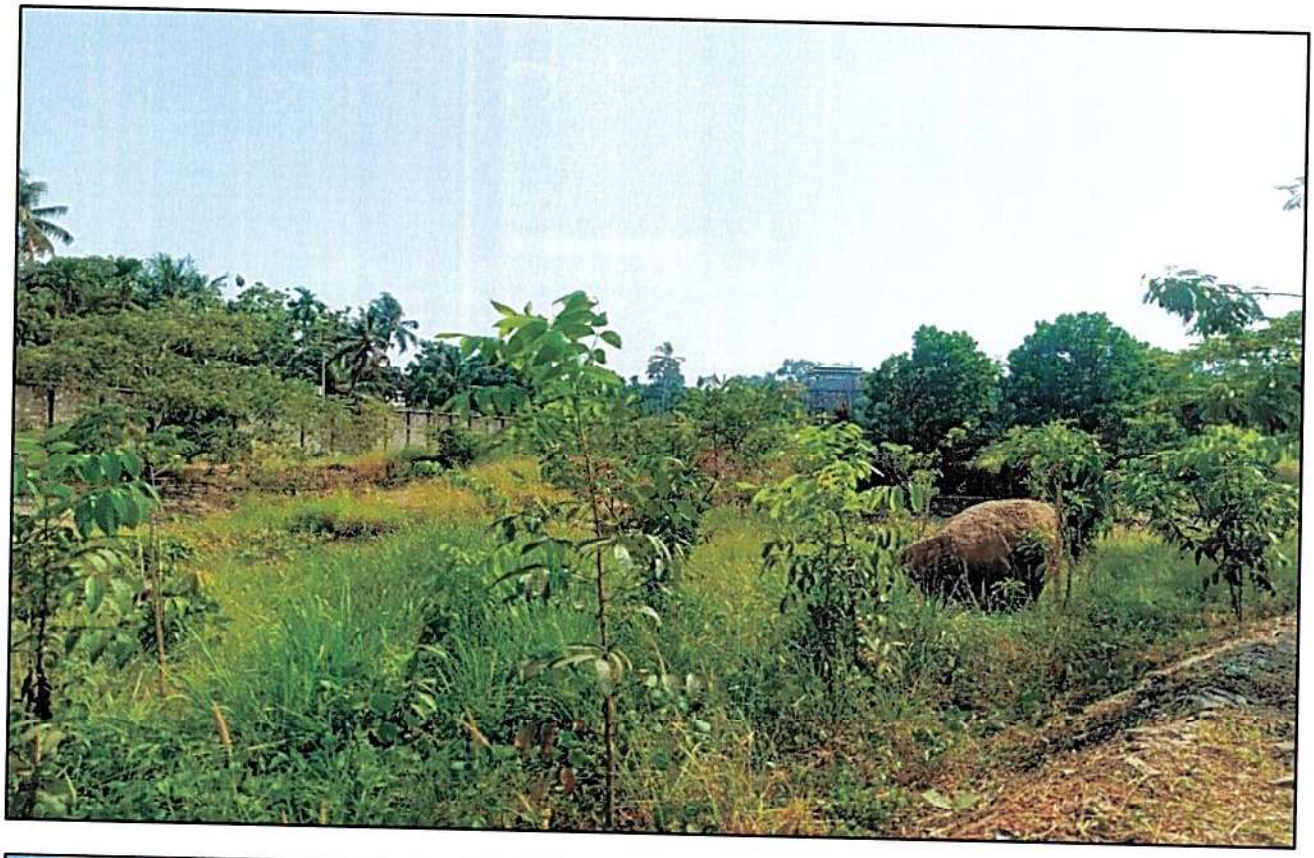
Note:

- Miyawaki forests being developed in selected locations of PDPP greenbelt in a total of 65 Cents of land for the faster and denser development of green belt.
- Areas marked in green shades – plantation is completed by 31st March 2021.(40 Acres)

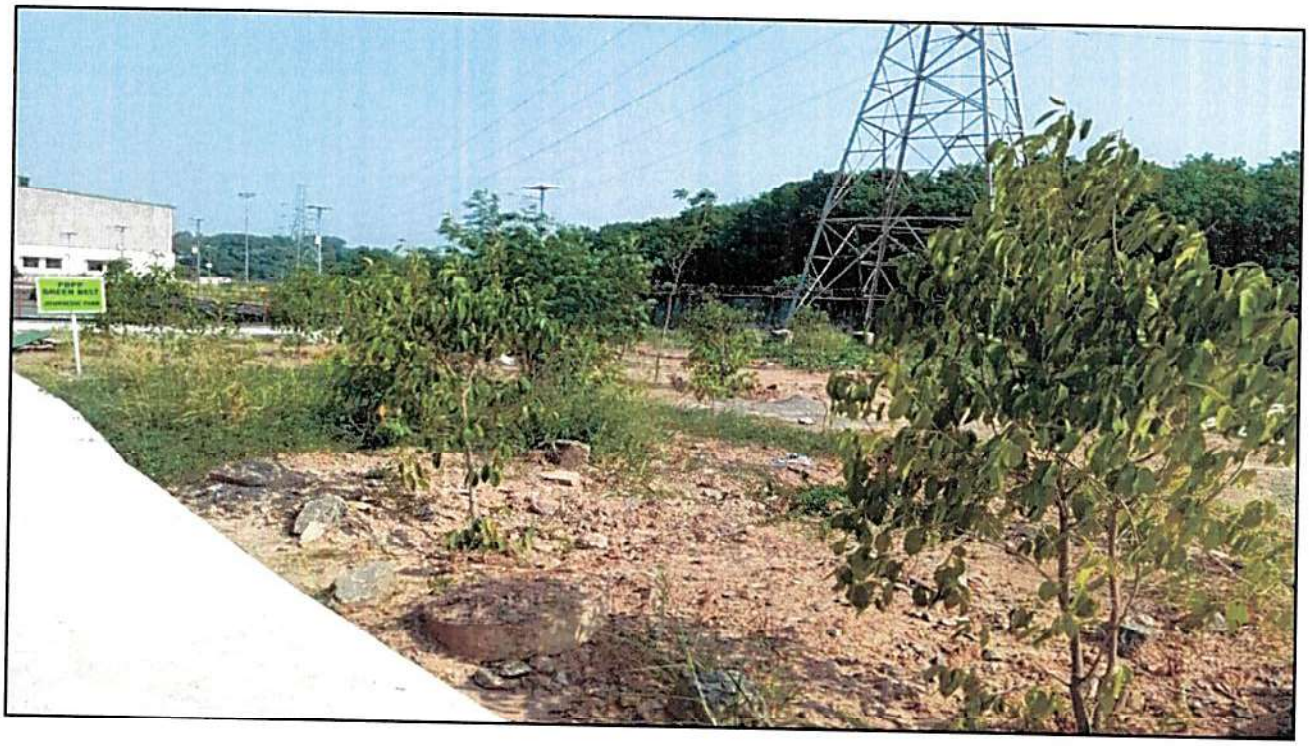
## GREEN BELT DEVELOPMENT AREA MARKED IN LAYOUT – APRIL 2021



## PHOTOPGRAPHS OF GREENBELT DEVELOPMENT (MARCH -2021)




Name : Pisava
Botanical Name : Artocarpus heterophyllus
Family : Moraceae
Sanskrit : Panasam
English : Jackfruit
Uses : Anti-inflammatory, anti-microbial diuretic
Parts Used : Fruit, bud, bark



