

# Executive Summary of Integrated Draft EIA Report for

**“Expansion of the Existing SPVC Plant from 600 KTA to 1200 KTA, with  
backward integration of the raw material VCM of 750 KTA capacity”**

At

Survey numbers: 70 Part, 71 Part, 72, 73, 74 Part, 75 Part, 76 Part, 133 Part & 134 and Associated  
Survey Numbers, Village Semmankuppam & Thiyagavalli, Cuddalore District, Tamil Nadu - 607005

Category: 5(e), Category “A”

**TOR Identification No.:** TO25A2301TN5808288N Dated 28.07.2025

and

**“Upgradation of Existing Marine Terminal Facilities with proposed Hydrocarbon  
transfer pipelines, crossover bridge along Uppanar River, Sea water intake &  
Outfall facilities and 20 MLD Desalination Plant”**

At

Chithirapettai, Semmankuppam and Thiyagavalli Villages, Cuddalore District, Tamil Nadu

Category : 7(e) Category “A”

**TOR Identification No.:** TO24A3501TN5664131N Dated: 01.12.2024

## PROJECT PROPONENT

**M/s. CHEMPLAST CUDDALORE VINYLs LIMITED**

## EIA CONSULTANTS

|                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                       |
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| <p>Volume 1 by M/S. PERFECT ENVIRO<br/>SOLUTIONS PVT. LTD<br/>(NABET Registered List of Accredited<br/>Consultant Organisations/<br/>NABET/EIA/2225/RA 0284) (Rev.01) Valid Up<br/>to 26/11/2025)</p>  | <p>Volume 2 by INDOMER COASTAL<br/>HYDRAULICS (P) LTD.<br/>(ISO 9001: 2015 CERTIFIED, NABET- QCI &amp;<br/>NABL ACCREDITED)</p>  |
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## **1. INTRODUCTION**

Chemplast Cuddalore Vinyls Limited (CCVL) is a major player in India's chemical industry, specializing in the production of polyvinyl chloride (PVC) resins located in Cuddalore district, Tamil Nadu. CCVL is a subsidiary of Chemplast Sanmar Limited, which is a part of the Sanmar Group, a prominent business conglomerate in India with interests in chemicals, engineering and shipping. Established to cater to the growing demand for PVC, CCVL produces high-quality suspension-grade PVC resins, which are widely used in various sectors like construction, agriculture, and consumer goods. The company's PVC products are essential for making pipes, profiles, wires, cables, and other materials due to their durability and versatility which places a strong emphasis on sustainable manufacturing practices, including effective wastewater management, pollution control, and compliance with environmental standards. Over the years, CCVL has maintained a solid reputation for quality, consistency, and commitment to safety, making it a preferred supplier for PVC resins in the domestic market.

### **1.1 Project Description**

CCVL is manufacturing Suspension Grade Poly Vinyl Chloride (SPVC) at its facility in Cuddalore, Tamil Nadu. The existing plant is located within the SIPCOT Industrial Complex, Phase II, covering a total area of 25.1862 hectares. It falls under Survey Nos. 70 (Part), 71 (Part), 72, 73, 74 (Part), 75 (Part), 76 (Part), 133 (Part), and 134. The plant has an existing production capacity of 600 KTA of PVC Resins, for which prior Environmental Clearance was granted via Letter No. SEIAA-TN/F.No.6788/5(e)EC-69/2019 dated 19.11.2019 and subsequently amended via letter No. SEIAA-TN/ F. No. 6788/ 5(e)EC. No:69/ Amendment/ 2023 dated 08.08.2023. The plant is now operating with the SPVC Resin production capacity of 350000 Tons/Annum vide its latest CTO for Expansion I vide TNPCB Order No. 2307247638383 (Air) & 2307147638383 (Water) dated 08.02.2023, valid till 31.03.2027.

Now, the company proposes an expansion of the existing SPVC production capacity from 600 KTA to 1200 KTA along with backward integration of the raw material Vinyl Chloride Monomer (VCM) of 750 KTA capacity, with addition in plot area by acquiring an adjacent land parcel measuring 39.4436 ha. The proposed land area lies partly within SIPCOT area (Survey Nos. 129/3 & 129/6, 132/2 & 132/4) and the balance of the survey numbers are outside the SIPCOT area.

The project was granted Specific Terms of Reference (ToR) from MoEF&CC vide TOR Identification No. TO25A2301TN5808288N and File No. IA-J-11011/132/2020-IA(II) dated 28.07.2025 for the proposed expansion of production capacity. The EIA study has been carried out as per the TOR granted and in compliance to the requirements of the EIA Notification, 2006 and its subsequent amendments.

Also, CCVL has been operating a Marine Terminal Facility (MTF) at Cuddalore, to ensure a reliable and efficient feedstock supply for its PVC operations. The MTF has served as an import hub for essential raw materials for PVC production. Chemplast Sanmar Limited (CSL) have obtained Environmental clearance for the existing MTF from the Ministry of Environment, Forest and Climate Change (MoEF &

CC) vide F. No.11-63/2005-IA-III dated 12.09.2024.dated 19.12.2005. Subsequently, MoEF & CC granted Transfer of EC from Chemplast Sanmar Limited to Chemplast Cuddalore Vinyls Limited vide File No.11-63/2005-IA-III dated 12.09.2024.

At present CCVL is operating the MTF at Chithirapettai village, Cuddalore for importing Vinyl Chloride Monomer (VCM) which is the feed stock for the above-mentioned PVC manufacturing unit. MTF is constructed approximately 1.0 km offshore within the port limits of Cuddalore minor port.

CCVL is having valid Consent to Operate orders granted by TNPCB vide Consent Order No. 2307147638958 & 2307247638958 dated 28.02.2023, valid till 31st March 2027.

The proposed expansion of the MTF at Cuddalore aims to enhance berthing and cargo handling capacity to meet the increased feedstock import requirements for the proposed Vinyl Chloride Monomer (VCM) production unit.

- The existing terminal with a berthing capacity of 20,000 DWT will be upgraded to accommodate vessels up to 38,500 DWT.
- The expansion includes construction of a 1,060 m × 12 m approach trestle, a 384 m × 11 m crossover bridge over the Uppanar River, and installation of a 20 MLD desalination plant for process water supply.
- Cargo handling capacity will increase from 0.366 million TPA to 1.5 million TPA, including VCM, ethylene, and ethylene dichloride.
- The total development area after expansion will be 14.119 ha, entirely within non-forest land.

The project was granted Terms of Reference (ToR) from MoEF&CC vide TOR IdentificationNo. TO24A3501TN5664131N and File No. 11-63/2005-IA-III, dated 02.12.2024

The EIA and EMP for the SPVC expansion and proposed VCM have been carried out by Perfact Enviro Solutions Pvt. Ltd, QCI-NABET-accredited NABET/EIA/2225/RA0284 (Rev.01) valid upto 26.11.2025) consultancy with NABL-accredited laboratory facilities - M/s. Perfact Researchers Pvt Ltd., vide Certificate No. TC-6993, valid up to 03.04.2029.

The EIA and EMP for the proposed MTF upgradation with proposed Hydrocarbon transfer pipelines, crossover bridge along Uppanar River, Sea water intake & Outfall facilities and 20 MLD Desalination Plant has been prepared by Indomer Coastal Hydraulics (P) Ltd., Chennai, an ISO 9001:2015-certified and QCI-NABET-accredited (NABET/EIA/23-26/RA 0315 dated 13 September 2026) consultancy with NABL-accredited laboratory facilities for relevant sectors.

In compliance with Specific ToR Condition No. 1.1 (Carryout cumulative impact assessment for the instant proposal including the interlinked project for upgradation of MTF along with associated facilities as per OM dated 24.12.2010) of TOR issued to “Expansion of the Existing SPVC Plant from 600 KTA to 1200 KTA, with backward integration of the raw material VCM of 750 KTA capacity” by Industrial Projects - 2 and “Upgradation of Existing Marine Terminal Facilities and Proposed 20 MLD Desalination Plant” by INFRA-1 and the Office Memorandum vide File No. F. No.

J-11013/41/2006-IA.II(I)\* of MoEF&CC dated 24th December 2010, regarding Integrated and Interlinked projects - procedure, this is an integrated project. Consequently, a Cumulative Impact Assessment has been undertaken to evaluate the combined effects of both the projects - the SPVC expansion with the proposed VCM unit and the upgradation of existing MTF. An Executive summary of Integrated Draft EIA is prepared (this document) for the overall integrated developed with cumulative draft EIA which has two volumes as under:

- **Volume I:** Expansion of the Existing SPVC Plant from 600 KTA to 1200 KTA, with backward integration of the raw material VCM of 750 KTA capacity. - in compliance with TOR granted vide TOR Identification No. TO25A2301TN5808288N, File No. IA-J-11011/132/2020-IA(II) dated 28.07.2025
- **Volume II:** Upgradation of Existing Marine Terminal Facilities with proposed Hydrocarbon transfer pipelines, crossover bridge along Uppanar River, Sea water intake & Outfall facilities and 20 MLD Desalination Plant - in compliance with TOR granted vide TOR Identification No. TO24A3501TN5664131N, File No. 11-63/2005-IA-III dated 02.12.2024.

The proposed projects are integral to the long-term sustainability of CCVL's operations. By establishing a dedicated VCM unit and strengthening marine import infrastructure, the company will reduce dependency on external feedstock supplies, enhance production efficiency, and optimize logistics for raw material handling. The project will also contribute to industrial growth in the region, generating employment opportunities and supporting downstream PVC-based industries.

Environmental safeguards have been embedded into the project design and will be further reinforced through the implementation of the Environmental Management Plan (EMP) and the recommended mitigation measures, ensuring compliance with national regulations and minimizing potential environmental impacts.

## 1.2 Identification of the Project

*Table 1. Identification of the Project*

| Name of Project                                                                                                                                                                     | Activity & Category          | Remark                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| "Expansion of existing SPVC plant from 600 KTA to 1200 KTA with backward integration of the raw material VCM of 750 KTA capacity" by M/s. Chemplast Cuddalore Vinyls Limited (CCVL) | Activity: 5(e) & Category: A | The project falls under, Petrochemical based processing industry. The existing plant is located within the SIPCOT Industrial Complex, Phase II. Also, the proposed expansion project site is located on various survey Nos. out of which 129/3, 129/6, 132/1 & 132/4 survey numbers which are within the SIPCOT industrial area (which is a Severely polluted area (SPA)) and the rest of the land is outside the SIPCOT area. Hence, the project is categorized as category A project as per EIA notification 2006 as amended to date with applicability of general conditions (due to proximity to the SPA). |
| "EIA & EMP study to obtain EC and CRZ                                                                                                                                               | Activity: 7(e)               | The Project falls under Ports and Harbours - Ports,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Name of Project                                                                                                                                                                                                                   | Activity & Category | Remark                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------|
| clearance for Upgradation of Existing Marine Terminal Facilities with proposed Hydrocarbon transfer pipelines, crossover bridge along Uppanar River, Sea water intake & Outfall facilities and Proposed 20 MLD Desalination Plant | & Category: A       | harbours, jetties, marine terminals, breakwaters and dredging |

## 1.3 Project Details

### 1.3.1 Integrated Project Location on Google Earth

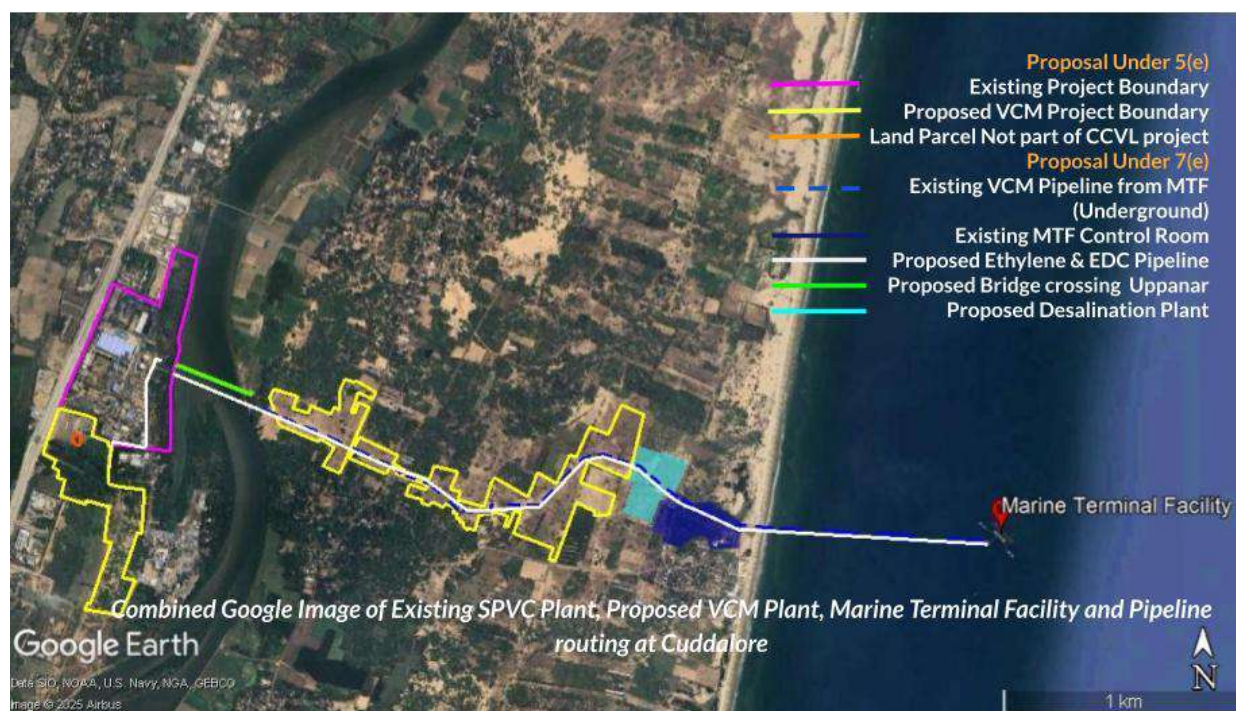


Figure 1. Combined Google Image of Existing SPVC Plant, Proposed VCM Plant, Marine Terminal Facility And Pipeline Routing At Cuddalore

### 1.3.1 Project Details of Expansion of the Existing SPVC Plant and proposed VCM Unit

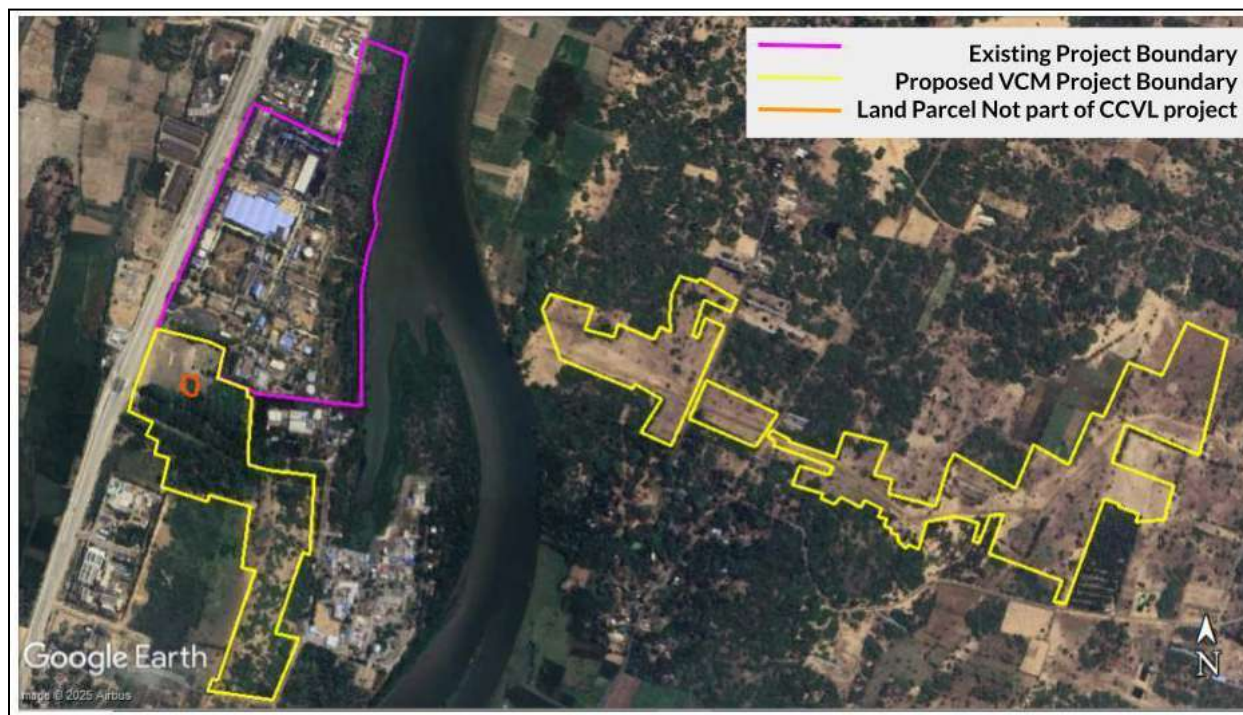


Figure 1. Project Location on Google Earth

The proposed project involves increase in SPVC production capacity from 600 KTA to 1200 KTA, with backward integration of the raw material Vinyl Chloride Monomer (VCM) production unit with a capacity of 750 KTA, with addition in plot area by acquiring an adjacent land parcel measuring 39.4436 ha. This expansion area is located across multiple survey numbers, including: 130/1A1A, 131/1B, 131/2, 132/1, 132/2, 132/4, 135/1B1, 129/3, 129/6, 62/1, 62/2B (Part), 67/1B, 67/2, 112/1B, 133/15 to 133/21, 133/4, 133/6, 134/1, 134/3 to 134/5, 136/1 (Part), 137/2, 137/9 to 137/14, 138/2 to 138/5, 138/9A, 138/13, 139/3, 139/5 to 139/12, 139/14B, 141/2B, 141/3B, 141/4, 141/5, 154/2, 158/5, 158/7, 160/4 to 160/7, 163/2, 163/3A & 3B, 164/2B, 165/1A (Part), 165/1B2 (Part), 175/1, 176/2 & 6, 177/3, and 178/6. These are located near Semmankuppam and Thiyagavalli villages in Cuddalore District, Tamil Nadu. The plant has an existing production capacity of 600 KTA of PVC Resins, for which prior Environmental Clearance was granted via Letter No. SEIAA-TN/F.No.6788/5(e)EC-69/2019 dated 19.11.2019 and subsequently amended via letter No. SEIAA-TN/ F. No. 6788/ 5(e)EC. No:69/ Amendment/ 2023 dated 08.08.2023.

