

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL  
SOUTHERN ZONE, CHENNAI.**

**Original Application No. 180 of 2023 (SZ)**

**And**

**Original Application No. 183 of 2023 (SZ)**

SUOMOTU based on the Visual media  
titled Chennai Rains Makkalai Vathaikkum  
Oil Companies-Shocking Story - Michaung  
Ground Report covered by on VIKATAN TV  
Chennai dt.06.12.2023

**Vs**

The District Collector Chennai District  
And Ors

... Respondents

**With**

R.L. Srinivasan, Chennai.

...Applicant

**Versus**

The Tamil Nadu Coastal Zone  
Management Authority,  
Chennai and Ors.

...Respondent(s)

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**Advocate for Respondent: TNPCB  
Thiru.S. Sai Sathya Jith,  
Advocate, Chennai.**

**BEFORE THE NATIONAL GREEN TRIBUNAL,  
SOUTHERN ZONE- CHENNAI**

**O.ANO.180 of 2023**

**AND**

**O. A NO.183 OF 2023**

**IN THE MATTER OF**

Tribunal on its own motion SUOMOTU based on the Visual media titled Chennai Rains Makkalai Vathaikkum Oil Companies- Shocking Story – Michaung Ground Report covered by VIKATAN TV Chennai dt.06.12.2023

With

The District Collector Chennai District  
And Ors.

...Respondents

AND

R.L. Srinivasan, Chennai.

...Applicant (s)

Versus

The Tamil Nadu Coastal Zone Management Authority,  
Rep. by its Member Secretary, Chennai and Ors.

...Respondent(s)

**REPORT FILED ON BEHALF OF THE RESPONDENT -  
TAMIL NADU POLLUTION CONTROL BOARD**

I, J. Josephine Sahayarani, D/o. Jesu Rajan, Christian, aged about 57 years, having my office at 76, Mount Salai, Guindy, Chennai – 600032, do hereby solemnly affirm and sincerely state as follows:-

1. I am the Joint Chief Environmental Engineer, Tamil Nadu Pollution Control Board (TNPCB), Chennai – 600 032, and I am authorized to file this Report duly approved by the Chairperson as on behalf of the Respondent Tamil Nadu Pollution Control Board (TNPCB). I am well acquainted with the facts of the case from the records.

*J. Josephine Sahayarani*  
26/2/2024  
**JOINT CHIEF ENVIRONMENTAL ENGINEER  
TAMIL NADU POLLUTION CONTROL BOARD  
No.76, MOUNT SALAI, GUINDY,  
CHENNAI-600 032.**

2. It is respectfully submitted that on 10.1.2024, the Tamil Nadu Pollution Control Board has filed its report before the Hon'ble Tribunal(SZ), Chennai and it may be pleased to take as part and parcel of this case.
3. It is respectfully submitted that the Tamil Nadu Pollution Control Board has submitted the report on status of oil spill cleaning works till 10.01.2024. Action taken report after 10.01.2024 towards the compliance of Hon'ble NGT (SZ) order dt:11.01.2024 is submitted as follows:
4. It is respectfully submitted that to ascertain the cause of the oil leak in the Ennore creek area, the Government have constituted a Technical Team consists of (i) the Member secretary, TNPCB, (ii) Principal Scientist, Chennai Zonal Centre, CSIR- NEERI, (iii) Regional Director, CPCB, Chennai; (iv) Commandant, Indian Coast Guard (v) Professor, Dept. of Chemical Engineering, Anna university vide G.O.(MS) No.178 ECC& F Department dated 10.12.2023. The technical team inspected the Chennai Petroleum Corporation Limited (CPCL) premises & surrounding area and also Ennore Creek area on 11.12.2023 and submitted their report to the Government on 11.01.2024 (Report is enclosed as Annexure). The Technical Team has made following recommendations to be carried out by M/s. Chennai Petroleum Corporation Limited (CPCL)
  - i. Study on flood management for entire premises to avoid such incident in future and waste/product/raw material shall not go out from their premises during flooding or cyclone.
  - ii. Raise the height of all storage tanks of Storm water collection, effluent and sludge by considering worst situation of flood.
  - iii. Take up maintenance of crude oil tanks and complete the separation of oil as well as bio-remediation of sludge well before the monsoon.
  - iv. Have preparedness plan in place to avoid such incidence in future.

*J. S. Kumar* 89  
26/2/2024  
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- v. Fix the permanent booms/oil separators in the vulnerable areas including outside the CPCL premises. Periodic maintenance should be undertaken before monsoon season.
- vi. Install sensors in the vulnerable area to give warnings.
- vii. Complete the cleaning operations in the Buckingham canal and Ennore creek area and take-up restoration flora and fauna.
- viii. Enhance the design of storage tanks to withstand extreme weather events like floods. This could include elevated structures, reinforced containment walls, and waterproof sealing.
- ix. Install flood barriers around critical areas to prevent water from reaching the tanks. Additionally, the unit shall have secondary containment systems that can prevent oil from spreading if a spillage occurs.
- x. Ensure regular maintenance of all tanks including ETPs and pipelines to address any potential vulnerabilities. This should include frequent inspections, especially before expected adverse weather conditions.
- xi. Utilize technology like remote sensing and automated monitoring systems to detect early signs of leakages or structural weaknesses.
- xii. Develop and regularly update a comprehensive emergency response plan. This plan should include procedures for immediate containment and clean-up in case in a leakage.
- xiii. Work closely with local government authorities to align safety protocols and response strategies.
- xiv. Conduct independent audits and inspections of oil facilities to ensure compliance with safety and environmental standards.
- xv. Educate the local community about potential risks and emergency procedures in the event of an oil leakage.
- xvi. Collaborate with NGO's and international bodies to protect and restore ecosystems like mangroves that are affected by oil leakages.

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- xvii. Take full responsibility for the clean-up operations, employing the best available technology to minimize the environmental impact.
- xviii. Allocate funds specifically for the restoration of damaged ecosystems of B Canal and Ennore Creek and mangroves. This could involve cleaning operations, replanting mangroves, and rehabilitating wildlife.

Further, the Technical Team recommended that the TNPCB shall undertake the following:

- i. TNPCB shall workout the environmental compensation to be levied to M/s CPCL in consultation with CPCB immediately after the receipt of IIT Madras study report on the scientific assessment of environmental damage caused by this oil spillage incident including the finger printing of the oil and the quantification of oil that would have reached the water bodies.
  - ii. TNPCB shall take legal action against the unit of M/s CPCL and its occupier under the Environmental legislations for the violations committed by the unit.
5. It is respectfully submitted that after detailed scrutiny of the Technical Team report, the Government has accepted all recommendations made by the Technical Committee and directed TNPCB to implement all recommendations of the technical team and report the compliance vide Letter No. 8466/EC.3/2023-18 dated 02.02.2024(Copy enclosed).Based on the Government direction, TNPCB issued directions to M/s.CPCL under Section 33 A of the Water (P&CP) Act 1974 on 11.01.2024 & 05.02.2024(Copy enclosed) to comply with the recommendation of the Technical Team.
6. It is submitted that M/s. CPCL's reply dated 16.01.2024 & 16.02.2024 to the above directions which is enclosed as an annexure. From the reply furnished by M/s. CPCL and report received from JCEE(M), TNPCB, Chennai the following are submitted:

*g. for 2024*  
26/2/2024

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- i. CPCL has assessed the oil spillage through M/s.Hubert Enviro Care System Pvt Ltd, Chennai and reported 1483 litre of oil has been spilled from the unit premises.
- ii. The unit complied with the conditions of Oil spill clearing activities by engaging existing special agencies
- iii. The unit has agreed to carryout periodic mock drill, safety audit of crude oil pipeline and maintenance of crude oil tanks well before the onset of monsoon.
- iv. Agree to bear all the expenditures incurred by TNPCB towards the works carried out on the oil spill cleanup operation and also analysis charges and cost of study being conducted on oil assessment & Environment Impact Study by IIT,Chennai.
- v. CPCL has initiated action for providing permanent booms in the Buckingham Canal and in the storm water Canal near the north and south gates of CPCL and will be completed by April 2024.
- vi. Oil water separation system has been provided in the inlet of all storm water ponds. Additional Oil water separation system in upstream of storm ponds is planned. Target by May 2024.
- vii. For providing suitable dyke and leachate collection system to the Bio remediation area, the unit has stated that bio-remediation pit in CPCL is above ground structure & is having impervious layer to prevent any water ingress. Any water accumulation inside the Bio remediation pit is dewatered using pumps/gully suckers and is being treated in ETPs. Construction of dyke is planned. Target by April 2024.
- viii. Towards the compliance of condition on increasing the height of all storage tanks of Storm water collection, effluent and sludge by considering worst situation of flood, the unit has engaged an expert agency Viz M/s WAPCOS to study the Storm water system and the recommendations given by WAPCOS will be implemented. The same agency has been engaged to prepare

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monsoon emergency preparedness plan and flood management study. Target by April 2024

- ix. For installing sensors in the vulnerable area to give warnings about any abnormal incidents, CPCL has taken action for procurement of online analysers and will be installed at the outlet of all stormwater ponds, leading outside the premises. Target by March 2024.
  - x. For providing OCEMS for the parameters pH, TSS, COD, BOD & Oil and Grease in the upstream and downstream of Buckingham canal and connect the same to WQW, TNPCB Chennai server, CPCL has taken action for procurement of online analysers. Installation and On-line connectivity will be completed by Jun 2024.
  - xi. For installing additional CAAQM station in the villages Sathyamoorthy Nagar & Manali, M/s.CPCL has taken action for the procurement of CAAQM analysers for installing in Thriuvottiyur & Manali area. Target by July 2024.
7. It is further respectfully submitted that the Indian Coast Guard – East carried out final aerial survey on 29.12.2023 and reported in vide letter dated 04.01.2024 which is enclosed as an Annexure stating that no trace of oil was observed in the water bodies and in the adjoining sea areas (letter enclosed). The content of the report is reproduced as follows:

*“The Oil Spill removal operation was undertaken professionally and suitable advice wherever needed was provided by the Coast Guard regularly. A final aerial survey was undertaken on 29 Dec 23 by the Coast Guard and no trace of oil in the water bodies or at the adjoining sea areas was noticed”.*

Thus it is respectfully submitted that the entire oil cleaning activities along stretch of Buckingham canal, Kosasthaliar river and Ennore creek area have been fully completed.

*J. for 2024*  
26/2/2024

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8. It is further submitted that cleaning of mangroves were done in the period between 01.01.2024 & 31.01.2024. A total of 1356 nos. of manpower and 20 boats (on daily basis) were engaged to restore a length of 4744 m of affected mangroves. High power Hydrojets and Water sprayers were used initially to clean the oil slicks. Pruning and trimming of oil affected leaves, branches were carried out. The collected branches and pruned debris were collected in 4825 bags and sent to M/s.CPCL campus for further scientific disposal. Thus mangroves cleaning activities were also completed daily report from 01.01.2024 to 31.01.2024 is enclosed as an Annexure.
9. It is respectfully submitted that oil mixed water and oil laden soil/debris collected during the oil clearing activity is now stored inside the CPCL premises. In order to safe disposal of above wastes, M/s.CPCL has applied for one-time authorization under Hazardous Waste Management Rules, 2016 to TNPCB on 22.02.2024. The unit proposed to treat oil-mixed water in ETP; to treat the Soil/debris through Bio remediation and to dispose of the oil adsorbent pads/booms through incineration at Treatment Storage Disposal Facility (TSDF), Gummidipoondi. TNPCB issued One-time authorization for the scientific disposal of above Hazardous waste within a period of 6 months, vide proceeding dated 24.02.2024
10. It is respectfully submitted that the report which has filed on 10.01.2024 may be taken as part and parcel regarding action taken by the National Centre for Coastal Research. The final report is awaited from NCCR.
11. It is respectfully submitted that TNPCB had sought technical assistance from the Council of Scientific & Industrial Research - National Institute of Oceanography (CSIR - NIO), Goa for the process of bioremediation of affected areas by using bio-dispersants. The works for this process commenced on 09.01.2024 with 5 different locations (2 Control location & 3 Treatment locations). NIO has reported that the sample

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analysis work is currently in progress and the report will be submitted soon after completion of the work.

12. It is respectfully submitted that the Government have entrusted IIT, Madras to carry out the quantification of the oil spill and environmental impact assessment so as to assess the oil spillage and also to levy the Environmental Compensation. In this regard, the TNPCB has released a fund of Rs.1,03,80,000/- (Rupees One Crore Three Lakhs Eighty Thousand Only) vide proceeding dated 31.01.2024, to the Department of Environment and Climate Change for making payment to IIT Madras. The final report is awaited from IIT, Madras.

Under the above circumstances, it is humbly prayed that this Hon'ble National Green Tribunal may be pleased to pass such further or other orders as this Hon'ble Tribunal may deem fit and proper in the facts of this case and thus render justice.

*J. Josephine Sahayarani*  
26/1/2024

JOINT CHIEF ENVIRONMENTAL ENGINEER  
TAMIL NADU POLLUTION CONTROL BOARD  
No.76, MOUNT SALAI, GUINDY,  
CHENNAI-600 032.

### VERIFICATION

I, J. Josephine Sahayarani, D/o. Jesu Rajan, working as Joint Chief Environmental Engineer, having office at No. 76, Anna Salai, Guindy, Chennai-32, do hereby submit that the above contents are true to the best of my knowledge and belief through records.

*J. Josephine Sahayarani*  
26/1/2024

JOINT CHIEF ENVIRONMENTAL ENGINEER  
TAMIL NADU POLLUTION CONTROL BOARD  
No.76, MOUNT SALAI, GUINDY,  
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## **TAMIL NADU POLLUTION CONTROL BOARD**

### **Report of the Technical Team on the oil spillage in Ennore Creek Area during the recent flood caused by Michaung cyclone**

**January 2024**



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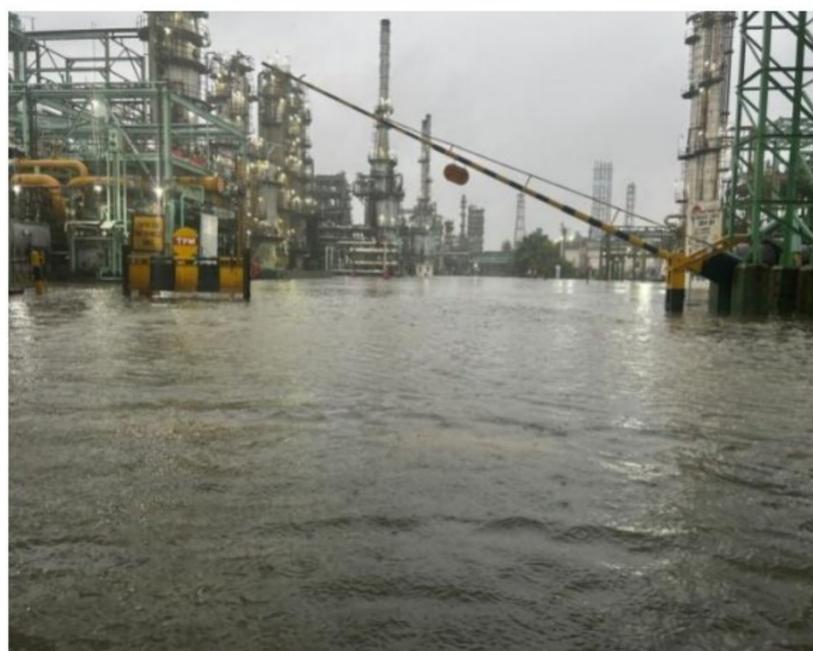
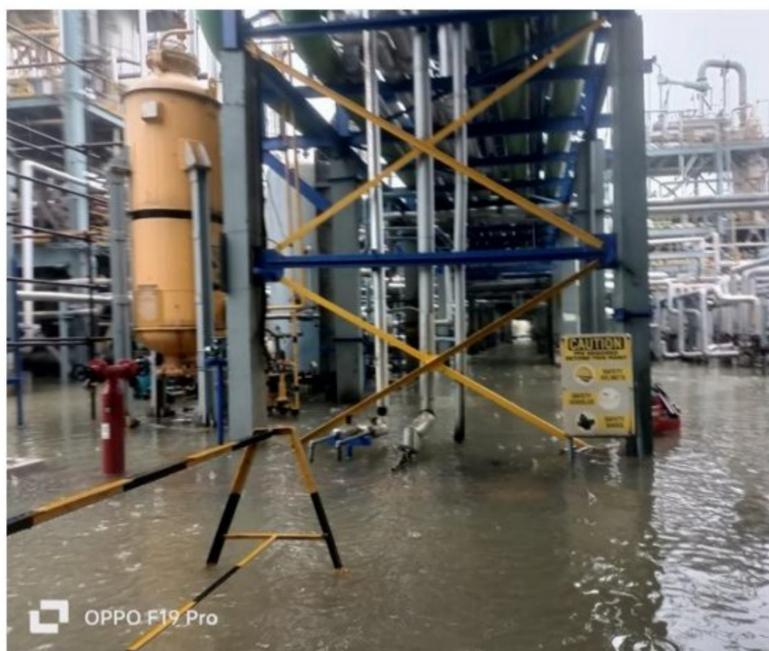
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## **Report of the Technical Team on the oil spillage in Ennore Creek Area during the recent flood caused by Michaung cyclone**

### **1. Preamble**

The unprecedented heavy rain on 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> of December 2023 due to Michaung cyclone and the release of excess water from Poondi and Puzhal reservoirs caused severe flooding of several parts of Chennai including Manali and Ennore and inundated several residential and industrial areas. Based on the information received regarding oil spillage into Buckingham canal the Joint Chief Environmental Engineer (Monitoring) (JCEE (M)) Chennai inspected the area on 05/12/2023. During the inspection, the JCEE (M) found a layer of oil floating on the B' Canal from CPCL up to Ennore creek. The people of the villages on the bank of the B' canal in Ennore and near the Ennore creek complained about the flow of oil in B' Canal. The JCEE (M) collected sample of the water in Ennore creek area and sent them to the TNPCB laboratory for analyzing and finding the source and the amount of oil present in the water.



### **Stagnation of rain water inside M/s CPCL during recent flood**

As the flood water started to recede on subsequent days, the oil deposition on the shrubs and trees in the canal and on the banks of the canal became visible. Fishermen in Ennore creek also complained about the presence of oil in Ennore creek and

deposition of oil on their boats/vessels. Hence the JCEE (M), Chennai along with District Environmental Engineer, Ambattur and the Assistant Environmental Engineer, Manali inspected the area again on 07/12/2023 and further on 09/12/2023 and observed the following:

1. The Oil spillage stretches were found spread from the unit M/s. CPCL to Ennore creek upto a distance of 11 km in Buckingham canal and in Kosasthalaiyar River in Ennore Creek area.
2. The residential area of Kattukuppam, Sathyamurthy Nagar, Nettukuppam, Thalakupam, Sivan Padai Veedhi, Ennore Kuppam, Thazhan Kuppam, Mugathuvara Kuppam, Kargil Nagar mainly affected are all along the stretch of the Buckingham canal.
3. Mangroves in the Buckingham canal near Sivan Padai Veedhi and Kosasthalaiyar River both the banks were affected due to oil spillage.

The TNPCB officials also collected samples in the creek area of Nettukuppam and in B' Canal near Thazhankuppam village and sent them for analysis.



**Collection of water sample near Ennore creek**

As more complaints about the damages caused due to the oil deposition in the B' Canal water, its banks and in Ennore Creek, were received and as the Hon'ble NGT in its order dated 09.12.2023 has directed to take immediate steps to arrest the oil spread, the Government of Tamil Nadu decided to constitute a Technical Team to provide a detailed report on this incident to the Government.

## 2. Formation of Technical Team

The Environment, Climate Change and Forests Department, Government of Tamil Nadu constituted a Technical Team vide G.O.(Ms) No.178 dated 10.12.2023 with the following Experts/officers to ascertain the cause of the oil spillage in the Ennore Creek area, assess the damage caused and to suggest remedial measures (Annexure I)

1	ThiruR.Kannan, Member Secretary, TNPCB	Chairman
2	Dr.G.Saravanan, Principal Scientist, Chennai Zonal Centre, CSIR, NEERI	Member
3	Ms. H.D.Varalaxmi, Scientist-E & Regional Director, Regional Directorate, Central Pollution Control Board, Chennai	Member
4	Thiru V. Kumar, Commandant, Indian Coast Guard	Member
5	Prof V.T.Perarasu, Department of Chemical Engineering, Anna University Chennai	Member

## 3. Geography of the Area

### 3.1 Manali– EnnoreIndustrial Complex

The Manali and Ennore industrial area, located along the Coromandel Coast north of Chennai, is a sprawling hub of economic activity. The Manali Industrial Complex is one of the largest petrochemical complexes in India and the only one in Tamil Nadu. This Petrochemical Complex is located at 13°10'4" Northern latitude and 80°15'43" eastern longitude and is about 20 km north of Chennai. This Industrial complex spreads over in the revenue villages of Manali, Chinnasekadu, Voiyakadu Sadayankuppam, Amulavoyal, Ennore and Eranvor of Tiruvottiyur Taluk, Chennai District of Tami Nadu. Just adjacent to this petrochemical complex is the Ennore

industrial area which houses thermal power plants, large scale chemical and fertiliser units making Manali – Ennore a complex industrial hub of Tamil Nadu. Manali-Ennore Industrial Complex is surrounded by Buckingham Canal & Tiruvottiyur village on the East, Chennai city on the South, Kossathaliyar River on the North and the villages of Manjambakkam, Mathur and Madavaram of Chennai District on the West. It is well connected by Ennore High Road and National Highway 5A. The Ennore port is located at 15 km and Thiruvottiyur Railway Station 3 km away.



### Google map showing the villages and the water bodies in Manali – Ennore area

This industrial complex spread over 2000 hectares, it houses major players in the oil refining, petrochemicals, pharmaceuticals, Engineering and chemicals industries, driving Chennai's industrial engine. Manali Industrial Area is vital in India's petrochemical and energy sectors, supplying raw materials for various industries. The

zone contributes significantly to Chennai's and Tamil Nadu's GDP, with estimates ranging from 10% to 15%.

Major Industries located in this region are:

- Chennai Petroleum Corporation Limited (CPCL)
- Madras Fertilizers Limited (MFL)
- Manali Petrochemical Ltd (MPL)
- Tamil Nadu Petroproducts Limited (TPL)
- National Thermal Power Corporation Ltd
- Ashok Leyland
- L&T Shipbuilding
- Sriram Fibers Ltd (SRF)
- Cetex Petrochemicals,
- Supreme Petrochemicals
- Indian Additives Ltd
- Kothari Petrochemicals Ltd
- BalmerLawrie& Co
- KCP
- NatcoPharma
- Raj Petro
- Piramal Pharma
- Toshiba JSW Power Systems Private Limited
- MRF
- Carborundum Universal

The region has also numerous water bodies and macro drains, including Buckingham canal, Kosasthaliyar River, and Ammulavoyal channel. Despite having such large water bodies for effective flood drainage, the area is experiencing frequent flooding due to the lack of a drainage master plan for the region, encroachments and inadequate storm water drainage systems.

### 3.2 Chennai Petroleum Corporation Limited (CPCL)

Chennai Petroleum Corporation Limited (CPCL) is a public sector unit, a group company of Indian Oil Corporation Ltd which is located at Manali Village, Tiruvottiyur Taluk, Chennai District and spread across an area of 832 acres. CPCL refinery commenced its production since 1969. The unit is in the business of refining crude Petroleum Oil with total capacity of 10.5 MMTPA. The main products of the refinery are LPG, Motor Spirit, Superior Kerosene, Aviation Turbine Fuel, High Speed Diesel, Naphtha, Bitumen, Lube Base Stocks, Paraffin Wax, Fuel Oil, Hexane and Petrochemical feed stocks. This refinery plays a vital role of a mother industry supplying feed stocks to the neighbouring industries located in Manali, Chennai.

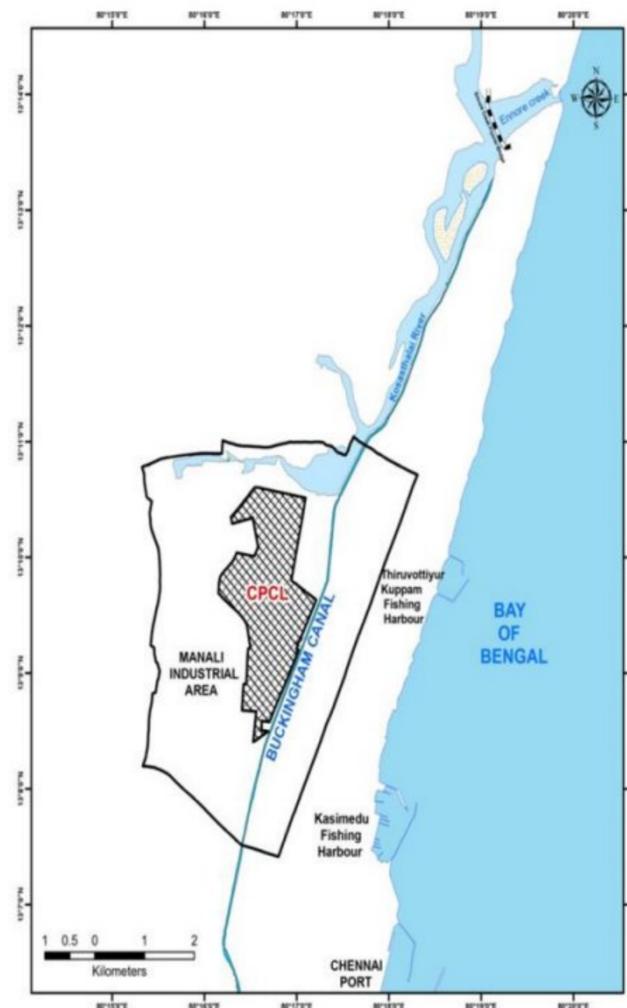


**A view of CPCL refinery**

CPCL has obtained consent valid upto 31.03.2024 for 9 plants out of which 6 plants are process plants, 2 are utility plants and one is crude pipeline plant. These plants include 3 Crude Oil Refineries, Diesel Hydro De-Sulphurization Unit, Resid Upgradation Project, Propylene, Butylene & Lube Expansion Plant, Hexane Plant, Gas

Turbine Generator Power Plant, Crude Pipeline Project & Tertiary Sewage Treatment Plant.

