

EXECUTIVE SUMMARY OF EIA REPORT

Proposed Manufacturing of Synthetic Organic Chemicals

At

Gut No. 358, Village – Dhamane, Tal: Maval, Dist: Pune –
410506, Maharashtra

By

M/s. Teknovace Wood Coatings Pvt. Ltd

Environmental Consultant



Envirosphere

Consultant & Engineers

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NABET/EIA/23-26/SA 0246 Certified Organization

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Baseline period – 1st March 2026 to 31st May 2026

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1. Introduction

This Executive Summary has been prepared as a concise overview of the Environmental Impact Assessment (EIA) Report developed in accordance with the EIA Notification, 2006 and its subsequent amendments. The summary presents brief information regarding the proposed project, existing environmental conditions of the surrounding area, anticipated environmental and social impacts, and the proposed mitigation measures.

As per Environmental Impact Assessment (EIA) Notification, September 14th, 2006 and amendments thereof, the proposed project falls under Activity 5(f) i.e., Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates). As the proposed project is located outside the notified industrial area & proposed water consumption is less than 25 m³/day and fuel consumption is less than 25 TPD, the project is categorized as Category B1 and requires prior Environmental Clearance from the State Environment Impact Assessment Authority (SEIAA), Maharashtra.

To assess the existing environmental status of the study area, baseline environmental monitoring was conducted during the Pre - monsoon season from 1st March 2026 to 31st May 2026. Eight monitoring locations each were selected within a 10 km radius of the project site for assessment of air quality, water quality, noise levels, and soil quality. Sample collection and analysis were carried out through NABL and NABET accredited laboratory facilities of Ultratech Environmental Consultancy and Laboratory Private Limited.

The proposed production capacity of Synthetic organic chemicals is 12,000 TPA (Tons Per Annum). comprising Alkyd Resin, Acrylic Resin, Polyester Resin, Water-Based Resin and UV Resin. These products are widely used in the wood coatings, decorative paints, industrial coatings, adhesives, inks and allied sectors. The project is expected to contribute significantly to industrial growth, employment generation, and regional economic development.

The manufacturing process involves controlled-temperature polymerization reactions using various raw materials. Thermal Fluid Heaters will be used in the process, with Light Diesel Oil proposed as fuel. The estimated LDO requirement is approximately 250 kg/hr.

The total water requirement for the project is estimated at 24 KLD, out of which 16.5 KLD will be fresh water sourced through Ground Water, while 7.5 KLD of treated wastewater will be recycled and reused. Treated water from the ETP, RO and MEE systems (5.5 KLD) will be reused for cooling tower makeup, while treated sewage from the STP (2 KLD) will be utilized for gardening purposes. The project proposes adoption of a Zero Liquid Discharge (ZLD) system.

Hazardous and non-hazardous waste generated from the project will be managed as per applicable environmental regulations and disposed through authorized CHWTSDF facilities and approved recyclers. The company is committed to compliance with all environmental norms and sustainable industrial development.

The total capital investment for the proposed project is estimated at INR 8 Crores. Under Corporate Environmental Responsibility (CER), an amount of INR 16 Lakhs has been proposed for various environmental and social development activities.

The project is expected to generate direct employment for approximately 60 persons during the construction phase and around 55 persons during the operational phase, apart from indirect employment opportunities in transportation, maintenance, supply chain, and allied services.

The total power requirement for the project is 253 kW, which will be supplied by Maharashtra State Electricity Distribution Company Limited. Approximately 10.27% of the total power demand is proposed to be met through solar energy.

The project comprises a total plot area of 3,947.52 sq. m, of which 1,208.19 sq. m is proposed for road widening/service road, resulting in a net plot area of 2,739.33 sq. m. The proposed total built-up area is 2,893.40 sq. m and ground coverage is 578.68 sq. m. A greenbelt of 686.46 sq. m (25.06% of the plot area) is proposed within the project premises.

The EIA Report prepared by Envirosphere Consultant and Engineers LLP includes a detailed assessment of the anticipated environmental impacts during construction and operation phases along with proposed mitigation measures, the summary of which is presented in this Executive Summary.

2. Purpose of the report

The present Environmental Impact Assessment (EIA) Report has been prepared for obtaining Environmental Clearance (EC) for the Manufacturing of Synthetic Organic Chemicals in accordance with the provisions of the EIA Notification, 2006 and its subsequent amendments.

The primary objective of the report is to assess the potential environmental and socio-economic impacts arising from the proposed project activities, recommend suitable mitigation measures for minimizing such impacts, and formulate an appropriate Environmental Management Plan (EMP) to ensure environmentally sound and sustainable development of the project.

The report also aims to provide relevant information regarding the proposed project to the concerned government authorities, local communities, and other stakeholders, and to facilitate the Public Hearing process.