Table 2. Project Details (SPVC + VCM)

| S. No. | Particulars | Unit | Project Details                                                                                                                                                         |                   |                  |                                   |
|--------|-------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------|-----------------------------------|
|        |             |      | Existing (A)                                                                                                                                                            | Proposed SPVC (B) | Proposed VCM (C) | Total After Expansion (D = A+B+C) |
| 1.     | Location    | -    | Survey Number: 70 Part, 71 Part, 72,73,74 Part,75 Part, 76 Part, 133 Part & 134 and Associated Survey Numbers, village Semmankuppam & Thiyagavalli, Cuddalore District, |                   |                  |                                   |

| S. No.            | Particulars                  | Unit                                                | Project Details                 |                              |                                |                                      |                                               |
|-------------------|------------------------------|-----------------------------------------------------|---------------------------------|------------------------------|--------------------------------|--------------------------------------|-----------------------------------------------|
|                   |                              |                                                     | Existing (A)                    | Proposed SPVC (B)            | Proposed VCM (C)               | Total After Expansion (D = A+B+C)    |                                               |
|                   |                              |                                                     | Tamil Nadu                      |                              |                                |                                      |                                               |
| 2.                | Total Area                   | m <sup>2</sup>                                      | 251862                          | -                            | 394436                         | 646298                               |                                               |
|                   |                              | ha                                                  | 25.1862                         | -                            | 39.4436                        | 64.6298                              |                                               |
| 3.                | Green Area                   | ha                                                  | 9.7976                          | -                            | 16.2539                        | 26.0515                              |                                               |
| 4a.               | Cost of the Project          | Cr. (INR)                                           | 500                             | 6000                         |                                | 6500                                 |                                               |
| 4b.               | CER Budget                   | Cr. (INR)                                           | -                               | 20                           |                                | 20                                   |                                               |
| 5.                | Plant Capacity               |                                                     |                                 |                              |                                |                                      |                                               |
| 5a.               | EC Products                  |                                                     |                                 |                              |                                |                                      |                                               |
| 5a.i              | PVC Resin                    | KTA                                                 | 600                             | 600                          | -                              | 1200                                 |                                               |
| 5a.ii             | Vinyl Chloride Monomer (VCM) | KTA                                                 | -                               | -                            | 750                            | 750                                  |                                               |
| 5b.               | By Product                   |                                                     |                                 |                              |                                |                                      |                                               |
| 5b.i              | HCl (30-35%)                 | TPA                                                 | -                               | -                            | 200                            | 200                                  |                                               |
| 6.                | Manpower Details             |                                                     |                                 |                              |                                |                                      |                                               |
| 6a.               | Construction Phase           | Nos.                                                | Permanent: 50, Contractual: 800 |                              |                                |                                      |                                               |
| 6b.               | Operation Phase              | Nos.                                                | 568                             | 500                          | 250                            | 1318                                 |                                               |
| 7.                | Power Requirement and Source |                                                     |                                 |                              |                                |                                      |                                               |
| 7a.               | Source                       | Grid power from Tamil Nadu Electricity Board (TNEB) |                                 |                              |                                |                                      |                                               |
| 7b.               | Requirement                  | MW                                                  | 14                              | 14                           | 30                             | 58                                   |                                               |
| 8.                | Air Emission Management      |                                                     |                                 |                              |                                |                                      |                                               |
| Utility Emissions |                              |                                                     |                                 |                              |                                |                                      |                                               |
| 8a.               | D.G. Sets (Backup)           | Capacity                                            | kVA                             | 2000 each                    | 2000 each                      | 2000 each                            | 2000 each                                     |
|                   |                              | No.                                                 | -                               | 7                            | 4                              | 3                                    | 14                                            |
|                   |                              | Fuel                                                | LPH                             | HSD-100                      | HSD-100                        |                                      | HSD-200                                       |
|                   |                              | APCM                                                | -                               | Adequate Stack Height        |                                |                                      |                                               |
|                   |                              | m                                                   |                                 |                              |                                |                                      |                                               |
| 8b.               | Boiler                       | Capacity                                            | TPH                             | 43, & 52.5                   | 50                             | 50                                   | 43, 52.5 & 50                                 |
|                   |                              | No.                                                 |                                 | 1 each                       | 2                              | 3                                    | 1,1 & 5                                       |
|                   |                              | Fuel type with Quantity                             | TPD or Nm3/day                  | Coal-330 TPD                 | Natural Gas-70000 Nm3/day each |                                      | Coal-330 TPD & Natural Gas-70000 Nm3/day each |
|                   |                              | APCM                                                | -                               | ESP andAdequate Stack Height |                                |                                      |                                               |
| 8c.               | EDC Cracking Furnace         | Capacity                                            | -                               | -                            | -                              | -                                    | -                                             |
|                   |                              | No.                                                 | -                               | -                            | -                              | 4                                    | 4                                             |
|                   |                              | Fuel type with Quantity                             | Nm3/h                           |                              |                                | Natural Gas 216000 Nm³/day each      | Natural Gas 216000 Nm³/day each               |
| 8d.               | Incinerator                  | Capacity                                            | -                               | -                            | -                              | -                                    | -                                             |
|                   |                              | No.                                                 | -                               | -                            | -                              | 1                                    | 1                                             |
|                   |                              | Fuel type with Quantity                             | Nm3/h                           | -                            | -                              | Natural Gas 1000 Nm3/hr (only during | Natural Gas 1000 Nm3/hr (only during          |

| S. No. | Particulars                                    |              | Unit | Project Details                                  |                                                  |                  |                                                  |
|--------|------------------------------------------------|--------------|------|--------------------------------------------------|--------------------------------------------------|------------------|--------------------------------------------------|
|        |                                                |              |      | Existing (A)                                     | Proposed SPVC (B)                                | Proposed VCM (C) | Total After Expansion (D = A+B+C)                |
|        |                                                |              |      |                                                  |                                                  | start up)        | start up)                                        |
| 9.     | Process Emissions                              |              |      |                                                  |                                                  |                  |                                                  |
| 9a.    | Vent Gas Absorption System for VCM Recovery    | Stack        | Nos. | 2                                                | 2                                                | -                | 4                                                |
|        |                                                | Stack Height | m    | 20 m each                                        | 20 m each                                        | -                | 20 m each                                        |
|        |                                                | Pollutants   | -    | VCM                                              | VCM                                              | -                | VCM                                              |
|        |                                                | APCM         | -    | -                                                | -                                                | -                | -                                                |
| 9b.    | PVC Dryer Section                              | Stack        | Nos. | 4                                                | 4                                                | -                | 8                                                |
|        |                                                | Stack Height | m    | 44 m each                                        | 44 m each                                        | -                | 44 m each                                        |
|        |                                                | Pollutants   | -    | VCM & PM                                         | VCM & PM                                         | -                | VCM & PM                                         |
|        |                                                | APCM         | -    | Multi-cyclone followed by wet scrubber and stack | Multi-cyclone followed by wet scrubber and stack | -                | Multi-cyclone followed by wet scrubber and stack |
| 9c.    | Emergency Vent attached to VCM Storage Tank    | Stack        | Nos. | 1                                                | 0                                                | -                | 1                                                |
|        |                                                | Stack Height | m    | 60                                               | 60                                               | -                | 60                                               |
|        |                                                | Pollutants   | -    | -                                                | -                                                | -                | -                                                |
|        |                                                | APCM         | -    | -                                                | -                                                | -                | -                                                |
| 9d.    | Coal Heading Conveyor-Transfer Point - 1       | Stack        | Nos. | 2                                                | 2                                                | -                | 4                                                |
|        |                                                | Stack Height | m    | 15.5 m each                                      | 15.5 m each                                      | -                | 15.5 m each                                      |
|        |                                                | Pollutants   | -    | PM                                               | PM                                               | -                | PM                                               |
|        |                                                | APCM         | -    | Bag filter and stack                             | Bag filter and stack                             | -                | Bag filter and stack                             |
| 9e.    | Coal Heading Conveyor-Transfer Point - 2       | Stack        | Nos. | 2                                                | 2                                                | -                | 4                                                |
|        |                                                | Stack Height | m    | 22.75 m each                                     | 22.75 m each                                     | -                | 22.75 m each                                     |
|        |                                                | Pollutants   | -    | PM                                               | PM                                               | -                | PM                                               |
|        |                                                | APCM         | -    | Bag filter and stack                             | Bag filter and stack                             | -                | Bag filter and stack                             |
| 9f.    | Coal Feed Hopper                               | Stack        | Nos. | 2                                                | 2                                                | -                | 4                                                |
|        |                                                | Stack Height | m    | -                                                | -                                                | -                | -                                                |
|        |                                                | Pollutants   | -    | PM                                               | PM                                               | -                | PM                                               |
|        |                                                | APCM         | -    | Water sprinklers for dust suppression            | Water sprinklers for dust suppression            | -                | Water sprinklers for dust suppression            |
| 9g.    | PVC Bagging Section - Bagging machine - 3 Nos. | Stack        | Nos. | 6                                                | 6                                                | -                | 12                                               |
|        |                                                | Stack Height | m    | -                                                | -                                                | -                | -                                                |
|        |                                                | Pollutants   | -    | PM                                               | PM                                               | -                | PM                                               |
|        |                                                | APCM         | -    | Reverse jet bag filter- 3 Nos.                   | Reverse jet bag filter- 3 Nos.                   | -                | Reverse jet bag filter- 3 Nos.                   |
| 9h.    | Product Silo - 3 Nos.                          | Stack        | Nos. | 6                                                | 6                                                | -                | 12                                               |
|        |                                                | Stack Height | m    | -                                                | -                                                | -                | -                                                |

| S. No.      | Particulars                              |              | Unit                                                        | Project Details |                   |                       |                                   |
|-------------|------------------------------------------|--------------|-------------------------------------------------------------|-----------------|-------------------|-----------------------|-----------------------------------|
|             |                                          |              |                                                             | Existing (A)    | Proposed SPVC (B) | Proposed VCM (C)      | Total After Expansion (D = A+B+C) |
|             |                                          | Pollutants   | -                                                           | PM              | PM                | -                     | PM                                |
|             |                                          | APCM         | -                                                           | Bin vent filter | Bin vent filter   | -                     | Bin vent filter                   |
| 9i.         | Oxy scrubber vent                        | Stack        | Nos.                                                        | -               | -                 | -                     | -                                 |
|             |                                          | Stack Height | m                                                           | -               | -                 | -                     | -                                 |
|             |                                          | Pollutants   | -                                                           | -               | -                 | Air, Hydrocarbons     | Air, Hydrocarbons                 |
|             |                                          | APCM         | -                                                           | -               | -                 | Captive Incineration  | Captive Incineration              |
| 9j.         | Emergency vent for ethylene storage tank | Stack        | Nos.                                                        | -               | -                 | -                     | -                                 |
|             |                                          | Stack Height | m                                                           | -               | -                 | -                     | -                                 |
|             |                                          | Pollutants   | -                                                           | -               | -                 | Ethylene              | Ethylene                          |
|             |                                          | APCM         | -                                                           | -               | -                 | Adequate stack height | Adequate stack height             |
| 9k.         | Emergency vent for EDC storage tank      | Stack        | Nos.                                                        | -               | -                 |                       |                                   |
|             |                                          | Stack Height | m                                                           | -               | -                 |                       |                                   |
|             |                                          | Pollutants   | -                                                           | -               | -                 | VCM                   | VCM                               |
|             |                                          | APCM         | -                                                           | -               | -                 | Adequate stack height | Adequate stack height             |
| 10a.        | Hazardous Waste                          | TPA          | 9551                                                        |                 |                   |                       |                                   |
| 10b.        | Solid waste                              | TPA          | Biodegradable (Domestic Waste)- 39.74                       |                 |                   |                       |                                   |
|             |                                          |              | Non-Biodegradable (Plastic, paper, wood, glass, etc.)-55.68 |                 |                   |                       |                                   |
| 11.         | Water Requirement                        |              |                                                             |                 |                   |                       |                                   |
| 11a.        | Source of Fresh water supply             |              | Desalination Plant                                          |                 |                   |                       |                                   |
| 11b.        | Total Requirement                        |              | KLD                                                         | 9799            | 9799              | 5243                  | 24841                             |
| 11c.        | Fresh Water                              |              | KLD                                                         | 4102            | 4102              | 3218                  | 11422                             |
| 11d.        | Total Treated Effluent for reuse         |              | KLD                                                         | 5659            | 5659              | 1997                  | 13315                             |
| 11e.        | Total Treated Sewage for reuse           |              | KLD                                                         | 38              | 38                | 28                    | 104                               |
|             | Wastewater Generation & Treatment        |              |                                                             |                 |                   |                       |                                   |
| 11e.        | Total Wastewater Generation              |              | KLD                                                         | 5660            | 5660              | 2097                  | 13417                             |
| 11e - (i)   | Industrial Wastewater Generation         |              | KLD                                                         | 5620            | 5620              | 2069                  | 13309                             |
| 11e - (ii)  | Sewage Generation                        |              | KLD                                                         | 40              | 40                | 30                    | 110                               |
| 111f        | ETP                                      |              | KLD                                                         | 6400            | 6400              | 3000                  | 15800                             |
| 11f - (i)   | STP                                      |              | KLD                                                         | 50              | 50                | 40                    | 140                               |
| 11f - (ii)  | RO                                       |              | KLD                                                         | 6000            | 6000              | 3000                  | 15000                             |
| 11f - (iii) | MEE                                      |              | KLD                                                         | 600             | 600               | 300                   | 1500                              |

### 1.3.2 Project Details of Upgradation of Existing Marine Terminal Facilities with proposed Hydrocarbon transfer pipelines, crossover bridge along Uppanar River, Sea water intake & Outfall facilities and Proposed 20 MLD Desalination Plant



Figure 2. Project Location (MTF Facility)

The proposed project is located in the Chithirapettai, Semmankuppam and Thiyagavalli villages, Cuddalore district, 32 km south of Pondicherry and 80 km north of Karaikal. The project is an upgradation of existing MTF to expand the operating capacity of the CCVL as well as to access the island jetty during rough weather through proposed trestle. The project does not involve relocation of the green habitation of the people.

Table 3. Project Details (MTF Facility)

| S. No.           | Particulars        | Unit | Project Details                                                                        |          |                 |
|------------------|--------------------|------|----------------------------------------------------------------------------------------|----------|-----------------|
|                  |                    |      | Existing                                                                               | Proposed | After expansion |
| 1                | Location           | -    | Chithirapettai, Semmankuppam and Thiyagavalli Villages, Cuddalore District, Tamil Nadu |          |                 |
| 2                | Total Plot area    | ha   | 6.374                                                                                  | 7.745    | 14.119          |
| 3                | Green area         | ha   | 2                                                                                      | 0.5      | 2.5             |
| Manpower Details |                    |      |                                                                                        |          |                 |
| i                | Construction Phase | Nos. | Permanent: 10, Contractual:150                                                         |          |                 |
| ii               | Operation Phase    | Nos. | 65                                                                                     | 60       | 125             |
| 4                | Power              |      |                                                                                        |          |                 |
| i                | Power Requirement  | kVA  | 500                                                                                    | 2000     | 2500            |

## Existing and Proposed Facilities

*Table 4. Details of Existing and Proposed facilities*

| In sea                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | On land                                                                                                                                                                                                                                                                                                                                                                                                     | In Uppanar River                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Existing Facilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                   |
| <ul style="list-style-type: none"> <li>Island jetty capable of berthing ships upto 20000 DWT.</li> <li>2 nos. breasting Dolphins (14 m x 14 m)</li> <li>4 nos. mooring dolphins (10 m x 10 m)</li> <li>Unloading platform (20 m x 10 m) with marine loading arm for VCM</li> <li>Substation cum control building (20 m x 9 m)</li> <li>Walkway Bridge connecting mooring and breasting dolphins (200 m x 1.2 m)</li> <li>2 nos. subsea VCM pipelines passing 1060 m in sea and 2430 m in land.</li> <li>Seawater intake system with pipeline having 400 m in sub-sea and 2430 m in land.</li> <li>Brine rejects the outfall system with the pipeline having 800 m in sub-sea and 2430 m in land.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>2 nos. x VCM pipelines along with intake and brine reject pipelines in the RCC trench having 2430 m from LFP to plant.</li> </ul>                                                                                                                                                                                                                                    | <ul style="list-style-type: none"> <li>2 nos. x VCM pipelines running beneath the Uppanar riverbed, along with desalination intake and brine reject pipelines, approximately 384 m across the river.</li> </ul>                                                                                                   |
| Proposed Facilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                   |
| <ul style="list-style-type: none"> <li>New approach trestle from jetty to land fall point (1060 m x 12 m)</li> <li>Upgradation of existing breasting dolphins (22 m x 18 m) - 2 nos.</li> <li>Upgradation of existing mooring dolphins - 4 nos.</li> <li>Additional mooring dolphins (10 m x 10 m) - 2 nos.</li> <li>Two additional loading arms</li> <li>Proposed walkway bridge</li> <li>New firewater pump house cum substation (65 m x 21 m)</li> <li>New tug berth (27 m x 5 m)</li> <li>Capital dredging - <math>2.6 \times 10^6 \text{ m}^3</math></li> <li>Pipelines for transporting chemicals, fire water and desalinated water from MTF to existing and proposed plant (1060 m in sea over approach trestle and 3430 m on land), EDC Pipeline (20" dia.), VCM Pipeline (16" dia.), VCM coolant (4" dia.), Ethylene (16" dia.), Ethylene Coolant pipeline (6" dia.), Fire water pipeline (24" dia.), Desalinated water pipeline (4" dia.)</li> <li>Seawater intake pipeline (1200 m in land and 800 m in sea laid over the approach trestle)</li> <li>Brine rejects outfall pipeline diffuser (1200 m) in land 800 m in sea laid over the approach trestle.</li> <li>Construction of temporary material load out the jetty for a length of 400 m from LFP.</li> </ul> | <ul style="list-style-type: none"> <li>Desalination plant of 20 MLD capacity</li> <li>Pipelines for transporting feedstock from MTF to proposed VCM plant extending ~3430 m (LFP to plant)</li> <li>Seawater intake and brine reject pipeline from LFP to desalination plant.</li> <li>2 nos. x 12" pipeline for supplying desalinated water extending 1900 m (Desalination plant to Main plant)</li> </ul> | <ul style="list-style-type: none"> <li>Crossover bridge across Uppanar river carrying Pipelines for transporting chemicals and 2 nos. x 12" pipeline for supplying desalinated water (Desalination plant to Main plant) - 384 m</li> <li>Power, communication cables, overhead transmission lines etc.</li> </ul> |