The trade effluent generated from the refining activities is treated in 3 nos of Effluent Treatment Plants with capacities of 300 KL/hr (2 nos) & 465 KL/hr which is further treated through RO. The treated effluent is partly recycled to boiler feed and balance treated effluent is stored in two Guard Ponds which is further used for fire water network, gardening and cooling tower make up. Further the unit has provided storm water collection ponds to collect the rain water and provision made for treat the same in ETP. Oil water separators are provided in the storm water collection ponds. The unit has installed 40 nos. of stacks at their process section, 6 nos. of stacks at boiler and 5 nos. of stacks at Gas Turbines. OCEMS connectivity has been established at 51 stacks for the pollutant parameters such as SO<sub>2</sub>, NO<sub>x</sub>, PM & CO to CAC, TNPCB and CPCB servers.

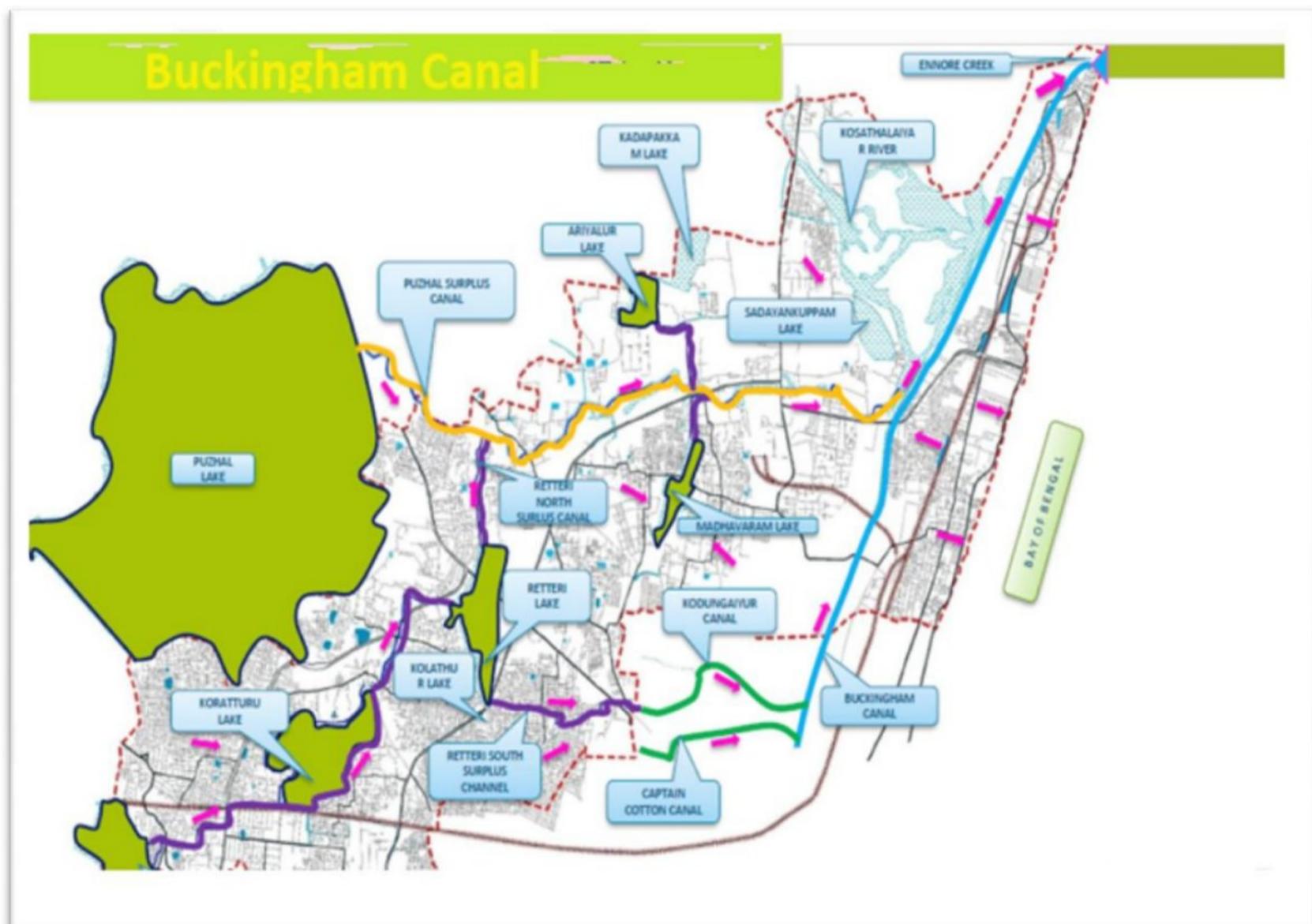


**The location of CPCL in the Manali industrial area along side Buckingham Canal and Kosasthalaiyar River**

### 3.3. Buckingham Canal

The Buckingham Canal is a historical waterway located in the city of Chennai, Tamil Nadu. It stands as a testament to the city's rich heritage and the vital role it played in fostering trade and transportation. The canal covers a considerable distance, serving as a significant aquatic artery, meandering through various parts of Chennai and connecting several water bodies.

In terms of geography, the canal originates at Ennore Creek, providing a link between the Pulicat Lake and the Adyar River. It passes through several neighborhoods of Chennai, such as Royapuram, George Town, and Mylapore, providing a scenic view of urban and suburban life along its banks. The canal's network extends up to the southern parts of the city, thereby enhancing connectivity and providing a historical perspective to the urban landscape.

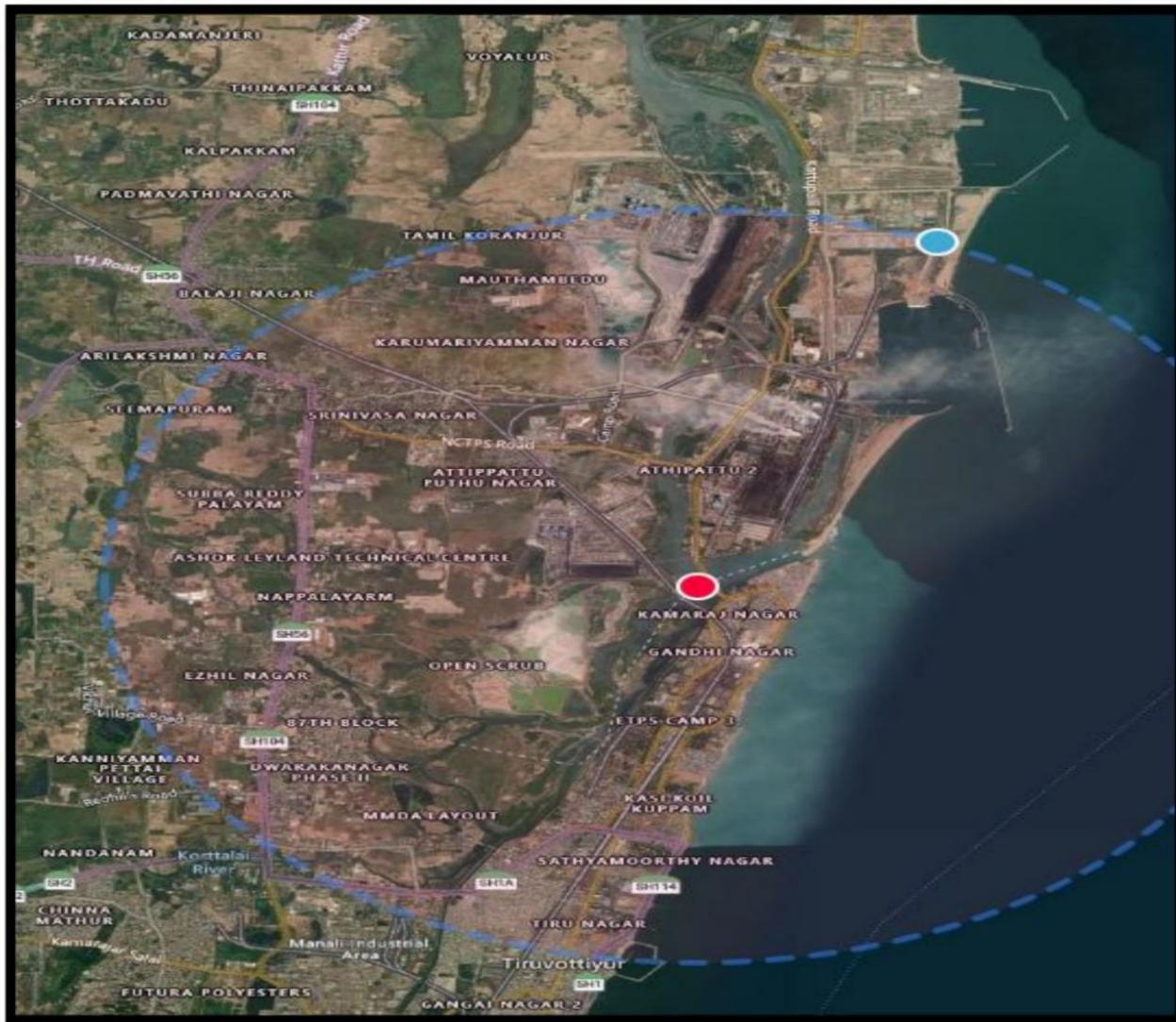


A map showing various water bodies around Manali – Ennore area

### 3.4. Ennore Creek

Ennore Creek, situated in the northern part of Chennai, is a vital water body that plays a significant role in the ecological and environmental landscape of the region. It is an estuarine creek that extends for approximately 25 kilometers, winding its way through the urban and industrialized areas of North Chennai.

The creek serves as a crucial transitional zone where freshwater from rivers and storm water runoff merges with the saline waters of the Bay of Bengal. Diverse ecosystems, including mangrove forests, mudflats, and tidal wetlands flank Ennore Creek. These ecosystems provide a habitat for a rich diversity of flora and fauna, serving as breeding grounds for several fish species and supporting numerous bird species, making it a hotspot for biodiversity. This unique ecosystem plays a crucial role in the region's ecological balance, supporting a diverse range of flora and fauna, acting as a natural flood control mechanism, and even contributing to the local economy.



Google map showing the location of Ennore creek

### **3.5 Ecological Significance of Ennore Creek:**

Ennore Creek has extensive mangrove forests and is home to various plant species like *Avicennia marina*, *Rhizophora mucronata*, and *Sonneratia apetala*. These mangroves act as breeding grounds for fish and crustaceans, protect the coastline from erosion, and filter pollutants from the water. The rich ecosystem attracts a variety of bird species, including migratory birds like flamingos, pelicans, and sandpipers. Over 120 bird species have been documented in the Ennore Creek area, making it a haven for birdwatchers and nature enthusiasts.

The creek has diverse aquatic life, including fish, shrimps, crabs, and molluscs. These organisms play a vital role in the food chain and contribute to the ecosystem's overall health. Ennore Creek experiences strong tidal rhythms, influencing water flow and sediment transport. This dynamic environment creates unique habitats for various species and also plays a role in coastal protection.

### **3.6 Residential areas and fisherman activities**

The Ennore region in Chennai is characterized by a unique juxtaposition of residential areas and vibrant fisherman activities along the Ennore Creek surroundings. This dynamic coexistence reflects the diverse lifestyles and economic activities that thrive in this coastal area.

Ennore is home to a mix of residential communities, ranging from traditional villages to more modern urban developments. The residents of these areas often have a strong connection to the water bodies that surround them, as many households depend on fishing or other maritime-related activities for their livelihoods. The residential landscape in Ennore is marked by a blend of traditional dwellings and newer housing developments, highlighting the area's socio-economic diversity.

Fishing is a predominant and time-honored occupation in the Ennore region, sustained by the rich marine resources provided by the Ennore Creek and the nearby Bay of Bengal. Fishermen in the area engage in various fishing techniques, including traditional methods such as net fishing and more modern approaches using

mechanized boats. The creek's estuarine ecosystem contributes significantly to the abundance of marine life, making it an ideal location for fishing activities.

Several fishing villages are in the Ennore Creek surroundings, each with its own distinct character and community ties. These villages are often close-knit, with residents sharing a deep-rooted connection to the sea and its resources. Fishing villages contribute to the cultural fabric of the region, maintaining age-old traditions while adapting to the changing dynamics of the fishing industry.

### **3.7 Mangrove forests**

Ennore is renowned for its extensive mangrove forests that play a pivotal role in the region's ecological health. These lush green ecosystems, characterized by salt-tolerant trees and shrubs, are situated along the banks of Ennore Creek and contribute significantly to the area's environmental sustainability. Ennore's mangrove forests are biodiversity hotspots and serve as critical habitats for a diverse range of flora and fauna. These ecosystems are breeding grounds for various fish species, mollusks, and crustaceans, providing a nursery for juvenile marine life. The intertwining roots of mangroves also offer shelter to numerous species of birds, insects, and amphibians.

Mangroves help in water quality improvement by acting as natural filters, trapping sediments and pollutants from runoff before they reach the water bodies. This natural filtration process helps maintain water quality in Ennore Creek, ensuring a healthier environment for aquatic life and the local community. The dense network of mangrove roots acts as a natural buffer against coastal erosion and storm surges. This protective barrier helps stabilize the shoreline, reducing the impact of tidal movements and safeguarding adjacent areas from the adverse effects of extreme weather events. The mangroves of Ennore contribute significantly to the local fisheries industry and country's economy. They support the livelihoods of numerous fishermen who depend on the abundant marine life that these coastal forests nurture by providing a favorable environment for fish breeding and spawning.

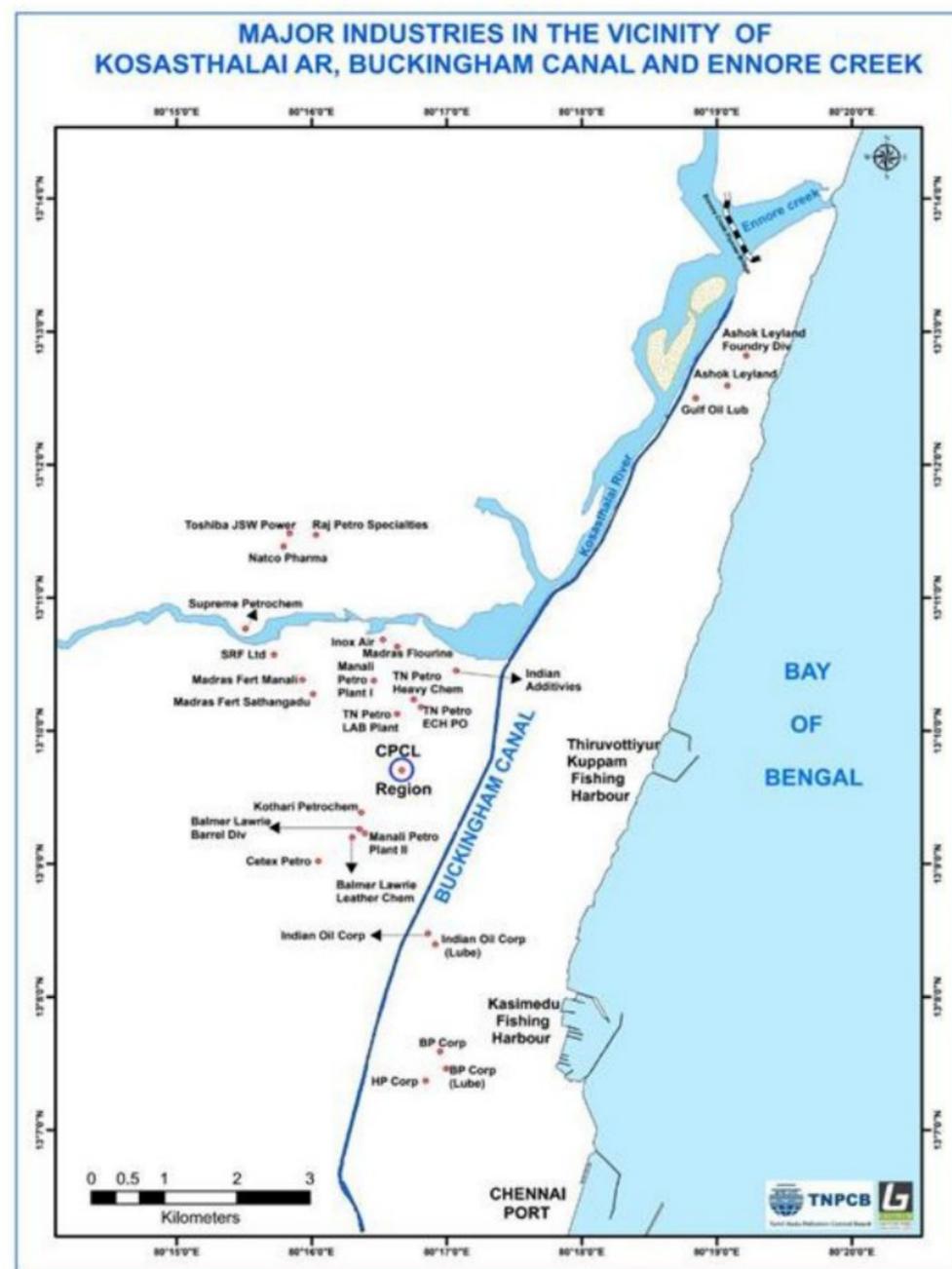


**A view of mangrove forest in Ennore creek**

Mangroves are highly efficient carbon sequestration agents, capturing and storing large amounts of carbon dioxide from the atmosphere. This not only helps mitigate the impacts of climate change but also contributes to the overall reduction of greenhouse gas emissions. The ability of mangroves to trap sediment and build up land elevation over time makes them crucial in adapting to rising sea levels. These forests act as natural barriers, helping coastal areas withstand the challenges posed by climate change.

#### 4. Details of Preliminary Inspection carried in the industries in Manali and Ennore by TNPCB

The TNPCB has formed 7 teams consisting of DEEs, AEEs and AEs to inspect all the industries in Manali area to check whether any oil spillage has happened during the flood. The inspection team of TNPCB visited 29 industries in Manali and Ennore area on 11/12/2023 and the summary of the observation made during the inspection is listed in the Table. The location of the major industries and the water bodies in Manali area is shown in the following figure.



A map showing the location major industries and water bodies in Manali

<b>Sl. No</b>	<b>Name of the Industry</b>	<b>Observation of oil spillage in the premises</b>
1	M/s. Indian Additives Ltd Manali Village	Reported that during a flood on 04.12.2023, flood water mixed with thick black oil entered into the unit premises through the main gate entrance and spread over the area.
2	M/s. Kothari Petrochemicals Ltd (Co-Generation Power Plant) Sathangadu Village	No traces of oil were found within the premises
3	M/s. Kothari Petrochemicals Ltd Sathangadu Village	No traces of oil were found within the premises
4	M/s. Cetex Petrochemical Ltd Sathangadu Village	No traces of oil were found within the premises
5	M/s. Madras Fertilizers Ltd Sathangadu Village	No traces of oil were found in the storm water drain leading to Buckingham Canal
6	M/s. Madras Fertilizers Ltd Manali Village	No traces of oil were found in the storm water drain leading to Buckingham Canal
7	M/s. Supreme Petrochem Ltd Manali Village	No traces of oil were found in the storm water drain leading to Buckingham Canal
8	M/s. SRF Ltd Technical Textile Business Manali Village	No traces of oil were found in the storm water drain leading to Buckingham Canal
9	M/s. Gulf Oil Lubricants India Ltd Kathivakkam Village	No traces of oil were found in the storm water drain
10	M/s. Ashok Leyland Ltd Ennore Village	No traces of oil were found in the storm water drain
11	M/s. Ashok Leyland Ltd – Foundry Division Kathivakkam Village	No traces of oil were found in the storm water drain
12	M/s. Manali Petrochemical Ltd – Plant I Manali Village	No traces of oil or oily matter were found in the storm water drain and adjoining areas.
13	M/s. Manali Petrochemical Ltd – Plant II Manali Village	No oily matter was found in the drain and its side walls
14	M/s. Tamilnadu Petrochemicals Ltd – Heavy Chemicals Division Manali Village	No oily matter was found in the drain and its side walls
15	M/s. Tamilnadu Petrochemicals Ltd – ECH – PO Plant Manali Village	No oily matter was found in the drain and its side walls
16	M/s. Tamilnadu Petrochemicals Ltd – LAB Plant Manali Village	No oily matter was found in the drain and its side walls

17	M/s. Raj Petro Specialties Pvt Ltd Manali Village	No oil-bearing wastewater was flowing in the storm water drain.
18	M/s. Natco Pharma Ltd Manali Village	No oil bearing waste water was flowing in the storm water drain.
19	M/s. Toshiba JSW Power System Pvt Ltd Manali Village	Water containing lube oil in the machines was found contained in the premises itself and no oil bearing wastewater was flowing in the channel.
20	M/s. Bharat Petroleum Corporation Ltd (Lube Oil Blending Plant) Tondiarpet Village	Stagnated flood was water found to be drained out completely
21	M/s. Bharat Petroleum Corporation Ltd (Tondiarpet Installation) Tondiarpet Village	Stagnated flood water was found to be drained out completely
22	M/s. Hindustan Petroleum Corporation Ltd (Chennai Terminal – Lubes) Tondiarpet Village	Stagnated flood water was found to be drained out completely
23	M/s. Indian Oil Corporation Ltd (Lube Oil Blending Plant) Tondiarpet Village	A stagnated flood water was found to be drained out completely
24	M/s. Indian Oil Corporation Ltd (Tondiarpet Terminal) Tondiarpet Village	The storm water near the administrative Building was removed but the tank farm area was flooded with 1 feet depth of water
25	M/s. BalmerLawrie& Co Ltd, Barrel Division Sathangadu Village	The unit has not contributed to the cause of the recent oil spillage in the Ennore creek area.
26	M/s. BalmerLawrie& Co Ltd, Grease and Lubricant Division Sathangadu Village	The unit has not contributed the cause of the recent oil spillage in the Ennore creek area.
27	M/s. BalmerLawrie& Co Ltd, Leather Chemicals Division Sathangadu Village	The unit has not contributed the cause of the recent oil spillage in the Ennore creek area.
28	M/s.Inox Air Products Pvt Ltd Manali Express Highway	The unit has not contributed the cause of the recent oil spillage in the Ennore creek area.
29	M/s. Madras FlourinePvt Ltd Manali Express Highway	The unit has not contributed to the cause of the recent oil spillage in the Ennore creek area.

From the inspection reports, it is inferred that no oil foot prints were observed in the premises of 28 industries and the oil footprints were observed only in one industry namely M/s. Indian Additives Ltd.,(IAL) in addition to M/s. CPCL. It was informed by

M/s. Indian Additives Ltd., that flood water mixed with thick black oil entered into the unit premises through the main gate entrance and spread over the area.

## 5. Inspection of the Technical Team and observations

The Technical Team inspected the entire premises of M/s CPCL in general and in particular, the storm water drainage system & its storage ponds, the Petcoke processing area, the ETP area, sludge storage tanks, sludge bioremediation process area and crude storage area during the inspection, the following observations were made.



### Inspection of CPCL by the Technical Team on 11/12/12023

1. The storm water collection pond A was inspected and it was observed that there is a provision to pump the storm water to collection Pond C and there is an outlet leading to Buckingham Canal. Under normal circumstances, the Pond A storage water is pumped into ETP, however, it is pumped outside the premises into Buckingham Canal during heavy rains. Though there is an oil water separator

provided, as the level of storm water raises above the pond level, there seems to be an overflow that can reach the Buckingham Canal along with a huge quantity of floating oil.

2. The traces of oil on the shrubs, roads and side walls located in and around the Pond A area indicates the possible overflow of oil from the storm water ponds. There is a surge pond located adjacent to Pond "A" where a lot of oil spillages were noticed and a cleaning operation was under progress. Though this pond is reported to be not in use, the stagnated water in this pond with high oil content could have overflowed into Buckingham Canal from M/s CPCL premises.



**Oil spillage observed around Storm water collection Pond A**



**Surge pond and drain opposite to surge pond**

3. During the inspection of the Pond “C”, it was noticed that there is a provision to pump out the water for further treatment in the ETP for reuse. However, there is also a provision, where the water stored in the pond shall directly reach the Buckingham Canal. There are also possibilities that oil may be directly flowing out when the level of water is raised more than the brim level of the pond.