BPCL-KOCHI REFINERY -LAND DETAILS

# ANNEXURE 17

PREVALING WIND DIRECTION

N

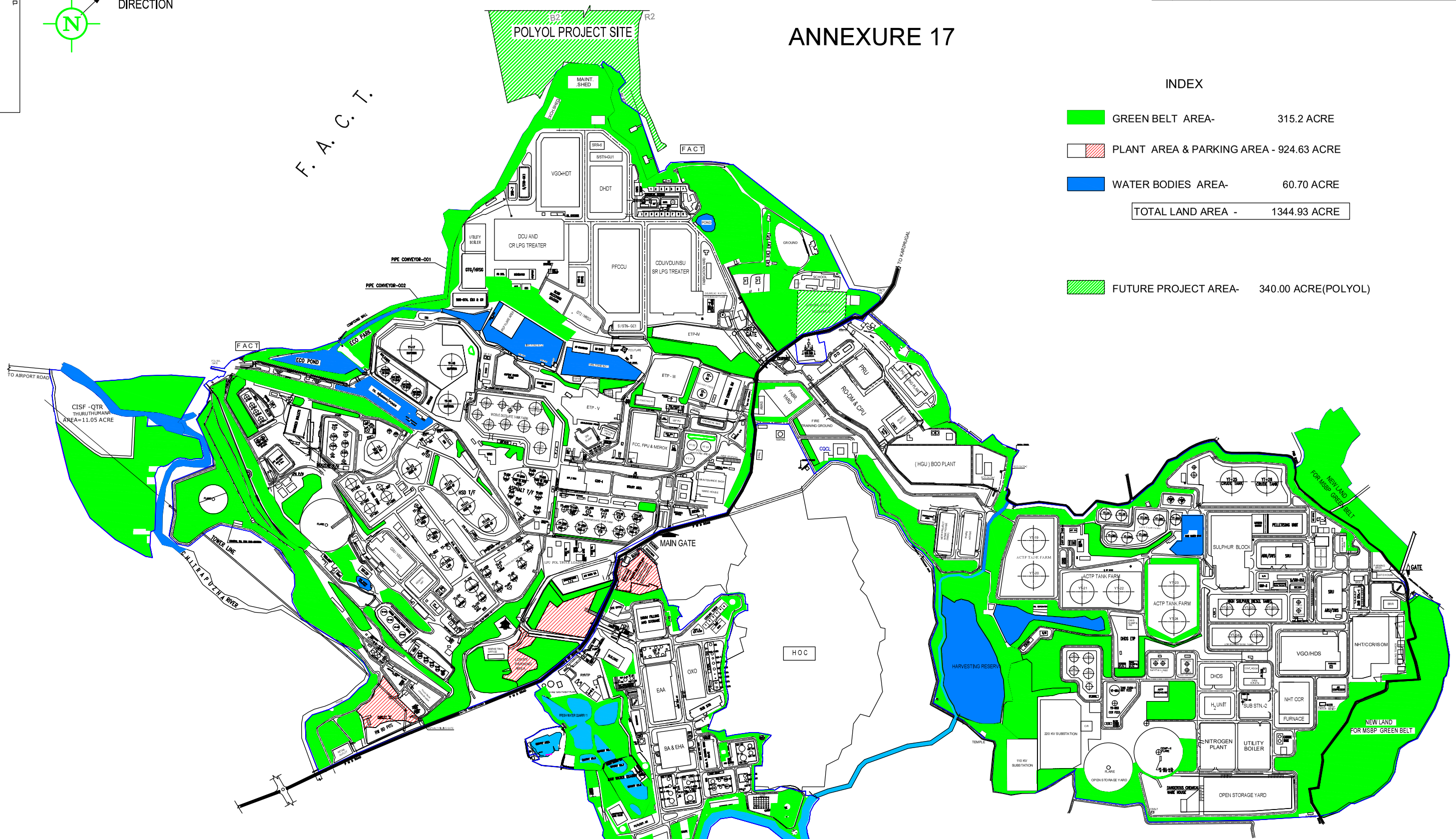
| LIST OF MATERIALS | | |
|---|---|---|
| ITEM | QTY. | DESCRIPTION |

## INDEX

- GREEN BELT AREA- 315.2 ACRE
- PLANT AREA & PARKING AREA - 924.63 ACRE
- WATER BODIES AREA- 60.70 ACRE

TOTAL LAND AREA - 1344.93 ACRE

- FUTURE PROJECT AREA- 340.00 ACRE(POLYOL)




NOTES:

1. ALL DIMENSIONS AND CO-ORDINATES ARE IN METERS.

| NO. | DATE | REVISIONS | DRN. | CHD. | APRD. |
|---|---|---|---|---|---|
| | | | | | |

| | | |
|---|---|---|
| UNIT/AREA | DESIGN | SSPS |
| | DRAWN | AGV |
| | CHECKED | SBJ |
| | " | |
| | APPROVED | CHK(ST) |
| | " | CHK(LE) |
| | " | GM(PR&A) |
| | " | COMOHR-I/C) |
| | " | |
| REFERENCE DRAWING | " | |

भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड
BHARAT PETROLEUM CORPORATION LIMITED
कोच्चि रिफ़ाइनरी
KOCHI REFINERY

TITLE:-

OVERALL PLOTPLAN - GREEN BELT OF KR

| DATE 01/06/2021 | SCALE | DRAWING NO. KR-A0-00-09-7200 | SHT. 1 OF 1 |
|---|---|---|---|
| W.O. NO. | | | REV. 0 |

ANNEXURE 18

# BPCL KR PHOTO NO: 1

# BPCL KR PHOTO NO: 2

# BPCL KR PHOTO NO: 3

# BPCL KR PHOTO NO: 4

# BPCL KR PHOTO NO: 5

# BPCL KR PHOTO NO: 6

# BPCL KR PHOTO NO: 7

# BPCL KR PHOTO NO: 8

# BPCL KR PHOTO NO: 9

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# BPCL KR PHOTO NO: 38

BPCL KR PHOTO NO: 39

BPCL KR PHOTO NO: 40

ANNEXURE 19

**¦ÉÉ®úiÉ ºÉ®úEòÉ®ú**
**GOVERNMENT OF INDIA**
{Éä]ÅõÉäÊ±ÉªÉ¨É ¡ÉlÉÉ Ê´Éº¡òÉä]õEò ºÉÖ®úlÉÉ ºÉÆMÉ`öxÉ ({ÉäºÉÉä)
**PETROLEUM AND EXPLOSIVES SAFETY ORGANIZATION (PESO)**
EòÉªÉÉÇ±ÉªÉ ={É-¨ÉÖJªÉ Ê´Éº¡òÉä]õEò ÊxÉªÉÆjÉEò
**OFFICE OF THE DEPUTY CHIEF CONTROLLER OF EXPLOSIVES**
EäòÎxpùªÉ ¦É´ÉxÉ, EòÉEòxÉÉRó, B®úxÉÉEÖò±É¨É, EòÉäÎSSÉ, (Eäò®ú±É) - 682037
**Kendriya Bhavan,Kakkanad,Ernakulam, Kochi,(KERALA) - 682037**
Fax: (0484)2427276, Ph: 2427286, 2427296

No. P/ General/2021/8 Dated: 06/08/2021

To
The Environmental Engineer.
KSPCB, Ernakulam

Sub: - Technical Committee report on the ground realities of allegations against BPCL-Kochi Refinery, Ambalmugal, Kochi-Regarding

Ref: - Letter No.PCB/EKM/DOII/IOA-217/07,Dated 03/08/2021.

Sir,

The Final Copy of the report as forwarded by you with your letter under reference is signed and forwarded herewith the following dissent note. The same may please be kept attached to the final report.

PESO is not consensual with the recommendations given in item 3 of Chapter 5 of the report regarding the requirement of buffer zone of 250-300m around the refinery as per the recommendations clause 10.20(ii) of the M B Lal committee's report, since the same is not incorporated in the Petroleum Rules as yet. The committee can report on the existing statutes and not on the basis of some other committee's recommendations. Moreover, all the licences/ approvals granted by PESO to the BPCL-Kochi refinery under the Petroleum Rules are only after receipt of the No Objection Certificate (NOC) from the District Magistrate (DM). The NOC issued by the DM is after due consideration of all safety aspects of the vulnerable sections of society as stated in Clause 10.20(i) of the M B Lal committee,s report. Hence recommendations for implementation of 250-300 meter green belt may be deleted in the report if it is not statute under the acts and rules administered by other organizations.