3. Identification of Project and Project Proponent

The proposed project involves the manufacturing of resins, namely Alkyd Resin, Acrylic Resin, Polyester Resin, Water-Based Resin, and UV Resin, at Gut No. 358, Village Dhamane, Taluka Maval, District Pune – 410506, Maharashtra. The final products comprise high-quality synthetic resins intended for use in wood coatings and general industrial applications.

The project is expected to generate significant direct and indirect employment. The company will make good faith efforts to employ skilled and unskilled manpower from nearby villages, thus supporting rural livelihoods. The facility is being designed to serve the domestic, export, and government supply chains effectively. This project will not only strengthen the company's market competitiveness but also contribute to Pune's emergence as a Chemical industry. The

company is committed to sustainable development through the implementation of Zero Liquid Discharge (ZLD) systems, solvent recovery units, and greenbelt development covering over 25.06 % of the site area.

Mr. Pankaj Singh, Founder and Managing Director of Teknovace Wood Coatings Pvt. Ltd., is a Chemical Engineer from NIT Rourkela and holds a Master's degree from UICT, Matunga. With over 16 years of experience in the paints and coatings industry, he has played key leadership roles in international joint ventures and has contributed to innovations in nanoclay manufacturing and advanced coating technologies. His achievements have earned him several industry accolades, including the Young Entrepreneur Award (2018–19).

Supporting the company's vision is Mr. Nikhil Mahapatra, Executive Director of Teknovace Coatings Pvt. Ltd., who holds a B.Tech degree from NIT Rourkela. Together, they lead the organization with a strong focus on innovation, quality, and technological advancement. Under their leadership, Teknovace aims to build a global presence by delivering innovative, high-performance coating solutions that meet evolving industry needs.

4. Location of the Project

The proposed project will be carried out at Gut No. 358, Village – Dhamane, Tal: Maval, Dist: Pune – 410506, Maharashtra. The Project site accessible via an internal road (Dhamane Road) that links to the NH 48 - Mumbai Satara Highway in Urse Village approximately 3.73 km to the NNE. **Figure 1** shows index map of the project site whereas Google Imagery with corner co-ordinates is depicted in **Figure 2**.

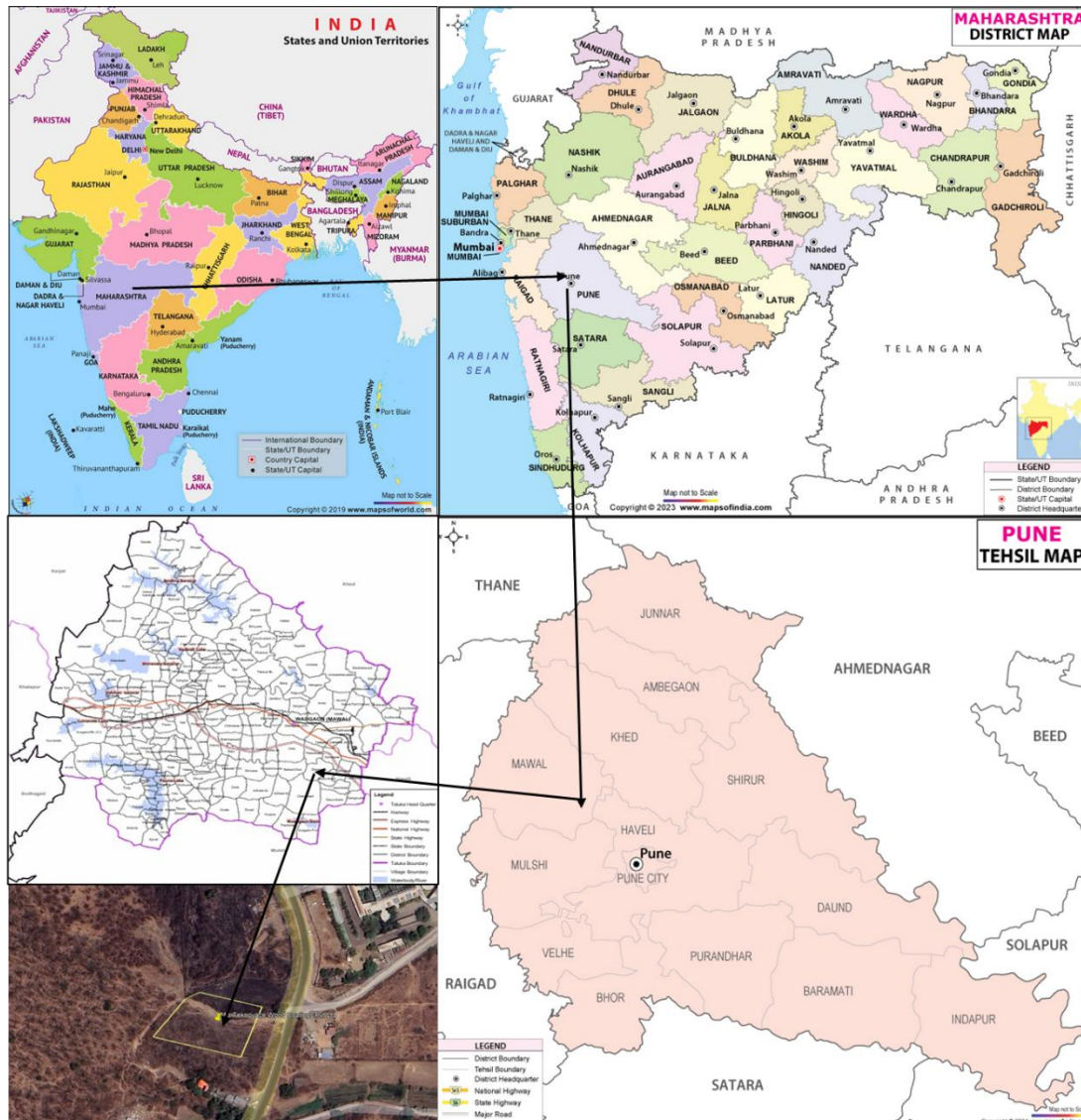
The environmental setting around the site is summarized in **Table 1** which includes key details such as the nearest IMD station is in Pune, the nearest town is Pune, and the nearest airport is Pune International Airport. Additionally, the area is characterized by the presence of several water bodies, including Lake Swarali, Talegaon Dabhade Lake, Kasarsai Dam, Sudha Lake, Pawana River, and Indrayani River.