## 1.4 Environment Sensitivity & Accessibility

### Environment Sensitivity

Table 5. Project Site Specific Environmental Sensitivity Details

| Particulars                    | Distance                                                   | Direction |
|--------------------------------|------------------------------------------------------------|-----------|
| Water Bodies                   |                                                            |           |
| Uppanar River*                 | 72 m from western corridor and 107 m eastern corridor East | E         |
| Perumal Lake                   | 4.34 km                                                    | SW        |
| Gedilam River                  | 7.17 km                                                    | NNE       |
| Copper Hills Lake              | 7.40 km                                                    | N         |
| Kedilam River                  | 10.76 km                                                   | NNW       |
| Then Pennai River              | 12.60 km                                                   | NNE       |
| Forest                         |                                                            |           |
| None with in 15 km radius      |                                                            |           |
| Critically Polluted Area (SPA) | Project is within the SPA of Cuddalore, Tamil Nadu         |           |
| ASI Monuments                  |                                                            |           |
| None with in 15 km radius      |                                                            |           |
| Wildlife Sanctuary             |                                                            |           |
| None with in 15 km radius      |                                                            |           |
| Inland, Coastal, marine        |                                                            |           |
| Bay of Bengal                  | 0.60 km                                                    | E         |
| Eco-Sensitive Area             |                                                            |           |
| None within 15 km radius       |                                                            |           |
| Nearest Settlement             |                                                            |           |
| Pundiyankuppam                 | 0.81 km                                                    | SW        |

Table 6. Project Site Specific Connectivity Details

| Particulars                                  | Distance                 | Direction                |
|----------------------------------------------|--------------------------|--------------------------|
| <b>Road</b>                                  |                          |                          |
| Nochikkadu to Perumal Koil Road              | Adjacent to Project Area | Adjacent to Project Area |
| Nochikadu-Naduthittu Road                    | Adjacent to Project Area | Adjacent to Project Area |
| NH-45A ( Chennai-Nagapathinam HWY 32)        | 0.02 km                  | W                        |
| NH-532 (Cuddalore-Vadalur Road)              | 2.58 km                  | NW                       |
| State Highway No.-138(Kurinjpadi-Cuddalore)  | 7.52 km                  | NW                       |
| State Highway No.-68 (Kuddalore Main Road)   | 10.67 km                 | N                        |
| State Highway No.-9 (Nellikuppam Main Road ) | 11.97 km                 | N                        |
| <b>Railway Station</b>                       |                          |                          |
| Alapakam Railway Station                     | 2.36 km                  | SSW                      |
| Capper Quarry Railway Station                | 3.45km                   | NNE                      |
| Kullanchavadi Railway Station                | 7.44 km                  | WSW                      |
| Cuddalore Port Junction/ Railway Station     | 7.78 km                  | NNE                      |
| Tirupadripuliyur Railway Station             | 10.87 km                 | NNE                      |
| Varakalpattu Railway Station                 | 13.21 km                 | NNW                      |
| <b>Airport</b>                               |                          |                          |
| Puducherry Airport                           | 35.74 km                 | NNE                      |

## 1.5 PROJECT DESCRIPTION

### 1.5.1 Expansion of the Existing SPVC Plant and proposed VCM Unit

#### Production Capacity

Table 7. Production Capacity (SPVC + VCM)

| S. No. | Product/ Byproduct     | CAS No.   | Unit | Existing (As per EC 2019) | Proposed | Total After Expansion |
|--------|------------------------|-----------|------|---------------------------|----------|-----------------------|
| 1      | PVC Resin              | 9002-86-2 | KTA  | 600                       | 600      | 1200                  |
| 2      | Vinyl Chloride Monomer | 75-01-4   |      | 0                         | 750      | 750                   |
| S. No. | ByProduct              | CAS No.   | Unit | Existing (As per EC 2019) | Proposed | Total After Expansion |
| 2      | HCl (30-35%)           | 7647-01-0 | KTA  | -                         | 200      | 200                   |

#### Raw Materials & Storage

Table 8. Details of Raw Materials Quantity

| Product Name           | Raw Material                                    | CAS No.    | Existing Quantity (TPA) | Proposed Quantity (TPA) | Total After Expansion (TPA) |
|------------------------|-------------------------------------------------|------------|-------------------------|-------------------------|-----------------------------|
| PVC Resin              | VCM Feedstock                                   | 75-01-4    | 601800                  | 601800                  | 1203600                     |
|                        | Dematerialized water                            | 7732-18-5  | 1440000                 | 1440000                 | 2880000                     |
|                        | Initiators                                      | 1611162-9  | 600                     | 600                     | 1200                        |
|                        | Granulating Agents                              | NA         | 780000                  | 780000                  | 1560000                     |
|                        | Stabilizers                                     | NA         | 360                     | 360                     | 720                         |
|                        | Build up suppressant                            | NA         | 60                      | 60                      | 120                         |
|                        | Others (includes inhibitor, antifoam, solvents) | NA         | 900                     | 900                     | 1800                        |
| Vinyl Chloride Monomer | Ethylene                                        | 74-85-1    | -                       | 183750                  | 183750                      |
|                        | Oxygen                                          | -          | -                       | 101250                  | 101250                      |
|                        | Ethylene Dichloride                             | 0107-06-02 | -                       | 633750                  | 633750                      |

#### Air Emission Stacks & Associated Air Pollution Control System (APCS)

Existing stacks with Associated Air Pollution Control Systems (APCS) will be retained and additional stacks will be provided for the proposed expansion.

#### Details of Flue Gas Stacks

Table 9. Details of Flue Gas Stacks

| S. No.                                 | Stack attached to | Capacity | Fuel Name and its Quantity | Stack Height m | Stack Dia (m) | Stack Velocity (m/s) | APCM Detail | Emissions | Standard Limit (mg/Nm <sup>3</sup> ) | Proposed Limits as project is in CPA (mg/Nm <sup>3</sup> ) |
|----------------------------------------|-------------------|----------|----------------------------|----------------|---------------|----------------------|-------------|-----------|--------------------------------------|------------------------------------------------------------|
| Existing Stacks for 600 KTA SPVC Plant |                   |          |                            |                |               |                      |             |           |                                      |                                                            |

| S. No.                                         | Stack attached to       | Capacity    | Fuel Name and its Quantity | Stack Height m | Stack Dia (m) | Stack Velocity (m/s) | APCM Detail           | Emissions        | Standard Limit (mg/Nm³)                                                                                       | Proposed Limits as project is in CPA (mg/Nm³)                       |
|------------------------------------------------|-------------------------|-------------|----------------------------|----------------|---------------|----------------------|-----------------------|------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| 1                                              | DG Sets (7 Nos.)        | 2000 kVA    | HSD, 100 lit/ hr. each     | 30             | 0.45          | 14                   | Adequate stack height | PM, NOx, CO      | As per CPCB Emission Standard for DG:<br>PM: 75 mg/Nm³<br>CO: 150 mg/Nm³<br>NOx: 360 ppmv                     | PM: 55 mg/Nm3<br>CO: 100 mg/Nm3<br>NOx: 250 ppmv                    |
| 2                                              | Boiler-1                | 43 MT/ hr   | Coal, 220 TPD              | 54             | 1.2           | 18                   | ESP and Stack         | PM, SOx, NOx, CO | As per G.S.R. 820(E) dated 09.11.2012<br>SO2: 50 mg/Nm3<br>NOx: 250 mg/Nm3<br>PM: 50 mg/Nm3<br>CO: 100 mg/Nm  | SO2: 30 mg/Nm³<br>NOx: 150 mg/Nm³<br>PM: 50 mg/Nm³<br>CO: 80 mg/Nm³ |
| 3                                              | Boiler-2                | 52.5 MT/ hr | Coal, 220 TPD              | 60             | 1.2           | 18                   | ESP and Stack         | PM, SOx, NOx, CO |                                                                                                               |                                                                     |
| Proposed Stacks for 600 KTA SPVC Plant         |                         |             |                            |                |               |                      |                       |                  |                                                                                                               |                                                                     |
| 1.                                             | DG Sets (4 Nos.)        | 2000 kVA    | HSD, 100 lit/ hr. each     | 30             | 0.45          | 14                   | Adequate stack height | PM, NOx, CO      | As per CPCB Emission Standard for DG:<br>PM: 75 mg/Nm³<br>CO: 150 mg/Nm³<br>NOx: 360 ppmv                     | PM: 55 mg/Nm3<br>CO: 100 mg/Nm3<br>NOx: 250 ppmv                    |
| 2.                                             | Boiler-3                | 50 TPH      | Natural gas, 70000 Nm³/day | 60             | 1.2           | 18                   | Adequate stack height | PM, SOx, NOx, CO | As per G.S.R. 820(E) dated 09.11.2012<br>SO2: 50 mg/Nm3<br>NOx: 250 mg/Nm3<br>PM: 50 mg/Nm3<br>CO: 100 mg/Nm  | SO2: 30 mg/Nm³<br>NOx: 150 mg/Nm³<br>PM: 50 mg/Nm³<br>CO: 80 mg/Nm³ |
| 3.                                             | Boiler-4                | 50 TPH      | Natural gas, 70000 Nm³/day | 60             | 1.2           | 18                   | Adequate stack height | PM, SOx, NOx, CO |                                                                                                               |                                                                     |
| Proposed Flue Gas Stacks for 750 KTA VCM Plant |                         |             |                            |                |               |                      |                       |                  |                                                                                                               |                                                                     |
| 1.                                             | EDC Cracking Furnace-1* | -           | Natural Gas 216000 Nm³/day | 60             | 0.7           | 9.70                 | Adequate stack height | PM, SOx, NOx, CO | As per G.S.R. 820(E) dated 09.11.2012<br>SO2: 50 mg/Nm³<br>NOx: 250 mg/Nm³<br>PM: 50 mg/Nm³<br>CO: 100 mg/Nm³ | SO2: 30 mg/Nm³<br>NOx: 150 mg/Nm³<br>PM: 50 mg/Nm³<br>CO: 80 mg/Nm³ |
| 2.                                             | EDC Cracking Furnace-2* | -           | Natural Gas 216000 Nm³/day | 60             | 0.7           | 9.70                 | Adequate stack height | PM, SOx, NOx, CO |                                                                                                               |                                                                     |
| 3.                                             | EDC Cracking Furnace-3* | -           | Natural Gas 216000 Nm³/day | 60             | 0.7           | 9.70                 | Adequate stack height | PM, SOx, NOx, CO |                                                                                                               |                                                                     |
| 4.                                             | EDC Cracking            | -           | Natural Gas 216000         | 60             | 0.7           | 9.70                 | Adequate stack height | PM, SOx, NOx, CO |                                                                                                               |                                                                     |

| S. No. | Stack attached to  | Capacity | Fuel Name and its Quantity                                  | Stack Height m | Stack Dia (m) | Stack Velocity (m/s) | APCM Detail                            | Emissions                                       | Standard Limit (mg/Nm <sup>3</sup> )                                                                                                                                                                                                                                                                                                 | Proposed Limits as project is in CPA (mg/Nm <sup>3</sup> )                                                                                                                                                             |
|--------|--------------------|----------|-------------------------------------------------------------|----------------|---------------|----------------------|----------------------------------------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        | Furnace-4*         |          | Nm <sup>3</sup> /day                                        |                |               |                      |                                        |                                                 |                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                        |
| 5.     | Incinerator        | -        | Natural Gas 1000 Nm <sup>3</sup> /hr (only during start up) | 45             | 0.11          | 11                   | HCl scrubber and Adequate stack height | PM, SO <sub>x</sub> , CO, NO <sub>x</sub> , HCl | <b>As per CPCB Common HW Incinerator Guidelines:</b><br>PM: 50 mg/Nm <sup>3</sup><br>SO <sub>2</sub> : 200 mg/Nm <sup>3</sup><br>CO: 100 mg/Nm <sup>3</sup><br>NO <sub>x</sub> : 400 mg/Nm <sup>3</sup><br><br><b>As per G.S.R. 820(E) dated 09.11.2012</b><br>HCl: 50 mg/Nm <sup>3</sup><br>Cl <sub>2</sub> : 10 mg/Nm <sup>3</sup> | PM: 50 mg/Nm <sup>3</sup><br>SO <sub>2</sub> : 100 mg/Nm <sup>3</sup><br>CO: 50 mg/Nm <sup>3</sup><br>NO <sub>x</sub> : 200 mg/Nm <sup>3</sup><br>HCl: 30 mg/Nm <sup>3</sup><br>Cl <sub>2</sub> : 5 mg/Nm <sup>3</sup> |
| 6.     | Emergency DG Set-1 | 2000 kVA | HSD, 100 lit/hr                                             | 30             | 0.45          | 14                   | Adequate stack height                  | PM, NO <sub>x</sub> , CO                        | <b>As per CPCB Emission Standard for DG:</b><br>PM: 75 mg/Nm <sup>3</sup><br>CO: 150 mg/Nm <sup>3</sup><br>NO <sub>x</sub> : 360 ppmv                                                                                                                                                                                                | PM: 55 mg/Nm <sup>3</sup><br>CO: 100 mg/Nm <sup>3</sup><br>NO <sub>x</sub> : 250 ppmv                                                                                                                                  |
| 7.     | Emergency DG Set-2 | 2000 kVA | HSD, 100 lit/hr                                             | 30             | 0.45          | 14                   | Adequate stack height                  | PM, NO <sub>x</sub> , CO                        |                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                        |
| 8.     | Emergency DG Set-3 | 2000 kVA | HSD, 100 lit/hr                                             | 30             | 0.45          | 14                   | Adequate stack height                  | PM, NO <sub>x</sub> , CO                        |                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                        |
| 9.     | Boiler-5           | 50 TPH   | Natural gas, 70000 Nm <sup>3</sup> /day                     | 60             | 1.2           | 18                   | Adequate stack height                  | PM, SO <sub>x</sub> , NO <sub>x</sub> , CO      | <b>As per G.S.R. 820(E) dated 09.11.2012</b><br>SO <sub>2</sub> : 50 mg/Nm <sup>3</sup><br>NO <sub>x</sub> : 250 mg/Nm <sup>3</sup><br>PM: 50 mg/Nm <sup>3</sup><br>CO: 100 mg/Nm <sup>3</sup>                                                                                                                                       | SO <sub>2</sub> : 30 mg/Nm <sup>3</sup><br>NO <sub>x</sub> : 150 mg/Nm <sup>3</sup><br>PM: 50 mg/Nm <sup>3</sup><br>CO: 80 mg/Nm <sup>3</sup>                                                                          |
| 10.    | Boiler-6           | 50 TPH   | Natural gas, 70000 Nm <sup>3</sup> /day                     | 60             | 1.2           | 18                   | Adequate stack height                  | PM, SO <sub>x</sub> , NO <sub>x</sub> , CO      |                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                        |
| 11.    | Boiler-7           | 50 TPH   | Natural gas, 70000 Nm <sup>3</sup> /day                     | 60             | 1.2           | 18                   | Adequate stack height                  | PM, SO <sub>x</sub> , NO <sub>x</sub> , CO      |                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                        |

\*Note: SKO and LDO will be used as backup fuels for natural gas (NG) when it is unavailable for EDC Cracking furnace

## Details of Process Gas Stacks

Table 10. Details of Process Gas Stacks

| S. No.                                 | Source of Emission | Number of Stacks | Stack Height (m) | Stack Height (m) | Stack Dia (m) | Pollution Control Measures | Emissions | Standard Emission Limit (mg/Nm <sup>3</sup> ) | Proposed Limits as project is in CPA(mg/Nm <sup>3</sup> ) |
|----------------------------------------|--------------------|------------------|------------------|------------------|---------------|----------------------------|-----------|-----------------------------------------------|-----------------------------------------------------------|
| Existing Stacks for 600 KTA SPVC Plant |                    |                  |                  |                  |               |                            |           |                                               |                                                           |

| S. No.                                        | Source of Emission                             | Number of Stacks | Stack Height (m) | Stack Height (m) | Stack Dia (m) | Pollution Control Measures                       | Emissions | Standard Emission Limit (mg/Nm <sup>3</sup> )                                                     | Proposed Limits as project is in CPA(mg/Nm <sup>3</sup> ) |
|-----------------------------------------------|------------------------------------------------|------------------|------------------|------------------|---------------|--------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| 1                                             | Vent Gas Absorption System for VCM Recovery    | 2                | 20 m each        | 0.60             | 12            | -                                                | VCM       | As per G.S.R. 820(E) dated 09.11.2012<br>VCM- 10 mg/Nm <sup>3</sup>                               | VCM- 10 mg/Nm <sup>3</sup>                                |
| 2                                             | PVC Dryer Section                              | 2                | 44 m each        | 1.00             | 14            | Multi-cyclone followed by wet scrubber and stack | VCM & HCl | As per G.S.R. 820(E) dated 09.11.2012<br>VCM- 10 mg/Nm <sup>3</sup><br>HCl -30 mg/Nm <sup>3</sup> | VCM- 10 mg/Nm <sup>3</sup><br>HCL -20 mg/Nm <sup>3</sup>  |
| 3                                             | Emergency Vent attached to VCM Storage Tank    | 1                | 60               | 0.35             | 20            | -                                                | -         | As per G.S.R. 820(E) dated 09.11.2012<br>VCM- 10 mg/Nm <sup>3</sup>                               | VCM- 10 mg/Nm <sup>3</sup>                                |
| 4                                             | Coal Heading Conveyor- Transfer Point - 1      | 2                | 15.5 m each      | 0.40             | 14            | Bag filter and stack                             | PM        | As per G.S.R. 820(E) dated 09.11.2012<br>PM- 50 mg/Nm <sup>3</sup>                                | PM- 50 mg/Nm <sup>3</sup>                                 |
| 5                                             | Coal Heading Conveyor- Transfer Point - 2      | 2                | 22.75 m each     | 0.40             | 14            | Bag filter and stack                             | PM        |                                                                                                   |                                                           |
| 6                                             | Coal Feed Hopper                               | 2                | -                | 0.50             | 14            | Water sprinklers for dust suppression            | PM        |                                                                                                   |                                                           |
| 7                                             | PVC Bagging Section - Bagging machine - 3 Nos. | 6                | -                | 0.35             | 14            | Reverse jet bag filter- 3 Nos.                   | PM        |                                                                                                   |                                                           |
| 8                                             | Product Silo - 3 Nos.                          | 6                | -                | 0.30             | 14            | Bin vent filter                                  | PM        |                                                                                                   |                                                           |
| <b>Proposed Stacks for 600 KTA SPVC Plant</b> |                                                |                  |                  |                  |               |                                                  |           |                                                                                                   |                                                           |
| 9                                             | Vent Gas Absorption System for VCM Recovery    | 2                | 20 m each        | 0.60             | 12            | -                                                | VCM       | As per G.S.R. 820(E) dated 09.11.2012<br>VCM- 10 mg/Nm <sup>3</sup>                               | VCM- 10 mg/Nm <sup>3</sup>                                |
| 10                                            | PVC Dryer Section                              | 2                | 44 m each        | 1.00             | 14            | Multi-cyclone followed by wet scrubber and stack | VCM & PM  | As per G.S.R. 820(E) dated 09.11.2012<br>VCM- 10 mg/Nm <sup>3</sup><br>HCl -30 mg/Nm <sup>3</sup> | VCM- 10 mg/Nm <sup>3</sup><br>HCL -20 mg/Nm <sup>3</sup>  |
| 11                                            | Emergency Vent attached to VCM Storage Tank    | 0                | 60               | 0.35             | 20            | -                                                | -         | As per G.S.R. 820(E) dated 09.11.2012<br>VCM- 10 mg/Nm <sup>3</sup>                               | VCM- 10 mg/Nm <sup>3</sup>                                |
| 12                                            | Coal Heading Conveyor- Transfer Point - 1      | 2                | 15.5 m each      | 0.40             | 14            | Bag filter and stack                             | PM        | As per G.S.R. 820(E) dated 09.11.2012<br>PM- 50 mg/Nm <sup>3</sup>                                | PM- 50 mg/Nm <sup>3</sup>                                 |
| 13                                            | Coal Heading Conveyor- Transfer Point - 2      | 2                | 22.75 m each     | 0.40             | 14            | Bag filter and stack                             | PM        |                                                                                                   |                                                           |