Yours Faithfully,

(Dr P K Rana)
Controller of Explosives
For Dy. Chief Controller of Explosives, Ernakulam

**Copy for information to:**
The Chairman, State Polution Control Board
Trivandrum, Kerala

ANNEXURE 20

# Thiruvaniyoor Gramapanchayat Office

Thiruvaniyoor P O , Ernakulam Pin:- 682308
thiruvaniyoorgp@gmail.com

**No: P-1/16** **Date : 02/02/2016**

**From,**
President,
Thiruvaniyoor Gramapanchayat

**To,**
BPCL Kochi Refinery, Ambalamugal

**Sir,**

**Sub** :Meeting of Land development at Thiruvaniyoor for Petchem Project.

**Ref** :Meeting on 09/12/2015 and its minutes.

With reference on above subject and reference in the minutes of meeting in point no.2, 'the diversion canal width shall be with 11meters at bottom , 23 metres top and 5 metres depth', "should be at the Southern side of the Project property" may be added and it may be implemented as shown in the site plan produced along with this letter and copy of minutes on 9th December, 2015.

Yours faithfully

Adv. K C Paulose
President
Thiruvaniyoor Gramapanchayat

PRESIDENT
THIRUVANIYOOR GRAMA PANCHAYAT

**A Meeting and site visit on Land development, Drainage diversion & boundary wall construction at Thiruvaniyoor for Petchem Project on 9.12.2015 & 01.02.2016.**

**Present**

**Local**

Mr Paulose KC,
President, Thiruvaniyoor Grama Panchayath

Ms Ambily Shibu,
Member, Block Panchayath

Mr Regi Illikkapparambil
Member Thiruvaniyoor Grama Panchayath

Mr Thankappan KO,
Mr Rajan OP,

Mr Prasad M,
Mr Sajeev NS,

Local Resident

**BPCL Kochi Refinery**

Mr Suresh John,
DGM (Petchem-Civil)

Mr George Paul,
DGM (Project Tech- Petrochem)

Mr George Thomas,
CM (E&A)

Mr Johnson K,
SM (Petchem)

Mr Vineeth M Varghese,
Manager (PR)

Ms Ancy Johnson,
Dy Manager (PR & LW)

**Minutes of Meeting**

A meeting was convened on Land development, drainage diversion and boundary wall construction at Thiruvaniyoor for Petchem Project. Panchayat Preseident presented the concerns of the local community in connection with boundary wall constructions and land development activities for PDPP.

After detailed discussions, there was a combined site visit to resolve the issues. The following points were discussed and agreed.

1. Storm water canal for a length of 750 Mtrs approximate length starting from HOC boundary wall corner will be diverted outside boundary wall and drains from Puthencruz and Thiruvaniyoor will be joined in the canal and flow will be along the southern side of PDPP property as per the attached sketch and the canal in this stretch will be retained outside KR boundary wall. After 750 meters stretch, the canal will enter into BPCL property for flowing into chithrapuzha.

2. The diversion canal width shall be 11 Mtrs at bottom and 5 Mtrs depth with sloping sides.

3. All existing storm water drains from Thiruvaniyoor Grama Panchayat area and joining the acquired paddy field shall be maintained.

4. Existing kucha road which is running along the periphery of BPCL land in Thiruvaniyoor Grama Panchayat area shall be suitably be modified in view of BPCL filling for boundary wall.

5. During the joint inspection the president and ward members requested BPCL to raise appro. 1.5 km Kacha road continuous to the Existing kucha road which is running along the periphery of BPCL land in Thiruvaniyoor Grama Panchayat to either sides of the road from KR community development scheme.

   This will ensure the following benefits:

   1. Better utilization of the road by public and KR.
   2. Connectivity to Highway
   3. To check flooding in the neighbouring area

Mr Paulose KC,
President,
Thiruvaniyoor Grama Panchayath

PRESIDENT
THIRUVANIYOOR GRAMA PANCHAYAT

THIRUVANIYOOR GRAMA PANCHAYATH OFFICE

Mr Suresh John,
DGM (Petchem-Civil)

Mr George Paul,
DGM (Project Tech- Petrochem)

Mr George Thomas,
CM (E&A)

# തിരുവാണിയൂർ ഗ്രാമ പഞ്ചായത്ത്

17.06.2020 തീയതി നടന്ന സാധാരണയോഗത്തിലെ
18/1 നമ്പർ തീരുമാനം.

അജണ്ട : 18 ഇന്റഗ്രേറ്റഡ് റിഫൈനറി എക്സ്പാൻഷൻ പ്രൊജക്ട് (BPCL)തോട് ഗതിമാറ്റുന്നത് കമ്മറ്റി തിരുമാനത്തിന്റെ പകർപ്പ് ലഭ്യമാക്കുന്നത് സംബന്ധിച്ച് -

തീരുമാന നമ്പർ : 18/1 തീയതി 17.06.2020

തിരുമാനം :-

ഇൻറഗ്രേറ്റഡ് റിഫൈനറി എക്സ്പാൻഷന് പ്രൊജക്ടിനായി ബി.പി.സി.എൽ. ഏറ്റെടുത്തിട്ടുള്ള വസ്തുവിലൂടെ കടന്നുപോകുന്ന തോട് ഗതിമാറ്റുന്നതിന് ഗ്രാമപഞ്ചായത്തിന്റെ തിരുമാനം നൽകണമെന്ന് ആവശ്യപ്പെട്ട് തദ്ദേശ സ്വയംഭരണ (RC)വകുപ്പിൻറെ 14.02.2020 തീയതിയിലെ RC 4/178/2017 ത.സ്വ.ഭ.വ നമ്പർ കത്ത് പഞ്ചായത്ത് കമ്മിറ്റി വിശദമായി ചർച്ച ചെയ്തു. തിരുവാണിയൂർ ഗ്രാമപഞ്ചായത്തിലെ കക്കാട് വാർഡിൽ ബി.പി.സി.എൽ കമ്പനിയുടെ എക്സ്പാൻഷന് പ്രൊജക്ടിന് വേണ്ടി നിലവിലുണ്ടായിരുന്ന തോടിന്റെ കമ്പനിയോട് ചേർന്നുള്ള ഭാഗം കമ്പനിയുടെ വികസനത്തിനായി നികത്തുകയും ഏറ്റിക്കര, മറ്റക്കുഴി ഭാഗങ്ങളിൽ നിന്നും വരുന്ന പഞ്ചായത്തുവക തോടുകൾ കമ്പനി മുൻകൈ എടുത്ത്കമ്പനിയുടെ മതിൽകെട്ടിന് പുറത്തുകൂടി ചിത്രപ്പുഴയിലേക്ക് ഒഴുകുന്ന വിധം തോടിന്റെ മുകൾഭാഗത്ത് 23 മീറ്റർ വീതിയിലും അടിഭാഗത്ത് 11 മീറ്റർ വീതിയിലും 5 മീറ്റർ താഴ്ചയിലും വെള്ളം സുഗമമായ് ഒഴുകുന്നവിധം മുൻപ് ഉണ്ടായിരുന്ന തോടിന് പകരമായി പുതിയ തോട് നിർമ്മിച്ചിട്ടുണ്ട് ടി തോടിന്റെ കുറച്ചുഭാഗം കമ്പനിക്കകത്തുകൂടി ഒഴുകിയാണ് ചിത്രപ്പുഴയിൽ ചേരുന്നത്. ടി ഭാഗത്തിന്റെ ഉടമസ്ഥാവകാശവും പരിശോധനാ സ്വാതന്ത്ര്യവും നിയമാനുസൃതം തിരുവാണിയൂർ പഞ്ചായത്തിൽ നിലനിർത്തി, അതിന്റെ സംരക്ഷണവും മെയിന്റനൻസും കമ്പനിയ്ക്കകത്തുനിന്നും യാതൊരുവിധ മാലിന്യങ്ങളും തോട്ടിലേക്കു വരാതിരിക്കുന്നതിനുള്ള കരുതലും കമ്പനിയുടെ ഭാഗത്തുനിന്നും ഉണ്ടാകണമെന്ന നിബന്ധനയും കമ്പനി കർശനമായും പാലിക്കേണ്ടതാണെന്നും കമ്മിറ്റി തിരുമാനിച്ചു.