#### **Oil spillage observed near Pond C and its surroundings**

4. In Pond “D” also, there is a provision to pump out the storm water for further treatment in ETP for reuse. Here also there are possibilities of oil mixed water may be directly flowing out from the premises when the level of water is raised more than the level of the pond.
5. In the ETP and MTF(Mandatory Tank Farm) areas, where Pond“E” is located which has also got pumping facility to discharge into the Buckingham Canal. A

thick layer of oil found in the drainage area and pipelines reveals that a huge quantity of oil could have found its way to the Buckingham Canal.



**Drain leading to B' Canal which was cleaned before the inspection by CPCL**

6. There is a sludge storage tank where the tank bottom sludge is brought and stored. From this sludge, oil is removed through a centrifugal system for further reuse and the remaining sludge is sent for bioremediation. During the inspection, it was found that there occurred an overflow which could have carried oil along with thick oil sludge to the Buckingham Canal. Though this tank is situated at higher elevation, there is no proper protection to contain the overflow during rainy days; overflow from this tank joins the storm water drain which leads eventually to Buckingham Canal.





**Oil Sludge storage tanks and their surrounding area**

7. The bioremediation of oil sludge operation is also carried out in an open area without any roof which might have also added further discharge of oil content into the Buckingham Canal.
8. During the inspection of Buckingham Canal, there were no traces of oil found in the upstream side of M/s CPCL, whereas oil deposits are found continuously in the banks of Buckingham Canal in the downstream of M/s. CPCL storm water outlet points. There was a flow in the Buckingham Canal which was also carried oil traces in the downstream of M/s CPCL discharge points.



**Oil Spillage observed on side walls of Buckingham canal**



**Oil spillage deposited in EnnoreCreek**

The cleanup operation carried out by M/s CPCL in Ennore Creek was also inspected by the team and found that the magnitude of the cleaning is very low when compared to the level of cleaning operations to be undertaken for the removal of oil in the Buckingham Canal and Ennore creek.

Seven teams comprising of Engineers from TNPCB inspected the remaining industries in the Manali area on 11.12.2023 to ascertain the discharge of oily substances during the heavy rains. From the inspection reports, it is inferred that no oil foot prints were observed in the premises of 28 industries and the oil footprints were observed only in one industry namely M/s. Indian Additives Ltd.,(IAL) in addition to M/s. CPCL. It was informed by M/s. Indian Additives Ltd., that flood water mixed with thick black oil entered into the unit premises through the main gate entrance and spread over the area.

### **5.1 Meeting of the Team and Visit to Ennore Creek area to visualize the ongoing clean-up operation:**

A meeting has been organized by TNPCB through VC comprising Technical Team members dated 13<sup>th</sup> Dec. 2023 to discuss various aspects of the oil spread issues. It was decided that the team members would visit the Ennore Creek area to monitor the status of Buckingham Canal and its restoration. Subsequently, a meeting

was convened at TNPCB office dated 14<sup>th</sup> Dec. 2023 to discuss the details of monitoring and analysis reports.



**Photo showing foot print of oil spillage from R&D Gate of CPCL to drain**



**Photo showing oil spillage residues on compound wall near to the drain**

It is also observed that the oil spillage residues on side walls of drain passing in front of Research Centre Gate of CPCL. M/s IAL is located next to this gate. Efforts are being made to collect the oil from Buckingham Canal, Kosasthalaiyar River and Ennore Creek through oil booms, gully suckers, oil skimmers, .TNPCB reported that 2,20,040 litres of oil-water mixture has been collected (as of 31.12.2023). The actual quantity of oil present in the above said oil water mixture is to be assessed after analyzing the representative samples from collected mixture.

Efforts are being made to remove the oil-deposited soil/wastes from the bank of Buckingham Canal and Kosasthalaiyar River. It was informed that 663.5 tonnes of oil laden soil & debris have been removed from Buckingham Canal and Kosasthalaiyar River and stored them at the premises of CPCL. The actually quantity of oil present in the above said soil/wastes is to be assessed after analyzing the representative samples from collected mixture.

## **5.2 Field visit of Team to find other sources for Oil spillage in Buckingham Canal and Ennore Creek:**

The Team members and TNPCB officials verified the suspected three pipelines crossing across the drain which is joining Kosasthalaiyar River and confirmed through respective owners of the pipelines that one pipeline is carrying treated effluent for marine disposal and two pipes belongs to Chennai Metro Water Supply in that one is defunct. The team revisited the suspected oil spillage sources inside the CPCL, huge oil spillage foot print was observed around the pond D, oil bearing water might be breached from this pond through outlet of the south side compound. The reconstruction of the portion of the Southside compound wall confirms the breaching of oilbearing water to adjacent storm water drain exist in CMD Steel yard. The foot print of oil spillage along this drain in spite of cleaning confirms the breaching of huge quantity of oil bearing water from the CPCL process area. The stagnated oil in the storm water drain contributing thin oil spillage to Buckingham canal and Kosasthalairiver.



**Photos showing 3 pipe line crossing drain Patch work done in breached compound wall**



**Photos showing oil / oil laden water from CPCL found its way into the storm water drain passing through the CMDA steel yard**

The Team also observed oil spillage foot prints in many places of process area and as well as near to old defunct ETP inside the premises. The two pipelines having cuts and with oil smears were observed near the process area which is also indicating the breaching of pipeline carrying slop oil or crude. The unit was not allowed to take photographs as per their protocol, team asked the unit to produce the photos of spots visited but no photos are received .

Stagnated oil bearing water was observed around the crude oil tank (Tank no 117), huge oil spillage foot print observed along with the drain adjacent to this tank. This also one of the strong suspicious source of oil breach.



**Photo showing oil spillage along drain passing adjacent to sludge storage and crude oil storage tank**

**6. Findings of the Team based on the information provided by the M/s CPCL:**

As per the suggestions of the Team TNPCB requested M/s CPCL to provide certain details viz; quantity of slop oil, O&M details, the mass balance of raw materials, sludge storage, etc. M/s CPCL has submitted the following details vide letter dated 14.12.2023, the details are as below;

SI NO	Information requested	Information provided by CPCL											
i	Oily waste material collected from day to day operations, from all the storm water ponds, ETPs and other sources and its quantity, its storage method and disposals details	<p>Slop Oil quantity collected from storm water ponds, ETPs and other sources for the last three months is furnished below</p> <table border="1"> <thead> <tr> <th>Month</th> <th>Quantity, KL</th> </tr> </thead> <tbody> <tr> <td>September</td> <td>1939</td> </tr> <tr> <td>October</td> <td>4528</td> </tr> <tr> <td>November</td> <td>1238</td> </tr> </tbody> </table> <p>Slop oil is stored in Slop Tanks and reprocessed with Crude.</p>	Month	Quantity, KL	September	1939	October	4528	November	1238			
Month	Quantity, KL												
September	1939												
October	4528												
November	1238												
ii	Whether cleaning operation carried out before Michaung flood, its collection details.	<p>Details of major activities carried out as part of pre monsoon preparedness is furnished below:</p> <ul style="list-style-type: none"> <li>▪ Storm water canal cleaning</li> <li>▪ Building roof cleaning</li> <li>▪ Dewatering pumps checking &amp; availability</li> </ul>											
iii	Whether all the refineries are in operation during the flood, if not details shall be furnished. Further receipt of crude oil from 1st December 2023 to 9th December 2023 shall be furnished	<p>Out of 3 Refineries, only one Refinery was in operation during flood. Other two Refineries were under circulation.</p> <p>Details of Crude Oil Receipt from 01.12.23 to 09.12.23 is furnished below:</p> <table border="1"> <thead> <tr> <th>Date</th> <th>Crude receipt in TMT</th> </tr> </thead> <tbody> <tr> <td>01.12.23</td> <td rowspan="4">No receipt</td> </tr> <tr> <td>02.12.23</td> </tr> <tr> <td>03.12.23</td> </tr> <tr> <td>04.12.23</td> </tr> <tr> <td>05.12.23 20.48 hrs to 07.12.23 06.00 hrs</td> <td>135</td> </tr> <tr> <td>09.12.23 18.54 hrs to 11.12.23 hrs 07.12 hrs</td> <td>99</td> </tr> </tbody> </table>	Date	Crude receipt in TMT	01.12.23	No receipt	02.12.23	03.12.23	04.12.23	05.12.23 20.48 hrs to 07.12.23 06.00 hrs	135	09.12.23 18.54 hrs to 11.12.23 hrs 07.12 hrs	99
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iv	Total quantity of Sludge stored inside the premises and its	Quantity of Sludge Stored in CPCL is 2300 KL in sludge pond. The sludge would be mechanically treated to extract oil and residual material would be											

	method of disposal	bioremediated. Extract oil would be reprocessed thro' crude tanks																																				
v	Frequency of conducting spillage deduction along with details of records maintained.	Spillage Detection & Repair study is carried out yearly once in CPCL and the report is submitted to TNPCB regularly. The latest report is submitted in Jan 23 (Annexure-A)																																				
vi	Mass balance of raw material and product manufactured	<p>Mass balance in Tons/ day furnished below</p> <table border="1"> <tr> <td>Crude through put</td> <td>28.8</td> </tr> <tr> <td>LPG</td> <td>1.0</td> </tr> <tr> <td>Naphtha</td> <td>2.4</td> </tr> <tr> <td>Petrol (M.S)</td> <td>3.0</td> </tr> <tr> <td>ATF</td> <td>3.2</td> </tr> <tr> <td>Diesel</td> <td>15.0</td> </tr> <tr> <td>Lobs/Wax</td> <td>0.8</td> </tr> <tr> <td>Bitumen</td> <td>1.2</td> </tr> <tr> <td>Internal fuel</td> <td>2.2</td> </tr> </table>	Crude through put	28.8	LPG	1.0	Naphtha	2.4	Petrol (M.S)	3.0	ATF	3.2	Diesel	15.0	Lobs/Wax	0.8	Bitumen	1.2	Internal fuel	2.2																		
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vii	<p>Number of unused storage tanks and number of it for maintenance</p> <p>The details of date of clean in progress taken for crude oil tanks, slops storage and other.</p>	<p>Details of idle and M&amp;I tanks is furnished as Tanks released and under Maintenance</p> <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Tank No.</th> <th>Service</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>343</td> <td>DWO(HH)</td> <td>Released in Oct 23</td> </tr> <tr> <td>2</td> <td>412</td> <td>SK(LAB)</td> <td>Released in Sep 23</td> </tr> <tr> <td>3</td> <td>418</td> <td>ATF</td> <td>Released in Oct 23</td> </tr> <tr> <td>4</td> <td>107</td> <td>Crude</td> <td>Released in Oct 23</td> </tr> <tr> <td>5</td> <td>820</td> <td>Dry slop</td> <td>Released in Sep 23</td> </tr> <tr> <td>6</td> <td>310</td> <td>HN/DAO</td> <td>Released in Mar'23</td> </tr> <tr> <td>7</td> <td>311</td> <td>IN/HN/DAO</td> <td>Released in Mar'23</td> </tr> <tr> <td>8</td> <td>309</td> <td>Raff</td> <td>Released in Jun'23</td> </tr> </tbody> </table>	Sl. No.	Tank No.	Service	Remarks	1	343	DWO(HH)	Released in Oct 23	2	412	SK(LAB)	Released in Sep 23	3	418	ATF	Released in Oct 23	4	107	Crude	Released in Oct 23	5	820	Dry slop	Released in Sep 23	6	310	HN/DAO	Released in Mar'23	7	311	IN/HN/DAO	Released in Mar'23	8	309	Raff	Released in Jun'23
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		11	312	IN/HN/DAO	Released in Sep'23												
		12	919	Wax	Released in Oct'23												
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viii	Details of the sludge stored in the open yard	All sludge is stored in concrete pit with impervious layer and is at higher elevation.															
ix	Any operations carried out to protect the refinery to avoid untoward incidents during the flood time	<ul style="list-style-type: none"> <li>➤ One Refinery out of 3 Refineries was operated to maintain product supply to market.</li> <li>➤ Tractors trailers &amp; fire truck were operated to bring Manpower &amp; Material inside Refinery</li> </ul>															
x	The details of Characteristics of waste oil collected from ETPs & storm water collection ponds	<p>Slop oil is a mixture of oil collected from various sources. Slop Oil is reprocessed with crude. Since the qty of slop oil is very minimal, analysis is not required. However as per instruction, one sample was analysed today (14.12.23) and the result is furnished below.</p> <p>a) Density-0.873 gm/cc  b) Sulphur- 2.09 %  c) Flash- 37 Deg C  d) Viscosity @ 40 Deg C- 6.6</p>															
xi	The details of products sent to Manali customers and control mechanism provided to safe guard during no demand period	<table border="1"> <thead> <tr> <th>Industry</th> <th>Products</th> <th>In case of No demand</th> </tr> </thead> <tbody> <tr> <td>TPL</td> <td>LABFS</td> <td>Will be absorbed in Diesel pool / converted to ATF</td> </tr> <tr> <td>MPL</td> <td>Propylene</td> <td>Will be sold as LPG</td> </tr> </tbody> </table>				Industry	Products	In case of No demand	TPL	LABFS	Will be absorbed in Diesel pool / converted to ATF	MPL	Propylene	Will be sold as LPG			
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			<i>KPL</i>	<i>PBFS</i>		
				<i>LPBFS</i>		
			<i>Cetex Petrochemicals</i>	<i>Butene2</i>		
				<i>MEKFS</i>		

From the above information, the Team noticed the following;

- As per the information given at Sl. (i), it is inferred that the average slop oil collected from ETPs and other sources ranges from 50 kld to 150 kld. Due to heavy rain since December 03 and 04, 2023, the collection of slop oil might not be happened, this slop oil might be washed away due to rising of water levels in all ponds since the ponds were just above the ground level. As per this information, the quantity washed away might be more than 400 kl.
- As per the information given at Sl.(iv), it is inferred that 2300 kl oil-bearing sludge is being stored in the sludge pond. The same was observed during the team visit and noticed that the sludge stored was up to the brim level, the oil mixed sludge might be washed away to drain due to the flood which is directly leading to the Buckingham Canal.
- As per the information given at Sl(vii), it is inferred that eight crude oil storage tanks were taken for maintenance during September – October 2023. The oil-bearing sludge required to be separated through centrifugation and the same has to be taken for bio remediation. At least 90 days are required to complete one cycle of bio remediation. Eight tanks were taken for maintenance in the last three months, the oil bearing sludge might be stored in the ponds, due to the flood, these sludge might be washed away. One of the nearby industry namely M/s Indian Additives Ltd, reported to the TNPCB team on 04.12.2023 that the mixture of thick Black oil & water was gushed into their premises. The statement of industry also confirms that the probability of washing of oil-bearing sludge from their storage dykes.
- In spite of sever cyclonic and heavy rain fall alert by IMD and Govt. of Tamil Nadu, the unit is not taken any precautionary measures to contain the oil spillage from

their ponds and ETPs. And also unit is not having either flood management plan or emergency contingency plan to contain oil spillage.

## **7. Monitoring of Water and Air Quality**

### **7.1 Variation of Oil & Grease level in water bodies**

The presence of 828 mg/L of Oil & Grease and 48.4 mg/L Total Phenolic Compounds in the sample collected at Ennore Creek Bridge on 05/12/2023 as against the standards of 10 mg/L and 1.0 mg/L clearly indicates the high oil content in the water bodies. (Annexure 2).

On 07.12.2023, five samples were collected along the Buckingham Canal stretch and near CPCL campus and the Oil & Grease value was varying from 28 mg/L at the B' Canal, near IOCL gate, Tondiarpet to 158 mg/L at Ennore creek. This report clearly indicates that Oil & Grease value in the B' Canal in the upstream of CPCL was lower compared to its level in Ennore creek which is in the downstream of CPCL. The Oil & Grease value was 230 mg/L in the sample collected in the stagnant water in the storm water drain near south gate of CPCL. The high Oil & Grease value in B' Canal in the downstream of CPCL and in the stagnant water in the storm water drain near south gate of CPCL clearly indicate oil spillage from CPCL.

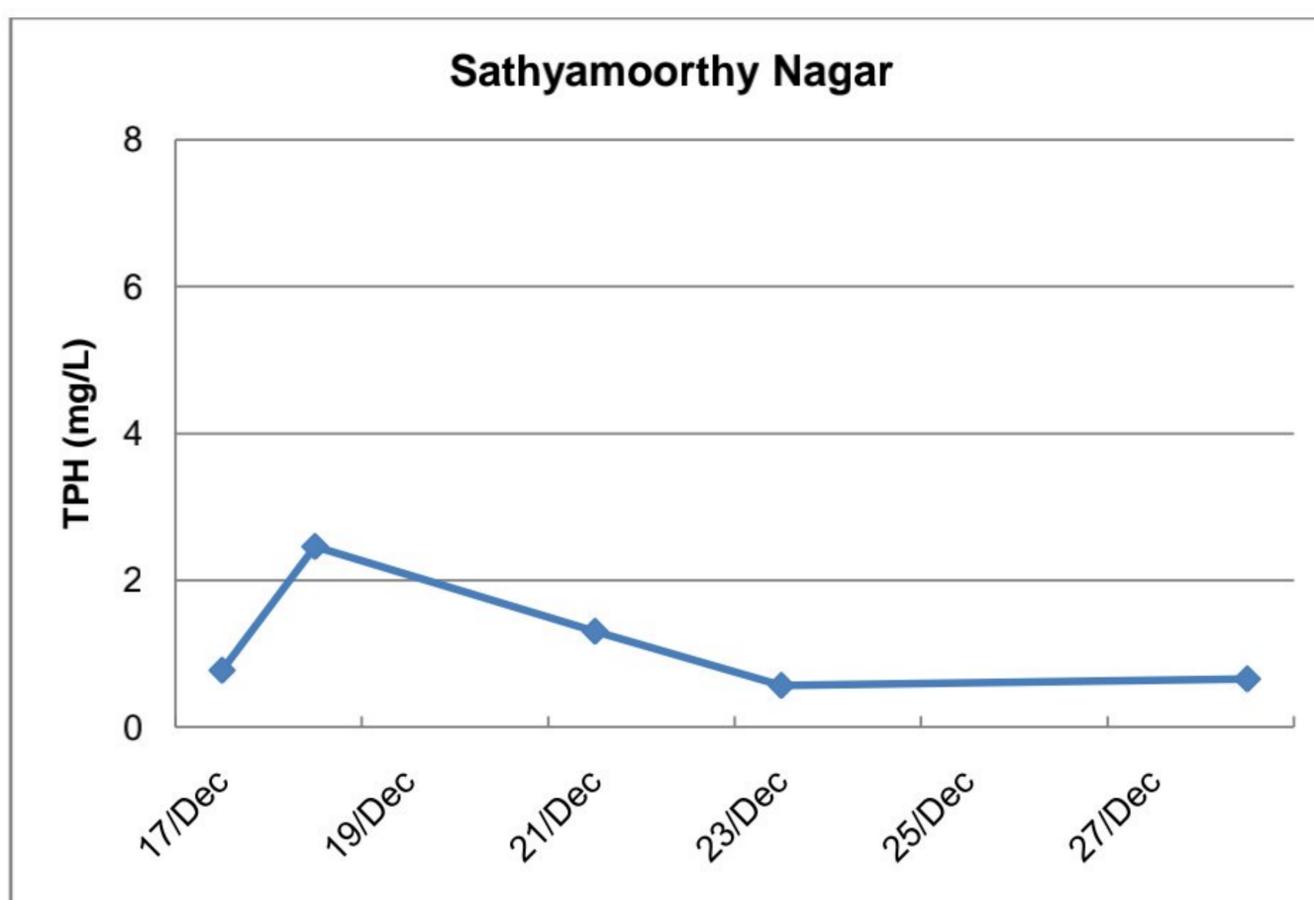
The Oil & Grease value in the samples collected on 09/12/2023 from storm water ponds inside the CPCL premises ranges from 46 mg/L to 96 mg/L indicates clearly that Oil & Grease got mixed with storm water in the unit of CPCL.

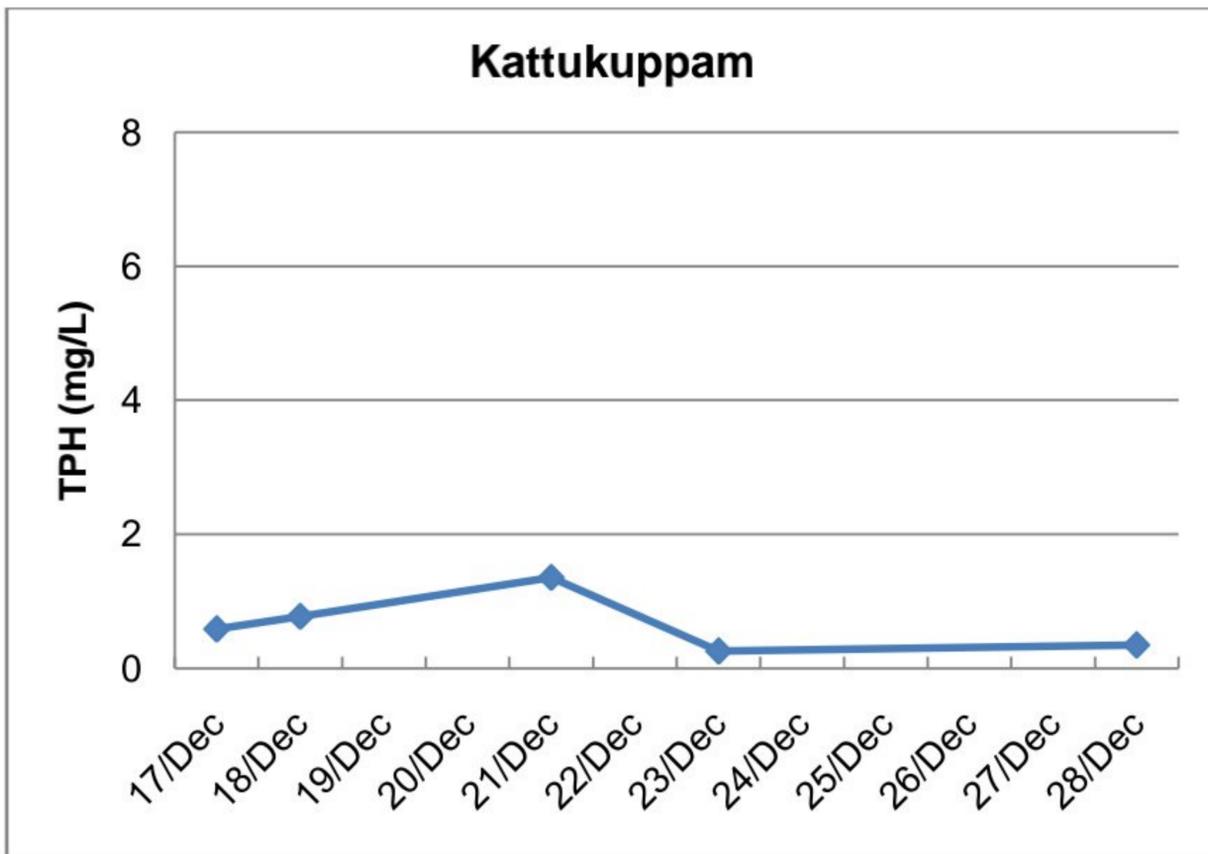
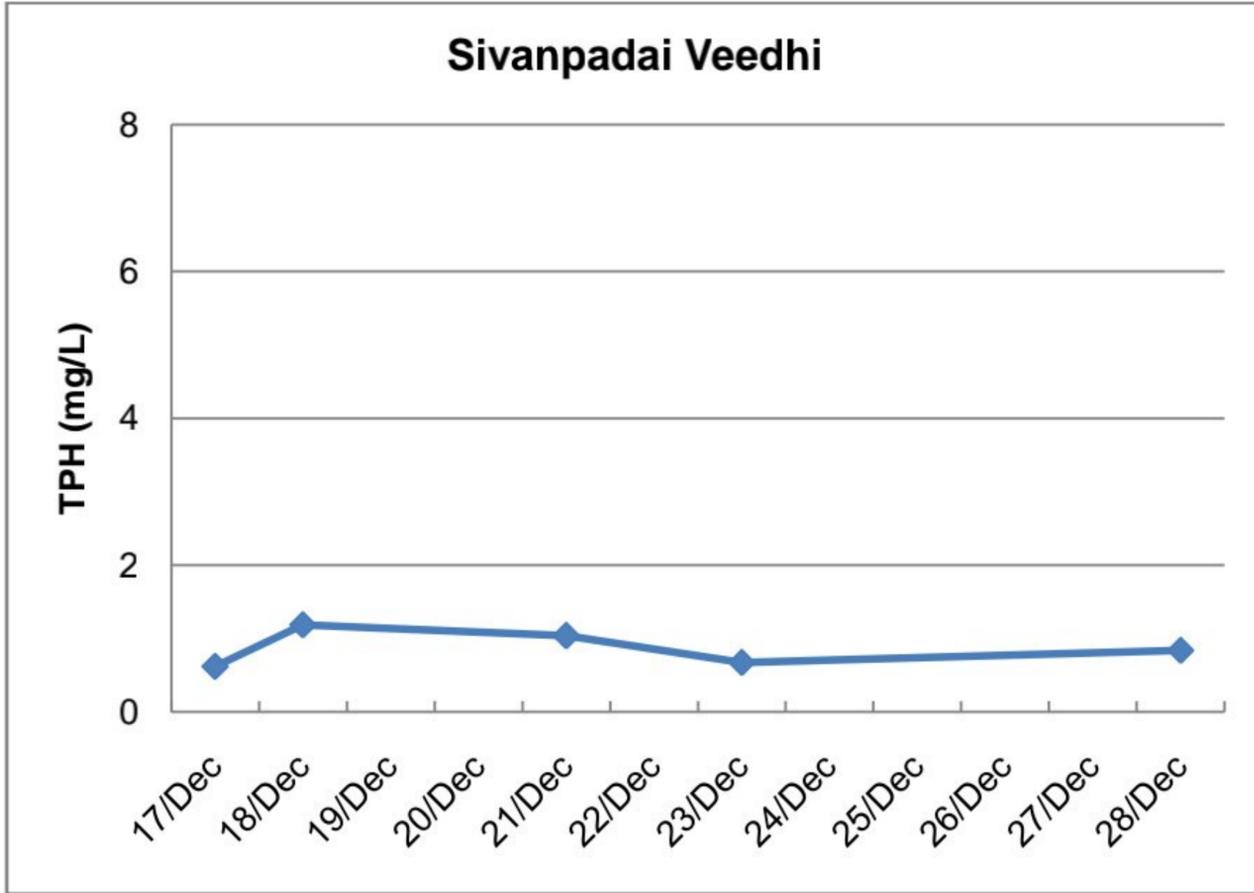
### **7.2 Variation of Total Petroleum Hydrocarbons (TPH) level in water bodies**