| S. No.                                               | Source of Emission                             | Number of Stacks | Stack Height (m) | Stack Height (m) | Stack Dia (m) | Pollution Control Measures            | Emissions         | Standard Emission Limit (mg/Nm <sup>3</sup> )                            | Proposed Limits as project is in CPA(mg/Nm <sup>3</sup> ) |
|------------------------------------------------------|------------------------------------------------|------------------|------------------|------------------|---------------|---------------------------------------|-------------------|--------------------------------------------------------------------------|-----------------------------------------------------------|
| 14                                                   | Coal Feed Hopper                               | 2                | -                | 0.50             | 14            | Water sprinklers for dust suppression | PM                |                                                                          |                                                           |
| 15                                                   | PVC Bagging Section - Bagging machine - 3 Nos. | 6                | -                | 0.35             | 14            | Reverse jet bag filter- 3 Nos.        | PM                |                                                                          |                                                           |
| 16                                                   | Product Silo - 3 Nos.                          | 6                | -                | 0.30             | 14            | Bin vent filter                       | PM                |                                                                          |                                                           |
| <b>Proposed Process Stacks for 750 KTA VCM Plant</b> |                                                |                  |                  |                  |               |                                       |                   |                                                                          |                                                           |
| 17                                                   | Oxy scrubber vent                              | -                | -                | -                | -             | Captive Incineration                  | Air, Hydrocarbons |                                                                          |                                                           |
| 18                                                   | Emergency vent for ethylene storage tank       | -                | -                | -                | -             | Adequate stack height                 | Ethylene          | As per G.S.R. 820(E) dated 09.11.2012<br>Ethylene- 10 mg/Nm <sup>3</sup> | Ethylene- 10 mg/Nm <sup>3</sup>                           |
| 19                                                   | Emergency vent for EDC storage tank            | -                | -                | 0.35             | 20            | Adequate stack height                 | VCM               | As per G.S.R. 820(E) dated 09.11.2012<br>VCM- 10 mg/Nm <sup>3</sup>      | VCM- 10 mg/Nm <sup>3</sup>                                |

## Water Requirement

**Source of Water** - Desalination plant.

**Existing Water Requirement:** Total Fresh Water Requirement of the industry is 4102 KLD, which is being met through Desalination Plant. Out of total fresh water, 40 KLD is used for domestic purposes, 1986 KLD is used in DM Plant, 100 KLD is used in Plant Wash, 1560 KLD will be used in Cooling tower and the balance 416 KLD will be used in Greenbelt. 4510 KLD is used for Process and 775 KLD is used for Boiler. 38 KLD of treated sewage is reused in Greenbelt development and 2000 KLD of treated effluent is used in Cooling Tower and 3659 KLD of treated effluent is used in DM Plant.

## After Expansion Water Requirement:

Total Fresh Water Requirement for the proposed expansion is 11.422 MLD, which is being met through the Desalination Plant. Out of total water requirement of 24.841 MLD, 0.11 MLD will be used for domestic purposes, 12.430 MLD will be used in DM Plant, 0.30 MLD is used in Plant Wash, 11.07 MLD will be used in Cooling tower and the balance 0.958 MLD will be used in Greenbelt.

## Wastewater Generation & Management:

Total waste water generation after expansion will be 13.419 MLD. Total 110 KLD of sewage will be generated from Domestic which will be treated in STP of capacity 140 KLD. Remaining 13.309 MLD of

effluent (8.840 MLD from process, 0.300 MLD from Plant Wash, 3.309 MLD from Cooling Tower, 0.820 MLD from DM Plant & 0.090 MLD from Boiler Blowdown) will be treated in ETP of capacity 15.800 MLD.

### **Power Requirement**

The total power requirement after the proposed expansion will be 58 MW. It is proposed to be sourced from the Grid power from Tamil Nadu Electricity Board (TNEB). For standby power requirements, the existing installation comprises 7 nos. of 2000 kVA DG sets. As part of the expansion, 4 additional DG sets of 2000 kVA each are proposed for the SPVC plant, and 3 DG sets of 2000 kVA each are proposed for the VCM plant.

Accordingly, the total DG capacity after expansion will be 14 nos. x 2000 kVA, ensuring uninterrupted power supply during grid outages.

### **Fuel Requirement**

Renewable Energy: The company commits to sourcing renewable energy, where feasible, through partnerships with solar and wind power plants.

### **Manpower**

Permanent employment will increase from 176 Nos. to 346 Nos. and temporary/contractual employment will increase from 568 Nos. to 1068 Nos.

### **Greenbelt Development**

It is proposed to develop gardening and landscaping in an area of 26.0515 ha (64.3746 acres) by the proponent. The overall green cover in the project site will be 40.31 % of the plot area after the proposed expansion.

Total no. of trees planted are 65,129 of which 23611 no. of Trees are already planted and 41518 no. of trees are proposed to be planted.

### **Rainwater Harvesting**

Rooftop rainwater that is available for collection is estimated around 146.38 m<sup>3</sup>/hr. Rooftop Runoff are directed to Intermediate collection sump and rainwater collection tank of 4200 m<sup>3</sup> capacity. Surface runoff will be diverted to the storm water drain.

### 1.5.2 Upgradation of Existing Marine Terminal Facilities with proposed Hydrocarbon transfer pipelines, crossover bridge along Uppanar River, Sea water intake & Outfall facilities and Proposed 20 MLD Desalination Plant

*Table 11. Project Details*

| Facilities         | Existing  | After Expansion |
|--------------------|-----------|-----------------|
| Berthing capacity  | 20000 DWT | 38500 DWT       |
| Breasting Dolphin  | 2 nos.    | 2 nos.          |
| Mooring dolphin    | 4 nos.    | 6 nos.          |
| Approach trestle   | -         | 1060 m x 12 m   |
| Crossover bridge   | -         | 384 m x 11 m    |
| Desalination plant | -         | 20 MLD          |

*Table 12. Details of cargo handling (existing and after expansion)*

| Feedstock import requirement (Million TPA) |          |                 |
|--------------------------------------------|----------|-----------------|
| Feedstock                                  | Existing | After Expansion |
| VCM                                        | 0.366    | 0.6             |
| Ethylene                                   | 0        | 0.2             |
| Ethylene Dichloride                        | 0        | 0.7             |
| Total                                      | 0.366    | 1.5             |

## 2. BASELINE ENVIRONMENTAL STUDIES

### 2.1 Expansion of the Existing SPVC Plant and proposed VCM Unit

#### 2.1.1 Terrestrial Environment

##### Study Period:

Monitoring was carried out from February 2024 to April 2024.

##### Ambient Air Quality:

**Core zone:** The mean value of PM10 at core zone locations ranges from (46.71 - 67.48 µg/m<sup>3</sup>) & PM2.5 ranges from (15.15 - 24.21 µg/m<sup>3</sup>), SO<sub>2</sub> ranges from (6.36- 10.37 µg/m<sup>3</sup>), NO<sub>2</sub> ranges from (10.26- 19.38 µg/m<sup>3</sup>), CO (0.30- 0.56 mg/m<sup>3</sup>), TVOC (0.009- 0.017 mg/m<sup>3</sup>), HCl (1.51- 2.46 µg/m<sup>3</sup>), Cl<sub>2</sub> (7.95- 12.97 µg/m<sup>3</sup>), O<sub>3</sub> (2.22- 4.19 µg/m<sup>3</sup>), NH<sub>3</sub> (3.08-5.81 µg/m<sup>3</sup>), THC (0.82- 1.55 mg/m<sup>3</sup>) & NMHC (0.05- 0.09 mg/m<sup>3</sup>) which are within the limits of National Ambient Air Quality Standards (NAAQS).

As per the Air Quality Index by CPCB, the air quality of the core zone is found to be Satisfactory during the sampling period from February 2024 to April 2024.

**Buffer zone:** The mean value of PM10 at buffer zone locations ranges from (44.32 - 99.07 µg/m<sup>3</sup>) & PM2.5 ranges from (14.25 - 33.20 µg/m<sup>3</sup>), SO<sub>2</sub> ranges from (6.00- 13.06 µg/m<sup>3</sup>), NO<sub>2</sub> ranges from (9.65- 24.03 µg/m<sup>3</sup>), CO (0.28- 0.70 mg/m<sup>3</sup>), TVOC (0.008- 0.021 mg/m<sup>3</sup>), HCl (1.42- 3.10 µg/m<sup>3</sup>), Cl<sub>2</sub> (7.50- 16.32 µg/m<sup>3</sup>), O<sub>3</sub> (2.09- 5.19 µg/m<sup>3</sup>), NH<sub>3</sub> (2.90-7.21 µg/m<sup>3</sup>), THC (0.77- 1.92 mg/m<sup>3</sup>) & NMHC (0.04- 0.11 mg/m<sup>3</sup>) which are within the limits of National Ambient Air Quality Standards (NAAQS).

As per the Air Quality Index by CPCB, the air quality of the buffer zone is found to be satisfactory during the sampling period from February 2024 to April 2024.

##### Ambient Noise Quality:

##### Core Zone :

The ambient noise level during day time at the proposed project site varies from 61.9 dB (A) to 62.2 dB (A) which are within the day time standard limit of Industrial area ~75 dB (A). During night the noise level at the project site ranges from 56.9 dB (A) to 57.4 dB (A) which are within the night time standard limit of Industrial area 70.0 dB (A).

##### Buffer Zone:

##### Residential Area:

- ☐ The ambient noise level at Thatchan Colony is 57.2 dB (A) which is slightly higher than daytime noise standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 46.1 dB (A) which is slightly higher than the night-time noise standard limit of ~ 45 dB (A).
- ☐ The ambient noise level at Poondiyankuppam is 57.7 dB (A) which is slightly higher than daytime noise standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 46.4 dB (A) which is slightly higher than the night-time noise standard limit of ~ 45 dB (A).
- ☐ The ambient noise level at Nochikadu is 54.7 dB (A) which is within the daytime noise standard limit of the Residential area of ~ 55.0 dB (A). During the night the noise level was recorded at 44.5 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).
- ☐ The ambient noise level at Thiruchopuram is 55.8 dB (A) which is slightly higher than the daytime noise standard limit of the Residential area of ~ 55.0 dB (A). During the night the noise level was recorded at 45.8 dB (A) which is slightly higher than the night-time noise standard limit of ~ 45.0 dB (A).
- ☐ The noise level at Tondamanathan 56.8 dB (A) which is slightly higher than the daytime noise standard limit of ~ 55 dB (A). During the night the noise level was recorded at 46.5 dB (A) which is slightly higher than the night-time noise standard limit of ~ 45 dB (A).
- ☐ The noise level at Valudambattu is 54.6 dB (A) which is within the daytime noise standard limit of ~ 55 dB (A). During the night the noise level was recorded at 43.9 dB (A) which is within the night-time noise standard limit of ~ 45 dB (A).

#### **Commercial Area:**

- ☐ The noise level at NH-32 is 61.3 dB (A) which is within the daytime noise within the standard limit of Commercial area ~ 65.0 dB (A). During the night the noise level was recorded at 58.9 dB (A) which is slightly higher than the night-time noise standard limit of ~ 55 dB (A).
- ☐ The noise level at NH-532 is 63.2 dB (A) which is within the daytime noise within the standard limit of Commercial area ~ 65.0 dB (A). During the night the noise level was recorded at 60.2 dB (A) which is slightly higher than the night-time noise standard limit of ~ 55 dB (A).

#### **Groundwater Quality:**

**Core zone:** The water quality of the core zone shows that

1. The Total Dissolved Solids (TDS) of the sampling location is 504 mg/l. The TDS of sampling location is within the acceptable limit of 500 mg/l & permissible limit i.e., 2000 mg/l respectively.
2. The Total Hardness of the sampling location is 310 mg/l. The Total Hardness of sampling location is within the acceptable limit of 200 mg/l & permissible limit of 600 mg/l respectively.
3. The Alkalinity of the sampling location is 260 mg/l. The alkalinity of sampling location is within the acceptable limit of 200 mg/l & permissible limit i.e. 600 mg/l respectively.
4. The Chloride Concentration of the sampling location is 284 mg/l. The Chloride concentration of sampling location is within the acceptable limit of 250 mg/l respectively.

**Buffer zone:** The water quality of the buffer zone shows that

1. The Total Dissolved Solids (TDS) of the sampling locations ranges from 337.4 mg/l to 1515.3 mg/l. The TDS of sampling locations are within the acceptable limit of 500 mg/l & permissible limit i.e. 2000 mg/l respectively.
2. The Total Hardness of the sampling locations ranges from 200 mg/l to 420 mg/l. The Total Hardness of sampling locations are within the acceptable limit of 200 mg/l & permissible limit of 600 mg/l respectively.
3. The Alkalinity of the sampling locations ranges from 44 mg/l to 280 mg/l. The alkalinity of sampling locations are within the acceptable limit of 200 mg/l & permissible limit i.e. 600 mg/l respectively.
4. The Chloride Concentration of the sampling locations ranges from 159.9 mg/l to 559.8 mg/l. The Chloride concentration of sampling locations are within the acceptable limit of 250 mg/l respectively.

#### **Conclusion**

The groundwater quality parameters (buffer zone) are within the IS 10500:2012 (Drinking water standard).

#### **Surface water Quality:**

Surface water samples were collected from 5 locations namely Uppanar River Upstream, Uppanar River Downstream, Pond Near Kodandaramapuram, Perumal Lake and Capper Hills Lake. As per the samples collected and analyzed from locations SW1, SW2, SW3, SW4 & SW5, surface water quality is meeting the criteria defined by class C as per the CPCB criteria. It is suitable for drinking water after conventional treatment and disinfection.

#### **Soil Quality:**

**Core Zone:** After analyzing the samples collected from the site, it shows that the soil texture is 5/3 Dull Reddish Brown, pH is 7.24. Amount of primary nutrients like Organic matter is 0.39 %, the available nitrogen 64.6 mg/kg is low to medium and available Potassium 20.9 mg/kg is medium to high & the available Phosphorus 4.6 mg/kg is medium to high range.

The overall fertility of this soil would be considered moderate to low. While the phosphorus levels are adequate, the low levels of organic matter, nitrogen, and potassium suggest that the soil may need amendments, particularly organic matter and fertilizers, to improve fertility.

**Buffer Zone:** 4/6 Reddish Brown, pH ranges from 6.16 to 7.34, Amount of primary nutrients like Organic matter 0.21 to 1.05, the Available Nitrogen 54.6 to 99.4 mg/kg is low to high range, the Available Phosphorus 5.4 to 8.8 mg/kg is low to high range, Available Potassium 20.9 to 29.8 mg/kg is low to high range.

The overall fertility of this soil would be considered moderate. The soil has good potential due to its clay loam texture and relatively neutral pH, but the fertility is limited by low to medium levels of organic matter, nitrogen, and potassium.

#### **Biological Environment:**

## Flora and fauna of Core Zone:

**Flora( Core zone):** In the core zone following a variety of tree species were observed, Proposed project site is dominated by few grass species and few scattered patches of *Prosopis juliflora*, *Calotropis procera*, *Zizyphus mauritiana*, etc.

**Fauna (Core zone):** *Calotes versicolor* (Indian Garden Lizard) and *Hemidactylus flaviviridis* (Yellow Bellied House Gecko), Green bee-eater, Spotted dove, Asian koel, Asian paradise-flycatcher, White-browed wagtail, Indian Robin, *Funambulus pennanti* (Indian Five-Striped Squirrel) have been sighted at core zone.

**Flora of the Buffer Zone:** *Peltophorum pterocarpum*, *Cocos nucifera*, *Phoenix sylvestris*, *Annona squamosa*, *Mangifera indica*, *Lannea coromandelica*, *Tectona grandis*, *Acacia auriculiformis*, *Adenanthera microsperma*, *Albizia lebbbeck*, *Albizia saman*, *Ficus hispida*, *Ficus religiosa*, *Moringa pterygosperma*, *Eucalyptus tereticornis*, *Syzygium cumini*, *Zizyphus mauritiana*, *Phyllanthus debilis*, *Phyllanthus simplex*, *Aeschynomene indica*, *Ocimum basilicum*, *Leucas aspera*, *Polygonum glabrum*, *Scoparia dulcis*, *Tylophora indica*, *Ipomoea pes-tigridis*, etc.

**Fauna (Buffer zone):** *Ptyas mucosa*, *Xenochrophis piscator*, *Naja naja*, *Motacilla citreola*, *Phylloscopus collybita*, *Grus grus*, *Tringa nebularia*, *Upupa epops*, *Falco tinnunculus*, *Milvus migrans*, *Anas clypeata*, *Streptopelia orientalis*, *Circus macrourus*, *Saxicola caprata*, *Clamator jacobinus*, *Gallinago stenura*, *Vanellus malabaricus*, *Rhodonessa rufigula*, *Emberiza bruniceps*, *Ficedula parva*, *Anthus richard*, *Coracias benghalensis*, *Sus scrofa*, *Funambulus pennantii*, *Felis chaus*, *Herpestes edwardsii*, *Rhesus macaque* *Canis aureus*, *Hystrix indica*, etc.

**Endangered Species:** There are 13 numbers of scheduled species. These are *Felis chaus*, *Canis aureus*, *Urva edwardsii*, *Hystrix indica*, *Ptyas mucosa*, *Fowlea piscator*, *Naja naja*, *Grus grus*, *Tringa nebularia*, *Grus virgo*, *Pavo cristatus*, *Circus macrourus*, *Aquila nipalensis*.