തിരുവാണിയൂർ വില്ലേജ് ബ്ലോക്ക് 40-ൽ റിസർവ്വേ നമ്പർ 4/3, 4/4, 4/7, 4/10, 5/2, 5/3, 5/4, 5/5, 7/1, 8/4 8/5, 8/7, 8/8, 8/9, 8/10, 8/13, 9/3, 9/4, 9/5, 9/6, 9/7, 11/3, 11/7, 62/3,62/4, 62/5, 62/6, 62/7, 62/8, 62/9, 62/12, 62/13 62/15, 62/17, 63/5, 63/13, 63/14, 63/15, 64/2, 64/3, 64/4, 64/5, 64/10, 64/11, 65/2, 65/3, 65/7, 65/8, 65/9, 65/10, 65/11 65/12, 65/13, 65/16, 65/17,65/18 -ൽപ്പെട്ട 328.84 ആർ ഭൂമിയിലാണ് പുതിയതായി തോട് നിർമ്മിച്ചിട്ടുള്ളത്. ടി ഭൂമിയ്ക്ക് ഒരു ആറിന് 15000 രൂപ ഫെയർവാല്യൂ രേഖപ്പെടുത്തിയതായ് തിരുവാണിയൂർ വില്ലേജാഫിസർ ഫെയർവാല്യൂ സർട്ടിഫിക്കേറ്റ് നൽകിയിട്ടുണ്ട്. തിരുവാണിയൂർ വില്ലേജ് ബ്ലോക്ക്-40-ൽ റിസർവ്വേ 2/1, 3/1, 4/1,63/1, 64/1, 65/1 -ൽപ്പെട്ട 94.20 ആർ ഭൂമിയിലാണ് പഴയ തോട് സ്ഥിതി ചെയ്തിരുന്നത്. ടി ഭൂമിയ്ക്ക് ഫെയർവാല്യൂ രേഖപ്പെടുത്തി തിരുവാണിയൂർ വില്ലേജാഫിസർ നൽകിയിട്ടില്ല. തിരുവാണിയൂർ വില്ലേജ് ആഫിസില് നിന്നും ലഭിച്ച പരസ്പരം കൈമാറുന്ന ഭൂമിയുടെ വിസ്തീർണ്ണം, BTR പകർപ്പ്, ഫെയർവാല്യൂ സർട്ടിഫിക്കറ്റ് എന്നിവയും കൊച്ചി റിഫൈനറി സ്പെഷ്യൽ തഹസിൽദാർ (I A)-ൽ നിന്നും ലഭിച്ച അതിർത്തി വ്യക്തമാക്കുന്ന ലൊക്കേഷൻ മാപ്പ് എന്നിവ സഹിതം തദ്ദേശ സ്വയംഭരണ (RC)വകുപ്പിന് കൈമാറുന്നതിന തിരുമാനിച്ചു.

(ഒപ്പ്)
പ്രസിഡന്റ്

//ശരിപകർപ്പ് //

സെക്രട്ടറി

THIRUVANIYOOR GRAMA PANCHAYAT OFFICE
THIRUVANIYOOR P.O., PIN-682308

K. T. SANTHOSH
SECRETARY
THIRUVANIYOOR GRAMA PANCHAYAT
THIRUVANIYOOR. P. O.
PHONE: 0484-2730029

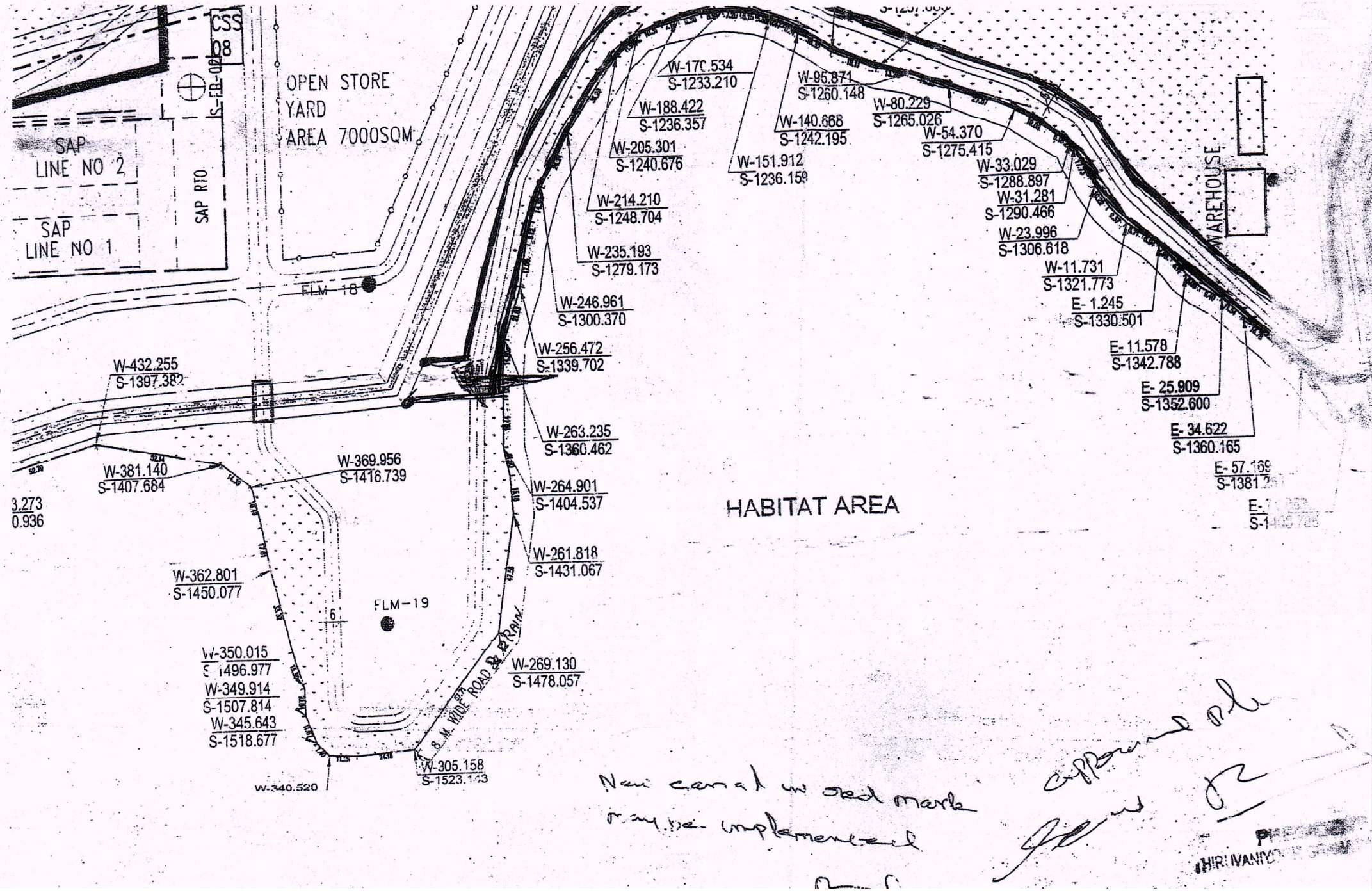
നിലവിൽ തോടായി തിരുവാണിയൂർ ഗ്രാമപഞ്ചായത്തിൽ നിക്ഷിപ്തമായ ഭൂമിയുടെ വിവരണം.

| ക്രമ നമ്പർ | വില്ലേജ് | ബ്ലോക്ക് നമ്പർ | സർവ്വെനമ്പർ | വിസ്തീർണ്ണം(ആർ) |
|---|---|---|---|---|
| 1 | തിരുവാണിയൂർ | 40 | 2/1 | 17.40 |
| 2 | തിരുവാണിയൂർ | 40 | 3/1 | 13.80 |
| 3 | തിരുവാണിയൂർ | 40 | 4/1 | 12.00 |
| 4 | തിരുവാണിയൂർ | 40 | 63/1 | 25.80 |
| 5 | തിരുവാണിയൂർ | 40 | 64/1 | 16.20 |
| 6 | തിരുവാണിയൂർ | 40 | 65/1 | 9.00 |
| | | | ആകെ | 94.20 (2.32 ഏക്കർ) |