Table 1: Environmental Attributes from Project Site

Sr. No.	Environmental Sensitivity	Details	Distance & Direction
1	Nearest Reserved / Protected Forests	1. Reserve Forest near Dhamane	0.05 km – West
		2. Reserve Forest near Kusgoan	8.43 km – SSE
		3. Reserve Forest near Shelakewadi	7.82 km – SSW
		4. Reserve Forest near Talegoan Dabhade	3.31 km – NE
		5. Reserve Forest near Ozarde	7.31 km – NW
2	Nearest Water Bodies	1. Lake Swarali	3.81 km – SW
		2. Talegaon Dabhade Lake	5.54 km – NNE
		3. Kasarsai Dam	6.61 km – S
		4. Sudha Lake	6.70 km – SW

		5. Pawana River	1.19 km – N
		6. Indrayani River	7.55 km – NNE
3	Eco-Sensitive Zone or Protected Area	No	-

Sr. No.	Infrastructure Sensitivity	Details	Distance & Direction
1	Airport	Pune International Airport, Pune	29.11 km – ESE
2	Railway Station	Pune Railway Station	28.50 km – SE
3	Town	Pune	26.31 km – SSE
4	National Highway	NH 48 – Mumbai–Satara Highway	3.06 km – NNE



Proposed Manufacturing of Synthetic Organic Chemicals (Resins) by M/s. Teknovace
Wood Coatings Pvt. Ltd. at Gut No. 358, Village – Dhamane, Tal: Maval, Dist: Pune
– 410506, Maharashtra

Figure 1: Index Map of Project Site



Figure 2: Google Image of the Project Site with Corner Co-ordinates (Imagery Date-11/05/2026)

**Source: Google Earth Pro*

M/s. Teknovace
Wood Coatings
Pvt. Ltd

Proposed Manufacturing of Synthetic Organic Chemicals by M/s.
Teknovace Wood Coatings Pvt. Ltd. at Gut No. 358, Village –
Dhamane, Tal: Maval, Dist: Pune – 410506, Maharashtra.