## Socio-economic Environment:

**1. Demographics and Literacy:** The surveyed villages have varied population sizes, with the largest being Pachchyankuppam (8885 people) and the smallest being Anukkambattu (1645 people).

- Literacy rates are generally above 76%, with Tiruchchepuram (88%) and Pachchyankuppam (85%) being the most literate.
- Female literacy continues to trail behind male literacy in several villages, requiring gender-targeted educational support.

## 2. Infrastructure and Basic Amenities

- Road connectivity: All villages are connected by metalled roads
- Electrification: All villages are electrified with 100% individual connections, but many have non-functioning streetlights.

### **3. Sanitation and Toilets**

- Most villages have access to both individual and public toilets. In contrast, Thiyagavelli village has yet to be provided with public toilet facilities.

### **4. Education & Health Facilities**

- No village in the area has a college, highlighting a significant gap in local education.

### **5. Occupation and Livelihoods**

- Agriculture is the primary livelihood in 50-60% of households across villages.
- However, lack of deep boring facilities, farming equipment, and training continues to hinder productivity.
- Very few households are engaged in self-employment, businesses, or service jobs.

### **6. Water Supply**

- Drinking Water: all villages have piped water supply (PWS) to households, drinking water is supplied mainly through borewells, indicating problems related to the reliability or quality of the piped water supply system.

### **7. Social Composition and Inclusion**

The distribution of Scheduled Caste (SC), Scheduled Tribe (ST), and General category populations varies significantly across the villages

- Tiruchipuram: Features a majority SC population (57%).
- Sedappalayam: Records the highest proportion of ST (11%).
- Pachchankuppam: Is predominantly inhabited by the General category (96%).

### **8. Health & Disease Prevalence**

- Seasonal illnesses like Diarrhea, typhoid, jaundice, and asthma were reported in almost all villages.
- 1-3% prevalence of jaundice and asthma across some villages.

## **2.2 Upgradation of Existing Marine Terminal Facilities with proposed Hydrocarbon transfer pipelines, crossover bridge along Uppanar River, Sea water intake & Outfall facilities and Proposed 20 MLD Desalination Plant**

### **2.2.1 Terrestrial Environment**

Baseline Monitoring Period: February 2024 to May 2024

Baseline data were collected for assessing the ambient air quality, noise levels, surface water quality, ground water quality, soil quality, socio-economic status and ecology & biodiversity of the terrestrial environment following the EIA notification 2006 with respect to the requirements under TOR Identification No: TO24A3501TN5664131N dated 02.12.2024..

**Meteorology:** The meteorological parameters such as temperature, average pressure, cloud cover, humidity and rainfall were studied for the project location.

The maximum air temperature for region is about 35°C in June and minimum of around 22°C is found in January and February. The approximate annual rainfall received in the region is about 1299.6 mm. The humidity varied between 65 % and 81 % during the year.

**Ambient air quality:** Monitoring for gaseous and particulate parameters specified in NAAQS, 2009 was performed at 6 locations using high and low volume air samplers. The results obtained are for some of the important parameters are as below:

During the monitoring period, PM10 concentrations across the six ambient air quality locations (AQ1-AQ6) were observed to range between 33.6–82.2  $\mu\text{g}/\text{m}^3$ , with mean values varying from 42.4 to 65.9  $\mu\text{g}/\text{m}^3$ , the highest being recorded at AQ2. PM2.5 levels ranged from 16.7–43.1  $\mu\text{g}/\text{m}^3$ , with mean concentrations between 20.9 and 33.8  $\mu\text{g}/\text{m}^3$ , also highest at AQ2. SO<sub>2</sub> concentrations remained comparatively low across all stations, ranging from 5.9–18.6  $\mu\text{g}/\text{m}^3$ , with mean values between 6.9 and 13.4  $\mu\text{g}/\text{m}^3$ , indicating minimal contribution from sulphur-based emissions. Overall, the results indicate that AQ2 experiences relatively higher PM10 and PM 2.5, likely due to localized emission sources or higher activity levels, while the remaining stations maintain moderate to low pollutant concentrations, particularly for SO<sub>2</sub>.

During the monitoring period, NO<sub>2</sub> concentrations across the six stations ranged from 6.9–26.8  $\mu\text{g}/\text{m}^3$ , with mean values between 10.0 and 19.7  $\mu\text{g}/\text{m}^3$ , the highest levels being observed at AQ2. Ozone (O<sub>3</sub>) was detected only at AQ1, AQ2 and AQ3, ranging from 5.2–11.3  $\mu\text{g}/\text{m}^3$ , with mean concentrations between 5.4 and 8.5  $\mu\text{g}/\text{m}^3$ , while at AQ4, AQ5 and AQ6 ozone remained below detectable limits (BDL) throughout the sampling period. Ammonia (NH<sub>3</sub>) levels were low across all stations, with observed values ranging from 5.1–12.1  $\mu\text{g}/\text{m}^3$ , and mean concentrations in the range of 5.2–7.7  $\mu\text{g}/\text{m}^3$ . The 98th percentile values for all three pollutants closely followed their respective maxima, indicating only short-term fluctuations without any persistent spikes. Overall, NO<sub>2</sub> levels remained moderate,

ammonia levels were consistently low, and ozone was either low or BDL at multiple locations, indicating minimal photochemical smog formation potential in the region.

Ambient air quality of 10 km project radius satisfies National Ambient Air Quality Standard limit.

**Noise Environment:** Noise monitoring was carried out at 6 different locations to assess the existing noise level of the study area. The noise levels complied with the ambient noise regulations set forth in the Environment (Protection) Act of 1986's Noise Pollution Regulation and Control. (Amendment) Rules, 2002, as amended by S.O. 1088(E), dated October 11, 2002.

The equivalent noise levels monitored at six locations (NQ1–NQ6) indicate that daytime noise levels ranged from a minimum of 34.7 dB(A) to a maximum of 64.0 dB(A), with daytime Leq varying between 43.6 and 59.9 dB(A), the highest being recorded at NQ2. Nighttime noise levels were comparatively lower, with Lmax values ranging from 41.2 to 55.6 dB(A) and Leq values between 39.6 and 52.8 dB(A). Among all locations, NQ2 reported the highest noise levels during both day and night, likely due to higher traffic movement or human activity in the vicinity, while NQ6 and NQ3 reflected relatively quieter ambient conditions. Overall, the recorded noise levels indicate a generally calm acoustic environment at most stations with isolated higher values at NQ2.

**Ground Water quality:** Ground water samples were collected from different locations to assess the existing ground water quality of the study area. The physio chemical characteristics are confirmed to IS 10500:2012 standards.

The groundwater sample analysed shows a pH of 7.92, which lies well within the acceptable range of 6.5–8.5 as per IS:10500:2012, indicating neutral to slightly alkaline nature of the water. The chloride concentration was observed to be 20 mg/L, which is significantly lower than the acceptable limit of 250 mg/L, reflecting negligible salinity intrusion. Total hardness was recorded at 90 mg/L, which is also much below the acceptable threshold of 200 mg/L, categorising the water as 'soft' in nature. The Total Dissolved Solids (TDS) level was observed at 280 mg/L, well within the acceptable limit of 500 mg/L, indicating good mineral balance and potability. Overall, the tested groundwater sample complies with all major physico-chemical parameters of IS:10500:2012, suggesting that the water quality is suitable for drinking and domestic use without any major treatment requirement. It suggests that the region's ground water is good in nature and it may be used for drinking purposes after conventional treatment.

**Surface Water Quality:** Surface water samples were collected at different locations to assess the surface water quality in the study area. The samples were compared with CPCB surface water classification and found suitable for various designated classes such as outdoor bathing, drinking water source, irrigation, industrial purposes, etc.

The surface water sample exhibits a pH value of 7.59, which is within the desirable range of 6.5–8.5, indicating neutral to slightly alkaline water quality. The Total Dissolved Solids (TDS) concentration was recorded at 280 mg/L, well below the permissible limit of 500–2100 mg/L, signifying low mineralization and good aesthetic quality. Microbiological analysis shows absence of both Total Coliform and E. coli, reflecting no faecal contamination and indicating suitability for primary contact uses such as bathing, as per CPCB Water Quality Criteria. Overall, CPCB Class B standards,

suggesting that the surface water body is relatively clean and suitable for outdoor bathing and general recreational purposes.

**Soil Quality:** Soil quality assessment was conducted at different locations to understand the existing soil characteristics. The soil quality analysis shows that the land side of the soil in the study area is predominantly composed of fine sand nature.

The analysed soil sample (SQ1) recorded a porosity of 25% and a bulk density of 1.54 g/cm<sup>3</sup>, indicating moderately compact soil structure with average aeration characteristics. The soil pH was measured at 5.7, signifying slightly acidic nature, which is generally suitable for the growth of most vegetation except highly alkaline-loving species. The moisture content was found to be 0.13%, reflecting relatively dry soil conditions, likely influenced by local climatic factors and surface exposure. The organic carbon content was recorded at 0.51%, representing moderate fertility status and indicating the presence of essential organic matter supportive of microbial activity and plant growth. Overall, the soil characteristics suggest a moderately fertile profile with slightly acidic nature and suitable structure for vegetation establishment.

**Socio economics:** This socioeconomic profile was conducted with a specific focus on the upgrade of the existing MTF in the SIPCOT Industrial Estate, Phase II complex. The existing MTF has been in operation for 15 years, beginning in 2009. The SIPCOT industrial park and existing CCVL business have already improved people's living conditions in the project region. Now, adding these facilities again will raise the status of the people there. Existing industrial and commercial activities have already improved living standards in the region, and the proposed upgrade aims to further enhance socioeconomic conditions.

**Ecology and Biodiversity:** To understand the existing status of flora and fauna within the study area, ecological assessment has been carried out.

### **Flora**

**Tree species:** A total of 33 tree species belonging to 17 families were observed in the study area.

**Shrubs:** During the survey a total of 24 shrub species belonging to 13 families from the study area were observed.

**Herbs and Grasses:** The Herbaceous and Grasses are dried up due to the summer season, except in the river and pond sites of the study area. A total of 63 herbs and 13 grass species belonging to 25 families were recorded.

**Climbers:** The climbers were observed from the river side, coastal region and wetland parts of the study area. 10 climber species belonging to six families and five creeper species belonging to 3 families were noted from the study area.

### **Fauna:**

**Butterflies:** According to a previous study report, there were 60 species, and 44 genera classified into five families in the Cuddalore district. A total of 17 species of butterflies have been documented from this region.

**Amphibians:** About 11 species of amphibians were reported from this region.

**Reptiles:** About 22 species of reptiles were reported from this region.

**Birds:** List of terrestrial and aquatic birds (Perumal Lake and adjacent areas and rice fields) sited and reported earlier during the present study visit. The number of species reported from Cuddalore earlier is 345 and the number of globally threatened species reported in the study area is 12. A total of 37 species were recorded. Local people mainly use Perumal Lake for fishing, cattle grazing and domestic purposes.

### 2.2.2 Marine Environment

The baseline data on marine environment were collected around 10 km radius from project location. The seawater samples, seabed sediment samples and biological samples were collected at 10 locations. The water samples were collected at three depths across the vertical i.e., surface, mid depth and bottom.

**Seawater Quality:** During the study period, the water quality results for the study area were found to be within the typical range for coastal waters in terms of physicochemical parameters, heavy metals, and nutrient values. Therefore, this study area is not considered to be contaminated in the open sea.

**Seabed Sediment:** seabed sediments are composed of Fine sand and medium sand.

Concentrations of organic matter, total nitrogen, and phosphorus showed normal and within the typical range for coastal sediments.

#### Marine ecology and biodiversity

**Phytoplankton:** Primary productivity, Species composition and Numerical abundance has been studied. Totally 56 species of phytoplankton were observed, comprising four groups viz., 41 species of diatoms (Bacillariophyta), 12 species of dinoflagellates (Pyrrophyta), 1 species of green algae (Chlorophyta) and 2 species of blue-green algae (Cyanophyta).

**Zooplankton:** Totally, 54 species of zooplankton were identified in the samples from the study area.

**Subtidal benthic organisms:** The density of macrobenthic organisms varied from 720 to 1040 nos./m<sup>2</sup> at all stations (SB1 to SB10).

**Intertidal benthic organisms:** The density of intertidal benthic organisms varied between 345 and 420 Nos./m<sup>2</sup>. Arthropoda and Mollusca dominated at all the stations than Polychaeta.

**Coastal vegetation:** The present study reveals that sand dunes are present within a 10 km radius and height ranges from 0.5 to 5 m with moderate vegetation. Existing sand dunes will not be affected by the proposed project for elevated pipeline facilities.

**Seagrasses and Seaweeds:** Seagrass species were absent within the project region.

**Sea turtles:** The proposed LFP comes under Thammanampettai to Sothikuppam 8.0 km stretch, on the southern side Thammanampettai to Ayyampettai 3 km stretch and Ayyampettai to Samiyarpettai 3 km stretch and northern side Rasapettai 4.8 km stretch are nesting area.

The proposed project location is approximately 14 km north of Devanampatnam, where the Forest Department Cuddalore has been developing turtle nesting hatcheries from 2021 to 2023. The proposed construction of the elevated pipeline corridor does not impact the ground area.

**Marine Mammals:** Marine mammals were not observed within the project region.

**Mangroves:** During the study period, true mangrove species of *Avicennia marina*, *Rhizophora mucronata* and *Excoecaria agallocha* mangrove associate species (salt marsh) such as *Arthrocnemum indicum*, *Suaeda maritima* and *Sesuvium portulacastrum* were observed in the the Uppnar creek bank regions near project site.

According to CRZ, mangroves are only present in 1530 m south and 2080 m north of the proposed elevated trestle pipeline. Further, the construction of an elevated pipeline trestle will not damage or uproot the existing mangroves.

**Coral reefs:** Coral species were absent within the project region.

**Fisheries:** The estimated marine fish production of Cuddalore district was 5,47,615 lakh tonnes in 2020-21. There are 43 fishing villages comprising of 12,988 fishing families and 12,577 traditional fishermen families. Among the total fishing families 46,090 fisherfolk population are engaged in fishing as per the Fisheries census data.

### **3. ANTICIPATED ENVIRONMENTAL IMPACT AND MITIGATION MEASURES**

#### **3.1 Impact & Mitigation for Expansion of the Existing SPVC Plant and proposed VCM Unit**

##### **3.1.1 Air Environment**

**During the construction/ installation phase** impacts on ambient air would be mainly due to dust emissions and movement of vehicles. However, these impacts would be short term in nature and limited only to the construction period. Dust suppression systems (water spray) will be used. Construction materials will be fully covered during transportation to the project site by road.

**During the operational phase**, impacts will be mainly due to emissions from the operation of DG sets. Adequate stack height and other APCMs shall be installed to mitigate negative impacts on the environment.

##### **3.1.2 Land Use**

- **Agriculture Land:**

Based on analyzed imagery and ground truth, Crop land area extents have been extracted. The Agricultural Land area is about 17332.8 hectares which is 45.48 percent of the total 10 km radius study area.

- **Built up Land:**

Based on analysis of imagery, using GIS and ground truth the total built up area is about 3760.8 hectares which is 6.97 percent of the total study area.

- **Waste/Barren Land:**

The Barren Land area occupies around 1457.1 ha which is 3.82 percent of the study area.

- **Wet Land-Water Bodies:**

Based on satellite data and ground truth, the total area covered by the inland wetland, river and water bodies is 15557.5 hectares which is 40.82 percent of the total study area.

No negative impact on land use is envisaged as the project site is an existing operational industry. Moreover, the additional plot will be used for the Production plant area, Solid waste storage/ Disposal Area.

##### **3.1.3 Soil Environment**

Chemical degradation of soil may occur while refueling vehicles transporting construction materials and servicing. Procedures for maintenance of equipment would ensure that this risk is minimized, and clean-up response is rapid if any spill occurs. Lubricating waste oil will be collected separately in drums and handed over to the authorized outside agency of vehicles through breakage due to wear and tear.

### **3.1.4 Socio-Economic Environment**

Aspects of project activities which would be dust emission, waste generation and socio-economic conditions in the nearby area which could impact to the extent of annoyance, loss of life respiratory problems to nearby population further, positive impacts include an increase in employment and revenue generation among the population in the nearby area. To minimize negative impacts, mitigation measures like proper air pollution control systems will be used, effluent treatment by ETP will be provided and industrial activities will be restricted and limited only to the project area. Proper segregation of waste, good housekeeping, maximization of employment to locals, proper treatment and disposal of all wastes generated from the plant would also be adopted in the area. All the safety measures will be followed and a safety data sheet will be provided.

### **3.1.5 Ecology & Biodiversity**

The major activities which would have an impact on the Ecology and Biodiversity in the project area and the surroundings would be site preparation, excavation, manufacturing process, operation of machinery & equipment, transportation, loading & unloading of raw material. The aspects of the activities would be dust emission, increase in GLC, increase in noise level, soil erosion, noise generation, water contamination, vehicular emission and waste generation which would directly /indirectly impact in decrease in transpiration rate of flora, loss of habitat, decrease in plant/tree cover, disturbance to avi-fauna and other species, premature senescence of floral species and hence decrease in population of local faunal species in the area and the surroundings. To minimize such impacts, mitigation measures like provision of air pollution control equipment, scrubbing system to the vents, provision and proper maintenance of green area, installation of water sprinkling systems and dust suppression systems, provision of noise barriers, maintenance of vehicular movement near the project site and proper disposal and treatment of wastes generated from the project site. Vehicular movement for transportation of raw material will be carried out only in day-time and will try to avoid unnecessary honking with the help of sign boards. Green belt/greenery will be developed along most of the periphery of the project area as well as along roads.

### **3.1.6 Noise and Vibration**

The major activities which would have an impact on the environment would be operation of machinery and transportation. The aspects of the activities would be an increase in noise level and increased noise generation which could lead to physiological and psychological problems to workers and nearby population, increased vibration in the nearby areas and an indirect decrease in the biological diversity in the nearby area. To minimize such impacts, mitigation measures like restriction of activities in the limited project area, proper maintenance of equipment and machinery, maintenance of noise barriers, provision of protective devices like earmuffs, compactors, silencers etc., installation of green area in the nearby area, provision of No-Honking Zone in the area, maintenance of vehicular and traffic movement etc. would be adapted in the project site.