തോട് പുറമ്പോക്കിന് പകരമായി ബി.പി.സി.എൽ. തിരുവാണിയൂർ ഗ്രാമപഞ്ചായത്തിന് വിട്ടുതരേണ്ടുന്ന സ്ഥലത്തിൻറെ വിവരണം

| ക്രമ നമ്പർ | വില്ലേജ് | ബ്ലോക്ക് നമ്പർ | സർവ്വെനമ്പർ | വിസ്തീർണ്ണം(ആർ) |
|---|---|---|---|---|
| 1 | തിരുവാണിയൂർ | 40 | 4/3 | 6.29 |
| 2 | തിരുവാണിയൂർ | 40 | 4/4 | 7.43 |
| 3 | തിരുവാണിയൂർ | 40 | 4/7 | 6.95 |
| 4 | തിരുവാണിയൂർ | 40 | 4/10 | 5.23 |
| 5 | തിരുവാണിയൂർ | 40 | 5/2 | 8.77 |
| 6 | തിരുവാണിയൂർ | 40 | 5/3 | 6.98 |
| 7 | തിരുവാണിയൂർ | 40 | 5/4 | 13.91 |
| 8 | തിരുവാണിയൂർ | 40 | 5/5 | 3.37 |
| 9 | തിരുവാണിയൂർ | 40 | 7/1 | 11.36 |
| 10 | തിരുവാണിയൂർ | 40 | 8/4 | 11.66 |
| 11 | തിരുവാണിയൂർ | 40 | 8/5 | 1.20 |
| 12 | തിരുവാണിയൂർ | 40 | 8/7 | 12.94 |
| 13 | തിരുവാണിയൂർ | 40 | 8/8 | 8.54 |
| 14 | തിരുവാണിയൂർ | 40 | 8/9 | 3.05 |
| 15 | തിരുവാണിയൂർ | 40 | 8/10 | 3.51 |
| 16 | തിരുവാണിയൂർ | 40 | 8/13 | 0.49 |
| 17 | തിരുവാണിയൂർ | 40 | 9/3 | 9.35 |
| 18 | തിരുവാണിയൂർ | 40 | 9/4 | 9.24 |
| 19 | തിരുവാണിയൂർ | 40 | 9/5 | 2.81 |
| 20 | തിരുവാണിയൂർ | 40 | 9/6 | 5.34 |
| 21 | തിരുവാണിയൂർ | 40 | 9/7 | 1.19 |
| 22 | തിരുവാണിയൂർ | 40 | 11/3 | 9.50 |
| 23 | തിരുവാണിയൂർ | 40 | 11/4 | 0.22 |
| 24 | തിരുവാണിയൂർ | 40 | 11/7 | 6.92 |
| 25 | തിരുവാണിയൂർ | 40 | 62/3 | 0.27 |
| 26 | തിരുവാണിയൂർ | 40 | 62/4 | 5.98 |
| 27 | തിരുവാണിയൂർ | 40 | 62/5 | 4.19 |

| | | | | |
|---|---|---|---|---|
| 28 | തിരുവാണിയൂർ | 40 | 62/6 | 2.88 |
| 29 | തിരുവാണിയൂർ | 40 | 62/7 | 4.72 |
| 30 | തിരുവാണിയൂർ | 40 | 62/8 | 5.57 |
| 31 | തിരുവാണിയൂർ | 40 | 62/9 | 5.04 |
| 32 | തിരുവാണിയൂർ | 40 | 62/12 | 0.99 |
| 33 | തിരുവാണിയൂർ | 40 | 62/13 | 5.07 |
| 34 | തിരുവാണിയൂർ | 40 | 62/15 | 3.88 |
| 35 | തിരുവാണിയൂർ | 40 | 62/17 | 4.30 |
| 36 | തിരുവാണിയൂർ | 40 | 63/5 | 13.15 |
| 37 | തിരുവാണിയൂർ | 40 | 63/13 | 0.34 |
| 38 | തിരുവാണിയൂർ | 40 | 63/14 | 4.46 |
| 39 | തിരുവാണിയൂർ | 40 | 63/15 | 3.82 |
| 40 | തിരുവാണിയൂർ | 40 | 64/2 | 8.85 |
| 41 | തിരുവാണിയൂർ | 40 | 64/3 | 2.03 |
| 42 | തിരുവാണിയൂർ | 40 | 64/4 | 17.76 |
| 43 | തിരുവാണിയൂർ | 40 | 64/5 | 8.75 |
| 44 | തിരുവാണിയൂർ | 40 | 64/10 | 3.76 |
| 45 | തിരുവാണിയൂർ | 40 | 64/11 | 3.54 |
| 46 | തിരുവാണിയൂർ | 40 | 65/2 | 7.27 |
| 47 | തിരുവാണിയൂർ | 40 | 65/3 | 8.66 |
| 48 | തിരുവാണിയൂർ | 40 | 65/7 | 6.19 |
| 49 | തിരുവാണിയൂർ | 40 | 65/8 | 1.93 |
| 50 | തിരുവാണിയൂർ | 40 | 65/9 | 1.37 |
| 51 | തിരുവാണിയൂർ | 40 | 65/10 | 8.50 |
| 53 | തിരുവാണിയൂർ | 40 | 65/11 | 0.12 |
| 54 | തിരുവാണിയൂർ | 40 | 65/13 | 7.68 |
| 55 | തിരുവാണിയൂർ | 40 | 65/16 | 3.94 |
| 56 | തിരുവാണിയൂർ | 40 | 65/17 | 2.39 |
| 57 | തിരുവാണിയൂർ | 40 | 65/21 | 4.83 |
| 58 | തിരുവാണിയൂർ | 40 | 65/25 | 11.55 |
| | | | ആകെ | 330.42 (ആർ) |


CSS 08
S-EB-02
OPEN STORE YARD AREA 7000SQM
SAP LINE NO 2
SAP RTO
SAP LINE NO 1
FLM-18
W-432.255
S-1397.382
W-381.140
S-1407.684
W-369.956
S-1416.739
W-362.801
S-1450.077
FLM-19
W-350.015
S-1496.977
W-349.914
S-1507.814
W-345.643
S-1518.677
W-340.520
W-305.158
S-1523.143
6 M WIDE ROAD
W-269.130
S-1478.057
W-261.818
S-1431.067
W-264.901
S-1404.537
W-263.235
S-1360.462
W-256.472
S-1339.702
W-246.961
S-1300.370
W-235.193
S-1279.173
W-214.210
S-1248.704
W-205.301
S-1240.676
W-188.422
S-1236.357
W-170.534
S-1233.210
W-151.912
S-1236.159
W-140.668
S-1242.195
W-95.871
S-1260.148
W-80.229
S-1265.026
W-54.370
S-1275.415
W-33.029
S-1288.897
W-31.281
S-1290.466
W-23.996
S-1306.618
W-11.731
S-1321.773
E- 1.245
S-1330.501
E- 11.578
S-1342.788
E- 25.909
S-1352.600
E- 34.622
S-1360.165
E- 57.169
S-1381.2
3.273
0.936
HABITAT AREA
WAREHOUSE
New canal to be marked may be implemented
approved
HIRIYANY

# LAYOUT PLAN OF PDPP
# BPCL-KOCHI REFINERY

LEGEND:-

BOUNDARY WALL

OLD THODU

REROUTED CANAL

1. ALL DIMENSIONS, CO-ORDINATES & LEVELS ARE IN M METRE. UNLESS

REROUTED CANAL

OLD THODU

HABITAT AREA

HOC

HOC EXISTING PLANT

BPCL-QUARRY

BPCL-CAR PARKING AREA

HABITAT AREA

HABITAT AREA

HABITAT AREA

FUTURE FACILITIES

FUTURE FACILITIES

THODU

THODU

THODU

FLARE STACK

355 M

23 M

66 KV HT LINE

66 KV HT LINE

66 KV HT LINE

66 KV HT LINE

PROPOSED RELOCATION FOR (EXISTING) AAUMS-2

PUMP SHED (56Mx8M)

NHT/ISOMERATE FEED PUMPS (YP-50A/B, YF-54A/B, YP-55A/B)