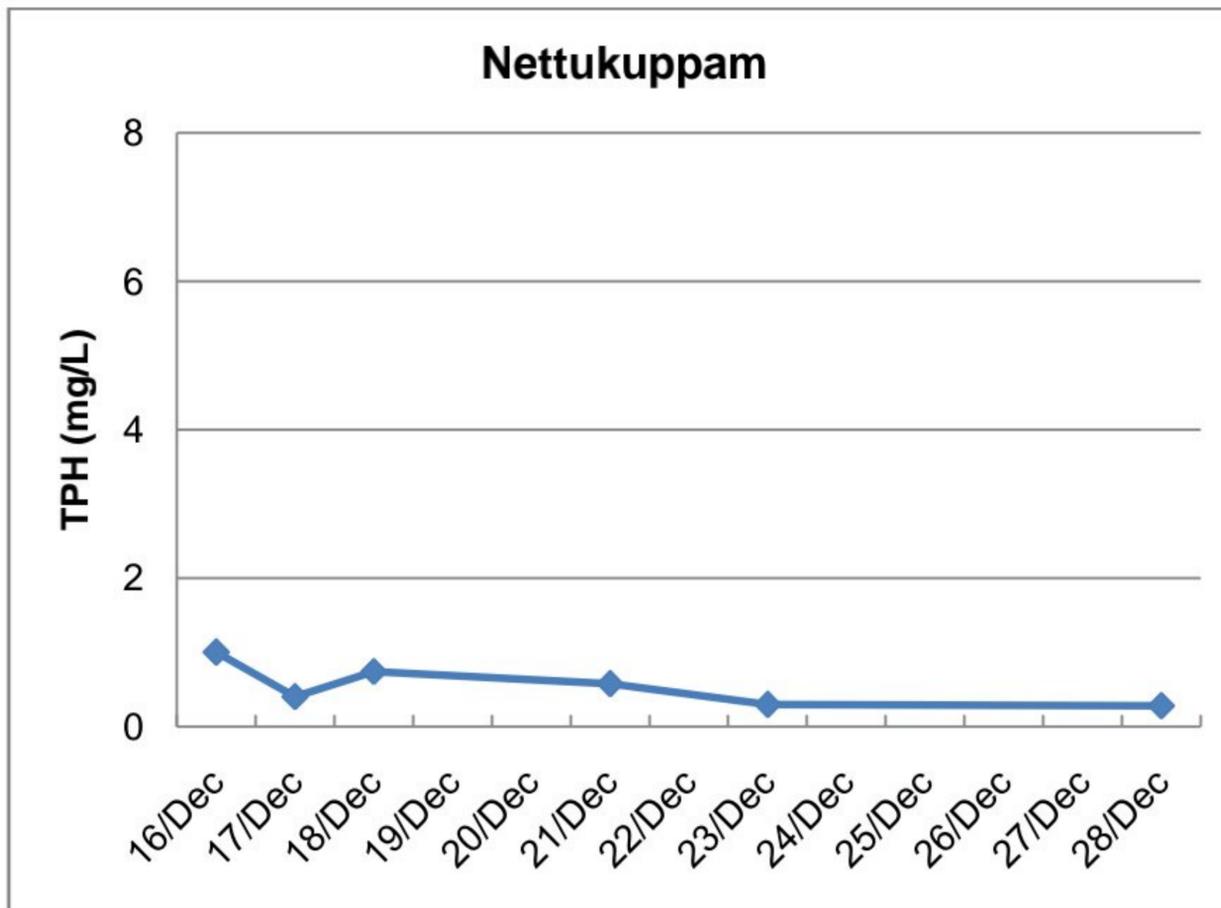
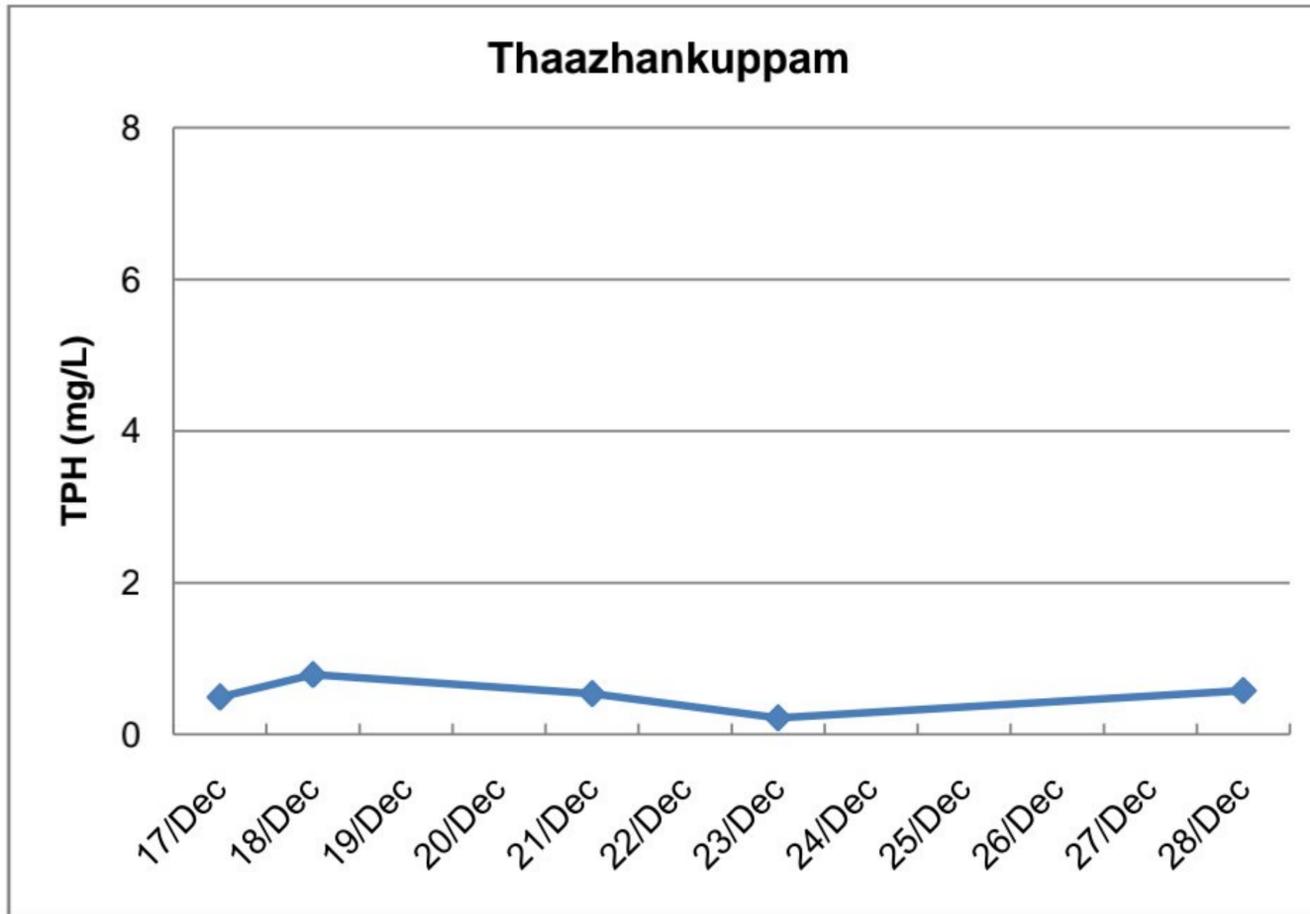
Surface water samples were collected by TNPCB officials and analysed at a NABL accredited private laboratory post the oil spillage and cleaning activities carried out across Ennore and Neighbouring coastal areas (17-12-2023 to 28-12-2023). Samples were analysed for Total Petroleum Hydrocarbons (TPH) and the results are tabulated below. The decreasing trend of TPH value from 17/12/2023 to 23/12/2023 in most of the locations and the flat graph of the same from 23/12/2023 probably indicates that no fresh contamination of B' Canal is occurring from CPCL which is the

major contributor of TPH. The cleaning and remediation activities is responsible for reduction of TPH initially.

Sampling Location	17.12.2023	18.12.2023	21.12.2023	23.12.2023	28.12.2023
Sathyamoorthy Nagar	0.772	2.458	1.302	0.565	0.653
SivanpadaiVeedhi	0.619	1.185	1.034	0.672	0.837
Kattukuppam	0.584	0.775	1.355	0.253	0.344
Thaazhankuppam	0.488	0.787	0.536	0.217	0.576
Nettukuppam	0.402	0.74	0.573	0.294	0.277



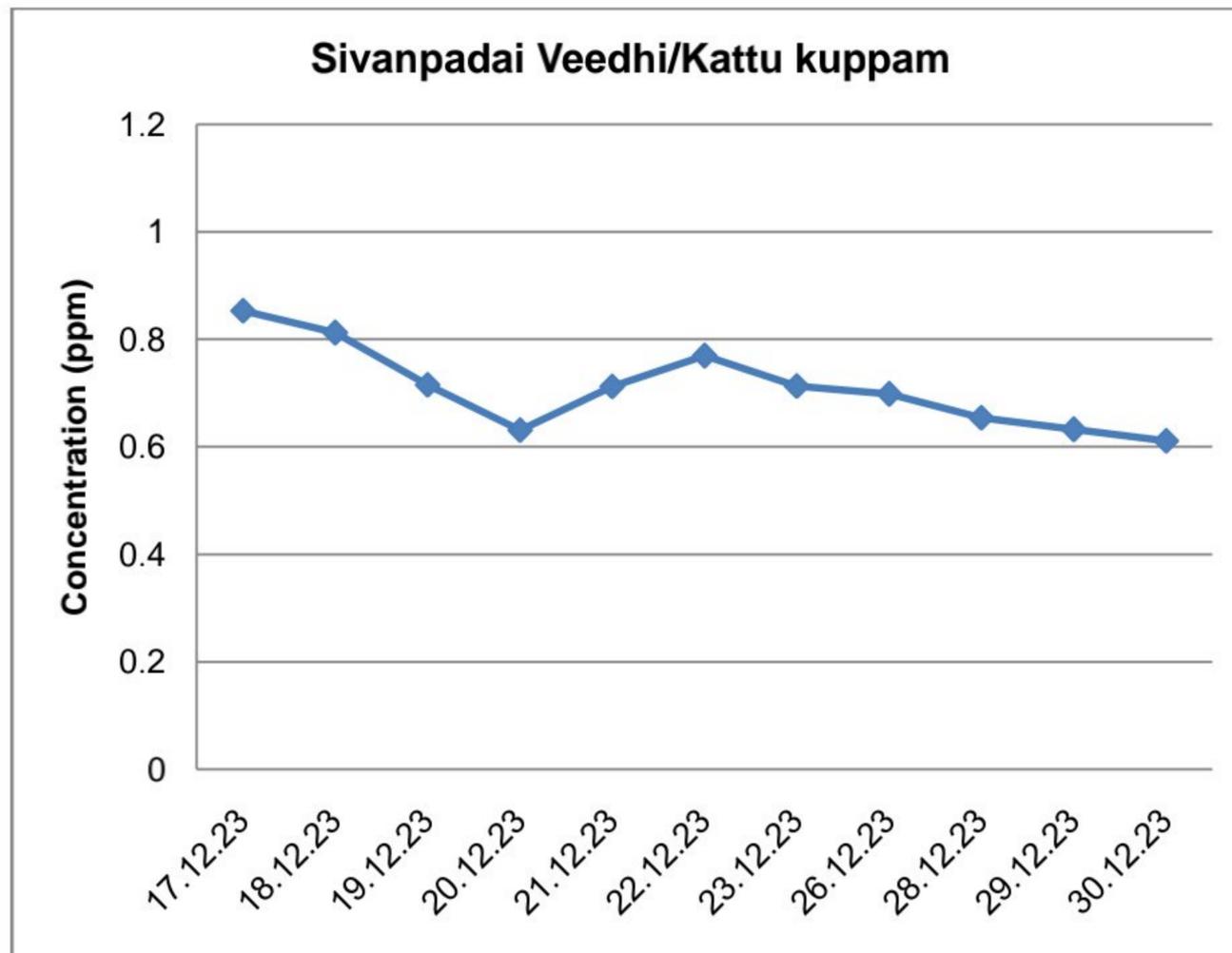


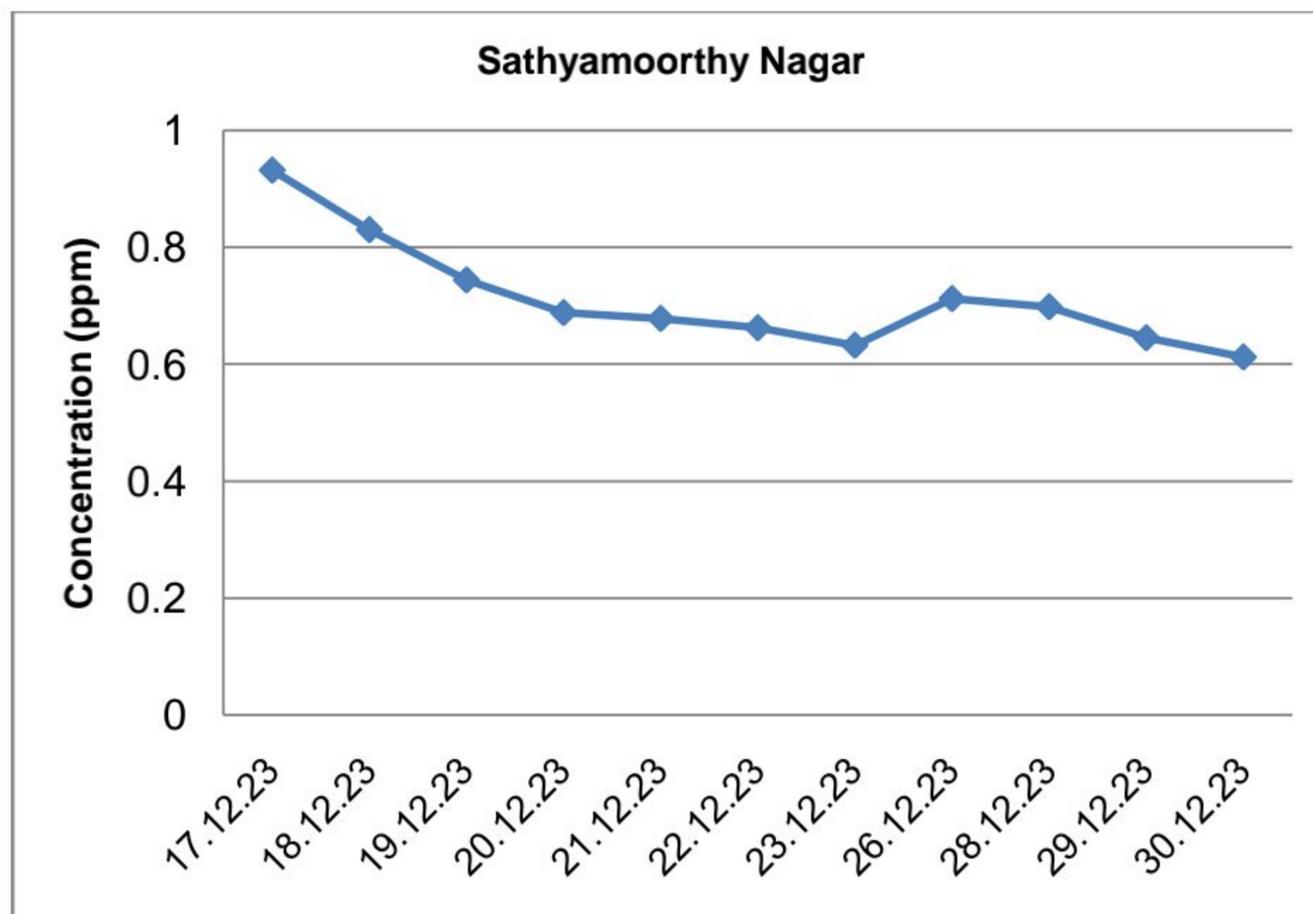
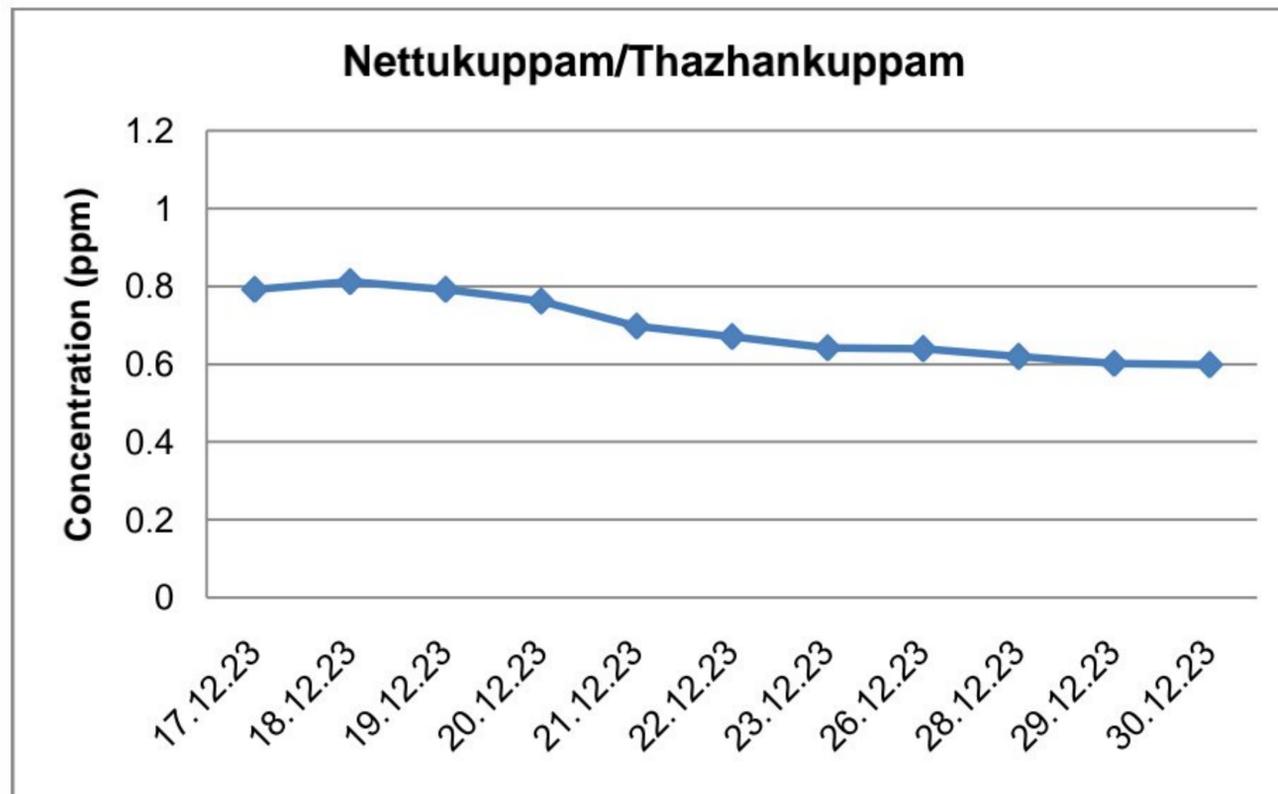


Graphs showing the variation of TPH value at various sampling locations

### 7.3 Variation of Total VOC (TVOC) level in the ambient air

TVOC analysis in the ambient air was conducted in five locations covering upstream near IOCL Tondiyarpur Terminal and Near CPCL South Gate and downstream at Sivanpadai Veedhi/Kattukuppam at Nettukuppam/Thazhankuppam and at Sathyamoorthy Nagar of oil-spillage affected areas from 17<sup>th</sup> December 2023 to 30<sup>th</sup> December 2023.



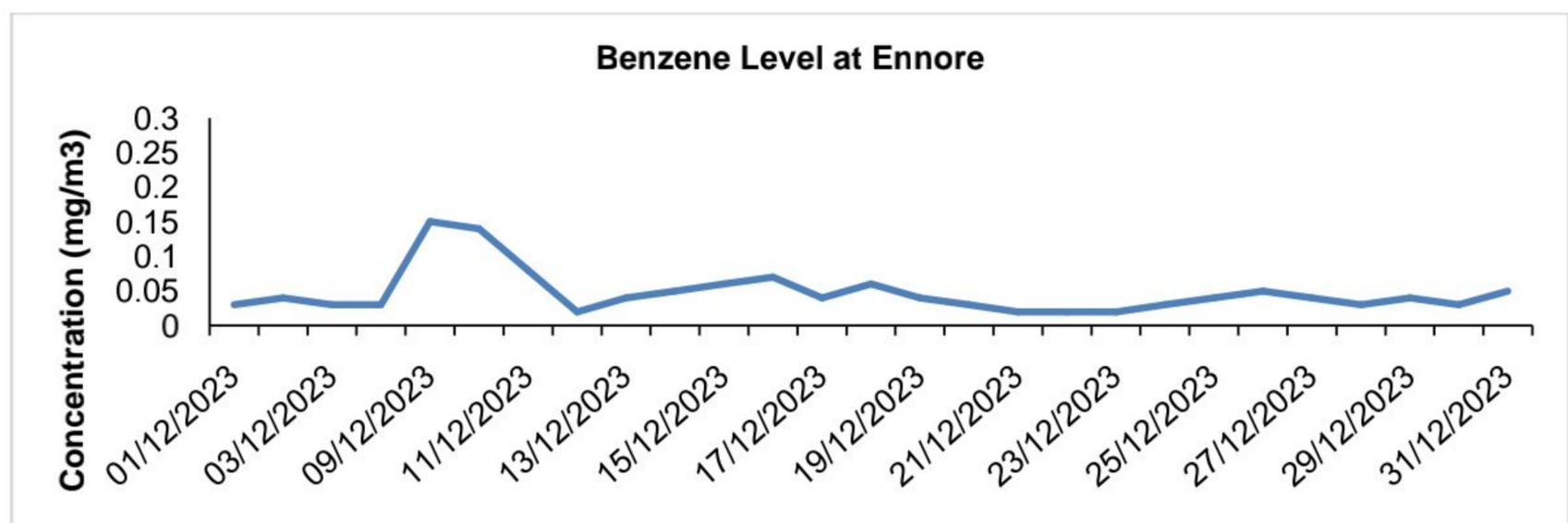


**Graphs showing the variation of TVOC value at various sampling locations**

The graph of TVOC results revealed gradual decreasing trend in all the locations due to continuous cleaning work carried out by CPCL under the supervision and guidance of Government of Tamil Nadu.

#### 7.4 Variation of Benzene level in the ambient air

The variation of benzene level in the ambient air monitored in Continuous Ambient Air Quality Monitoring (CAAQM) Station, Kathivakkam from 01/12/2023 to 31/12/2023 is shown in the following graph. It is inferred from the graph that the concentration of benzene increased slightly from 09.12.2023 to 12.12.2023 in the month of December due to oil spillage in the surrounding area. However, the concentration of the Benzene for the month of December 2023 is found to be well within the National Ambient Air Quality Standard (5 microgram/m<sup>3</sup> annual average). The concentration of benzene decreased progressively upon the commencement of cleaning activity. Further, from 05.12.2023 to 08.12.2023 the station was not in operation, due to power shutdown during Michaung cyclone.