### 3.1.7 Hydrology and Geology

The major activities which would have an impact on the Ecology and Biodiversity in the project area and the surroundings would be site preparation, excavation, manufacturing process, operation of machinery & equipment, transportation, loading & unloading of raw material. The aspects of the activities would be dust emission, increase in GLC, increase in noise level, soil erosion, noise generation, water contamination, vehicular emission and waste generation which would directly /indirectly impact transpiration rate of flora, loss of habitat, decrease in plant/tree cover, disturbance to avi-fauna and other species, premature senescence of floral species and hence decrease in population of local faunal species in the area and the surroundings. To minimize such impacts, mitigation measures like provision of air pollution control equipment, scrubbing system to the vents, provision and proper maintenance of plantation area, installation of water sprinkling systems and dust suppression systems, provision of noise barriers, maintenance of vehicular movement near the project site and proper disposal and treatment of wastes generated from the project site. Vehicular movement for transportation of raw material will be carried out only in day-time and will try to avoid unnecessary honking with the help of sign boards.

### 3.1.8 Solid and Hazardous Waste

The solid wastes generated from the expansion units will be utilized for beneficial purposes. The Company has assured that it will not dump the solid wastes inside the plant premises or on any land outside the plant premises.

#### i) Hazardous Wastes

Hazardous wastes will be managed as per **Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016**. The agreement was made with Re Sustainability IWM Solutions Limited on 05.09.2022 and Atlas Corporation on 17.03.2023. The agreement for the same is attached as **Annexure 20**.

*Table 14. Details of Hazardous Waste and its Management*

| S. No. | Type of Waste                     | HW Category* | Quantity per Year (MT) |                        |                        |       | Source                | Treatment / Disposal                         |
|--------|-----------------------------------|--------------|------------------------|------------------------|------------------------|-------|-----------------------|----------------------------------------------|
|        |                                   |              | Existing PVC (600 KTA) | Proposed PVC (600 KTA) | Proposed VCM (750 KTA) | Total |                       |                                              |
| 1      | Used / spent Oil                  | 5.1          | 16.2                   | 16.2                   | 20                     | 52.4  | Plant equipments      | Sent to authorized recyclers                 |
| 2      | Wastes or residues containing oil | 5.2          | -                      | -                      | 5                      | 5     | Plant equipments      | Sent to authorized recyclers (co-processing) |
| 3      | Distillation residue              | 20.3         | -                      | -                      | 22500                  | 22500 | Manufacturing process | Captive incineration                         |
| 4      | Furnace residue                   | 1.1          | -                      | -                      | 50                     | 50    | Manufacturing process | To TSDF                                      |
| 5      | Desal sludge                      | 35.3         | 1250                   | 1250                   | 2500                   | 5000  | Desalination plant    | To TSDF                                      |

| S. No. | Type of Waste          | HW Category* | Quantity per Year (MT) |                        |                        |       | Source                     | Treatment / Disposal                                                                                                       |
|--------|------------------------|--------------|------------------------|------------------------|------------------------|-------|----------------------------|----------------------------------------------------------------------------------------------------------------------------|
|        |                        |              | Existing PVC (600 KTA) | Proposed PVC (600 KTA) | Proposed VCM (750 KTA) | Total |                            |                                                                                                                            |
| 6      | ETP sludge             | 35.3         | 160                    | 160                    | 1500                   | 1820  | ETP                        | To TSDF                                                                                                                    |
| 7      | Chemical sludge (salt) | 35.3         | 1656                   | 1656                   | 1000                   | 4312  | Multiple Effect Evaporator | To TSDF                                                                                                                    |
| 8      | PVC lumps              | 22.2         | 10.8                   | 10.8                   | -                      | 21.6  | Manufacturing process      | Disposed off at TNWML (Tamil Nadu Waste Management Limited) common disposal facility at Gummudipondi, an authorized agency |
| 9      | Spent Catalyst         | 1.7          | -                      | -                      | 40                     | 40    | Manufacturing process      | Sell to Authorised recycler                                                                                                |

\*Note: (as per HWM Rules, 2016)

## ii) Municipal Solid Waste:-

Solid Waste: Non-Biodegradable wastes like plastic, paper and glass will be sold to authorized recyclers. Biodegradable wastes will be disposed of by inhouse OWC and will be used as manure for greenbelt development.

Table 15. Detail of Solid Waste Management

| Category          | Type of Waste                                       | Existing (A)     | Proposed SPVC (B) | Proposed VCM (C) | Total After Expansion (D = A+B+C) | Treatment Method                                                                                                        |
|-------------------|-----------------------------------------------------|------------------|-------------------|------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------|
|                   |                                                     | Quantity ( TPA ) |                   |                  |                                   |                                                                                                                         |
| Biodegradable     | Organic Waste                                       | 14.78            | 14.78             | 10.18            | 39.74                             | Treatment in inhouse organic waste convertor (OWC) and use manure for horticulture development purposes in the premises |
| Non-Biodegradable | Recyclable Waste (Plastic, paper, wood, glass, etc) | 22.18            | 22.18             | 11.32            | 55.68                             | Given to authorized recycler                                                                                            |
| Total             |                                                     | 36.96            | 36.96             | 21.50            | 95.42                             | -                                                                                                                       |

## iii) Non Hazardous Waste

Table 16. Non Hazardous Waste

| Name of the Waste | Existing         | Proposed | Total After Expansion | Mode of Disposal                    | Mode of transport |
|-------------------|------------------|----------|-----------------------|-------------------------------------|-------------------|
|                   | Quantity ( TPA ) |          |                       |                                     |                   |
| Fly ash           | 3360             | 3360     | 6720                  | Will be sold to authorized recycler | By Road           |

#### iv) E-Waste Details

*Table 17. E-Waste Details*

| TABLE 17.1: E-Waste Details |                              |                  |          |                       |                              |                   |
|-----------------------------|------------------------------|------------------|----------|-----------------------|------------------------------|-------------------|
| Name of the Waste           | Source                       | Existing         | Proposed | Total After Expansion | Mode of disposal             | Mode of transport |
|                             |                              | Quantity ( TPA ) |          |                       |                              |                   |
| E-Waste                     | Office electronic equipments | 0.5              | 0.5      | 1.0                   | Sent to Authorized recyclers | By Road           |

#### v) Battery Waste

*Table 18. Battery Waste Details*

| Name of the Waste | Source       | Existing         | Proposed | Total After Expansion | Mode of disposal                     | Mode of transport |
|-------------------|--------------|------------------|----------|-----------------------|--------------------------------------|-------------------|
|                   |              | Quantity ( TPA ) |          |                       |                                      |                   |
| Battery Waste     | Used battery | 1.5              | 1.5      | 3.0                   | Sell/dispose to Authorized recyclers | By Road           |

#### vi) Bio Medical Waste

*Table 19. Biomedical Waste Details*

| Name of the Waste                                   | Source                     | Existing         | Proposed | Total After Expansion | Mode of disposal                    | Mode of transport |
|-----------------------------------------------------|----------------------------|------------------|----------|-----------------------|-------------------------------------|-------------------|
|                                                     |                            | Quantity ( TPA ) |          |                       |                                     |                   |
| Soiled Waste                                        | Occupational Health Center | 0.16             | 0.16     | 0.21                  | Dispose of a Biomedical waste site. | By Road           |
| Expired or discarded medicine                       | Occupational Health Center | 0.16             | 0.16     | 0.21                  |                                     | By Road           |
| Microbiology & Biotechnology & other clinical waste | From Microbiology Lab      | 0.16             | 0.16     | 0.21                  |                                     | By Road           |
| Waste Sharps                                        | From Microbiology Lab      | 0.16             | 0.16     | 0.21                  |                                     | By Road           |
| Contaminated Waste (Recyclable)                     | OHC Medical Check up       | 0.16             | 0.16     | 0.21                  |                                     | By Road           |
| Glassware                                           | OHC Medical Check up       | 0.16             | 0.16     | 0.21                  |                                     | By Road           |
| Total                                               |                            | 1.0              | 1.0      | 1.26                  |                                     |                   |

### 3.1.9 Traffic Density

The activities which would probably be responsible for traffic congestion would be transportation of raw materials and products for which trucks and tempo will be used. Traffic to the different sites during construction/installation will be intensive and heavier than at present in normal operating conditions. The aspect of the activities would be generation of dust from movement of vehicles are likely to cause some impacts on the working population within the immediate vicinity of the project site. In turn, it will subject existing roads to more stress. To control the impact, dust suppression systems (water spray) will be used as per requirement at the construction site.

Construction materials will be fully covered during transportation to the project site by road. Vehicle flow during shift changes will be regulated by allowing exits in a phased manner. The present road

conditions are reasonably good for proposed movement of traffic. Preventive maintenance will be carried out for vehicles and pollution checks on a periodic basis will be mandatory. All the activities will be done for a limited period of time. The traffic survey for the proposed unit was conducted.

### **3.2 Impact & Mitigations for Upgradation of Existing Marine Terminal Facilities with proposed Hydrocarbon transfer pipelines, crossover bridge along Uppanar River, Sea water intake & Outfall facilities and Proposed 20 MLD Desalination Plant**

#### **3.2.1 Air Environment**

Emissions from construction equipment, work vessels, trucks and other vehicles used in construction work are major sources of air pollution. Dust from construction activities is also a possible source of air pollution. Ships are a possible source of airborne emissions such as gasses, smoke, soot and fumes. SO<sub>2</sub>, NO<sub>x</sub> are typical pollutants generated by ships while maneuvering and berthing and may affect air pollution in the coastal areas.

Good maintenance practices, efficient machineries, better housekeeping, planning of material transport routes, covered storage areas for construction materials etc. will help in managing and mitigating the impacts on air environment expected during the construction phase. To reduce the impact from windblown dust, vehicular and DG set emissions following practices should be adopted.

##### **3.2.1.1 Fugitive dust emissions**

- Covered storage for construction material wherever loose material is placed in bulk.
- Sprinkling of water in dust prone areas.
- Covered transportation of loose construction material.
- All open construction activities shall be barricaded.
- Provision of PPE like dust mask to the workers in dust prone areas.

##### **3.2.1.2 Vehicular emission and Construction machinery**

- All vehicles used shall have a valid PUC.
- Regular servicing and maintenance of machineries like cranes, excavators, rollers etc., as well as vehicles to control unwanted air pollutant emission.
- Speed restrictions for all vehicles entering the jetty premises to be practiced, idle running of machines, equipment, and vehicles to be avoided.
- All the onshore vehicles as well as offshore vessels (tugs, boats, barges, etc.) operated by CCVL would be maintained properly at scheduled intervals to minimize the local air pollution impacts.

### **3.2.1.3 Diesel generator**

- Low sulphur content fuel shall be used.
- Monitoring of DG set emission shall be carried out regularly as specified in the EMP.
- Stack emissions should be within norms prescribed by CPCB.
- It must be serviced regularly and must be used only during power cut.
- Adequate stack height should be provided.

### **3.2.2 Water & Wastewater management plan- Construction Phase**

Existing: Drinking water is sourced locally

After expansion: Drinking water RO will be established

Fire water demand to combat firefighting at Jetty is 43,434 LPM (2246 m<sup>3</sup>/hr). Following recommendations are made with regard to fire fighting for jetty by operation of following fire water pumps as follows:

- Diesel Driven pumps 2 nos.
- Electrical Driven pumps 1 no.
- Discharge capacity 1440 m<sup>3</sup>/hr at 145 m head

CCVL has proposed a desalination plant so that the water required will be drawn from the desalination plant. Hence, no ground water and additional surface water withdrawal is required.

#### **3.2.2.1 Storm Water Drainage System**

The proposed approach trestle and MTF are to be developed with a surface water drainage network connected to existing MTF. A new surface water drainage system within the new area is proposed with discharge into sea before oil separator. Surface water from the operation building, workshop, service bay etc. will be carried by the rectangular channel and container terminal will be through pipes.

#### **3.2.2.2 Sewage management**

A Packaged STP plant of 5 m<sup>3</sup> per day capacity has been proposed as a part of the pumphouse cum substation to cater for the sewage treatment from toilets.

The skid mounted packaged sewage treatment plant (STP) is proposed, which allows the effluent to be recycled for non-potable use such as gardening use etc. The proposed location of STP is near the operation building.

#### **Existing facilities**

The sewage generated from domestic and sanitary utilization shall be treated by separate Sewage treatment plants (MBBR and MBR Technology) and the treated water is to be utilized for plantation within the CCVL premises. The proper drainage system was maintained in the jetty area.

**On site sanitation facilities (Latrines and Urinals):** Enough accommodation of Latrines and Urinals separately marked as "For Men only" and "For Women only" must be displayed in the local language. The sewage will be collected in collection sump and the same must be treated through STP system.

### 3.2.2.3 Rainwater Harvesting

Rainwater harvesting systems will be installed in all the proposed area, canteen buildings. Installing a rainwater harvesting system in residential buildings can be a sustainable way to conserve water and reduce reliance on traditional water sources.

The natural source of rainwater will be collected, stored and the filtration process was carried out by charcoal bed filter and Chlorination. After the treatment, the treated water was stored and pumped to various locations in the CCVL area through underground pipes. No filtration system water was used for the dust suppression system.

### 3.2.3 Wastes management plan

Wastes from construction activities may include spoils generated by dredging. Disposal of dredged material may cause impacts on vegetation, leakage of contaminated materials and salt, odour, and other nuisances to the local community.

Construction work and dredging disturb bottom sediments and induce resuspension, dispersal, and settlement of such sediments. Dumping of dredged material directly alters bottom configuration and biota and may disperse toxic or harmful chemicals around the disposal site.

Following solid and hazardous waste management practice shall be followed during the construction phase.

*Table 20. Details of Hazardous waste*

| Type of waste                     | Quantity in TPA | Applicable Rule                                          | Management method at site                                        | Mode of disposal to be followed |
|-----------------------------------|-----------------|----------------------------------------------------------|------------------------------------------------------------------|---------------------------------|
| Municipal Solid waste             | 200             | Solid Waste Management Rules, 2016                       | Source segregation of waste and storage at site using waste bins | Through authorized vendors      |
| Hazardous waste                   | 45              | Hazardous Waste Management Rules, 2016                   | Shall be stored in HDPE drums in isolated place                  | Through authorized vendors      |
| Plastic Waste                     | 10              | Plastic Waste Management Rules, 2016                     | Shall be kept at isolated place under covered shed               | Through authorized vendors      |
| E - Waste                         | 16              | E Waste Management Rules, 2016                           | Shall be kept at isolated place under covered shed               | Through authorized vendors      |
| Construction and demolition waste | 50              | Construction and Demolition Waste Management Rules, 2016 | Follow Reduce, Reuse, Recycle method                             | Reuse in low lying area filling |

Waste minimisation followed in existing MTF

- Dedicated & specifically designed WASTE MANAGEMENT CELL for storage of all types of wastes.
- Segregation of all types of wastes, environmentally sound management of solid & hazardous wastes. 'Quantification of wastes' & 'segregation at source' drive is on, which has resulted in a 20% reduction in the quantity of waste that goes for final disposal.
- Resource recovery; maximum recovery of solid & hazardous wastes reduces waste that goes to landfill sites, reducing burden on the environment.
- Adopted practice of REUSE, REDUCE, RECOVER & RECYCLE of waste.
- Awareness programmes for source segregation and handling procedures for Port residents & Port employees.

### **3.2.4 Noise quality management plan**

The effective noise control measures shall be implemented during the construction phase to address the high noise generation from operation of construction equipment and machinery, vehicular transport, operation of pumps, compressors, and diesel generators.

Periodic maintenance of construction machinery and transportation vehicles shall be undertaken to reduce the noise impact. Silencers on engines and better greasing of rolling parts can reduce the noise level. Regular servicing of construction equipment, machineries, and vehicles. Ensure use of PPE like ear plugs/muff in high noise generating areas. Acoustic enclosure shall be provided for DG sets. Noise barriers should be adopted if required.

#### **Controls on Construction Activities**

- The following noise management measures and controls will be implemented for construction activities at the Project where it is reasonable and feasible to do so.
- Temporary cessation of work within an area, or from a particularly noisy piece of equipment, will be considered when adverse conditions are present.
- All plant and machinery used on-site will be maintained regularly to minimise noise generation.
- All plant and machinery used on-site will be operated in a proper and efficient manner (e.g., at correct speed) to minimise noise generation.
- Lesser noise generating construction activities (e.g., welding, and electrical works) will be conducted during the evening/night-time period.
- Regular communication and updates will be provided to local residents on the status and nature of site construction activities.

### **3.2.5 Dredge spoil management plan**

The total volume of capital dredging is  $2.6 \times 10^6 \text{ m}^3$  for development of the approach channel. Suitable capital dredged material will be disposed of at identified offshore disposal areas selected through mathematical model studies.

During the operational phase, part of the material dredged out as part of maintenance dredging shall be utilised for nourishment of the beach.

### Recommendations to manage dredge spoil

- Dredging schedule shall be appropriately planned, (i) selection of most favorable points in the tidal cycle to limit the extent of effects (ii) avoid sensitive periods /breeding season for fishes.
- List of DO(s) and DO NOT(s) shall be circulated among the workers involved in dredging.
- The net enclosures with booms shall be placed around the dredging area in order to control the spread of the turbid plume.
- Post dredging monitoring program shall be carried out to assess effect of dredging and disposal on marine ecology with the help of repudiated institutes.