PB-24

EXISTING S/S TO BE DISMANTLED

CUTTING FOR

QUARRY NO.1

QUARRY NO.3

QUARRY NO.4

QUARRY NO.7

QUARRY NO.8

QUARRY AREA

EXISTING ROAD TO BE WIDENED

RAW WATER QUARRY AREA

SUB STATION

RWTP

BPCL-MAK BUILDING

DRUM FILLING AND STORAGE 84x80

SITE OFFICE 55x43

BA & EHA 100x125

EAA 70x169

OXO 68x180

CHEMICAL WAREHOUSE

CONSTRUCTION WARE HOUSE

FIRE/SRV AIR SUP ROOM

CONTROL ROOM

Brost. R. CONTROL ROOM 97x42

SUB STN

GAS/CONDENSATE FEED

GAS/CONDENSATE

GAS/LINE-3PP

GAS/LINE-4PP

TO TRIVANDRUM

PETROL PUMP

PROPOSED ROAD

EXISTING ROAD

COMPOUND WALL

LATERITE COMPOUND WALL

ADJACENT BOUNDARY LINE

BOUNDARY LINE

N

BPCL-PDPP SITE LAYOUT

192

ANNEXURE 21

കേരള സർക്കാർ
സംഗ്രഹം

കൃഷി വകുപ്പ് - കേരള നെൽവയൽ തണ്ണീർത്തട സംരക്ഷണനിയമം 2008 - എറണാകുളം ജില്ലയിൽ കുന്നത്തുനാട് താലൂക്കിൽ പുത്തൻകുരിശ് വില്ലേജിൽ ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡിന്റെ കൊച്ചി റിഫൈനറിയുടെ വിപുലീകരണത്തിനും അനുബന്ധ പെട്രോ കെമിക്കൽ യൂണിറ്റിനും വേണ്ടി നിലം നികത്തുന്നതിന് ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് കൊച്ചി റിഫൈനറിയുടെ ജനറൽ മാനേജർ സമർപ്പിച്ച അപേക്ഷ-അനുമതി നൽകി - ഉത്തരവ് പുറപ്പെടുവിക്കുന്നു.

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കൃഷി (എൻ.സി.എ.) വകുപ്പ്

സ.ഉ.(എം.എസ്) നം. 371/13/കൃഷി തീയതി, തിരുവനന്തപുരം, 26/12/2013

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പരാമർശം:- 1. ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് - കൊച്ചി റിഫൈനറിയുടെ ജനറൽ മാനേജർ 3/6/2013 തീയതിയിൽ സമർപ്പിച്ച അപേക്ഷ

2. പുത്തൻകുരിശ് കൃഷി ഓഫീസറുടെ 22/6/2013 തീയതിയിലെ വിപിപി 21/2013-14 നമ്പർ കത്ത്

3. 29/6/2013 ലെ സംസ്ഥാനതല സമിതിയോഗ തീരുമാനം.

## ഉത്തരവ്

എറണാകുളം ജില്ലയിൽ കുന്നത്തുനാട് താലൂക്കിൽ പുത്തൻകുരിശ് വില്ലേജിൽ ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡിന്റെ കൊച്ചി റിഫൈനറിയുടെ പ്രോജക്ട് വിപുലീകരണത്തിനും അനുബന്ധ പെട്രോ കെമിക്കൽ യൂണിറ്റിനും വേണ്ടി 189,190,191,211 എന്നീ സർവ്വേ നമ്പരുകളിൽ ഉൾപ്പെട്ട 4.3901 ഹെക്ടർ (10.84 ഏക്കർ) നിലം നികത്തുന്നതിന് അനുമതിയ്ക്കായി ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് - കൊച്ചി റിഫൈനറിയുടെ ജനറൽ മാനേജർ പരാമർശം (1) പ്രകാരം സമർപ്പിച്ച അപേക്ഷ പ്രാദേശികതല നിരീക്ഷണ സമിതിയുടെ ശുപാർശ സഹിതം, പരാമർശം (2) പ്രകാരം പുത്തൻകുരിശ് കൃഷി ഓഫീസർ സർക്കാരിൽ സമർപ്പിക്കുകയുണ്ടായി. പ്രസ്തുത അപേക്ഷ 29/6/2013 തീയതിയിൽ ചേർന്ന സംസ്ഥാനതല സമിതി യോഗത്തിൽ പരിശോധിയ്ക്കുകയും 2008 ലെ കേരള നെൽവയൽ തണ്ണീർത്തട സംരക്ഷണ നിയമത്തിലെ

10(1)-ാം വകുപ്പ് പ്രകാരം സർക്കാരിലേക്ക് ഉചിതമായ തീരുമാനം കൈക്കൊള്ളുന്നതിനായി ശുപാർശ ചെയ്യുകയുണ്ടായി.

സർക്കാർ ഇക്കാര്യം വിശദമായി പരിശോധിച്ചു. എറണാകുളം ജില്ലയിൽ കുന്നത്തുനാട് താലൂക്കിൽ പുത്തൻകുരിശ് വില്ലേജിൽ കേന്ദ്രസർക്കാരിന്റെ ഉടമസ്ഥതയിലും നിയന്ത്രണത്തിലുമുള്ള ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡിന്റെ കൊച്ചി റിഫൈനറിയുടെ പ്രോജക്ട് വിപുലീകരണത്തിനും അനുബന്ധ പെട്രോ കെമിക്കൽ യൂണിറ്റിനും വേണ്ടി പുത്തൻകുരിശ് വില്ലേജിൽ 189,190,191,211 എന്നീ സർവ്വേ നമ്പരുകളിൽ ഉൾപ്പെട്ട 4.3901 ഹെക്ടർ (10.84 ഏക്കർ) നിലം നികത്തുന്നതിന് അനുമതിയ്ക്കായി ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് - കൊച്ചി റിഫൈനറിയുടെ ജനറൽ മാനേജർ പരാമർശം (1) പ്രകാരം സമർപ്പിച്ച അപേക്ഷ 2008 ലെ കേരള നെൽവയൽ തണ്ണീർത്തട സംരക്ഷണ നിയമത്തിലെ 10(1)-ാം വകുപ്പ് പ്രകാരം അനുമതി നൽകി ഉത്തരവ് പുറപ്പെടുവിക്കുന്നു.

(ഗവർണ്ണറുടെ ഉത്തരവിൻപ്രകാരം),
സുബ്രതാ ബിശ്വാസ്,
കാർഷികോൽപ്പാദന കമ്മീഷണർ
&
പ്രിൻസിപ്പൽ സെക്രട്ടറി

ജില്ലാ കളക്ടർ, എറണാകുളം
പ്രിൻസിപ്പൽ അഗ്രികൾച്ചറൽ ഓഫീസർ, എറണാകുളം
കൃഷി ഓഫീസർ, കൃഷി ഭവൻ, പുത്തൻകുരിശ്, എറണാകുളം
ജനറൽ മാനേജർ (എച്ച്-ആർ), ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് - കൊച്ചി റിഫൈനറി, അമ്പലമുകൾ - 682 302
കരുതൽ ഫയൽ / ഓഫീസ് കോപ്പി.

ഉത്തരവിൻ പ്രകാരം,

സെക്ഷൻ ഓഫീസർ.

കേരള സർക്കാർ
സംഗ്രഹം

കൃഷി വകുപ്പ് - കേരള നെൽവയൽ തണ്ണീർത്തട സംരക്ഷണനിയമം 2008 - സംസ്ഥാനതല സമിതി - എറണാകുളം ജില്ലയിൽ കുന്നത്തുനാട് താലൂക്കിൽ തിരുവാണിയൂർ വില്ലേജിൽ വിവിധ സർവ്വനമ്പരുകളിൽ ഉൾപ്പെട്ട 11.1844 ഹെക്ടർ (27.63 ഏക്കർ) നിലം ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് - കൊച്ചി റിഫൈനറിയുടെ പ്രോജക്ട് വിപുലീകരണത്തിനും അനുബന്ധ പെട്രോകെമിക്കൽ യൂണിറ്റിനും വേണ്ടി പരിവർത്തനപ്പെടുത്തുന്നതിന് ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് കൊച്ചി റിഫൈനറിയുടെ ജനറൽ മാനേജർ സമർപ്പിച്ച അപേക്ഷ - അനുമതി നൽകി - ഉത്തരവ് പുറപ്പെടുവിക്കുന്നു.