**Variation of benzene level in the ambient air monitored in CAAQM, Kathivakkam**

## **8. Findings of the Team :**

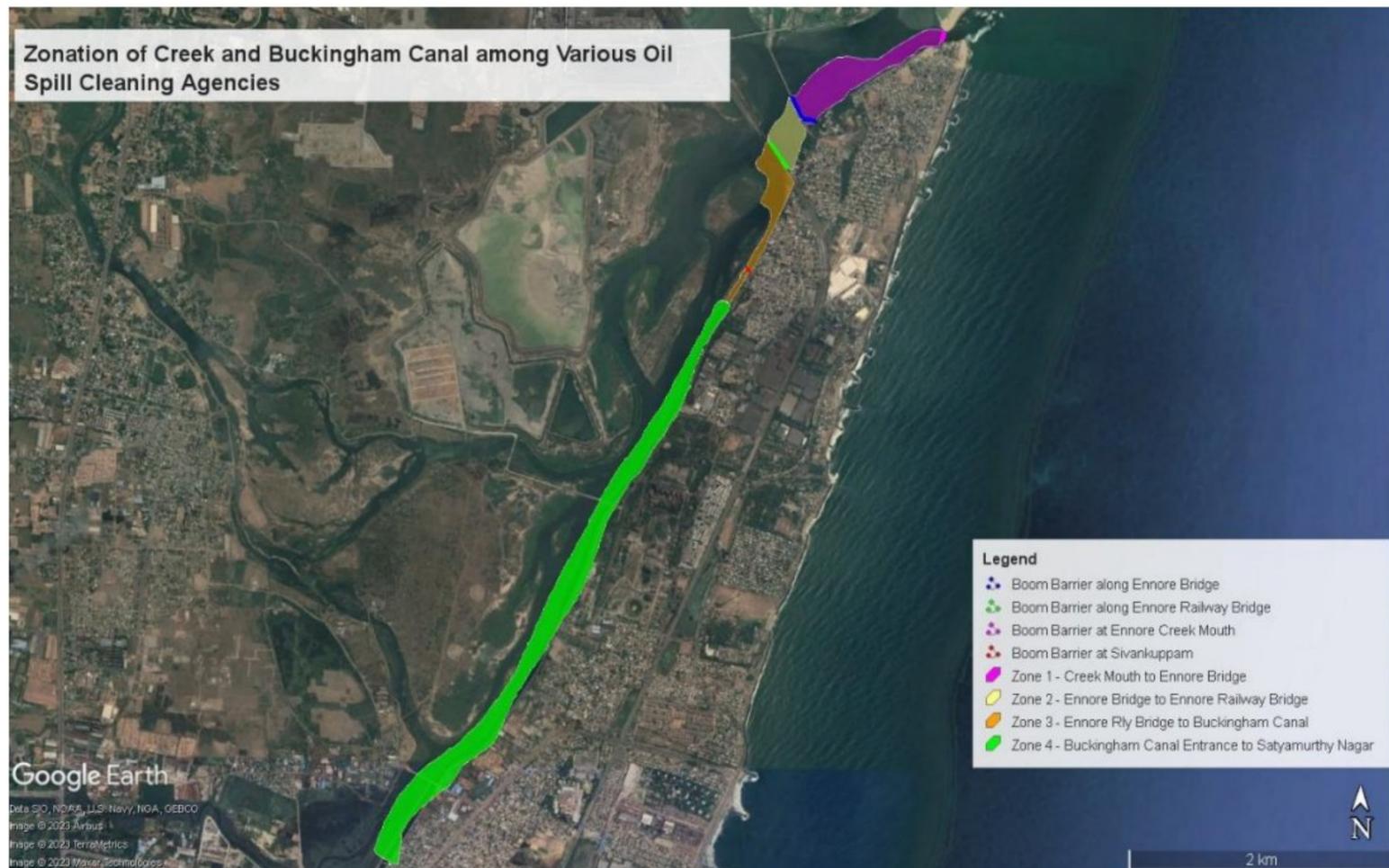
1. Based on the field observations, the team has come to the conclusion that the unit is a huge oil handling facility with the inadequate storm water management system and storm water storage ponds. It is therefore evident that a huge quantity of oil-bearing water has been breached from M/s Chennai Petroleum Corporation Ltd., into the Buckingham Canal and in turn to Ennore Creek during flooding caused by cyclone Michaung.
2. The information provided by the industry regarding the slop oil collection, tank bottom sludge collection, etc. proves that cumulative oil slops from the ETP, Storm water collection ponds and bottom sludge generated during the maintenance of eight crude tanks, are major sources of oil spillage into Buckingham Canal and Ennore Creek.
3. During the second visit of the team, breaching of compound wall adjacent to the drain, possible breaching of oil from the pipeline carrying slop oil/crude and breaching of tank bottom sludge from Crude oil tank no.117 were observed and the same confirms that oil spillage occurred inside the plant and spilled into the adjacent water bodies.

**As far as the estimation of amount of oil reached the water bodies and the environmental damage, IITM has been requested by the Government of Tamil Nadu to carry out a detailed scientific assessment of environmental damage caused by this incident including the finger printing of the oil and the quantification of oil that would have reached the water bodies. Based on the IITM assessment environmental compensation shall be worked out by TNPCB in consultation with CPCB and necessary action shall be taken to levy the same and collect it from CPCL.**

### 9. Remediation measures

The remediation works are focused on oil containment and oil removal. To serve as a focal point for all these oil clearing activities, an Oil spillage Management Co-ordination Centre was set up at Nettukuppam to monitor the oil clearing activities. Works for removal of oil from Buckingham Canal commenced on 12.12.2023 at Nettukuppam and Ennore Villages. The oil affected areas were divided into four stretches as below and specialized agencies were deployed for each stretch.

Zone	Name of the Stretch	Agency	Distance (Km)
I	Nettukuppam to Ennore Bridge	M/s. Viraj Clean Sea Enterprises	1.5
II	Ennore Bridge to Railway Bridge (Kattukuppaam)	M/s. Vens Hydra Lift Pvt Ltd	0.35
III	Railway Bridge to entrance of Buckingham canal	M/s. Sea Care Services	1.0
IV	Buckingham canal to Sathyamurthy Nagar	M/s. Neowin India Ltd	6



**Google map showing four cleaning zones**

Highly trained manpower from all these specialized agencies were mobilized on all four stretches for removal of oil mixed with water and oil laden debris. As on 01.12.2024, a total of 11,125 man-days has been utilized. On daily basis, the clearing activities were carried out with help of the following machinery and equipment



**Cleaning operations at Ennore mangrove forest area by trained manpower**

The detail of machineries used during remediation and cleaning operations are indicated in the following table

Machinery/Equipment deployed	
For Containment	Quantum
Oil Boom	1380 m
Absorbent Booms	100 m
Absorbent pads	11,500 Nos
For Removal	Quantum (on Daily Basis)
Tractors with trailers	2 Nos
Hydracrane	3 Nos
Boats	110 Nos
Gully Suckers	5 – 8 Nos
Pickup trucks	4 Nos
Oil Skimmers	6 Nos
JCBs	7Nos
Poclaim	4 – 6 Nos
Tippers	11 Nos

As a result of cleaning work for a span of 22 days i.e., from 12.12.2023 to 01.01.2024, a total of 2,20,040 litres of oil-water mixture and 663.5 tonnes of oil-laden soil and debris has been collected from the Buckingham Canal and Ennore Creek Areas. The collected oil mixed water & oil soaked debris are sent to CPCL for further treatment and scientific disposal.

## 10. Recommendations of the Team

After detailed inspection the team made the following recommendations.

### **Immediate measures**

1. The CPCL shall take up study on flood management for entire premises to avoid such incident that no waste/product/raw material shall not be gushed out of their premises
2. The CPCL shall rise the height of all storage tanks of Storm water collection, effluent and sludge by considering worst situation of flood
3. The CPCL shall take up maintenance of crude oil tanks well before onset of monsoon and to complete the separation of oil as well as bio-remediation of sludge well before the monsoon.
4. The CPCL shall have preparedness plan in place to avoid such incidence in future
5. The CPCL shall fix the permanent booms/oil separators in the vulnerable areas including the outside of CPCL premises. Periodic maintenance should be undertaken before monsoon season.
6. The CPCL shall install sensors in the vulnerable area to give warnings.
7. The CPCL shall complete the cleaning operations in the Buckingham canal and Ennore creek area and take-up restoration flora and fauna.

### **Long Term measure**

1. Improved Infrastructure Design: The CPCL shall enhance the design of storage tanks to withstand extreme weather events like floods. This could include elevated structures, reinforced containment walls, and waterproof sealing.
2. Flood Barriers and Containment Systems: The CPCL shall install flood barriers around critical areas to prevent water from reaching the tanks. Additionally, the unit shall have secondary containment systems that can prevent oil from spreading if a spillage occurs.
3. Regular Maintenance and Inspections: The CPCL shall ensure regular maintenance of all tanks including ETPs and pipelines to address any potential

- vulnerabilities. This should include frequent inspections, especially before expected adverse weather conditions.
4. Advanced Monitoring Systems: The CPCL shall utilize technology like remote sensing and automated monitoring systems to detect early signs of leakages or structural weaknesses.
  5. Emergency Response Plan: The CPCL shall develop and regularly update a comprehensive emergency response plan. This plan should include procedures for immediate containment and clean-up in case of a leakage.
  6. Collaboration with Local Authorities: The CPCL shall work closely with local government authorities to align safety protocols and response strategies.
  7. Regular Audits and Inspections: The CPCL shall conduct independent audits and inspections of oil facilities to ensure compliance with safety and environmental standards.
  8. Public Awareness and Preparedness: The CPCL shall educate the local community about potential risks and emergency procedures in the event of an oil leakage.
  9. Investment in Clean-up Technologies: The CPCL shall allocate resources for research and deployment of effective oil leakage clean-up technologies.
  10. Partnerships for Environmental Conservation: The CPCL shall collaborate with NGOs and international bodies to protect and restore ecosystems like mangroves that are affected by oil leakages.
  11. Environmental Clean-Up Initiatives: The CPCL shall take full responsibility for the clean-up operations, employing the best available technology to minimize the environmental impact.
  12. Ecosystem Restoration Funds: The CPCL shall allocate funds specifically for the restoration of damaged ecosystems of B Canal and Ennore Creek and mangroves. This could involve cleaning operations, replanting mangroves, and rehabilitating wildlife.

**Other industries**

Other industries located along the Buckingham canal and Kosasthalairiver shall be directed to take following measures;

1. The unit shall prepare proper flood management plan to address the issues aroused in recent flood
2. The unit shall check the height of all tanks including raw material/product/waste(liquid & Solid)
3. The unit shall phase out all underground tanks of raw material/product/oil etc.,
4. The unit shall provide adequate drainage system

**TNPCB**

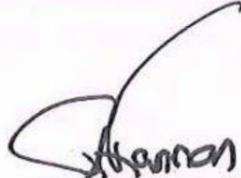
1. TNPCB shall workout the environmental compensation to be levied from M/s CPCL in consultation with CPCB immediately after the receipt of IIT Madras study report on the scientific assessment of environmental damage caused by this oil leakage incident including the finger printing of the oil and the quantification of oil that would have reached the water bodies.
2. TNPCB shall take immediate action to file a criminal case against the unit of M/s CPCL and its occupier for the violations of the conditions of the consent order issued under Water Act

  
Dr.G.Saravanan  
Principal Scientist, CSIR-  
NEERI

  
Prof. V.T.Perarasu  
Anna University

  
V.Kumar  
Commandant, ICG

  
H.D.Varalaxmi  
Scientist-E, RD, CPCB

  
R.Kannan  
Member Secretary,  
TNPCB

## **Annexure I**

### **Formation of Technical Team**





Environment - Constitution of a Technical team to ascertain the cause of the recent oil leak in the Ennore Creek Area – Orders - Issued

**Environment, Climate Change and Forests (EC3) Department**

**G.O.(Ms) No.178**

**Dated: 10.12.2023**

சோபகிருது, கார்த்திகை-24

திருவள்ளூர் ஆண்டு 2054

**ORDER:**

In order to ascertain the cause of the recent oil leak in the Ennore Creek area, the Government orders constitution of a Technical team with following Experts / Officers to find out the cause of the oil leak in the Ennore Creek area.

1. Thiru R.Kannan, Member Secretary, TNPCB - Chairman
2. Dr.G.Saravanan, Principal Scientist, Chennai Zonal Centre, CSIR-NEERI - Member
3. Ms.H.D.Varalaxmi, Scientist-E & Regional Director, Regional Directorate, Central Pollution Control Board, Chennai - Member
4. Thiru V. Kumar, Commandant, Indian Coast Guard - Member
5. Prof V.T.Perarasu, Department of Chemical Engineering, Anna University Chennai - Member

The technical team shall make a field to the CPCL premises and other related Industries in the forenoon of 11.12.2023 and submit their preliminary report before 4 p.m. on the same day so that it can be presented in the meeting of the State Oil Spill Crisis Management Group.

The Detailed Report shall be submitted by the Committee within 2 days from the date of issue of this Government Order.

**(BY ORDER OF THE GOVERNOR)**



**SUPRIYA SAHU**

**ADDITIONAL CHIEF SECRETARY TO GOVERNMENT**

To

The Chairperson, TNPCB, Chennai  
Thiru R.Kannan, MS, TNPCB - Chairman

Dr.G.Saravanan, Principal Scientist,  
Chennai Zonal Centre, CSIR-NEERI - Member

Ms.H.D.Varalaxmi, Scientist-E & Regional Director, Regional Directorate,  
Central Pollution Control Board, Chennai - Member

Thiru V. Kumar, Commandant, Indian Coast Guard - Member

Prof V.T.Perarasu, Department of Chemical Engineering, Anna University  
Chennai - Member

**Copy to**

The Senior Personal Assistant to Hon'ble Minister  
(Environment and Climate Change), Chennai - 9.  
PS to Chief Secretary to Government, Chennai - 9.  
Ps to ACS/Secretary-I to C.M, Chennai - 9.  
PS to ACS, ECCF Department, Chennai-9.  
PS to Special Secretary, ECCF Department, Chennai-9  
Stock file/spare copy

//FORWARDED BY ORDER//

SECTION OFFICER

## **Annexure II**

**ROA of water samples collected on 05/12/2023, 07/12/2023  
and 09/12/2023**





**TAMIL NADU POLLUTION CONTROL BOARD**  
**DISTRICT ENVIRONMENTAL LABORATORY – MANALI**

**REPORT OF ANALYSIS**

**R.O.A.No. 539/DEL-Manali Water Report 2023-2024 Dated:11.12.2023**

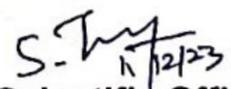
1. Name of the Sender : JCEE-Chennai
2. Nature and Number of Sample(s): One number of sample
3. Date and Time of Collection :05.12.2023 at 03:45 PM
4. Point of Collection : JCEE 001/12-23 - @ Kosasthalai River near  
Thalankuppam Bridge

S. No.	Parameters	JCEE code	JCEE 001/12-23
		LAB code	1331
		Unit	
1.	pH		interference
2.	TSS	mg/l	interference
3.	TDS	mg/l	interference
4.	Chloride	mg/l	interference
5.	Sulphate	mg/l	interference
6.	BOD	mg/l	interference
7.	COD	mg/l	interference
8.	Phenolic Compounds	mg/l	48.4
9.	Oil & Grease	mg/l	828

Inteference : Oily sample

Odour : Heavy Oily smell

As per CPCB Standard – 10 mg/L (Inland surface water)

  
 Deputy Chief Scientific Officer(A/C)  
 for DEL, Manali



**TAMIL NADU POLLUTION CONTROL BOARD**  
**DISTRICT ENVIRONMENTAL LABORATORY – MANALI**

**REPORT OF ANALYSIS**

R.O.A.No. 540/DEL-Manali Water Report 2023-2024 Dated:11.12.2023

1. Name of the Sender : DEE-Ambattur
2. Nature and Number of Sample(s): Five number of sample
3. Date and Time of Collection : 07.12.2023 from 08:40 AM to 02.:30 PM
4. Point of Collection : KM/01/12 - Stagnant water @ Outlet of storm water drain near south gate of CPCL  
KM/02/12 - Flowing water the culvert from the storm water drain near south gate of CPCL  
KM/03/12 - Buckingham canal near the gate of Indian oil corporation limited, Tondiarpet Terminal  
KM/04/12 - Ennore Creek Point 1  
KM/05/12 - Ennore Creek Point 2

S. No.	Parameters	DEE code	KM-01/12	KM-02/12	KM-03/12	KM-04/12	KM-05/12
		LAB code	1332	1333	1334	1335	1336
		Unit					
1.	pH		Interference	7.82	7.91	8.15	7.45
2.	TSS	mg/l	182	24	32	36	72
3.	TDS	mg/l	interference				
4.	Chloride	mg/l	interference				
5.	Sulphate	mg/l	interference				
6.	BOD	mg/l	interference				
7.	COD	mg/l	interference				
8.	Phenolic Compounds	mg/l	18.6	10.2	14.6	22.3	28.3
9.	Oil & Grease	mg/l	230	42	28	86	158

Inteference : Oily sample

Odour : Heavy Oily smell

S. V. A. 11/12/23  
Deputy Chief Scientific Officer(A/C)  
for DEL, Manali



TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.001-A-R01

Issue Date : 19/12/2023

ULR No : TC500623100005671F

JOE No : CE23-002151

Report Control No : CER0000394772

**Customer Provided Information**

Sample Name : POND WATER  
 Customer Name : DISTRICT ENVIRONMENTAL ENGINEER TAMIL NADU POLLUTION CONTROL BOARD  
 Customer Address : TAMIL NADU POLLUTION CONTROL BOARD,  
 : 77A, SOUTH AVENUE ROAD, AMBATTUR INDUSTRIAL ESTATE,  
 City : AMBATTUR,  
 Postal Code : 600058  
 State : TAMIL NADU  
 Country : INDIA  
 Sample Qty. : 4 X 1L  
 Recd.  
 Sampling Date : 09.12.2023  
 Sample Location : POND A

**Lab Provided Information**

Sample Type : POND WATER  
 Received on : 11/12/2023  
 Registered on : 11/12/2023  
 Test Start-End Date : 11/12/2023 - 15/12/2023  
 Sampling Date : 09.12.2023  
 NABL Group : Water  
 NABL Sub Group : Surface Water

This Report cancels and supersedes the Report No CE23-002151.001 dated 12/13/2023 issued by SGS India

**NABL Accredited Tests**

Analysis	Method	Result	Unit
<b>DISCIPLINE: CHEMICAL</b>			
<b>Polynuclear aromatic hydrocarbons (PAH)</b>			
Naphthalene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Acenaphthylene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Acenaphthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Fluorene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Phenanthrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(a)anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Chrysene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(b)fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(k)fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(a)pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Indeno(1,2,3-c,d)pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Dibenzo(a,h)anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L

Page 1 of 5

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 7 days (in case of perishable items) and 30 days for all other samples. The samples from regulatory bodies are to be retained as specified. This document cannot be reproduced except in full, without prior written approval of the Company.

No decision rule is applied, when comparing the measurement result(s) with the applicable limit(s) according to the specification in the respective standard or as shared by the customer.

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TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.001-A-R01

Issue Date : 19/12/2023

ULR No : TC500623100005671F

JOE No : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.001 dated 12/13/2023 issued by SGS India

## NABL Accredited Tests

Analysis	Method	Result	Unit
Benzo(g,h,i)perylene	USEPA 8100 (by GC-MS)	<0.01	µg/L
<b>* Diesel Range Organics (DRO) (C10 to C28)</b>			
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	0.139	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.562	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	1.166	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.896	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.874	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.392	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	2.007	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.285	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.929	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.134	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.213	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.114	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.155	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.093	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.826	mg/L
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.086	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.649	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.501	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.469	mg/L
<b>Total petroleum hydrocarbons (C8 to C28)</b>			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	0.139	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.562	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	1.166	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.896	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.874	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.392	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	2.007	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.285	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.929	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.134	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.213	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.114	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.155	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.093	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.826	mg/L

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TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.001-A-R01

Issue Date : 19/12/2023

ULR No : TC500623100005671F

JOE No : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.001 dated 12/13/2023 issued by SGS India

## NABL Accredited Tests

Analysis	Method	Result	Unit
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.086	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.649	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.501	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.469	mg/L
<b>* Gasoline range organics (GRO) (C8 to C10)</b>			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	0.139	mg/L
<b>Total petroleum hydrocarbons (C8 to C40)</b>			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	0.139	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.562	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	1.166	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.896	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.874	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.392	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	2.007	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.285	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.929	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.134	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.213	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.114	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.155	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.093	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.826	mg/L
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.086	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.649	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.501	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.469	mg/L
n-Nonacosane (C29)	USEPA 8015 B/NWTPH - HCID	0.063	mg/L
n-Triacontane (C30)	USEPA 8015 B/NWTPH - HCID	0.304	mg/L
n-Hentriacontane (C31)	USEPA 8015 B/NWTPH - HCID	0.068	mg/L
n-Dotriacontane (C32)	USEPA 8015 B/NWTPH - HCID	0.220	mg/L
n-Tritriacontane (C33)	USEPA 8015 B/NWTPH - HCID	0.066	mg/L
n-Tetratriacontane (C34)	USEPA 8015 B/NWTPH - HCID	0.167	mg/L
n-Pentatriacontane (C35)	USEPA 8015 B/NWTPH - HCID	0.665	mg/L
n-Hexatriacontane (C36)	USEPA 8015 B/NWTPH - HCID	1.030	mg/L
n-Heptatriacontane (C37)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L

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TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.001-A-R01

Issue Date : 19/12/2023

ULR No : TC500623100005671F

JOE No : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.001 dated 12/13/2023 issued by SGS India

## NABL Accredited Tests

Analysis	Method	Result	Unit
n-Octatriacontane (C38)	USEPA 8015 B/NWTPH - HCID	0.076	mg/L
n-Nonatriacontane (C39)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Tetracontane (C40)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
Oil & Grease	APHA 5520 B - 23rd Edition : 2017 (Liquid-Liquid,Partition-Gravimetric method)	96	mg/L
Phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2-Chloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2-Methylphenol (o-Cresol)	USEPA 8041A (by GC-FID)	<0.025	mg/L
3-Methylphenol & 4-Methylphenol (m & p-Cresol)	USEPA 8041A (by GC-FID)	0.394	mg/L
2-Nitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4-Dimethylphenol	USEPA 8041A (by GC-FID)	0.123	mg/L
2,4-Dichloro phenol	USEPA 8041A (by GC-FID)	0.127	mg/L
2,5-Dichlorophenol	USEPA 8041A (by GC-FID)	0.035	mg/L
2,3-Dichlorophenol	USEPA 8041A (by GC-FID)	0.067	mg/L
3-Chlorophenol & 4-Chlorophenol	USEPA 8041A (by GC-FID)	0.127	mg/L
2,6-Dichlorophenol	USEPA 8041A (by GC-FID)	0.179	mg/L
2,3,5-Trichloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4,6-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4,5-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,6-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3,5-Dichlorophenol	USEPA 8041A (by GC-FID)	0.170	mg/L
3,4-Dichlorophenol	USEPA 8041A (by GC-FID)	0.141	mg/L
2,4-Dinitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
4-Nitrophenol	USEPA 8041A (by GC-FID)	4.180	mg/L
2,3,5,6-Tetrachloro phenol	USEPA 8041A (by GC-FID)	0.151	mg/L
2,3,4,5-Tetrachlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4,6-Tetrachlorophenol	USEPA 8041A (by GC-FID)	0.141	mg/L
2-Methyl-4,6-dinitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3,4,5-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
Pentachlorophenol	USEPA 8041A (by GC-FID)	0.272	mg/L
Chlorobenzene	USEPA 5030C	<0.1	µg/L
1,3-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,4-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2,4-trichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2,3-trichlorobenzene	USEPA 5030C	<0.1	µg/L

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TC-5006

**SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.**

**Report No** : CE23-002151.001-A-R01

**Issue Date** : 19/12/2023

**ULR No** : TC500623100005671F

**JOE No** : CE23-002151

**Report Control No** : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.001 dated 12/13/2023 issued by SGS India

### NABL Accredited Tests

Analysis	Method	Result	Unit
Polychlorinated benzenes (Total: The sum of 6 individual compounds)	USEPA 5030C	<0.1	µg/L

Remark :

Per pro SGS India Private Ltd



**K\_MANOHARAN**

**Section Incharge**

**Authorized Signatory**

\*\*\*\*End of Report\*\*\*\*

## Test Report

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.001-B-R01

Issue Date : 19/12/2023

JOE No : CE23-002151

Report Control No : CER0000394772

### Customer Provided Information

Sample Name : POND WATER  
 Customer Name : DISTRICT ENVIRONMENTAL ENGINEER TAMIL NADU POLLUTION CONTROL BOARD  
 Customer Address : TAMIL NADU POLLUTION CONTROL BOARD,  
 : 77A, SOUTH AVENUE ROAD, AMBATTUR INDUSTRIAL ESTATE,  
 City : AMBATTUR,  
 Postal Code : 600058  
 State : TAMIL NADU  
 Country : INDIA  
 Sample Qty. : 4 X 1L  
 Recd.  
 Sampling Date : 09.12.2023  
 Sample Location : POND A

### Lab Provided Information

Sample Type : POND WATER  
 Received on : 11/12/2023  
 Registered on : 11/12/2023  
 Test Start-End Date : 11/12/2023 - 15/12/2023  
 Sampling Date : 09.12.2023  
 NABL Group : Water  
 NABL Sub Group : Surface Water

This Report cancels and supersedes the Report No CE23-002151.001 dated 12/13/2023 issued by SGS India

### Non-Accredited tests

Analysis	Method	Result	Unit
DISCIPLINE: CHEMICAL Total organic carbon	SO-IN-MUL-TE-158	131	mg/L

Remark :