### 3.2.6 Environment Management Plan during Operation Phase

*Table 21. Impact and Mitigation (MTF Facility) during Operation Phase*

| Environmental Components | Impact                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Air Environment          | <ul style="list-style-type: none"> <li>• Dust (PM10 &amp; PM2.5) from bulk cargo handling, storage, construction, and traffic (with heavy metals like Pb).</li> <li>• Gaseous emissions (SO<sub>2</sub>, NO<sub>x</sub>, CO, HC) from ships, vehicles, and cargo handling equipment.</li> <li>• Vapour/fumes release during liquid cargo tank cleaning and breather systems.</li> <li>• Accidental leakage causing toxic fumes, odours, explosions.</li> </ul> | <ul style="list-style-type: none"> <li>• Preventive maintenance of valves &amp; equipment.</li> <li>• Closed systems to reduce HC exposure.</li> <li>• Continuous ambient/workplace air monitoring (SPM, RPM, SO<sub>2</sub>, NO<sub>x</sub>, methane, NMHC).</li> <li>• Monitor meteorological parameters.</li> <li>• Plantation around emission sources to attenuate fugitive emissions.</li> </ul>                                                                                                                      |
| Noise Quality            | <ul style="list-style-type: none"> <li>• Noise from construction equipment, ship machinery, traffic, DG sets.</li> <li>• Vibration impact on nearby receptors.</li> </ul>                                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>• Follow BS 5228 for noise control.</li> <li>• Install acoustic fencing, temporary barriers, acoustic enclosures.</li> <li>• Shut down/ throttle idle machinery.</li> <li>• Handle materials carefully, plan off-peak deliveries.</li> <li>• Use anti-vibration mountings.</li> <li>• Regular maintenance of machinery.</li> <li>• DG sets with acoustic enclosures, meeting 75 dB(A) limits.</li> </ul>                                                                            |
| Water Management         | <ul style="list-style-type: none"> <li>• Water demand for jetty operation.</li> <li>• Marine water pollution due to wastewater, oil waste, spills, sewage discharge.</li> <li>• Stormwater runoff carrying pollutants.</li> </ul>                                                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>• Use desalination plant – no groundwater withdrawal.</li> <li>• Zero Liquid Discharge (ZLD).</li> <li>• Treat wastewater before discharge.</li> <li>• Oil-water separators for oily wastewater.</li> <li>• Provide reception facilities for oily ship waste.</li> <li>• Clean drains/outfalls before monsoon.</li> <li>• Construct retention ponds for runoff.</li> <li>• Install STP for sewage; recycle for gardening.</li> <li>• Rainwater harvesting in reservoirs.</li> </ul> |

| Environmental Components               | Impact                                                                                                                                                      | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Solid & Hazardous Waste                | <ul style="list-style-type: none"> <li>• Generation of municipal, plastic, e-waste, batteries, biomedical, hazardous, C&amp;D waste.</li> </ul>             | <ul style="list-style-type: none"> <li>• Dedicated Waste Management Cell.</li> <li>• Segregation at source &amp; resource recovery.</li> <li>• Composting of organic waste.</li> <li>• Authorized recyclers for plastic, e-waste, batteries, hazardous waste.</li> <li>• Biomedical waste handled via authorized facilities.</li> <li>• C&amp;D waste reused in low-lying areas.</li> </ul> |
| Green Belt Development                 | <ul style="list-style-type: none"> <li>• Potential air pollution, soil erosion, biodiversity loss.</li> </ul>                                               | <ul style="list-style-type: none"> <li>• Develop dense green belt (2500 plants/ha).</li> <li>• Prefer fast-growing, tall, evergreen, indigenous species.</li> <li>• Conserve mangroves, aquatic pockets &amp; salt-tolerant species.</li> <li>• Follow CPCB green belt guidelines.</li> <li>• Budget allocation for planting &amp; maintenance.</li> </ul>                                  |
| Energy Conservation & Renewable Energy | <ul style="list-style-type: none"> <li>• High energy demand from cargo handling, vehicles, lighting → GHG emissions.</li> </ul>                             | <ul style="list-style-type: none"> <li>• Energy policy &amp; audits.</li> <li>• Real-time energy monitoring.</li> <li>• Switch off idle machinery/vehicles.</li> <li>• Energy-efficient appliances &amp; LED lighting.</li> <li>• Maintenance for fuel efficiency.</li> <li>• Rationalize truck entry.</li> <li>• Install solar panels within premises.</li> </ul>                          |
| Eco-friendly Materials                 | <ul style="list-style-type: none"> <li>• Conventional construction materials cause environmental degradation.</li> </ul>                                    | <ul style="list-style-type: none"> <li>• Use eco-friendly materials like fly ash, ready-mix concrete.</li> <li>• Use fly ash for road construction.</li> </ul>                                                                                                                                                                                                                              |
| Leak & Accidental Spill Management     | <ul style="list-style-type: none"> <li>• Pipeline leakages causing explosions, pollution, accidents.</li> </ul>                                             | <ul style="list-style-type: none"> <li>• Use appropriate thickness pipelines.</li> <li>• Regular pigging &amp; intelligent pigging.</li> <li>• Restricted access to cargo corridor.</li> <li>• Oil spill contingency plan.</li> <li>• Prohibit discharge of oily waste &amp; sewage from ships (MARPOL compliance).</li> <li>• Regular inspection &amp; SOPs for operations.</li> </ul>     |
| Odour Management                       | <ul style="list-style-type: none"> <li>• Odour from liquid cargo handling &amp; waste storage.</li> </ul>                                                   | <ul style="list-style-type: none"> <li>• Store waste only in designated areas.</li> <li>• Minimize waste storage time (&lt;5 days).</li> <li>• Maintain clean premises.</li> </ul>                                                                                                                                                                                                          |
| Cargo Management                       | <ul style="list-style-type: none"> <li>• Stormwater runoff carrying contaminants.</li> <li>• Odour from liquid cargo.</li> <li>• Oil spill risk.</li> </ul> | <ul style="list-style-type: none"> <li>• Compact &amp; impervious stack yard.</li> <li>• Direct runoff to drainage channels with sedimentation tanks.</li> <li>• Inspect storage after rainfall.</li> <li>• Maintain updated material inventory.</li> <li>• Regular inspection of pipelines &amp; storage.</li> <li>• Suspend operations in adverse weather.</li> </ul>                     |

### 3.2.7 Summary of Impacts and Mitigation for the Proposed upgradation of the MTF and Desalination Plant

- Persons working in noise and vibration prone areas shall be provided with Personnel Protective Equipment (PPE) like ear muff with level III protection.
- They have to take adequate breaks from the noise and vibration prone environment to avoid

continuous exposure to high decibel noise and vibrations.

- Wastewater/sewage management through the STP system shall be ensured.
- No discharge of wastewater/sewage into uppanar river environment/CRZ areas.
- Surface runoff from the terminal and storage area shall be directed to the drainage channel.
- Drainage channel shall be designed in accordance with existing drainage pattern of project site.
- The scrap and waste construction materials should not be disposed into the seawater.
- Appropriate dredger, dredging technology shall be selected to minimize the impact.
- Net enclosures with booms shall be placed around the dredging area in order to control the spread of the turbid plume.
- To minimize the impacts of dredging, proper timings must be selected i.e. (i) selection of most favourable points in the tidal cycle to limit the extent of effects (ii) avoiding sensitive periods /breeding season for fishes and marine animals.
- Schedule for dredging shall be prepared and list of DO(s) and DO NOT(s) shall be circulated among the people involved in construction activities.
- Post dredging monitoring program shall be carried out to assess effect of dredging on marine ecology.
- Appropriate technology & reclamation method shall be selected to minimize the impact.
- All emissions shall be kept within National Ambient Air Quality Standards (NAAQS).
- Shoreline stabilization has to be planned.

## 4. ALTERNATIVE ANALYSIS

### 4.1 Alternative Site Analysis for Expansion of the Existing SPVC Plant and proposed VCM Unit

The project is a brownfield site with a proposed expansion of the existing SPVC Plant from 600 KTA to 1200 KTA, with backward integration of the raw material VCM of 750 KTA capacity. The assessment for the site is presented below:

- **Land:** The existing plant is operational under 25.1862 ha area, and for the proposed expansion there will be addition of land area of 39.4436 ha owned by M/s Chemplast Cuddalore Vinyls Limited. This total area will be adequate for the proposed expansion including locating our environmental components like greenbelt area, HW storage area, etc.
- **Connectivity:** The site is well connected with roads (Nochikkadu to Perumal Koil Road & Nochikadu-Naduthittu Road which are adjacent to project boundary) and Alapakkam Railway Station at a distance of 2.36 km, SSW.
- **Facilities & Utilities:** The existing plant has got all the facilities and utilities for the existing plant. There will be addition of machinery to cater the proposed expansion.
- **Power Supply:** There will be an addition of 44 MW of power supply from Grid power from Tamil Nadu Electricity Board (TNEB). Also for back-up source for power DG set of 7 Nos. x 2000 kVA are existing, DG set of 4 No. x 2000 kVA are proposed in SPVC plant and DG sets of 3 Nos. x 2000 kVA are proposed in the VCM plant. The total capacity of DG set after expansion will be 14 Nos. x 2000 kVA.
- **Water & Wastewater Management:** The fresh water requirement due to the proposed expansion will increase from 4102 KLD to 11422 KLD.  
The total effluent generation after expansion will be 13419KLD, which will be sent to ETP of 15800 KLD capacity followed by RO of 15000 KLD & MEE of 1500 KLD. Treated effluent of 13315 KLD will be reused in the Process, Boiler & Cooling tower. Total sewage generation after expansion will be 110 KLD which will be treated in STP of 140 KLD capacity. The treated sewage will be reused within the plant premises for greenbelt development.
- **Employment:** Due to the proposed expansion, the plant will generate additional employment 190 Nos. of permanent and 500 Nos. of temporary.
- **Greenbelt Development:** The green belt area is increasing from 9.7976 ha (24.2104 acres) to 26.0515 ha (64.3746 acres) (40.31% of total land area) after the proposed expansion, to maintain good air quality.
- No Rehabilitation and resettlement is required.

Considering the above mentioned advantages of the project location the existing site has been considered for the proposed expansion. This would also give benefits in utilizing the existing utilities and infrastructure within the project site to have minimal environmental and social footprints.

## **4.2 Alternative Site Analysis for Upgradation of Existing Marine Terminal Facilities with proposed Hydrocarbon transfer pipelines, crossover bridge along Uppanar River, Sea water intake & Outfall facilities and Proposed 20 MLD Desalination Plant**

Since the CCVL's Marine Terminal Facilities are already established and operating, no alternative site selection criteria have been considered for the expansion and modernization of the MTF.

Marine Terminal Facilities are existing already, Proposed activity is only expansion and modernization. Therefore, there is no alternative option.

## 5. ENVIRONMENTAL MONITORING PROGRAMME

### 5.1 EMP for Expansion of the Existing SPVC Plant and proposed VCM Unit

M/s Chemplast Cuddalore Vinyls Limited will ensure that the environmental performances of all the activities are monitored throughout the execution of the various project activities. Monitoring will include all the aspects and parameters related to the process emissions from the manufacturing process, storage area, work zone area, quantities of waste generated, effluent generation and its characteristics, Environmental quality of components like Air, water, Soil, Noise are being verified that they meet the prescribed standards. All the reports will be periodically submitted to the concerned regulatory authorities as compliance, audit reports.

Table 22. Monitoring Plan-Operation Phase

| Monitoring                    | Frequency of Monitoring | Parameters                                                                                            | Location                                                                                                                                                                                                                                                                                              | Numbers Per Year | Responsibility                                                 | Records to be maintained                     |
|-------------------------------|-------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------|----------------------------------------------|
| <b>Air &amp; Stack</b>        |                         |                                                                                                       |                                                                                                                                                                                                                                                                                                       |                  |                                                                |                                              |
| Ambient Air Quality           | Monthly                 | PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>x</sub> , VOCs, HCl, Cl <sub>2</sub> | 2 Onsite Location in different direction and 4 Buffer location                                                                                                                                                                                                                                        | 72               | -EMC (Air Incharge)<br>-External Laboratory analyst & incharge | NABL Accredited Lab Result                   |
| Process Stack                 | Monthly                 | PM, SO <sub>2</sub> , NO <sub>x</sub> , VOCs                                                          | 4 in Vent Gas Absorption System, 4 in PVC Dryer Section<br>1 in Emergency Vent attached to VCM Storage Tank, 4 in Coal Heading Conveyor- Transfer Point - 1, 4 in Coal Heading Conveyor- Transfer Point - 2, 4 in Coal Feed Hopper<br>12 in PVC Bagging Section - Bagging machine, 6 in Product Silo, | 48               | -EMC (Air Incharge)<br>-External Laboratory analyst & incharge | NABL 4 Buffer location Accredited Lab Result |
| Utility Stack                 | Monthly                 | PM, SO <sub>2</sub> , NO <sub>x</sub> , VOCs                                                          | 2 no of stacks for DG sets, 7 stacks for Boiler (1, 2, 3, 4, 5, 6, 7), 4 stacks for EDC Cracking Furnace(1, 2, 3, 4), 1 in incinerator, 3 for Emergency DG Set(1, 2, 3),                                                                                                                              | 84               | -EMC (Air Incharge)<br>-External Laboratory analyst & incharge | NABL Accredited Lab Result                   |
| <b>Water &amp; Wastewater</b> |                         |                                                                                                       |                                                                                                                                                                                                                                                                                                       |                  |                                                                |                                              |
| Water Quality                 | Yearly                  | Monitoring for                                                                                        | surface water                                                                                                                                                                                                                                                                                         | 1                | -EMC (Water                                                    | NABL                                         |

| Monitoring                                                            | Frequency of Monitoring | Parameters                                                                                                                        | Location                                                                      | Numbers Per Year | Responsibility                                                                                                                 | Records to be maintained              |
|-----------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
|                                                                       |                         | relevant parameters as per Drinking water standard IS – 10500                                                                     |                                                                               |                  | Incharge)<br>-External Laboratory analyst & incharge                                                                           | Accredited Lab Result                 |
| Waste Water Quality (Treated & Untreated)                             | Daily                   | Daily-BOD, COD, TSS, TDS, pH, Oil & Grease                                                                                        | ETP inlet & outlet, RO inlet & Outlet, MEE inlet & Outlet, STP inlet & outlet | 2,920            | -EMC (Water Incharge)                                                                                                          | NABL Accredited Lab Result & Logbooks |
|                                                                       | Monthly                 | CPCB discharge Parameters as given in the Standards for Organic Chemical Manufacturing Industry (GSR 608 (E) dated 21st July 2010 |                                                                               | 96               | -Internal Laboratory analyst & incharge for daily parameters<br>-External Laboratory analyst & incharge for monthly parameters |                                       |
| Surface water                                                         | Monthly                 | Monitoring for relevant parameters as per Drinking water standard IS – 10500 and as CPCB Surface water quality criteria           | Surface water: 1 onsite location                                              | 12               | -External Laboratory analyst & incharge                                                                                        | NABL Accredited Lab Result            |
| <b>Noise</b>                                                          |                         |                                                                                                                                   |                                                                               |                  |                                                                                                                                |                                       |
| Day & Night level Noise Monitoring                                    | Monthly                 | Leq (night), Leq (day),<br>Leq (24 hourly)                                                                                        | 2 onsite location                                                             | 24               | -EMC (Noise Incharge)<br>-External Environmental consultant                                                                    | NABL Accredited Lab Result            |
| <b>Soil</b>                                                           |                         |                                                                                                                                   |                                                                               |                  |                                                                                                                                |                                       |
| Qualitative and Quantitative Parameters                               | Yearly                  | All Parameters to check soil fertility<br>Pesticide testing in the soil                                                           | 7 Buffer location                                                             | 7                | -EMC (Soil Incharge)<br>-External Environmental consultant                                                                     | NABL Accredited Lab Result            |
| <b>Waste Generation Monitoring / Record Keeping</b>                   |                         |                                                                                                                                   |                                                                               |                  |                                                                                                                                |                                       |
| Records of generation, handling, storage, transportation and disposal | Daily                   | Hazardous, Non Hazardous, E-waste, Organic waste, recyclable waste, manure generated                                              | -                                                                             | 5                |                                                                                                                                | Logbooks                              |
| Sludge                                                                | Characterist            | TCLP test and                                                                                                                     | ETP Sludge, STP sludge                                                        | 24               | -External                                                                                                                      | NABL                                  |

| Monitoring                                                                                            | Frequency of Monitoring      | Parameters                                                                                                                                                         | Location                                                               | Numbers Per Year | Responsibility                          | Records to be maintained   |
|-------------------------------------------------------------------------------------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------|-----------------------------------------|----------------------------|
| Characteristics and Quantity                                                                          | cs-Monthly<br>Quantity-daily | Quantity                                                                                                                                                           |                                                                        |                  | Laboratory analyst & incharge           | Accredited Lab Result      |
| <b>Ecology and Biodiversity Monitoring</b>                                                            |                              |                                                                                                                                                                    |                                                                        |                  |                                         |                            |
| Green belt & plantation monitoring                                                                    | Yearly                       | Survival rate of the planted Trees, Greenbelt development status & Green area                                                                                      | -                                                                      | 1                | EMC (gardener )<br>-External            | Logbooks                   |
| <b>Social Monitoring</b>                                                                              |                              |                                                                                                                                                                    |                                                                        |                  |                                         |                            |
| Checking effectiveness of the Corporate Social Responsibility/ Corporate Environmental Responsibility | Annual                       | Cost spent and where it is carried out                                                                                                                             | -                                                                      | 1                | CSR Team                                | Audit Reports              |
| <b>Power and Energy Monitoring</b>                                                                    |                              |                                                                                                                                                                    |                                                                        |                  |                                         |                            |
| Energy savings                                                                                        | Annual                       | Energy consumption in terms of<br>1. Quantity of fossil fuels<br>2. Power drawn<br>Renewable energy<br>1. Solar harvesting<br>2. use of Alternate source of energy |                                                                        | 1                | Utility Team                            | Energy meter               |
| <b>Work Zone Monitoring</b>                                                                           |                              |                                                                                                                                                                    |                                                                        |                  |                                         |                            |
| Work Zone                                                                                             | Annual                       | PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>x</sub> , CO <sub>2</sub> , CO & VOCs                                                             | Process Area, DG Set Area, Raw material and finished Good Storage Area | 1                | -External Laboratory analyst & incharge | NABL Accredited Lab Result |

## 5.2 EMP for Upgradation of Existing Marine Terminal Facilities with proposed Hydrocarbon transfer pipelines, crossover bridge along Uppanar River, Sea water intake & Outfall facilities and Proposed 20 MLD Desalination Plant

The monitoring program shall be done during the operational phase of the project, and it shall be repeated at six monthly intervals as suggested by MoEFCC. The monitoring will be organized with a qualified and experienced environmental team. Standard procedure shall be followed in sample collection and analysis. Half yearly monitoring of air, noise, ground water, seawater quality, seabed

sediment and marine ecology is recommended at project area, nearby villages, waterfront area, approach channel and identified locations in Uppanar River.

Post project monitoring program has been planned based on the prediction of impacts and mitigation measures suggested.

## 6. ADDITIONAL STUDIES

### 6.1 Additional Studies for Upgradation of Existing Marine Terminal Facilities with proposed Hydrocarbon transfer pipelines, crossover bridge along Uppanar River, Sea water intake & Outfall facilities and Proposed 20 MLD Desalination Plant

Additional studies such as Hydrodynamic Modelling, Sediment transport model – MIKE 21 ST, Shoreline Changes Study, Traffic Survey, Vessel Tranquility study, Risk Assessment and Disaster Management Plan has been carried out and given in detail in the EIA report.

#### 6.1.1 Hydrodynamic Modelling

The hydrodynamic model indicates that the current speed remains less than 0.41 m/s under various conditions, including fair weather, southwest monsoon and northeast monsoon. The direction of flow varies with tidal conditions and monsoon influences, but overall, there is no significant change in the flow field after the development of proposed marine facilities.

#### 6.1.2 Sediment Transport Model – Mike 21 ST

##### Bed level changes – Existing scenario

Fair Weather: The model reveals that the nearshore regions remain stable with moderate deposition of 0.10 m over a period of four months and slight erosion is observed in the northern part of the project area with the order of 0.05 m.