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കൃഷി (എൻ.സി.എ.) വകുപ്പ്

സ.ഉ. (എം.എസ്) നം.54/2014/കൃഷി തീയതി, തിരുവനന്തപുരം 22/2/2014

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പരാമർശം:- 1. ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് - കൊച്ചി റിഫൈനറിയുടെ ജനറൽ മാനേജർ സമർപ്പിച്ച അപേക്ഷ
2. തിരുവാണിയൂർ കൃഷി ഓഫീസറുടെ KBTVR/XXV/8/13-14 നമ്പർ കത്ത്
3. 25/1/2014 ലെ സംസ്ഥാനതല സമിതിയോഗ തീരുമാനം.

## ഉത്തരവ്

എറണാകുളം ജില്ലയിൽ കുന്നത്തുനാട് താലൂക്കിൽ തിരുവാണിയൂർ വില്ലേജിൽ4/2, 3, 4, 5, 6, 7, 8, 9, 10, 5/5, 62/1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 63/2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 64/2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 65/ 2, 3,4 ,5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 6, 7, 8 എന്നീ സർവ്വേ നമ്പരുകളിൽ ഉൾപ്പെട്ട 11.1844 ഹെക്ടർ (27.63 ഏക്കർ) നിലം കേന്ദ്രസർക്കാരിന്റെ ഉടമസ്ഥതയിലും നിയന്ത്രണത്തിലുമുള്ള അമ്പലമുകളിലെ ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡിന്റെ കൊച്ചി റിഫൈനറിയുടെ പ്രോജക്ട് വിപുലീകരണത്തിനും അനുബന്ധ പെട്രോകെമിക്കൽ ജോയിന്റ് വെഞ്ചർ യൂണിറ്റുകൾക്കും മലിനീകരണ നിയന്ത്രണ ബോർഡിന്റെ നിബന്ധനകൾ പ്രാവർത്തികമാക്കുന്നതിനും വേണ്ടി പരിവർത്തനപ്പെടുത്തുന്നതിന് ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് - കൊച്ചി റിഫൈനറിയുടെ ജനറൽ മാനേജർ പരാമർശം (1) പ്രകാരം സമർപ്പിച്ച അപേക്ഷ പ്രാദേശികതല നിരീക്ഷണ സമിതിയുടെ ശുപാർശ സഹിതം, പരാമർശം (2) പ്രകാരം തിരുവാണിയൂർ കൃഷി

നിശ്ചിത ഇടവേളകളിൽ ഉറപ്പ് വരുത്തുവാനായി ഒരു സംവിധാനം ഉണ്ടാകേണ്ടതും അത് പരിശോധകർക്ക് പരിശോധനക്കായി നൽകേണ്ടതുമാണ്.

ഡി) പ്രസ്തുത സ്ഥലത്ത് ഒരു മഴവെള്ള സംഭരണി നിർമ്മിക്കേണ്ടതാണ്.

സർക്കാർ ഇക്കാര്യം വിശദമായി പരിശോധിച്ചു. എറണാകുളം ജില്ലയിൽ കുന്നത്തുനാട് താലൂക്കിൽ തിരുവാണിയൂർ വില്ലേജിൽ 4/2,3,4,5,6,7,8,9,10, 5/5, 62/1,2,3,4,5,6,7,8,9,10,11,12,13,14,63/2,3,4,5,6,7,8,9,10,11,12, 13, 14, 15 ,64/2,3,4,5,6,7,8,9,10,11, 12, 13, 14 ,65/2,3,4,5,6,7,8,9,10,11,12,13,15,16,17,18 എന്നീ സർവ്വേ നമ്പരുകളിൽ ഉൾപ്പെട്ട 11.1844 ഹെക്ടർ (27.63 ഏക്കർ) നിലം കേന്ദ്രസർക്കാരിന്റെ ഉടമസ്ഥതയിലും നിയന്ത്രണത്തിലുമുള്ള അമ്പലമുകളിലെ ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡിന്റെ കൊച്ചി റിഫൈനറിയുടെ പ്രോജക്ട് വിപുലീകരണത്തിനും അനുബന്ധ പെട്രോകെമിക്കൽ ജോയിന്റ് വെഞ്ചർ യൂണിറ്റുകൾക്കും മലിനീകരണ നിയന്ത്രണ ബോർഡിന്റെ നിബന്ധനകൾ പ്രാവർത്തികമാക്കുന്നതിനും വേണ്ടി പരിവർത്തനപ്പെടുത്തുന്നതിന് ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് - കൊച്ചി റിഫൈനറിയുടെ ജനറൽ മാനേജർ പരാമർശം(1) പ്രകാരം സമർപ്പിച്ച അപേക്ഷ പരിസ്ഥിതി വിലയിരുത്തൽ സമിതി (Environment Assessment Committee) ശുപാർശ ചെയ്തിരിക്കുന്ന മേൽ വിവരിച്ച നിബന്ധനകൾക്ക് വിധേയമായി അനുവദിച്ചു കൊണ്ട് ഉത്തരവ് പുറപ്പെടുവിക്കുന്നു.

(ഗവർണ്ണറുടെ ഉത്തരവിൻപ്രകാരം),
**സുബ്രതാ ബിശ്വാസ്,**
കാർഷികോൽപ്പാദന കമ്മീഷണർ &
പ്രിൻസിപ്പൽ സെക്രട്ടറി

ജനറൽ മാനേജർ (എച്ച്-ആർ), ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് -
കൊച്ചി റിഫൈനറി, അമ്പലമുകൾ - 682 302
ജില്ലാ കളക്ടർ, എറണാകുളം
പ്രിൻസിപ്പൽ അഗ്രികൾച്ചറൽ ഓഫീസർ, എറണാകുളം
കൃഷി ഓഫീസർ, കൃഷി ഭവൻ, തിരുവാണിയൂർ , എറണാകുളം
കരുതൽ ഫയൽ / ഓഫീസ് കോപ്പി.

ഉത്തരവിൻ പ്രകാരം,

സെക്ഷൻ ഓഫീസർ

കേരള സർക്കാർ

സംഗ്രഹം

കൃഷി വകുപ്പ് - കേരള നെൽവയൽ തണ്ണീർത്തട സംരക്ഷണനിയമം 2008 - സംസ്ഥാനതല സമിതി - എറണാകുളം ജില്ലയിൽ കുന്നത്തുനാട് താലൂക്കിൽ തിരുവാണിയൂർ വില്ലേജിൽ വിവിധ സർവ്വനമ്പരുകളിൽ ഉൾപ്പെട്ട 12.2140 ഹെക്ടർ നിലം ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് - കൊച്ചി റിഫൈനറിയുടെ പ്രോജക്ട് വിപുലീകരണത്തിനും അനുബന്ധ പെട്രോകെമിക്കൽ യൂണിറ്റിനും വേണ്ടി പരിവർത്തനപ്പെടുത്തുന്നതിന് ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് കൊച്ചി റിഫൈനറിയുടെ ജനറൽ മാനേജർ സമർപ്പിച്ച അപേക്ഷ - അനുമതി നൽകി - ഉത്തരവ് പുറപ്പെടുവിക്കുന്നു.

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കൃഷി (എൻ.സി.എ.) വകുപ്പ്

സ.ഉ. (എം.എസ്) നം. 123/2014/കൃഷി തീയതി, തിരുവനന്തപുരം, 04/06/2014

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പരാമർശം:-
1. ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് - കൊച്ചി റിഫൈനറിയുടെ ജനറൽ മാനേജർ സമർപ്പിച്ച അപേക്ഷ
2. തിരുവാണിയൂർ കൃഷി ഓഫീസറുടെ 3/03/2014 തീയതിയിലെ KBTVR/XXV/8/13-14 നമ്പർ കത്ത്
3. 4/4/2014 ലെ സംസ്ഥാനതല സമിതിയോഗ തീരുമാനം.