Per pro SGS India Private Ltd



**K\_MANOHARAN**

**Section Incharge**

**Authorized Signatory**

\*\*\*\*End of Report\*\*\*\*

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TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.002-A-R01

Issue Date : 19/12/2023

ULR No : TC500623100005672F

JOE No : CE23-002151

Report Control No : CER0000394772

**Customer Provided Information**

Sample Name : POND WATER  
 Customer Name : DISTRICT ENVIRONMENTAL ENGINEER TAMIL NADU POLLUTION CONTROL BOARD  
 Customer Address : TAMIL NADU POLLUTION CONTROL BOARD,  
 : 77A, SOUTH AVENUE ROAD, AMBATTUR INDUSTRIAL ESTATE,  
 City : AMBATTUR,  
 Postal Code : 600058  
 State : TAMIL NADU  
 Country : INDIA  
 Sample Qty. : 4 X 1L  
 Recd.  
 Sampling Date : 09.12.2023  
 Sample Location : POND C

**Lab Provided Information**

Sample Type : POND WATER  
 Received on : 11/12/2023  
 Registered on : 11/12/2023  
 Test Start-End Date : 11/12/2023 - 15/12/2023  
 Sampling Date : 09.12.2023  
 NABL Group : Water  
 NABL Sub Group : Surface Water

This Report cancels and supersedes the Report No CE23-002151.002 dated 12/13/2023 issued by SGS India

**NABL Accredited Tests**

Analysis	Method	Result	Unit
<b>DISCIPLINE: CHEMICAL</b>			
<b>Polynuclear aromatic hydrocarbons (PAH)</b>			
Naphthalene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Acenaphthylene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Acenaphthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Fluorene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Phenanthrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(a)anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Chrysene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(b)fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(k)fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(a)pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Indeno(1,2,3-c,d)pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Dibenzo(a,h)anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L

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TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.002-A-R01

Issue Date : 19/12/2023

ULR No : TC500623100005672F

JOE No : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.002 dated 12/13/2023 issued by SGS India

## NABL Accredited Tests

Analysis	Method	Result	Unit
Benzo(g,h,i)perylene	USEPA 8100 (by GC-MS)	<0.01	µg/L
<b>* Diesel Range Organics (DRO) (C10 to C28)</b>			
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	0.158	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.380	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.835	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.605	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	1.581	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.825	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	2.220	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.171	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	2.192	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.104	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.086	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.091	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.396	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.065	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.911	mg/L
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.106	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.728	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.563	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.522	mg/L
<b>Total petroleum hydrocarbons (C8 to C28)</b>			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	0.158	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.380	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.835	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.605	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	1.581	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.825	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	2.220	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.171	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	2.192	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.104	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.086	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.091	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.396	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.065	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.911	mg/L

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TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.002-A-R01

Issue Date : 19/12/2023

ULR No : TC500623100005672F

JOE No : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.002 dated 12/13/2023 issued by SGS India

## NABL Accredited Tests

Analysis	Method	Result	Unit
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.106	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.728	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.563	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.522	mg/L
<b>* Gasoline range organics (GRO) (C8 to C10)</b>			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	0.158	mg/L
<b>Total petroleum hydrocarbons (C8 to C40)</b>			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	0.158	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.380	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.835	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.605	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	1.581	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.825	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	2.220	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.171	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	2.192	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.104	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.086	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.091	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.396	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.065	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.911	mg/L
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.106	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.728	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.563	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.522	mg/L
n-Nonacosane (C29)	USEPA 8015 B/NWTPH - HCID	0.056	mg/L
n-Triacontane (C30)	USEPA 8015 B/NWTPH - HCID	0.342	mg/L
n-Hentriacontane (C31)	USEPA 8015 B/NWTPH - HCID	0.069	mg/L
n-Dotriacontane (C32)	USEPA 8015 B/NWTPH - HCID	0.242	mg/L
n-Tritriacontane (C33)	USEPA 8015 B/NWTPH - HCID	0.059	mg/L
n-Tetratriacontane (C34)	USEPA 8015 B/NWTPH - HCID	0.202	mg/L
n-Pentatriacontane (C35)	USEPA 8015 B/NWTPH - HCID	0.149	mg/L
n-Hexatriacontane (C36)	USEPA 8015 B/NWTPH - HCID	1.847	mg/L
n-Heptatriacontane (C37)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L

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TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.002-A-R01

Issue Date : 19/12/2023

ULR No : TC500623100005672F

JOE No : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.002 dated 12/13/2023 issued by SGS India

## NABL Accredited Tests

Analysis	Method	Result	Unit
n-Octatriacontane (C38)	USEPA 8015 B/NWTPH - HCID	0.087	mg/L
n-Nonatriacontane (C39)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Tetracontane (C40)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
Oil & Grease	APHA 5520 B - 23rd Edition : 2017 (Liquid-Liquid,Partition-Gravimetric method)	81	mg/L
Phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2-Chloro phenol	USEPA 8041A (by GC-FID)	0.060	mg/L
2-Methylphenol (o-Cresol)	USEPA 8041A (by GC-FID)	<0.025	mg/L
3-Methylphenol & 4-Methylphenol (m & p-Cresol)	USEPA 8041A (by GC-FID)	0.347	mg/L
2-Nitrophenol	USEPA 8041A (by GC-FID)	0.148	mg/L
2,4-Dimethylphenol	USEPA 8041A (by GC-FID)	0.169	mg/L
2,4-Dichloro phenol	USEPA 8041A (by GC-FID)	0.104	mg/L
2,5-Dichlorophenol	USEPA 8041A (by GC-FID)	0.327	mg/L
2,3-Dichlorophenol	USEPA 8041A (by GC-FID)	0.121	mg/L
3-Chlorophenol & 4-Chlorophenol	USEPA 8041A (by GC-FID)	0.087	mg/L
2,6-Dichlorophenol	USEPA 8041A (by GC-FID)	0.126	mg/L
2,3,5-Trichloro phenol	USEPA 8041A (by GC-FID)	0.152	mg/L
2,4,6-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4,5-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,6-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3,5-Dichlorophenol	USEPA 8041A (by GC-FID)	0.733	mg/L
3,4-Dichlorophenol	USEPA 8041A (by GC-FID)	0.203	mg/L
2,4-Dinitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
4-Nitrophenol	USEPA 8041A (by GC-FID)	6.692	mg/L
2,3,5,6-Tetrachloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4,5-Tetrachlorophenol	USEPA 8041A (by GC-FID)	0.072	mg/L
2,3,4,6-Tetrachlorophenol	USEPA 8041A (by GC-FID)	0.591	mg/L
2-Methyl-4,6-dinitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3,4,5-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
Pentachlorophenol	USEPA 8041A (by GC-FID)	0.639	mg/L
Chlorobenzene	USEPA 5030C	<0.1	µg/L
1,3-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,4-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2,4-trichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2,3-trichlorobenzene	USEPA 5030C	<0.1	µg/L

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TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.002-A-R01

Issue Date : 19/12/2023

ULR No : TC500623100005672F

JOE No : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.002 dated 12/13/2023 issued by SGS India

## NABL Accredited Tests

Analysis	Method	Result	Unit
Polychlorinated benzenes (Total: The sum of 6 individual compounds)	USEPA 5030C	<0.1	µg/L

Remark :

Per pro SGS India Private Ltd

K\_MANOCHARAN

Section Incharge

Authorized Signatory

\*\*\*\*End of Report\*\*\*\*

## Test Report

**SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.**

**Report No** : CE23-002151.002-B-R01

**Issue Date** : 19/12/2023

**JOE No** : CE23-002151

**Report Control No** : CER0000394772

### Customer Provided Information

**Sample Name** : POND WATER  
**Customer Name** : DISTRICT ENVIRONMENTAL ENGINEER TAMIL NADU POLLUTION CONTROL BOARD  
**Customer Address** : TAMIL NADU POLLUTION CONTROL BOARD,  
 : 77A, SOUTH AVENUE ROAD, AMBATTUR INDUSTRIAL ESTATE,  
**City** : AMBATTUR,  
**Postal Code** : 600058  
**State** : TAMIL NADU  
**Country** : INDIA  
**Sample Qty.** : 4 X 1L  
**Recd.**  
**Sampling Date** : 09.12.2023  
**Sample Location** : POND C

### Lab Provided Information

**Sample Type** : POND WATER  
**Received on** : 11/12/2023  
**Registered on** : 11/12/2023  
**Test Start-End Date** : 11/12/2023 - 15/12/2023  
**Sampling Date** : 09.12.2023  
**NABL Group** : Water  
**NABL Sub Group** : Surface Water

This Report cancels and supersedes the Report No CE23-002151.002 dated 12/13/2023 issued by SGS India

### **Non-Accredited tests**

Analysis	Method	Result	Unit
<b>DISCIPLINE: CHEMICAL</b> Total organic carbon	SO-IN-MUL-TE-158	248	mg/L

Remark :

Per pro SGS India Private Ltd



**K\_MANOHARAN**

**Section Incharge**

**Authorized Signatory**

\*\*\*\*End of Report\*\*\*\*

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TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.003-A-R01

Issue Date : 19/12/2023

ULR No : TC500623100005673F

JOE No : CE23-002151

Report Control No : CER0000394772

**Customer Provided Information**

Sample Name : POND WATER  
 Customer Name : DISTRICT ENVIRONMENTAL ENGINEER TAMIL NADU POLLUTION CONTROL BOARD  
 Customer Address : TAMIL NADU POLLUTION CONTROL BOARD,  
 : 77A, SOUTH AVENUE ROAD, AMBATTUR INDUSTRIAL ESTATE,  
 City : AMBATTUR,  
 Postal Code : 600058  
 State : TAMIL NADU  
 Country : INDIA  
 Sample Qty. : 2.5L  
 Recd.  
 Sampling Date : 09.12.2023  
 Sample Location : POND E INLET

**Lab Provided Information**

Sample Type : POND WATER  
 Received on : 11/12/2023  
 Registered on : 11/12/2023  
 Test Start-End Date : 11/12/2023 - 15/12/2023  
 Sampling Date : 09.12.2023  
 NABL Group : Water  
 NABL Sub Group : Surface Water

This Report cancels and supersedes the Report No CE23-002151.003 dated 12/13/2023 issued by SGS India

**NABL Accredited Tests**

Analysis	Method	Result	Unit
<b>DISCIPLINE: CHEMICAL</b>			
<b>Polynuclear aromatic hydrocarbons (PAH)</b>			
Naphthalene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Acenaphthylene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Acenaphthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Fluorene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Phenanthrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(a)anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Chrysene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(b)fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(k)fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(a)pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Indeno(1,2,3-c,d)pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Dibenzo(a,h)anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L

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TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.003-A-R01

Issue Date : 19/12/2023

ULR No : TC500623100005673F

JOE No : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.003 dated 12/13/2023 issued by SGS India

## NABL Accredited Tests

Analysis	Method	Result	Unit
Benzo(g,h,i)perylene	USEPA 8100 (by GC-MS)	<0.01	µg/L
<b>* Diesel Range Organics (DRO) (C10 to C28)</b>			
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.162	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.046	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.071	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.135	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	1.196	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	1.056	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.086	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.775	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.051	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	0.860	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.045	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.322	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.050	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.867	mg/L
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.142	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.697	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.636	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.501	mg/L
<b>Total petroleum hydrocarbons (C8 to C28)</b>			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.162	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.046	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.071	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.135	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	1.196	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	1.056	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.086	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.775	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.051	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	0.860	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.045	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.322	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.050	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.867	mg/L

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TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.003-A-R01

Issue Date : 19/12/2023

ULR No : TC500623100005673F

JOE No : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.003 dated 12/13/2023 issued by SGS India

## NABL Accredited Tests

Analysis	Method	Result	Unit
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.142	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.697	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.636	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.501	mg/L
<b>* Gasoline range organics (GRO) (C8 to C10)</b>			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
<b>Total petroleum hydrocarbons (C8 to C40)</b>			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.162	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.046	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.071	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.135	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	1.196	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	1.056	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.086	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.775	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.051	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	0.860	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.045	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.322	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.050	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.867	mg/L
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.142	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.697	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.636	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.501	mg/L
n-Nonacosane (C29)	USEPA 8015 B/NWTPH - HCID	0.054	mg/L
n-Triacontane (C30)	USEPA 8015 B/NWTPH - HCID	0.323	mg/L
n-Hentriacontane (C31)	USEPA 8015 B/NWTPH - HCID	0.064	mg/L
n-Dotriacontane (C32)	USEPA 8015 B/NWTPH - HCID	0.231	mg/L
n-Tritriacontane (C33)	USEPA 8015 B/NWTPH - HCID	0.050	mg/L
n-Tetratriacontane (C34)	USEPA 8015 B/NWTPH - HCID	0.194	mg/L
n-Pentatriacontane (C35)	USEPA 8015 B/NWTPH - HCID	1.315	mg/L
n-Hexatriacontane (C36)	USEPA 8015 B/NWTPH - HCID	0.329	mg/L
n-Heptatriacontane (C37)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L

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TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.003-A-R01

Issue Date : 19/12/2023

ULR No : TC500623100005673F

JOE No : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.003 dated 12/13/2023 issued by SGS India

## NABL Accredited Tests

Analysis	Method	Result	Unit
n-Octatriacontane (C38)	USEPA 8015 B/NWTPH - HCID	0.084	mg/L
n-Nonatriacontane (C39)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Tetracontane (C40)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
Oil & Grease	APHA 5520 B - 23rd Edition : 2017 (Liquid-Liquid,Partition-Gravimetric method)	50	mg/L
Phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2-Chloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2-Methylphenol (o-Cresol)	USEPA 8041A (by GC-FID)	<0.025	mg/L
3-Methylphenol & 4-Methylphenol (m & p-Cresol)	USEPA 8041A (by GC-FID)	<0.025	mg/L
2-Nitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4-Dimethylphenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4-Dichloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,5-Dichlorophenol	USEPA 8041A (by GC-FID)	0.139	mg/L
2,3-Dichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3-Chlorophenol & 4-Chlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,6-Dichlorophenol	USEPA 8041A (by GC-FID)	0.102	mg/L
2,3,5-Trichloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4,6-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4,5-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,6-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3,5-Dichlorophenol	USEPA 8041A (by GC-FID)	1.517	mg/L
3,4-Dichlorophenol	USEPA 8041A (by GC-FID)	0.263	mg/L
2,4-Dinitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
4-Nitrophenol	USEPA 8041A (by GC-FID)	3.397	mg/L
2,3,5,6-Tetrachloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4,5-Tetrachlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4,6-Tetrachlorophenol	USEPA 8041A (by GC-FID)	1.301	mg/L
2-Methyl-4,6-dinitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3,4,5-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
Pentachlorophenol	USEPA 8041A (by GC-FID)	2.237	mg/L
Chlorobenzene	USEPA 5030C	<0.1	µg/L
1,3-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,4-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2,4-trichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2,3-trichlorobenzene	USEPA 5030C	<0.1	µg/L

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TC-5006

**SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.**

**Report No** : CE23-002151.003-A-R01

**Issue Date** : 19/12/2023

**ULR No** : TC500623100005673F

**JOE No** : CE23-002151

**Report Control No** : CER0000394772

**This Report cancels and supersedes the Report No CE23-002151.003 dated 12/13/2023 issued by SGS India**

### NABL Accredited Tests

Analysis	Method	Result	Unit
Polychlorinated benzenes (Total: The sum of 6 individual compounds)	USEPA 5030C	<0.1	µg/L

Remark :

Per pro SGS India Private Ltd



**K\_MANOHARAN**

**Section Incharge**

**Authorized Signatory**

\*\*\*\*End of Report\*\*\*\*

## Test Report

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.003-B-R01

Issue Date : 19/12/2023

JOE No : CE23-002151

Report Control No : CER0000394772

### Customer Provided Information

Sample Name : POND WATER  
 Customer Name : DISTRICT ENVIRONMENTAL ENGINEER TAMIL NADU POLLUTION CONTROL BOARD  
 Customer Address : TAMIL NADU POLLUTION CONTROL BOARD,  
 : 77A, SOUTH AVENUE ROAD, AMBATTUR INDUSTRIAL ESTATE,  
 City : AMBATTUR,  
 Postal Code : 600058  
 State : TAMIL NADU  
 Country : INDIA  
 Sample Qty. : 2.5L  
 Recd.  
 Sampling Date : 09.12.2023  
 Sample Location : POND E INLET

### Lab Provided Information

Sample Type : POND WATER  
 Received on : 11/12/2023  
 Registered on : 11/12/2023  
 Test Start-End Date : 11/12/2023 - 15/12/2023  
 Sampling Date : 09.12.2023  
 NABL Group : Water  
 NABL Sub Group : Surface Water

This Report cancels and supersedes the Report No CE23-002151.003 dated 12/13/2023 issued by SGS India

### Non-Accredited tests

Analysis	Method	Result	Unit
DISCIPLINE: CHEMICAL Total organic carbon	SO-IN-MUL-TE-158	262	mg/L

Remark :

Per pro SGS India Private Ltd



**K\_MANOHARAN**

**Section Incharge**

**Authorized Signatory**

\*\*\*\*End of Report\*\*\*\*

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TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.004-A-R01

Issue Date : 19/12/2023

ULR No : TC500623100005674F

JOE No : CE23-002151

Report Control No : CER0000394772

**Customer Provided Information**

Sample Name : POND WATER  
 Customer Name : DISTRICT ENVIRONMENTAL ENGINEER TAMIL NADU POLLUTION CONTROL BOARD  
 Customer Address : TAMIL NADU POLLUTION CONTROL BOARD,  
 : 77A, SOUTH AVENUE ROAD, AMBATTUR INDUSTRIAL ESTATE,  
 City : AMBATTUR,  
 Postal Code : 600058  
 State : TAMIL NADU  
 Country : INDIA  
 Sample Qty. : 2.5L  
 Recd.  
 Sampling Date : 09.12.2023  
 Sample Location : POND E OUTLET

**Lab Provided Information**

Sample Type : POND WATER  
 Received on : 11/12/2023  
 Registered on : 11/12/2023  
 Test Start-End Date : 11/12/2023 - 15/12/2023  
 Sampling Date : 09.12.2023  
 NABL Group : Water  
 NABL Sub Group : Surface Water

This Report cancels and supersedes the Report No CE23-002151.004 dated 12/13/2023 issued by SGS India

**NABL Accredited Tests**

Analysis	Method	Result	Unit
<b>DISCIPLINE: CHEMICAL</b>			
<b>Polynuclear aromatic hydrocarbons (PAH)</b>			
Naphthalene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Acenaphthylene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Acenaphthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Fluorene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Phenanthrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(a)anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Chrysene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(b)fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(k)fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(a)pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Indeno(1,2,3-c,d)pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Dibenzo(a,h)anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L

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TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.004-A-R01

Issue Date : 19/12/2023

ULR No : TC500623100005674F

JOE No : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.004 dated 12/13/2023 issued by SGS India

## NABL Accredited Tests

Analysis	Method	Result	Unit
Benzo(g,h,i)perylene	USEPA 8100 (by GC-MS)	<0.01	µg/L
<b>* Diesel Range Organics (DRO) (C10 to C28)</b>			
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.154	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.093	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.071	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.967	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.276	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	1.857	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.089	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.822	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.051	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.058	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.062	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.166	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.049	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.761	mg/L
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	0.947	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.597	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.495	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.435	mg/L
<b>Total petroleum hydrocarbons (C8 to C28)</b>			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.154	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.093	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.071	mg/L
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n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.822	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.051	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.058	mg/L
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n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.166	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.049	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.761	mg/L

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TC-5006

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JOE No : CE23-002151

Report Control No : CER0000394772

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## NABL Accredited Tests

Analysis	Method	Result	Unit
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	0.947	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.597	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.495	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.435	mg/L
<b>* Gasoline range organics (GRO) (C8 to C10)</b>			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
<b>Total petroleum hydrocarbons (C8 to C40)</b>			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.154	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.093	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.071	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.967	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.276	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	1.857	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.089	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.822	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.051	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.058	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.062	mg/L
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n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.495	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.435	mg/L
n-Nonacosane (C29)	USEPA 8015 B/NWTPH - HCID	0.049	mg/L
n-Triacontane (C30)	USEPA 8015 B/NWTPH - HCID	0.282	mg/L
n-Hentriacontane (C31)	USEPA 8015 B/NWTPH - HCID	0.063	mg/L
n-Dotriacontane (C32)	USEPA 8015 B/NWTPH - HCID	0.203	mg/L
n-Tritriacontane (C33)	USEPA 8015 B/NWTPH - HCID	0.043	mg/L
n-Tetratriacontane (C34)	USEPA 8015 B/NWTPH - HCID	0.153	mg/L
n-Pentatriacontane (C35)	USEPA 8015 B/NWTPH - HCID	1.729	mg/L
n-Hexatriacontane (C36)	USEPA 8015 B/NWTPH - HCID	0.398	mg/L
n-Heptatriacontane (C37)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L

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TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.004-A-R01

Issue Date : 19/12/2023

ULR No : TC500623100005674F

JOE No : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.004 dated 12/13/2023 issued by SGS India

## NABL Accredited Tests

Analysis	Method	Result	Unit
n-Octatriacontane (C38)	USEPA 8015 B/NWTPH - HCID	0.070	mg/L
n-Nonatriacontane (C39)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Tetracontane (C40)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
Oil & Grease	APHA 5520 B - 23rd Edition : 2017 (Liquid-Liquid,Partition-Gravimetric method)	46	mg/L
Phenol	USEPA 8041A (by GC-FID)	0.189	mg/L
2-Chloro phenol	USEPA 8041A (by GC-FID)	0.093	mg/L
2-Methylphenol (o-Cresol)	USEPA 8041A (by GC-FID)	<0.025	mg/L
3-Methylphenol & 4-Methylphenol (m & p-Cresol)	USEPA 8041A (by GC-FID)	<0.025	mg/L
2-Nitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4-Dimethylphenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4-Dichloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,5-Dichlorophenol	USEPA 8041A (by GC-FID)	0.589	mg/L
2,3-Dichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3-Chlorophenol & 4-Chlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,6-Dichlorophenol	USEPA 8041A (by GC-FID)	0.152	mg/L
2,3,5-Trichloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4,6-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4,5-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,6-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3,5-Dichlorophenol	USEPA 8041A (by GC-FID)	0.759	mg/L
3,4-Dichlorophenol	USEPA 8041A (by GC-FID)	0.136	mg/L
2,4-Dinitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
4-Nitrophenol	USEPA 8041A (by GC-FID)	4.117	mg/L
2,3,5,6-Tetrachloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4,5-Tetrachlorophenol	USEPA 8041A (by GC-FID)	0.056	mg/L
2,3,4,6-Tetrachlorophenol	USEPA 8041A (by GC-FID)	0.776	mg/L
2-Methyl-4,6-dinitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3,4,5-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
Pentachlorophenol	USEPA 8041A (by GC-FID)	0.655	mg/L
Chlorobenzene	USEPA 5030C	<0.1	µg/L
1,3-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,4-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2,4-trichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2,3-trichlorobenzene	USEPA 5030C	<0.1	µg/L

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TC-5006

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**Issue Date** : 19/12/2023

**ULR No** : TC500623100005674F

**JOE No** : CE23-002151

**Report Control No** : CER0000394772

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### NABL Accredited Tests

Analysis	Method	Result	Unit
Polychlorinated benzenes (Total: The sum of 6 individual compounds)	USEPA 5030C	<0.1	µg/L

Remark :

Per pro SGS India Private Ltd



**K\_MANOHARAN**

**Section Incharge**

**Authorized Signatory**

\*\*\*\*End of Report\*\*\*\*

## Test Report

**SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.**

**Report No** : CE23-002151.004-B-R01

**Issue Date** : 19/12/2023

**JOE No** : CE23-002151

**Report Control No** : CER0000394772

### Customer Provided Information

**Sample Name** : POND WATER  
**Customer Name** : DISTRICT ENVIRONMENTAL ENGINEER TAMIL NADU POLLUTION CONTROL BOARD  
**Customer Address** : TAMIL NADU POLLUTION CONTROL BOARD,  
 : 77A, SOUTH AVENUE ROAD, AMBATTUR INDUSTRIAL ESTATE,  
**City** : AMBATTUR,  
**Postal Code** : 600058  
**State** : TAMIL NADU  
**Country** : INDIA  
**Sample Qty.** : 2.5L  
**Recd.**  
**Sampling Date** : 09.12.2023  
**Sample Location** : POND E OUTLET

### Lab Provided Information

**Sample Type** : POND WATER  
**Received on** : 11/12/2023  
**Registered on** : 11/12/2023  
**Test Start-End Date** : 11/12/2023 - 15/12/2023  
**Sampling Date** : 09.12.2023  
**NABL Group** : Water  
**NABL Sub Group** : Surface Water

This Report cancels and supersedes the Report No CE23-002151.004 dated 12/13/2023 issued by SGS India

### **Non-Accredited tests**

Analysis	Method	Result	Unit
<b>DISCIPLINE: CHEMICAL</b> Total organic carbon	SO-IN-MUL-TE-158	102	mg/L

Remark :

Per pro SGS India Private Ltd



**K\_MANOHARAN**

**Section Incharge**

**Authorized Signatory**

\*\*\*\*End of Report\*\*\*\*

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E-Mail: [dhq5@indiancoastguard.nic.in](mailto:dhq5@indiancoastguard.nic.in)

Tele : 044 -2346 0424



**MUKHYALAYA**

**TATRAKSHAK ZILA NO.5 (NTN)**

Headquarters

Coast Guard District No.5 (N TN)

Clive Battery Complex

Rajaji Salai, Chennai – 600 001

717

04 Jan 24

Dr. Jayanthi. M, IFS,  
Chairperson  
Tamil Nadu Pollution Control Board  
76, Mount Salai, Guindy  
Chennai – 600 032

**OIL SPILLAGE DUE TO CYCLONE MICHAUNG IN ENNORE CREEK AREA**

Dear Madam,

1. Refer to TNPCB letter T6/TNPCB/F.12753/RL/2023 dated 03 Jan 24.
2. It is intimated that based on media report on 07 Dec 23, ICG first located Oil Spill employing local Coast Guard Pollution Response Team. Continuous area survey was undertaken thereafter to assess the extent of Oil Spill and quantify the volume of Oil Spilled in creek area and adjoining sea near Kosathalaiyar River mouth to facilitate crucial data of oil spill for concerned Pollution Response agency acting upon as per area of responsibilities.
3. Notwithstanding the containment / recovery action by the polluter, to avoid any damage to coastal eco-system owing to any delay in response by the polluter, ICG undertook necessary response in the affected coastal area on 10 Dec 23 through Helicopter and Ships. The efficacy of the response actions was verified during aerial surveillance on 11 & 12 Dec 23 and it was confirmed to the state authorities during SOS-CMG meeting chaired by Chief Secretary and special meeting of NGT, that oil slick in the coastal water had been contained.
4. In order to analyze the possible effects of spilled / unrecovered oil, a quantum assessment of oil spilled has been undertaken in Ennore creek, Buckingham Canal and Kosathalaiyar river respectively. As per survey undertaken on 16 Dec 23, it was observed that most of the oil have been deposited in banks of Buckingham canal/ Kosthalaiyar river and the floating oil is observed to be leached from sand. Maximum oil spilled over water surface was calculated to be approximately 11.620 KL. Further traces of spilled oil were found in appx 20 Sq. km area outside Ennore Creek. Based on the video footage, the quantity of spilled oil at sea has been calculated. Maximum oil spilled outside Ennore Creek was calculated to be approximately 12.4 KL. Thus approx. 24 KL of oil has been calculated to be spilled over water surface due to the incidence.