Southwest monsoon: The model reveals that the nearshore regions show comparatively high deposition and erosion, of which the major part happens in the northern region. The order of sediment deposition near the project area over a period of four months is 0.15 m and the order of erosion near the project area over a period of four months is 0.20 m.

Northeast monsoon season: The model reveals that the nearshore region remains almost stable with a slight range of deposition and erosion in the order of 0.05 and 0.10 respectively.

##### Bed level changes – post-dredging scenario

Fair Weather: The model reveals that there is no significant bed level change in the dredging channel and the nearshore regions remain stable with moderate deposition of 0.12 m over a period of four months. Also, a slight erosion is observed in the southern part of the project area with an order of 0.08 m.

Southwest monsoon: The model reveals that the nearshore regions show comparatively high deposition and erosion, of which the major part happens in the northern region. The section of

dredging channel at the southern part shows accretion while the section at the northern part shows erosion. The order of sediment deposition near the project area over a period of four months is 0.20 m and the order of erosion near the project area over a period of four months is 0.25 m.

Northeast monsoon season: The model reveals that the nearshore region remains almost stable with a slight range of deposition and erosion in the order of 0.15 and 0.12 respectively and deposition prevails in the northern section of the dredging channel.

### **6.1.3 Littoral Drift**

The shoreline near the project location is oriented nearly in N11°E direction. The annual northerly transport was estimated as  $-0.31 \times 10^6 \text{ m}^3/\text{year}$  and southerly transport was estimated as  $0.21 \times 10^6 \text{ m}^3/\text{year}$ . The total annual gross transport was found to be  $0.52 \times 10^6 \text{ m}^3/\text{year}$ , and the annual net transport was estimated to be  $-0.10 \times 10^6 \text{ m}^3/\text{year}$  towards south.

### **6.1.4 Shoreline Change Data**

The shoreline studies for the period of 2000 – 2024 have shown that nearly 93 % of areas showed accretion and 7 % of area only noticed with erosion. Out of 200 transect lines, 15 were noticed with erosion and remaining 185 transect lines were noticed with accretion. The maximum accretion is observed near to the river mouth with a value of 5 m. The maximum erosion is observed in the southern region from the proposed project region with a value of 0.8 m .

## **6.2 Additional Studies for Expansion of the Existing SPVC Plant and proposed VCM Unit**

As per Terms of Reference issued vide letter No IA-J-11011/132/2020-IA(II) dated 28.07.2025 by Ministry of Environment, Forest, and Climate Change (MoEFCC), New Delhi following Additional Studies required to be carried out for the proposed expansion project.

### **6.2.1 Stack Height Optimization**

Long-term air quality modelling study is done, including sensitivity analysis, to determine the optimal stack height for flue gas and process vents, and/or propose necessary changes in layout to minimise impacts on sensitive receptors. The emissions from point & non-point sources spread or disperse in the air and cause an increase in the pollution level in ambient air. This causes an increase in Ground Level Concentration (GLC). This increase in GLC can be predicted for proposed projects using Air Dispersion Modelling. In this study, AERMOD developed by Lakes Environmental Inc. is used to calculate incremental Ground Level concentrations (GLC) for the proposed sources of air pollution in the current expansion, for Particulate emissions, Gaseous emissions (NO<sub>2</sub> & SO<sub>2</sub>).

The reduction in incremental concentration with higher stacks follows the expected dispersion pattern but the differences remain negligible, with post-project pollutant levels consistently remaining well within the prescribed CPCB Ambient Air Quality Standards.

This outcome demonstrates that increasing the stack height beyond 60 m does not lead to a proportionate improvement in ambient air quality. The diminishing returns with respect to pollutant dispersion highlight that a 60 m stack height is technically sufficient and environmentally acceptable for effective dispersion of emissions from the proposed utility sources.

Accordingly, the optimized stack height for the project is recommended as 60 m, since higher stack designs would not yield any substantial air quality benefits while potentially increasing structural and operational costs. This optimization ensures both regulatory compliance and engineering efficiency.

### **6.2.2 Compounded flood study**

M/s. Chemplast Cuddalore Vinyls Limited has approached National Institute of Ocean Technology (NIOT), Chennai to carry out Flood Risk Assessment for the project location. This report presents the preliminary findings based on field data collection and the initial outputs from hydrodynamic and hydrological modeling analyses.

#### **Observations**

The compound flood scenario, integrates the effects of the 100-year return period rainfall, astronomical tide, and storm surge generated by a Thane cyclone. Flooding amplifies due to the combined contribution of intense surface runoff from extreme rainfall, astronomical tide, and additional sea level rise induced by storm surge resulting in increased spatial extent and depth of inundation. In both the scenarios with past maximum rainfall event and compound flood scenario, the study area remains unaffected.

### **6.2.3 Decarbonization Study**

The decarbonization assessment of the CCVL plant demonstrates a clear opportunity for phased and targeted GHG reductions without compromising operational integrity. With gross annual emissions of approximately 426,856.9 tCO<sub>2</sub>-eq in the base year (2025), the plant's emission profile is largely driven by indirect electricity consumption, followed by process-related and transport emissions.

### **6.2.4 Environmental Cost Benefit Analysis (ECBA)**

The company's impressive Benefit-Cost Ratio (BCR) of 9.359 underscores the robust economic viability of its ongoing industry project. This exceptional BCR value signifies that the anticipated benefits of the project significantly surpass its costs, illustrating a compelling value proposition. For every unit of currency (₹ 1) invested, the company stands to gain Rs. 9.359 in returns, underscoring the project's potential for generating substantial profitability and economic prosperity. This favorable BCR reflects the company's strategic foresight and prudent investment decisions, as it indicates a judicious allocation of resources towards endeavors that promise high returns. With the benefits of the project, including revenue from product sales, tax efficiencies, and optimized operational expenses, far outweighing its associated costs, the company is poised for sustainable growth and success in the competitive industry landscape.

## 6.2.5 Qualitative Risk Assessment

A systematic Quantitative Risk Assessment (QRA) was conducted to identify, quantify, and evaluate the hazards associated with accidental releases of hazardous chemicals at the proposed CCVL VCM plant expansion and upgradation of MTF. The methodology adopted aligns with IS 15656:2006 (Indian Standard for Risk Analysis), OISD-STD-150 (Oil Industry Safety Directorate), and leading international best practices (CCPS, API, OSHA PSM, Seveso III Directive). All modeling and scenario analysis utilized current process design, chemical inventories, and site meteorological/topographical data.

Consequence analyses of all major credible and worst-case accidental release scenarios identified for the proposed VCM plant was carried out. Each scenario was selected based on process risk analysis, regulatory requirements, and industry experience with similar facilities. For each, the physical basis, likely initiating events, escalation pathways, and consequence modeling results are provided. Outputs are based on Fluidyn PANACHE v5.0.6 simulations and established QRA consequence criteria.

Scenarios:

- EDC-A1 (Credible Scenario One) – Ship Loading/Unloading Leak
- VCM-B2 (Credible Scenario Two) – Zone-1 Storage Leak (25 mm)
- ETH-D1 (Credible Scenario Three) – Liquid Unloading at Trestle (25 mm)
- ETH-D2 (Credible Scenario Four) – Vapour Transfer (Uppanar→Zone-1, 25 mm)

### Summary Table of Consequence Modeling Results

*Table 25. Summary of Consequence Modeling Results*

| Scenario Code | Endpoint(s) reported            | Outer contour (m) - approx | Receptor intersection   | Concern       |
|---------------|---------------------------------|----------------------------|-------------------------|---------------|
| EDC-A1        | ERPG-1/2/3; 12.5/37.5 (fire)    | 10                         | Within the MTF          | Low-Moderate  |
| VCM-B2        | AEGL-1; LEL; 12.5/37.5; 0.1/0.3 | 15                         | Within the Storage Dyke | Moderate-High |
| ETH-D1        | LEL; 12.5/37.5                  | 20                         | Within the MTF          | Moderate      |
| ETH-D2        | LEL; 12.5/37.5; 0.1/0.3         | 20                         | Within the MTF          | Moderate-High |

**\*Note:** EDC- Ethylene Dichloride, VCM- Vinyl Chloride Monomer, ERPG-Emergency Response Planning Guideline, AEGL- Acute Exposure Guideline Level, LEL/UFL- Lower Explosive Limit/Upper Flammable Limit, MTF- Marine Terminal Facility, ETH- Ethylene.

## 6.2.6 Contour Map For 2 M Interval

The Contour map shows the Digital Elevation Model (DEM) of a specific area with contour lines at 2-meter intervals. Minimum Elevation is 2.7353 meters (darkest shade on the map) and Maximum Elevation: 18.7263 meters (lightest shade on the map). The contours represent elevation at 2-meter intervals, with the yellow lines showing elevations such as 2, 4, 6, 8, 10, 12, and so on.

## **7. PROJECT BENEFITS**

### **7.1 Benefits of Expansion of the Existing SPVC Plant and proposed VCM Unit**

#### **7.1.1 Environment Benefits**

The proposed project adopts backward integration by producing VCM in-house, thereby eliminating long-distance transport of feedstock, reducing logistics-related emissions and marine handling risks. Natural gas will be used as the primary fuel for boilers and furnaces, resulting in substantially lower SO<sub>x</sub>, NO<sub>x</sub>, PM and CO<sub>2</sub> emissions while complying with CPCB/TNPCB standards through adequate stack heights and APC systems. The facility will operate on Zero Liquid Discharge (ZLD), with full reuse of treated effluent and sewage, ensuring no discharge to Uppanar River or nearby water bodies. Freshwater demand will be fully met through a 20,000 KLD desalination plant, preventing stress on local aquifers or community resources. Waste minimization, material recovery and sale of recyclables are integrated into operations, along with recovery of HCl as a by-product. More than 40% of the project area (26.05 ha) is dedicated to greenbelt, enhancing carbon sequestration and serving as a dust and noise buffer. Efficient process design and co-location of VCM and PVC production facilities will further reduce specific energy consumption and improve overall environmental sustainability.

#### **7.1.2 Economic Benefits**

The project will reduce dependency on imported feedstock by establishing in-house VCM production, conserving foreign exchange and supporting the Atmanirbhar Bharat initiative. Local and regional economies will benefit from increased demand for goods, services, and logistics support. The project will generate revenue for the government through taxes, duties, and utility charges. It will ensure consistent supply of PVC resins to downstream industries such as construction, agriculture, and packaging, supporting industrial growth. Additional capacity may open opportunities for export, enhancing India's competitiveness in the global petrochemical market.

#### **7.1.3 Social Benefits**

The project will generate 426 permanent and 1,068 contractual job opportunities, enhancing livelihoods and reducing local unemployment. The influx of skilled professionals will lead to knowledge sharing and capacity building in the region. Corporate Environmental Responsibility (CER) initiatives will focus on improving healthcare, education, sanitation, and drinking water facilities in nearby villages. Development of internal roads, utilities, and environmental infrastructure will benefit both the SIPCOT Industrial Area and surrounding communities, improving overall quality of life.

## **7.2 Benefits of Upgradation of Existing Marine Terminal Facilities with proposed Hydrocarbon transfer pipelines, crossover bridge along Uppanar River, Sea water intake & Outfall facilities and Proposed 20 MLD Desalination Plant**

### **7.2.1 Environment Benefits**

Based on project particulars and the existing environmental conditions, potential positive impacts likely to result from the proposed MTF development are identified below.

- Better Sea transport facilities/State of the art MTF.
- Revenue Generation
- Employment Opportunities – skilled, semi-skilled and unskilled labour during construction and operation phases of the project with specific attention to employment potential of local population
- Improvement in Physical Infrastructure like project infrastructure and ancillary facilities
- Improvement in social infrastructure like roads, railways, townships, housing, water supply, electrical power, drainage, educational institutions, hospitals, improved environmental conditions etc.
- Reduction of material costs due to reduction of transport cost.

### **7.2.2 Economic Benefits**

The expansion and modernisation Project would enable creation of state-of-the-art infrastructure facilities and necessary capacity for handling various commodities to drive & support the state & national EXIM and Coastal Trade in line with the envisaged demand growth. The Project facilities would also enable reduction in logistics cost and thereby positively impact export competitiveness for local, regional, and national trade. The Project would benefit CCVL by ensuring increased handling and operational capacity, reduced congestion, and increased revenue generation by handling more volume of liquid cargo. The Government would also directly benefit by way of more Revenue generation through taxes and other regulatory charges etc.

### **7.2.3 Social Benefits**

The proposed and expansion of MTF has considerable societal benefit. It will have a major impact on social and economic upliftment of the region by overall improvement in living standard by creation of more jobs, increase in volume of general trade, general improvement in MTF facility, spurring indirect economic activity and societal and help spur economic activity in the surroundings.

## 8. ENVIRONMENT MANAGEMENT PLAN

The main objectives of Environmental Management are to:

- Identify key environmental issues anticipated to be encountered during construction and operation phases of the project
- Provide guidelines for appropriate mitigation measures
- Ensure the mitigation measures are implemented
- Establish systems and procedures for implementing mitigation measures
- Monitor the effectiveness of mitigation measures
- Take necessary prompt action when unforeseen impacts occur

### 8.1 EMP for Expansion of the Existing SPVC Plant and proposed VCM Unit

#### i) Capital Cost

*Table 39. Capital Expenditure*

| S. No.       | Particulars                        | Existing<br>(INR Lakhs) | Proposed Cost<br>(INR Lakhs) | After Expansion<br>(INR Lakhs) |
|--------------|------------------------------------|-------------------------|------------------------------|--------------------------------|
| 1            | Air Management                     | 1250.0                  | 4400.0                       | 5650.0                         |
| 2            | Solid / Hazardous Waste Management | 50.0                    | 150.0                        | 200.0                          |
| 3            | Wastewater Management              | 2000.0                  | 6000.0                       | 8000.0                         |
| 4            | Green Belt                         | 32.7                    | 162.5                        | 195.2                          |
| 5            | Occupational Health & Safety       | 15.0                    | 50.0                         | 65.0                           |
| <b>Total</b> |                                    | <b>3347.7</b>           | <b>10762.5</b>               | <b>14110.2</b>                 |

#### ii) Recurring Cost

*Table 28. Recurring Expenditure*

| S. No.       | Particulars                         | Existing          | Proposed Cost | After Expansion |
|--------------|-------------------------------------|-------------------|---------------|-----------------|
|              |                                     | (INR Lakhs/Annum) |               |                 |
| 1            | Air Management                      | 100.0             | 15.0          | 115.0           |
| 2            | Solid / Hazardous Waste Management  | 154.0             | 921.3         | 1075.3          |
| 3            | Wastewater Management               | 4639.1            | 7083.1        | 11722.3         |
| 4            | Green Belt                          | 1.2               | 8.1           | 9.4             |
| 5            | Environment Monitoring & Management | 25.0              | 50.0          | 75.0            |
| 6            | Occupational Health & Safety        | 3.0               | 30.0          | 33.0            |
| <b>Total</b> |                                     | <b>4922.4</b>     | <b>8107.5</b> | <b>13029.9</b>  |

## 8.2 EMP for Upgradation of Existing Marine Terminal Facilities with proposed Hydrocarbon transfer pipelines, crossover bridge along Uppanar River, Sea water intake & Outfall facilities and Proposed 20 MLD Desalination Plant

### i) Capital Cost

Table 26. EMP Capital Cost

| S. No.       | Particulars                                                                                                  | Quantification   | Cost in Lakhs (₹) |
|--------------|--------------------------------------------------------------------------------------------------------------|------------------|-------------------|
| 1            | Fund allotted for concerns raised during Public Hearing (including greenbelt & open area development)        | -                | 50                |
| 2            | <b>Environment monitoring</b>                                                                                |                  |                   |
|              | Construction Phase: Air, Seawater and Seabed sediment quality                                                | 5 locations each | 5                 |
|              | Operational Phase: Air, Surface & Ground water, Soil and Seabed sediment quality                             | 5 locations each | 5                 |
| 3            | <b>Occupational health and safety, Training, firefighting facilities and Oil spill management facilities</b> |                  |                   |
|              | Safety helmet, shoes, goggles, ear plugs and gloves for the MTF workers                                      | -                | 5                 |
|              | Health check-up facilities                                                                                   | yearly once      | 4                 |
| 4            | <b>Waste management facilities</b>                                                                           |                  |                   |
|              | Collection and storage of generated waste in colour coded bins                                               | 10 locations     | 1                 |
|              | Disposal of waste through municipality / ship chandlers / other authorised vendors                           | -                | 1                 |
| 5            | Green belt development                                                                                       | -                | 20                |
| <b>Total</b> |                                                                                                              |                  | <b>91</b>         |

### ii) Recurring Cost

The environmental cost consists of expenses towards maintaining environmental norms within the specified limits during construction/ operation phase, e.g., testing of water/ soil and air as well as mitigation measures. Most of the items are covered under respective civil/ mechanical works.

Table 27. Recurring Expenditure

| S. No. | Particulars                                                  | Quantification | Cost in lakhs (₹) |
|--------|--------------------------------------------------------------|----------------|-------------------|
| 1      | Environmental Parameters Monitoring in and around jetty area | 4 locations    | 10                |
| 2.     | Operation of STP                                             | -              | 5                 |
| 5      | Ecological monitoring                                        | 3 seasons      | 15                |
| 6      | Shoreline monitoring                                         | yearly         | 2                 |
| 7      | Environmental cell Recurring Cost                            | -              | 20                |
| 8      | Greenbelt and open area development                          | -              | 5                 |
| 9      | Solid Waste Management                                       | -              | 1                 |
| 10     | Celebration and awareness program on environment             |                | 1                 |
| 11     | Maintenance of pollution control systems                     |                | 5                 |
| 12     | Implementation and audit for IMS                             |                | 1                 |
|        | <b>Total</b>                                                 |                | <b>65</b>         |

## 9. CONCLUSION

Comprehensive baseline environment study has been done to establish the baseline status of the study area within 10 km from the project site. The significant environment parameters for the terrestrial and marine environment are compared with the available National Standards. The impact assessment shows that there are no significant negative impacts due to proposed project activities on the surrounding environment. The implementation of suggested mitigation measures and environment management plan will ensure to keep the anticipated impacts to minimum so that the project will be completed without any significant change in baseline environment status.

The proposed expansion will result in direct & indirect employment and economic growth of the project area apart from the growth in the top line of the company. Further, this project will bring additional revenue to the Government apart from various CSR activities which will be beneficial to the nearby community. The project will deliver long-term socio-economic and environmental benefits with minimal incremental ecological footprint due to its location within an established industrial estate and adoption of modern process technologies. This will help in saving foreign exchange reserves and promote Atmanirbhar Bharat.