## ഉത്തരവ്

എറണാകുളം ജില്ലയിൽ കുന്നത്തുനാട് താലൂക്കിൽ തിരുവാണിയൂർ വില്ലേജിൽ 2/2, ,2/3, 2/4, 2/5, 2/6, 2/7, 3/2, 3/4, 3/5, 3/6, 3/7, 3/8, 3/9, 5/1, 5/2, 5/3, 5/4, 7/1, 8/1, 8/2, 8/3, 8/4, 8/5, 8/7, 8/8, 8/9, 8/10, 9/1, 9/2, 9/3, 9/4, 9/5, 9/6, 9/7, 11/1, 11/2, 11/3, 11/4, 11/5, 11/6, 11/7 എന്നീ സർവ്വേ നമ്പരുകളിൽ ഉൾപ്പെട്ട 12.2140 ഹെക്ടർ നിലം കേന്ദ്രസർക്കാരിന്റെ ഉടമസ്ഥതയിലും നിയന്ത്രണത്തിലുമുള്ള അമ്പലമുകളിലെ ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡിന്റെ കൊച്ചി റിഫൈനറിയുടെ പെട്രോ കെമിക്കൽ പ്രോജക്ടിന് വേണ്ടി പരിവർത്തനപ്പെടുത്തുന്നതിന് ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് - കൊച്ചി റിഫൈനറിയുടെ ജനറൽ മാനേജർ പരാമർശം (1) പ്രകാരം സമർപ്പിച്ച അപേക്ഷ പ്രാദേശികതല നിരീക്ഷണ സമിതിയുടെ ശുപാർശ സഹിതം, പരാമർശം (2) പ്രകാരം തിരുവാണിയൂർ കൃഷി ഓഫീസർ സർക്കാരിൽ സമർപ്പിക്കുകയുണ്ടായി. പ്രസ്തുത അപേക്ഷ 4/4/2014 തീയതിയിൽ ചേർന്ന സംസ്ഥാനതല സമിതി

യോഗത്തിൽ പരിശോധിയ്ക്കുകയും താഴെ പറയും പ്രകാരം തീരുമാനങ്ങൾ കൈക്കൊള്ളുകയും സർക്കാരിലേയ്ക്ക് റിപ്പോർട്ട് ചെയ്യുകയുമുണ്ടായി.

"Recommended being public purpose subject to the condition stated in GO (MS) 54/2014/AD dated 22/2/2014" i.e.

a. The existing stream in Puthencruz and Thiruvaniyoor villages will be retained as such in the present condition and will be protected.

b. The land filling should be need based and the materials required should be arranged within the campus and no filling materials allowed from outside (another hill should not be abolished)

c. A pond should be maintained in the campus for the pollution mitigation measures in the effluent canal passing out of the project area. There should be a mechanism to monitor the quality of water of the pond periodically and make it available for the inspection team.

d. A rain water harvesting pond should be maintained separately in the campus.

അതായ്ത്, അപേക്ഷയിലെ ആവശ്യം പൊതു ആവശ്യമായതിനാൽ 22/2/2014 ലെ സ.ഉ. (എം.എസ്). 54/14/കൃഷി നമ്പർ ഉത്തരവിലെ വ്യവസ്ഥകൾക്ക് വിധേയമായി ശുപാർശ ചെയ്യുന്നു. അതായത്,

എ) പുത്തൻകുരിശ്, തിരുവാണിയൂർ വില്ലേജുകളിലെ നിലവിലുള്ള തോട് അതുപോലെ നിലനിർത്തി സംരക്ഷിക്കേണ്ടതാണ്.

ബി) നിലം ആവശ്യാനുസരണം മാത്രം പരിവർത്തനപ്പെടുത്തേണ്ടതും ടി ആവശ്യത്തിനായി ഉപയോഗിക്കുന്ന വസ്തുക്കൾ മറ്റ് സ്ഥലങ്ങളിൽ നിന്നും കൊണ്ട് വരാതെ പ്രസ്തുത സ്ഥലത്തെ വസ്തുക്കൾ ഉപയോഗിച്ച് നികത്തേണ്ടതാണ്. (മറ്റൊരു കുന്ന് ഇല്ലാതാക്കാൻ പാടില്ല)

സി) പദ്ധതി പ്രദേശത്ത് നിന്ന് ഒഴുകിവരുന്ന മലിനജലം മലിനീകരണ നിയന്ത്രണ മാർഗ്ഗങ്ങൾ ഉപയോഗിച്ച് ശുദ്ധീകരിക്കുന്നതിന് campusൽ ഒരു കുളം നിർമ്മിക്കേണ്ടതാണ്. പ്രസ്തുത കുളത്തിലെ ജലത്തിന്റെ ഗുണമേന്മ ഉറപ്പ് വരുത്തുവാനായി നിശ്ചിത ഇടവേളകളിൽ ഒരു സംവിധാനം ഉണ്ടാകേണ്ടതും അത് പരിശോധകർക്ക് പരിശോധനക്കായി നൽകേണ്ടതുമാണ്.

ഡി) പ്രസ്തുത സ്ഥലത്ത് ഒരു മഴവെള്ള സംഭരണി നിർമ്മിക്കേണ്ടതാണ്.

സർക്കാർ ഇക്കാര്യം വിശദമായി പരിശോധിച്ചു. എറണാകുളം ജില്ലയിൽ കുന്നത്തുനാട് താലൂക്കിൽ തിരുവാണിയൂർ വില്ലേജിൽ 2/2, 2/3, 2/4, 2/5, 2/6, 2/7,

3/2, 3/4, 3/5, 3/6, 3/7, 3/8, 3/9, 5/1, 5/2, 5/3, 5/4, 7/1, 8/1, 8/2, 8/3, 8/4, 8/5, 8/7, 8/8, 8/9, 8/10, 9/1, 9/2, 9/3, 9/4, 9/5, 9/6, 9/7, 11/1, 11/2, 11/3, 11/4, 11/5, 11/6, 11/7 എന്നീ സർവ്വേ നമ്പരുകളിൽ ഉൾപ്പെട്ട 12.2140 ഹെക്ടർ നിലം കേന്ദ്രസർക്കാരിന്റെ ഉടമസ്ഥതയിലും നിയന്ത്രണത്തിലുമുള്ള അമ്പലമുകളിലെ ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡിന്റെ കൊച്ചി റിഫൈനറിയുടെ പെട്രോ കെമിക്കൽ പ്രോജക്ടിന് വേണ്ടി പരിവർത്തനപ്പെടുത്തുന്നതിന് ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് - കൊച്ചി റിഫൈനറിയുടെ ജനറൽ മാനേജർ പരാമർശം(1) പ്രകാരം സമർപ്പിച്ച അപേക്ഷയിലെ ആവശ്യം പൊതു ആവശ്യമായതിനാൽ മേൽ സൂചിപ്പിച്ച നിബന്ധനകൾക്ക് വിധേയമായി 12.2140 ഹെക്ടർ നിലം മാത്രം അനുവദിച്ചു കൊണ്ട് ഉത്തരവ് പുറപ്പെടുവിക്കുന്നു.

(ഗവർണ്ണറുടെ ഉത്തരവിൻപ്രകാരം),
**സുബ്രതാ ബിശ്വാസ്,**
കാർഷികോൽപ്പാദന കമ്മീഷണർ &
പ്രിൻസിപ്പൽ സെക്രട്ടറി

ജനറൽ മാനേജർ (എച്ച്-ആർ), ഭാരത് പെട്രോളിയം കോർപ്പറേഷൻ ലിമിറ്റഡ് - കൊച്ചി റിഫൈനറി, അമ്പലമുകൾ - 682 302
ജില്ലാ കളക്ടർ, എറണാകുളം
പ്രിൻസിപ്പൽ കൃഷി ഓഫീസർ, എറണാകുളം
കൃഷി ഓഫീസർ, കൃഷി ഭവൻ, തിരുവാണിയൂർ , എറണാകുളം
കരുതൽ ഫയൽ / ഓഫീസ് കോപ്പി.

ഉത്തരവിൻ പ്രകാരം,

സെക്ഷൻ ഓഫീസർ