-2-

5. The Oil Spill in the sea area was responded by the Coast Guard whereas the creek area was cleaned by oil spill response specialists contracted by the CPCL and coordinated by the TNPCB and Tamil Nadu Ministry of Environment. The Oil Spill removal operation was undertaken professionally and suitable advice wherever needed was provided by the Coast Guard regularly. A final aerial survey was undertaken on 29 Dec 23 by the Coast Guard and no trace of oil in the water bodies or at the adjoining sea areas was noticed. However, ICG Ships and Helicopters have been continuously monitoring the situation and it is confirmed that discoloration of water due to other reasons like sewage and other effluents etc. continue to persist in the Buckingham Canal which can be acted by the concerned authorities.

6. Photographs related to oil spill elucidating the status of cleaning operations is also shared as enclosure for better appreciation.

Regards,



(AK Shukla)  
Commandant(JG)  
Dist Ops and Plans Officer  
for Commander, CGDHQ-5(NTN)



Environment, Climate Change &  
Forest (EC.3) Department,  
Secretariat, Chennai- 600 009.  
E.mail : eccfd@tn.gov.in

**Letter No.8466/EC.3/2023-18, dated 02.02.2024**

From  
Tmt.Supriya Sahu, I.A.S.,  
Additional Chief Secretary to Government.

To  
✓ The Chairperson,  
Tamil Nadu Pollution Control Board,  
Chennai-32.

Sir,

Sub: Environment and Climate Change - Cyclone Michaung - Oil  
Spillage in Kosasthalaiyar River, Buckingham Canal & Ennore  
Creek - Technical Team formed - Report submitted -  
Recommendation - Regarding.

Ref: 1. G.O.(Ms) No.178, E,CC&F(EC.3) Department,  
dated.10.12.2023.  
2. From Chairperson, TNPCB, Chennai letter  
No.T6/TNPCB/F.12753/RL/2023, dated.11.01.2024.

-----  
With reference to your letter second cited, the Government has accepted  
all recommendations of the Technical Committee and hereby directs you to  
implement all recommendations of the Technical Committee on the oil spillage  
in Ennore Creek Area and report compliance.

2. An action taken report should be sent to Government, early.

Yours faithfully

for Additional Chief Secretary to Government

JcEE-I



## TAMIL NADU POLLUTION CONTROL BOARD



**Proceedings No. T6/TNPCB/12753/W/2023, Dated: 05.02.2024**

**Sub:** TNPCB – Industries – M/s. Chennai Petroleum Corporation Limited, Refinery I, II and III, Manali Village, Thiruvottiyur Taluk, Chennai District – Technical team report - Directions under Section 33A of the Water (Prevention and Control of Pollution) Act, 1974 as amended – Issued – Regarding.

**Ref:** 1. Board Proceedings No. T6/TNPCB/12753/W/2023, Dated: 11.01.2024.  
2. G.O.(Ms) No.178 dated 10.12.2023 Environment, Climate change and Forests (EC3) Dept, Tamilnadu.  
3. Report of the Technical Team on the oil spillage in Ennore Creek Area during the recent flood caused by Michaung cyclone- January 2024.  
4. Govt ECCF Department Lr No. 8466/EC.3/2023-18, Dated. 02.02.2024.

\*\*\*\*\*

Whereas the unit of M/s. Chennai Petroleum Corporation Limited, Refinery I, II and III, Manali Village, Thiruvottiyur Taluk, Chennai District was issued with direction under Section 33A of the Water (Prevention and Control of Pollution) Act, 1974 to comply with certain conditions vide ref 1 cited in connection with Oil spillage from the unit due to Michaung Cyclone on 04.12.2023 & 05.12.2023 which caused severe damage to the water bodies such as Buckingham canal, Kosasthalaiyar river & Ennore creek .

Whereas the Government of Tamil Nadu constituted a technical team vide G.O.(Ms) No.178 dated 10.12.2023 to ascertain the cause of the oil leak in the Ennore Creek area.

Whereas the technical team furnished the "Report of technical team on the oil spillage in Ennore Creek area during the recent flood caused by Michaung -January 2024" with recommendation to CPCL to comply with certain immediate measures and with certain long- term measures. The Government vide letter 4<sup>th</sup> cited have accepted all recommendations of the Technical Committee and directed TNPCB to implement all recommendations of the committee.

In the light of above, the following directions are issued under Section 33A of the Water (Prevention and Control of Pollution) Act, 1974 to M/s. Chennai Petroleum Corporation Limited, Refinery I, II and III, Manali Village, Thiruvottiyur Taluk, Chennai District for compliance:

### **Condition for immediate compliance**

1. The CPCL shall complete the cleaning operations in the Buckingham canal and Ennore creek area and take-up restoration flora and fauna.
2. The CPCL shall enhance the design of storage tanks to withstand extreme weather events like floods. This could include elevated structures, reinforced containment walls, and waterproof sealing.
3. The CPCL shall install flood barriers around critical areas to prevent water from reaching the tanks. Additionally, the unit shall have secondary containment systems that can prevent oil from spreading if a spillage occurs.

4. The CPCL shall ensure regular maintenance of all tanks including ETPs and pipelines to address any potential vulnerabilities. This should include frequent inspections, especially before expected adverse weather conditions.
5. The CPCL shall utilize technology like remote sensing and automated monitoring systems to detect early signs of leakages or structural weaknesses.
6. The CPCL shall develop and regularly update a comprehensive emergency response plan. This plan should include procedures for immediate containment and clean-up in case of a leakage.
7. The CPCL shall work closely with local government authorities to align safety protocols and response strategies.
8. The CPCL shall conduct independent audits and inspections of oil facilities to ensure compliance with safety and environmental standards.
9. The CPCL shall educate the local community about potential risks and emergency procedures in the event of an oil leakage.
10. The CPCL shall allocate resources for research and deployment of effective oil leak clean-up technologies.
11. The CPCL shall collaborate with NGOs and international bodies to protect and restore ecosystems like mangroves that are affected by oil leakages.
12. The CPCL shall take full responsibility for the clean-up operations, employing the best available technology to minimize the environmental impact.
13. The CPCL shall allocate funds specifically for the restoration of damaged ecosystems of B Canal and Ennore Creek and mangroves. This could involve cleaning operations, replanting mangroves, and rehabilitating wildlife.

Notwithstanding anything to the contrary herein, it is explicitly acknowledged that these directives are without prejudice to any further orders, amendments or supplementary instructions that may be issued pertaining to this subject matter. You are hereby obligated to promptly adhere to and implement any such future directives as may be communicated by this office.

The receipt of this proceeding shall be acknowledged.

*J. Prasad*  
7/2/24  
For Chairperson

To

The Managing Director,  
M/s. Chennai Petroleum Corporation Limited,  
Refinery I, II and III, Manali Village,  
Thiruvottiyur Taluk and Chennai District

Copy to

1. The Joint Chief Environmental Engineer (M),  
Tamil Nadu Pollution Control Board,  
Chennai Region
2. The District Environmental Engineer,  
Tamil Nadu Pollution Control Board,  
Ambattur.
3. Technical file.



## TAMIL NADU POLLUTION CONTROL BOARD



### Proceedings No. T6/TNPCB/12753/W/2023, Dated: 11.01.2024

**Sub:** TNPCB – Industries – M/s. Chennai Petroleum Corporation Limited, Refinery I, II and III, Manali Village, Thiruvottiyur Taluk, Chennai District – Directions under Section 33A of the Water (Prevention and Control of Pollution) Act, 1974 as amended – Issued – Regarding.

- Ref:**
1. Bd Proc.No.T6/TNPCB/F.0206AMB/RL/AMB/W /2022 dt. 22.08.2022
  2. Bd Proc. No. T6/TNPCB/F.0224AMB/RL/AMB/W/2022 Dt: 22/08/2022
  3. Bd's Proc. No.T6/TNPCB/12753/W/2023, Dated: 11.12.2023
  4. 4 .Bd's Lr. No.T6/TNPCB/F.12753/W/2023, Dated: 14.12.2023.
  5. JCEE(M)proc.F.1081-01/RL/JCEE(M)/TNPCB/CHN.ZONE/W/ 2022, Dated: 16.12.2023.
  6. Units letter EP&S:01:059, Dated: 16.12.2023 & 17.12.2023 .
  7. JCEE(M) Lr. No.JCEE(M)/TNPCB/Chennai/CPCL/2023,Dated: 09.01.2024.

\*\*\*\*\*

Whereas the unit of M/s Chennai Petroleum Corporation Limited (REF I, II CPP) & REFINERY III was issued with CTO valid upto 31.03.2024 vide Board's Proceedings 1<sup>st</sup> & 2<sup>nd</sup> subject to comply with certain conditions.

Whereas Oil leak from the unit due to Michaung Cyclone on 04.12.2023 & 05.12.2023, caused severe damage to the water boodies such as Buckingham canal, Kosasthalaiyar river & Ennore creek and therefore direction was issued under section 33 of A of the Water ( P&CP) 1974 as amended on 11.12.2023 vide reference 3<sup>rd</sup> cited to the unit of M/s. Chennai Petroleum Corporation Limited, Refinery I, II and III (M/s. CPCL) for immediate compliance of certain conditions.

Whereas the unit was instructed to carry out following points vide reference 4<sup>th</sup> cited to clean up the water bodies so as to mitigate further damage to the environment.

1. Undertake a complete estimation of oil spill in the area with the help of Experts, CPCL and Coast Guard.
2. Ensure the deployment of sophisticated machineries and specialized equipments.
3. Ensure that specialized sea cleaning agencies are immediately deployed with trained and well equipped man power.

Whereas the unit was issued with show cause notice by JCEE(M), CHN vide reference 5<sup>th</sup> cited, for non submission of compliance status to the Board's direction proc. dt: 11.12.2023 and Bd's letter dt: 14.12.2023. Later the unit of CPCL has furnished reply vide its letter dt: 16.12.2023 & 17.12.2023 for the direction and Board's letter issued.

Whereas the JCEE(M), CHN vide reference 7<sup>th</sup> cited, furnished the detailed report on the conditions of consent order that are not complied with. He has also furnished the point wise reply of the unit to the direction issued vide proc. Dt: 11.12.2023 & Board's Lr. Dt. 14.12.2023.

Whereas the JCEE(M), CHN vide reference 7<sup>th</sup> cited reported the following non compliances with respect to the conditions stipulated in the consent order, direction and Board's letter issued to the unit:

1. The unit of M/s. CPCL has not reported the fact on the discharge of oily effluent along with the storm water through the Storm water pond C, D and E. during the flood caused due to the Michaung Cyclone on 03.12.2023 & 04.12.2023.
2. **The unit has not furnished the complete estimate of oil spill caused by the unit in the Buckingham Canal and Ennore Creek area.**
3. The unit has not furnished comprehensive mapping study with a reputed technical institution to identify oil spread areas and to furnish the report with Action Plan to the Board.
4. Thick oil slick noticed in the storm water drains within the premises of the unit, in the canal leading from the northern side storm water outlet, CMDA steel complex yard, Buckingham Canal, Kosasthalaiyar River, Ennore Creek area, which is evident that huge quantity of oil bearing water has breached from M/s Chennai Petroleum Corporation Ltd., into the Buckingham Canal which has reached the Ennore Creek and affected the livelihood of the fisherman community, Environment, mangroves along the stretch of the Buckingham Canal.
5. The unit has not provided online sensor for the pollutant parameters such as pH, TSS, TDS & Oil and Grease at the outlet of Pond C and pond located near Refinery-III, which leads to the Buckingham Canal.
6. The unit has not provided OCEMS for the parameters pH, TSS, COD, BOD & Oil and Grease in the upstream and downstream of Buckingham canal and connects the same to WQW, TNPCB Chennai server and also to ensure the continuous online data transfer.

Whereas, the JCEE(M) has reported that the unit has not complied with the directions issued by the Board and not complied with the conditions of the consent order and recommended to issue further direction under section 33A of the Water ( P&CP) 1974 as amended to comply with the certain conditions.



## TAMIL NADU POLLUTION CONTROL BOARD



In the light of above, the following directions are issued under Section 33A of the Water (Prevention and Control of Pollution) Act, 1974 to M/s. Chennai Petroleum Corporation Limited, Refinery I, II and III, Manali Village, Thiruvottiyur Taluk, Chennai District for immediate compliance:

1. The unit shall furnish the complete estimate of oil spill caused by the unit in the Buckingham Canal and Ennore Creek area immediately.
2. The unit shall abide by the action to be taken under the provisions of Water (P&CP) Act, Air (P&CP) Act and E(P) Act including levy of **Environmental compensation for the non-compliance of conditions.**
3. The unit shall continue oil spill clearing activities by engaging the existing special agencies till the removal entire oil spill/oil laden soil and debris deposited in waterbodies / shore/land /mangrove areas
4. The unit shall carryout periodic mock drill to check their preparedness to effectively manage the emergency situation.
5. The unit shall conduct safety audit of crude oil transport pipelines periodically to ensure that the pipelines are safe and leak free.
6. The unit shall take up maintenance of crude oil tanks well before onset of monsoon and to complete the separation of oil as well as bio remediation of sludge well before the monsoon.
7. The unit shall carryout Bio remediation of the oil spill area through the National Institute of Oceanography, Goa and shall furnish the report to the Board **at the earliest.**
8. The unit shall bear the cost of the study of the Environmental Impact Assessment of Oil Spill in the Ennore Creek including Ground water contamination being carriedout by IIT Madras.

### Conditions to be complied within 3 months

9. The unit shall provide permanent booms in the Buckingham Canal stretch at proper interval right from the upstream of the unit upto Kargil nagar and also in the storm water canal near the north and South gates leading Buckingham canal and Kosasthalaiyar River.
10. The unit shall revamp the existing oil water separation system provided in the storm water ponds.
11. The unit shall remit all the expenditures incurred by TNPCB towards works carried out on the account of oil spill cleanup operation and also the analysis charges incurred for the analysis of sample collected during the cleaning operation through the NABL accredited laboratory/ NCCR/Board.

12. The unit shall provide suitable dyke and leachate collection system to the Bio remediation area and to connect the leachate to ETP for further treatment.
13. The unit shall provide CCTV network in the entire storm water network leading outside the premises.
14. The unit shall furnish the action plan for safe disposal of oil mixed water & oil laden soil / debris collected during the oil clearing activity stored inside the premises.
15. The unit shall rise the height of all storage tanks of Storm water collection, effluent and sludge by considering worst situation of flood.
16. The unit shall have preparedness plan in place to avoid such incidence in future and shall submit the same to the Board.
17. The unit shall fix permanent boomers/oil separators in the south gate areas. Periodic maintenance of the same shall be undertaken before every monsoon season.
18. The unit shall install sensors in the vulnerable area to give warnings about any abnormal incidents.

#### **Conditions to be complied within 6 months**

19. The unit shall provide OCEMS for the parameters pH, TSS, COD, BOD & Oil and Grease in the upstream and downstream of Buckingham canal and connect the same to WQW, TNPCB Chennai server and also ensure the continuous online data transfer.
20. The unit shall explore the possibility of installing OCEMS for the pollutant parameters such as pH, TSS, TDS & Oil and Grease at the outlet of Pond C and pond located near Refinery-III, which leads to the Buckingham Canal.
21. The unit shall take up study on flood management for entire premises to avoid such incident that no waste/product/raw material shall not be gushed out of their premises and furnish the report.
22. The unit shall design and provide adequate storm water collection system to avoid inundation inside the CPCL premises and washing of the effluent / stored oil outside the premises.
23. The unit shall provide additional CAAQM station in the villages Sathyamoorthy Nagar & Manali in consultation with TNPCB to monitor the air quality continuously.



## TAMIL NADU POLLUTION CONTROL BOARD

தமிழ்நாடு  
புறப்பொருள்  
கட்டுப்பாட்டு  
கழகம்

Notwithstanding anything to the contrary herein, it is explicitly acknowledged that these directives are without prejudice to any further orders, amendments or supplementary instructions that may be issued pertaining to this subject matter. You are hereby obligated to promptly adhere to and implement any such future directives as may be communicated by this office.

The receipt of this proceeding shall be acknowledged.

J. S. Suresh  
12/11/2024  
For Chairperson

**To**

The Managing Director,  
M/s. Chennai Petroleum Corporation Limited,  
Refinery I, II and III,  
Manali Village,  
Thiruvottiyur Taluk and Chennai District

**Copy to**

1. The Joint Chief Environmental Engineer (M),  
Tamil Nadu Pollution Control Board,  
Chennai Region
2. The District Environmental Engineer,  
Tamil Nadu Pollution Control Board,  
Ambattur.
3. Technical file.



## चेन्नै पेट्रोलियम कॉर्पोरेशन लिमिटेड

(भारत सरकार का उद्यम और आईओसीएल की समूह कंपनी)

## Chennai Petroleum Corporation Limited

(A Government of India Enterprise and Group Company of IOCL)



January 16, 2024

To  
The Chairperson  
Tamil Nadu Pollution Control Board  
76, Mount Salai,  
Chennai – 600032



Respected Madam,

Sub: TNPCB – Industries-M/s. Chennai Petroleum Corporation Limited, Refinery I,II and III, Manali Village, Thiruvottiyur Taluk, Chennai District – Directions issued under section 33A of the Water (Prevention and Control of Pollution) Act, 1974 as amended-Issued-Regarding

Ref: Proceedings No. T6/TNPCB/12753/W/2023, Dt.11.01.2024

This is with reference to the above Letter dated 11.01.2024. We would like to inform TNPCB that while all correspondences referred to in the Letter dated 11.01.2024 have been received, Letter No. JCEE(M)/TNPCB/Chennai/CPCL/2023 dated 09.01.2024 (Ref 7 of Letter dated 11.01.2024) has not been received by us so far.

Further, CPCL would like to submit the following:

CPCL refinery has been operating in Manali, Chennai since 1969 and has been compliant to various statutory regulations for over 50 years. CPCL would like to reiterate that incessant rainfall and subsequent release of large quantity of water from reservoirs resulted in extreme flooding of the refinery from December 4<sup>th</sup> to 6<sup>th</sup> 2023. The flooding was not limited to CPCL, but was experienced by the entire Manali industrial belt.

Also, CPCL has a robust Storm Water drainage system, which has withstood heavy rainfall for the past several decades and was performing satisfactorily during the rains caused by Cyclone Michaung.

-2-

With respect to the points listed for immediate compliance in the Letter dated 11.01.2024, CPCL would like to clarify as follows:

**TNPCB Letter Point No.1**

The unit will furnish the complete estimate of oil spill caused by the unit in the Buckingham Canal and Ennore Creek Immediately

**CPCL's Response:**

Since there was no pipeline leak or leak from any tank within CPCL, it is not feasible for CPCL to estimate the quantity of oil, suspected to have mixed with flood water after receding. However, CPCL is extending full support to the expert agencies (Coast Guard / IIT) for estimating the oil quantity.

CPCL will estimate the quantity of Oil Recovered from the Ennore Creek and this will be shared with TNPCB as soon as the estimation is completed.

**TNPCB Letter Point No.2**

The unit shall abide by the action to be taken under the provisions of Water (P&CP) Act, Air (P&CP) and E(P) Act including levy of Environmental compensation for the non-compliance of conditions

**CPCL's Response:**

CPCL is a Mini Ratna Public Sector Undertaking and group company of Indian Oil Corporation Limited. As indicated earlier, CPCL commenced its operations in 1969 and has always been compliant to the provisions of the respective Acts pertaining to Air, Water and Environment.

During cyclone Michaung and subsequent release of water from reservoirs, unprecedented and extreme flooding was experienced inside the refinery. Similar situation prevailed in the entire Manali industrial belt. Subsequently, presence of Oil was reported in the Ennore Creek.

CPCL, as a responsible Corporate citizen, arranged for 4 Specialised Agencies and deployed Oil Spill Recovery Equipment like Containment & Absorbent booms, Oil Skimmers, Absorbent Pads, heavy machinery, etc. required for the clean-up on a war footing basis, under the guidance of TNPCB. The clean-up of affected areas was completed by 20.12.2023 (as acknowledged by TNPCB / State Government). Subsequently, Residual cleaning activities were continued, as advised by TNPCB. Further, as advised by TNPCB, National Institute of Oceanography (NIO), Goa has been engaged for carrying out bio-remediation in the Mangrove area. Spraying of bio dispersants has commenced under the guidance of NIO/TNPCB/Forest Department.

-3-

**TNPCB Letter Point No.3**

The unit shall continue oil spill clearing activities by engaging the existing special agencies till the removal entire oil spill / oil laden soil and debris deposited in the waterbodies / shore / land / mangrove areas.

**CPCL's Response:**

As indicated in Point No.2, clean-up activities were completed on 20.12.2023. Residual cleaning activities were continued, as advised by TNPCB. Further, Bio remediation is being carried out through NIO, Goa in the Mangrove area under the guidance of TNPCB/Forest Department.

**TNPCB Letter Point No.4**

The unit shall carryout periodic mock drill to check their preparedness to effectively manage the emergency situation

**CPCL's Response:**

CPCL has a robust safety system with periodic mock drills covering various emergency scenarios. Although flooding due to release of water from reservoirs is not an operational scenario, Emergency response for Oil spill scenario will be included in future mock drill plans.

**TNPCB Letter Point No.5**

The unit shall conduct safety audit of crude oil transport pipelines periodically to ensure that the pipelines are safe and leak free

**CPCL's Response:**

Periodic integrity assessment of crude oil pipeline is being done by CPCL, and same will be continued in future.

**TNPCB Letter Point No.6**

The unit shall keep up maintenance of crude oil tanks well before onset of monsoon and to complete the separation of oil as well as bio remediation of sludge well before the monsoon

**CPCL's Response:**

Pre-monsoon checks of crude oil tanks is done before onset of monsoon. Moreover, bio-remediation of sludge is done periodically to avoid sludge accumulation. This will be continued in future.

-4-

**TNPCB Letter Point No.7**

The unit shall carryout Bio remediation of the oil spill area through the National Institute of Oceanography, Goa and shall furnish the report to the board at the earliest

**CPCL's Response:**

Based on the advice from TNPCB, National Institute of Oceanography, Goa was mobilised on emergency basis and they were stationed at site from 08.01.2024 to 10.01.2024. Moreover, as advised by TNPCB/NIO, bio dispersant was air lifted on 07.01.2024 from PINAQ Remedies India Pvt. Limited. 3 test sites and 1 control site were identified by NIO and sampling / spraying of bio dispersant was completed on 10.01.2024.

Next phase of bio-remediation study is planned from 19.01.2024 onwards. Further activities will be coordinated with NIO under the guidance of TNPCB. Report will be furnished as soon as it is received from NIO.

**TNPCB Letter Point No.8**

The unit shall bear the cost of the study of the Environmental Impact Assessment of Oil Spill in the Ennore Creek including Ground water contamination being carried out by IIT Madras

**CPCL's Response:**

As a responsible Corporate citizen, CPCL has taken the lead to engage all Agencies / Equipment for clean-up and bio remediation activities. As advised by TNPCB, CPCL agrees to bear cost of the Environmental Impact Assessment study by IIT Madras, for which a formal proposal is awaited.

ATR for the immediate action points has been provided above. ATR for action points to be complied within 3 months and 6 months will be provided progressively.

Yours faithfully,

For **Chennai Petroleum Corporation Limited**,

*Anil Sahni* 16/01/24  
(Anil Sahni)

Chief General Manager (TS)

CC : MS / JCEE-M ✓

# चेन्नै पेट्रोलियम कॉर्पोरेशन लिमिटेड

(भारत सरकार का उद्यम और आईओसीएल की समूह कंपनी)

## Chennai Petroleum Corporation Limited

(A Government of India Enterprise and Group Company of IOCL)



EP&S:01:059

16.02.2024

To

The Chairperson,  
Tamil Nadu Pollution Control Board,  
76, Mount Salai,  
Chennai – 600 032.

Respected Madam,

**Sub:** TNPCB – Industries – M/s Chennai Petroleum Corporation Limited, Refinery I,II and III, Manali Village, Thiruvottiyur Taluk, Chennai District – Directions issued under section 33A of the Water (Prevention and Control of Pollution) Act, 1974 as amended – Issued – Regarding

**Ref:** 1. Proceedings No: T6 / TNPCB / 12753 / W / 2023, Dt 11.01.2024  
2. CPCL' reply dated 16.01.2024

In continuation to the reply sent vide Ref.No: 2, regarding the compliance status for the directions issued by TNPCB vide Ref.No; 1, Please find enclosed the reply for the additional directions covered under 3 months & 6 months category.

CPCL always strives hard to preserve the Environment and abide by the directions issued by TNPCB from time to time.

Thanking you.

Yours truly,  
For Chennai Petroleum Corporation Limited,

**B. KOTHANDARAMAN**  
CGM(HSE)

CC: Member Secretary/TNPCB

JCEE(M) /TNPCB, Arumbakkam.

आई एस ओ 9001:2008, आई एस ओ 14001:2004, बी एस ओ एच एस ए एस 18001:2007 प्रमाणित कंपनी / An ISO 9001:2008, ISO 14001:2004, BS OHSAS 18001:2007 Certified company

कंपनी की सी आई एन एल 40101 टी एन 1965 जी ओ आई 005389 / The CIN of the Company is L 40101 TN 1965 GOI 005389

मणली, चेन्नै / Manali, Chennai - 600 068, फोन / Phone : 2594 4000 to 09, वेबसाइट/Website : www.cpcl.co.in

पंजीकृत कार्यालय : 536, अण्णा सालै, तेनाम्पेट, चेन्नै - 600 018 / Regd. Office : 536, Anna Salai, Teynampet, Chennai - 600 018. फोन / Phone : 24349232, 24349833, 24349294, फैक्स / Fax : +91-44-24341753

AnnexureConditions to be complied within 3 months:**TNPCB Direction-9:**

The unit shall provide permanent booms in the Buckingham Canal stretch at proper interval right from the upstream of the unit up to Kargil Nagar and also in the storm water canal near the North and South gates leading Buckingham canal and Kosasthaliyar River.

**CPCLs Reply:**

*CPCL has initiated action for the procurement of permanent booms. The booms will be installed in the Buckingham Canal and in the storm water canal near the North and South gates of CPCL. Target: April-24.*

**TNPCB Direction-10:**

The unit shall revamp the existing oil water separation system provided in the storm water ponds

**CPCLs Reply:**

*Oil water separation system has been provided in the inlet of all storm water ponds. Additional Oil water separation system in upstream of storm ponds is planned. Target: May'24.*

**TNPCB Direction-11:**

The unit shall remit all the expenditures incurred by TNPCB towards works carried out on the account of oil spill cleanup operation and also the analysis charges incurred for the analysis of sample collected during the cleaning operation through the NABL accredited laboratory / NCCR / Board.

**CPCLs Reply:**

*The expenditures incurred by TNPCB towards works carried out on account of oil spill cleanup operation and analysis will be remitted by CPCL as when the details are received from TNPCB.*



**TNPCB Direction-12:**

The unit shall provide suitable dyke and leachate collection system to the Bio remediation area and to connect the leachate to ETP for further treatment

**CPCLs Reply:**

*Bio remediation pit in CPCL is an above ground structure & is having impervious layer to prevent any water ingress. Any water accumulation inside the Bio remediation pit is dewatered using pumps / gully suckers and is being treated in ETPs. Construction of dyke is planned, Target Apr 24*

**TNPCB Direction-13:**

The unit shall provide CCTV network in the entire storm water network leading outside the premises.

**CPCLs Reply:**

*CCTV network installed at the outlet of all storm water ponds, leading outside the premises. Completed.*

**TNPCB Direction-14:**

The unit shall furnish the action plan for safe disposal of oil mixed water & oil laden soil / debris collected during the oil clearing activity stored inside the premises.

**CPCLs Reply:**

*Oil mixed water will be treated in ETP along with regular stream which have API separator, Dissolved Air Floater (DAF) and Tilting Plate Interceptor (TPI) for oil separation. The Soil / debris will be treated thro' Bio remediation and oil adsorbent pads / booms will be sent to TSDF, Gummudipoondi. CPCL has applied for one time HWA approval for the above.*

**TNPCB Direction-15:**

The unit shall rise the height of all storage tanks of Storm water collection, effluent and sludge by considering worst situation of flood.

**CPCLs Reply:**

*CPCL has entrusted an expert agency Viz M/s WAPCOS to study the Storm water system and the recommendations given by WAPCOs will be implemented.*

*Effluent water is stored in tanks and treated effluents are stored in elevated pond.*

*All the Sludge storage pits are above ground structure only. Water level during the flood period was much below the treated effluent storage pond and sludge storage ponds.*



**TNPCB Direction-16:**

The unit shall have preparedness plan in place to avoid such incidence in future and shall submit the same to the Board.

**CPCLs Reply:**

*CPCL storm water system is designed to withstand the higher level of rainfall (No problem was encountered during 2015 when the rainfall was higher than Dec 2023). The water level in CPCL was very much under control on up to 4<sup>th</sup> evening and the excess water released from reservoir resulted in flooding in Manali Industrial Area including CPCL. The water level inside CPCL reached maximum on 5<sup>th</sup> late evening when there was no rain.*

*There was no pipeline or tankage failure.*

*CPCL has entrusted an expert agency Viz M/s WAPCOS to study the Storm water system inside CPCL and NCCR for studying the flood situation in Manali Industrial Area. Based on study outcome, actions within CPCL and coordination with State Authorities for external area will be taken up.*

*After completion of the study recommendations, preparedness plan within CPCL will be submitted to the Board. Target Apr 24*

**TNPCB Direction-17:**

The unit shall fix permanent boomers / oil separators in the south gate areas. Periodic maintenance of the same shall be undertaken before every monsoon season.

**CPCLs Reply:**

*CPCL has initiated action for the procurement of permanent booms. The booms will be installed in the storm water canal near the South gate of CPCL. Target: April-24.*

*Periodic maintenance of the booms installed will be carried out by CPCL.*

**TNPCB Direction-18:**

The unit shall install sensors in the vulnerable area to give warnings about any abnormal incidents.

**CPCLs Reply:**

*CPCL has taken action for procurement of online analysers and will be installed at the outlet of all storm water ponds, leading outside the premises. Target Mar 24*



**Conditions to be complied within 6 months****TNPCB Direction-19:**

The unit shall provide OCEMS for the parameters pH, TSS, COD, BOD & Oil and Grease in the upstream and downstream of Buckingham canal and connect the same to WQW, TNPCB Chennai server and also ensure the continuous online data transfer.

**CPCLs Reply:**

*CPCL has taken action for procurement of online analysers for pH, TSS, COD, BOD and Oil & Grease. Installation and On-line connectivity will be completed. Target Jun '24*

**TNPCB Direction-20:**

The unit shall explore the possibility of installing OCEMS for the pollutant parameters such as pH, TSS, TDS & Oil Grease at the outlet of Pond C and Pond located near Refinery-III, which leads to the Buckingham Canal.

**CPCLs Reply:**

*CPCL has taken action for procurement of online analysers for pH, TSS, TDS and Oil & Grease and Installation at the outlet of Pond C and Pond located near Refinery-III, which leading outside the premises. Target Mar 24.*

**TNPCB Direction-21:**

The unit shall take up study on flood management for entire premises to avoid such incident that no waste / product / raw material shall not be gushed out of their premises and furnish the report.

**CPCLs Reply:**

*Please refer reply furnished in Point No: 16*

**TNPCB Direction-22:**

The unit design and provide adequate storm water collection system to avoid inundation inside the CPCL premises and washing the effluent / stored oil outside the premises.

**CPCLs Reply:**

*Please refer reply furnished in Point No: 16*



**TNPCB Direction-23:**

The unit shall provide additional CAAQM station in the villages Sathyamoorthy Nagar & Manali in consultation with TNPCB to monitor the air quality continuously.

**CPCLs Reply:**

*CPCL has taken action for the procurement of CAAQM analysers for installing in Thriuvottiyur & Manali area. Target Jul 24.*

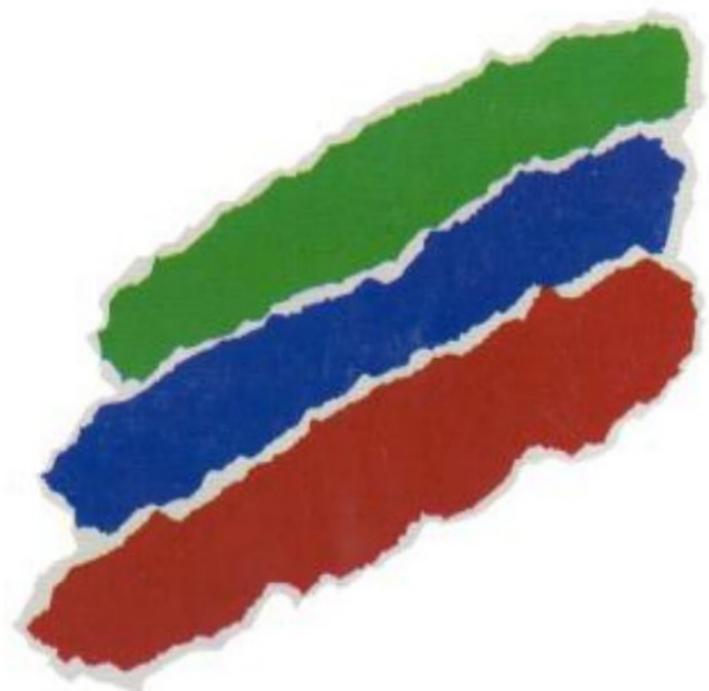
A handwritten signature in black ink, appearing to be 'A. R. S.', written in a cursive style.

**Distribution Restricted****Preliminary Draft Report**

**Pilot Studies on Net Environmental Benefit for cleaning oil spillage at 04 designated locations in the Ennore Creek, Buckingham Canal, Kosasthalaiyar River through the application of Nano Botanical Formulation Comprising of Alkylpolyglucosides, Fatty Acids & Botanical Extracts.**

**For  
Chennai Petroleum Corporation Ltd.  
Chennai- 600 032**

**17 February, 2024**



 <p>भारत का नवाचार इंजन The Innovation Engine of India</p>	<p>सीएसआईआर – राष्ट्रीय समुद्र विज्ञान संस्थान CSIR-NATIONAL INSTITUTE OF OCEANOGRAPHY (वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद) (COUNCIL OF SCIENTIFIC &amp; INDUSTRIAL RESEARCH) दोना पावला, गोवा, भारत / DONA PAULA, GOA - 403004 INDIA फ़ोन/Tel : 91(0)832-2450450/ 2450327 फैक्स /Fax: 91(0)832-2450602 इ-मेल/e-mail : <a href="mailto:ocean@nio.org">ocean@nio.org</a> बसाईट//Website: <a href="http://www.nio.org">www.nio.org</a></p>	 <p>भारत का नवाचार इंजन - राष्ट्रीय समुद्र विज्ञान संस्थान CSIR - National Institute of Oceanography</p>
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**External member invited by CPCL, Chennai**

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## 1 Introduction

In the aftermath of floods due to Cyclone Michaung on 4<sup>th</sup> December 2023, a massive oil spillage happened from the premises of Chennai Petroleum Corporation Limited (CPCL), leaking into Kosasthalaiyar River in north Chennai via the Buckingham Canal and storm drains ultimately reaching Ennore Creek. Consequently, the State's Environment Department has undertaken the emergency oil recovery work with the engagement of many agencies for the restoration of the affected environment on war footing.

To address the concerns of oil pollution in the fragile ecosystem, the Tamil Nadu Pollution Control Board (TNPCB) requested CSIR-National Institute of Oceanography (CSIR-NIO) Goa vide letter No. T6/TNPCB/F.12753/RL/2023 dt. 16/12/2023 to assist in perambulating the affected areas such as Ennore Creek, Buckingham Canal, Kosasthalaiyar River, and other adjoining water bodies and to suggest possible bioremediation measures on an immediate basis after the completion of Manual and mechanical cleaning of the above-mentioned affected sites.

In this regard, the CSIR-NIO team (Dr Suneel Vasimalla, Senior Scientist & Mr R.A. Sreepada, Former-Senior Principal Scientist, CSIR-NIO, Goa) visited the oil spill affected sites to assess the situation arising out of massive oil spill in the ecologically fragile aquatic ecosystem during 20-22 December 2023. Discussions were also held with the concerned officials of TNPCB, State Forest Department, Environment Department, Wetland Authority, etc. After an extensive assessment of the situation by reconnaissance survey and considering the damage caused to the fragile marine ecosystem as a consequence of massive oil spillage, the CSIR-NIO team suggested possible immediate remedial measures by the application of bio-dispersant for effective treatment of spilt oil in the Ennore Creek and adjoining areas such as Buckingham Canal, Kosasthalaiyar River etc.

CSIR-NIO is one of the authorised agencies for testing and approval of oil spill dispersants and bioremediation products for combating oil spills along the Indian coast.

CSIR-NIO has been actively working on a few biodispersants, specifically on Nano Botanical Formulations Comprising AlkylPolyglucosides, Fatty Acids, and Botanical Extracts for their Oil Spill Bioremediation potentials in order to achieve maximum Net Environmental Benefit. Results of a wide range of Laboratory tests of such Biodispersants containing such formulations

by CSIR-NIO have shown a high degree of dispersion potentials for different types of oil and bioremediation potential without affecting the aquatic biota NIO/TSP-xx/2023; TSP3420.

After the careful examination of the affected sites and the fragile aquatic ecosystem (productive intertidal areas, mangrove ecosystems, wetlands etc.) and to achieve maximum net environmental benefit by the visiting Team, a suggestion was made to TNPCB for the application of such Biodispersants on a trial basis. With the approval of the concerned authorities, 10 litres of one such dispersant formulation, after being diluted 10 times with seawater, was sprayed onto a few areas on a trial basis on 20th December 2023, in the presence of TNPCB officials and CPCL officers.

After witnessing the results of the trial application of biodispersant and follow-up extensive discussions with the concerned officials, the Chairperson, TNPCB, vide letter Nos T6/TNPCB/F.12753/RL/2023 dt. 22/12/2023 & T6/TNPCB/F.12753/RL/2023-1 dt. 22/12/2023 requested CSIR-NIO to submit the work proposal for the application of Biodispersant product at 4 designated locations, 3 sites to act as Biodispersant Treated and 01 sites to act as Control (no dispersant application) on an emergent basis. The geographical locations of selected sites were made in consultation with TNPCB and CPCL after the approval of the techno-commercial proposal by CPCB. The geographic locations of 03 Treatment Sites and a Control Site in the study area have been given in Table 1.

Based on the above request, CSIR-NIO proposed to carry out a comparative assessment study of the application of 'Herbal Nanotech Biodispersant' by evaluating Net environmental benefit in terms of key parameters. The quantity of biodispersant recommended by CSIR-NIO Goa for treating the oil spill was 5000 litres. This includes the application of dispersants at the designated sites identified by TNPCB for the treatment of the oil spillage and the assessment of related water quality parameters, including the quantification of Total Petroleum Hydrocarbons (TPHC), at regular intervals.

### ***1.1 Scope of the Proposed Study***

The main purpose of the proposed study is to conduct a comparative assessment study of the application of 'Herbal Nanotech biodispersant' in achieving maximum Net Environmental Benefit in treating oil spillage by regular monitoring in terms of key water quality parameters

and the quantification of bulk petroleum hydrocarbons (TPHC) of 03 Treated sites (biodispersant application) and a Control Site (no biodispersant application).

## **1.2 Objectives**

The overall objectives of the proposed work are:

- (i) To carry out a comparative assessment of Net Environment benefits in Herbal Nanotech Biodispersant Treated and Control sites by regular monitoring of key water quality parameters and quantification of bulk petroleum hydrocarbons (TPH).
- (ii) To train 02 TNPCB scientists on water quality analysis & quantification of bulk petroleum hydrocarbons.

Procurement of requisite quantities of herbal Nanotech Biodispersant (5000 litres) falls within the Scope of TNPCB.

## **2 Methodology**

### **2.1 Sampling**

CSIR-NIO team, along with the TNPCB and CPCL representatives, conducted the first filed sampling from 09 to 11 January 2024. A 1000-litre herbal nanotech dispersant procured by CPCL from M/s. Pinaq Remedies (India) Pvt. Ltd, Rajkot were made available at the Ennore Creek site. Four sampling stations (Table 1 and Fig. 1) were chosen for the pilot study. Initially, before the application of bio-dispersant, samples of surface water and surficial sediment (0-2 cm sediment layer) were collected from four sites, Control, T1, T2, and T3, during low tide time on 09 January 2024 (This served as Baseline data). The Niskin sampler collected all the water samples, and the sediment samples were collected with the acrylic mini-core sampler. The day after collecting the samples (Baseline data), the bio-dispersant was applied at sites T1 (300 L), T2(300 L) and T3(400 L) locations on 10 January 2024 (Fig. 2) in the presence of the officials of TNPCB, CPCL. The area of the application of dispersant at site T1 was 132 m<sup>2</sup>, at T2 was 115 m<sup>2</sup> and at T3 was 91 m<sup>2</sup>. Figure 3 further depicts the snapshots of the sampling at those mentioned locations.

**Table 1. Geographical coordinates of sampling stations and field samplings**

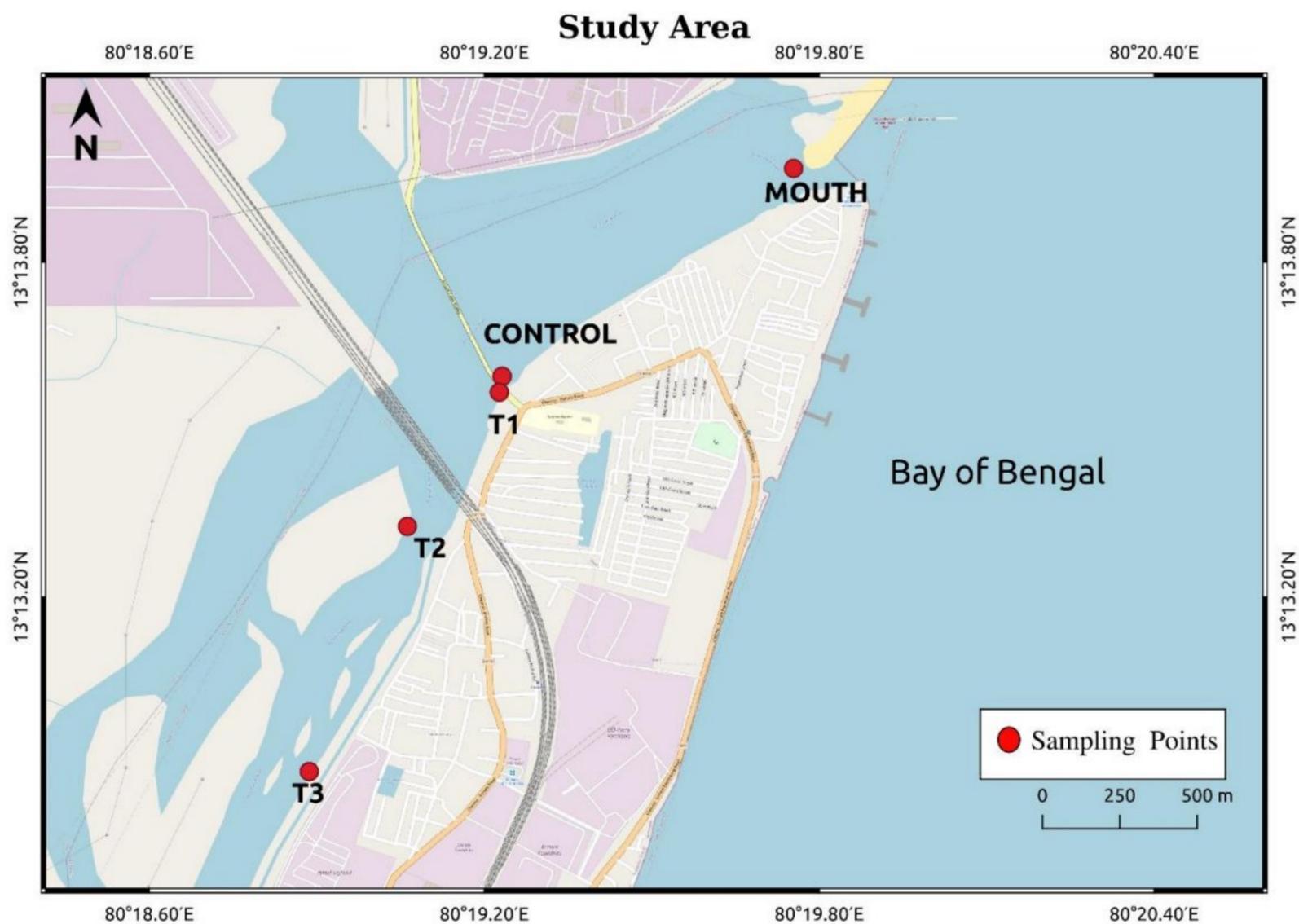
Location	Latitude (N)	Longitude (E)	First sampling	Second sampling	Third sampling	Fourth sampling
Mouth (M)	13° 23' 28.75"	80° 32' 92.26"	10.01.24	20.01.24	05.02.24	20.02.24
Control (C)	13° 13' 35.74"	80° 19' 13.93"	10.01.24	20.01.24	05.02.24	20.02.24
Site T1	13° 13' 58.10"	80° 19' 45.27"	10.01.24	20.01.24	05.02.24	20.02.24
Site T2	13° 13' 19.59"	80° 19' 04.76"	10.01.24	20.01.24	05.02.24	20.02.24
Site T3	13° 12' 52.99"	80° 18' 52.58"	10.01.24	20.01.24	05.02.24	20.02.24

**First sampling :** Before application of Biodispersant

**Second sampling :** 10 days post application of Biodispersant

**Third sampling :** 25 days post application of Biodispersant

**Fourth sampling:** 40 days post application of Biodispersant



**Figure 1. Study area with sampling stations marked with red dots Stations, T1, T2 & T3 correspond to Treatment sites (Biodispersant application and CONTROL (No Biodispersant)).**



**Figure 2. Application of bio-dispersant at chosen locations (a) T1, (b) T2 and (c) T3 on 09 January 2024 in the oil spill zones in the Ennore Creek.**



**Figure 3. Snapshots of water and sediment sampling at T1, T2 and T3 and control sites by CSIR-NIO team.**

### 3. Work in progress

The collected water samples at all the locations from all four field samplings are being analyzed for basic water quality parameters including the total petroleum hydrocarbons, and total bacterial and viral counts. Similarly, the sediment samples will also be analyzed for total petroleum hydrocarbons. The baseline sampling (First sampling) results will be compared with the second, third, and fourth sampling results to understand the impact that is caused due to the application of bio-dispersants. This work is currently in progress, and the final report will be submitted soon after completion of the work. The list of the possible parameters that will be analyzed for the report is given in Table 2.

**Table 2. Tentative list of parameters considered for the analysis**

S.No	Water samples (surface)	Sediment samples (top 2cm)
1	Water Quality parameters pH, salinity, DO, BOD, TBC (Total Bacterial Count), TVC (Total Viral count), Chlorophyll, bulk PHC	TVC, TBC, bulk PHC

**BEFORE THE HON'BLE NATIONAL  
GREEN TRIBUNAL  
SOUTHERN ZONE, CHENNAI.**

**Original Application No. 180 of 2023 (SZ)  
And  
Original Application No. 183 of 2023 (SZ)**

SUOMOTU based on the Visual media titled  
Chennai Rains Makkalai Vathaikkum Oil  
Companies- Shocking Story - Michaung  
Ground Report covered by on VIKATAN TV  
Chennai dt.06.12.2023

**Vs**

The District Collector Chennai District  
And Ors

... Respondents

**With**

R.L. Srinivasan, Chennai.

..Applicant

Versus

The Tamil Nadu Coastal Zone Management  
Authority, Rep. by its Member Secretary,  
Chennai and Ors.

...Respondent(s)

**REPORT FILED ON BEHALF OF THE  
2<sup>ND</sup> RESPONDENT – TAMIL NADU  
POLLUTION CONTROL BOARD**

**Advocate for Respondent: TNPCB  
Thiru.S. Sai Sathya Jith,  
Advocate, Chennai.**

**Date:26.02.2024.**

**Date of hearing on:27.02.2024**