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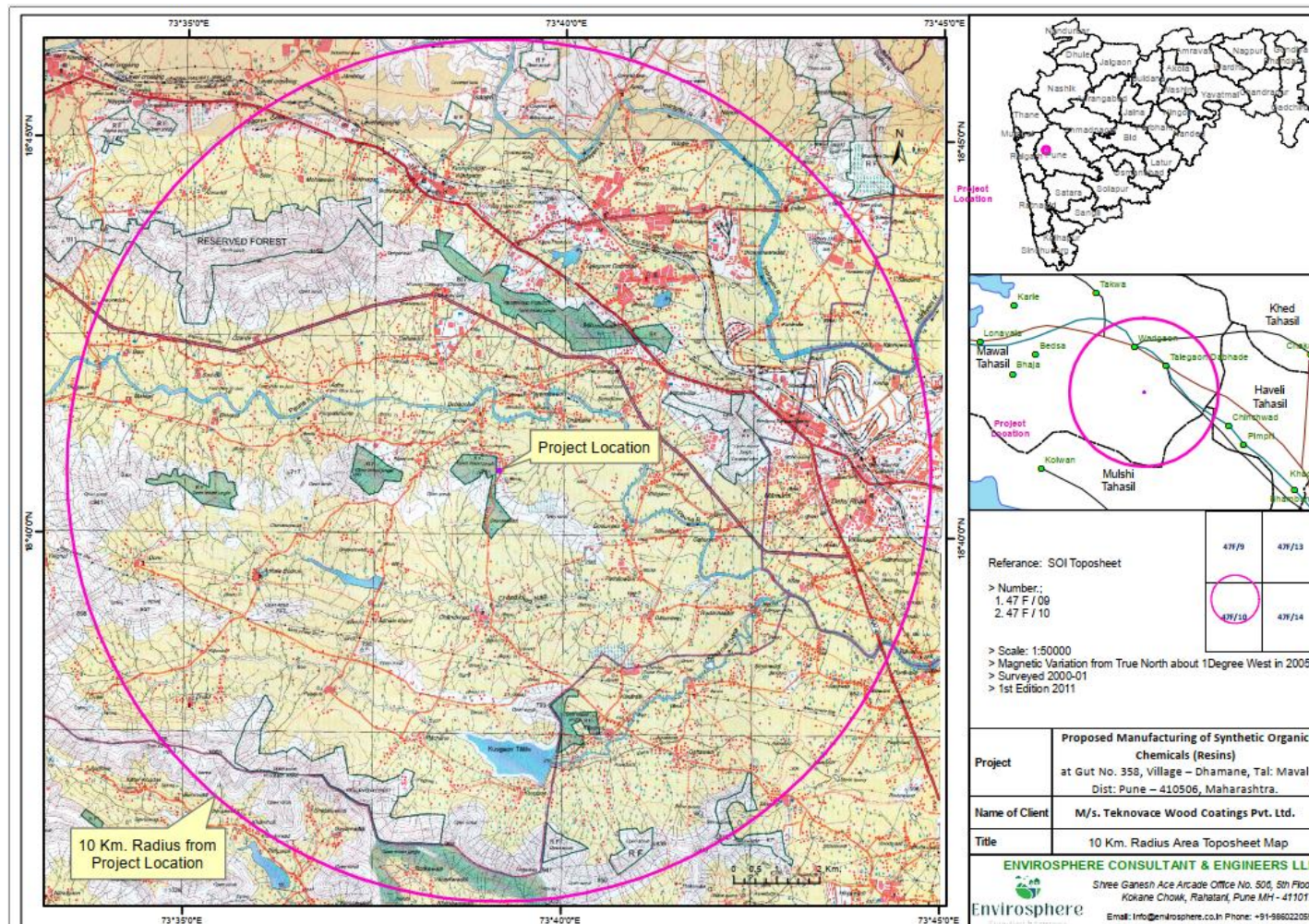


Figure 3: Project Location with 10 km radius study area shown on SOI Toposheet

5. Nature and Size of the Project

As per Environmental Impact Assessment (EIA) Notification, September 14th, 2006 and amendments thereof, the proposed project falls under Activity 5(f) i.e., Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates of the EIA Notification 2006 and its subsequent amendments. The proposed project site is located outside the notified industrial area. Further, the proposed project has a total water requirement of less than 25 m³/day and fuel consumption of less than 25 TPD. Accordingly, the proposed project falls under Category 'B1' and requires prior Environmental Clearance from the State Environment Impact Assessment Authority (SEIAA), Maharashtra.

The industry has Proposed Manufacturing of Synthetic Organic Chemicals. The proposed project will have a total manufacturing capacity of 12,000 MT/A.

The project comprises a total plot area of 3,947.52 sq. m, of which 1,208.19 sq. m is proposed for road widening/service road, resulting in a net plot area of 2,739.33 sq. m. The proposed total built-up area is 2,893.40 sq. m and ground coverage is 578.68 sq. m. A greenbelt of 686.46 sq. m (25.06 % of the plot area) is proposed within the project premises.

Table 2: Size and Magnitude of Operation

Sr.	Name of Chemical	Proposed Production Quantity (MT/A)
1.	Alkyd Resin	3600
2.	Acrylic Resin	2400
3.	Polyester Resin	1500
4.	Water Based Resin	3000
5.	UV Resin	1500
Total		12,000 MT/A

6. Land Details

Project site is spread in to 2739.33 sq.m. area. Land is under industrial use. The non-agriculture land is owned by M/s. Teknovace Wood Coatings Pvt. Ltd. Detailed area bifurcation is given in **Table 3** The plant layout with production area, utilities, green belt area has been shown in **Figure 4** below –

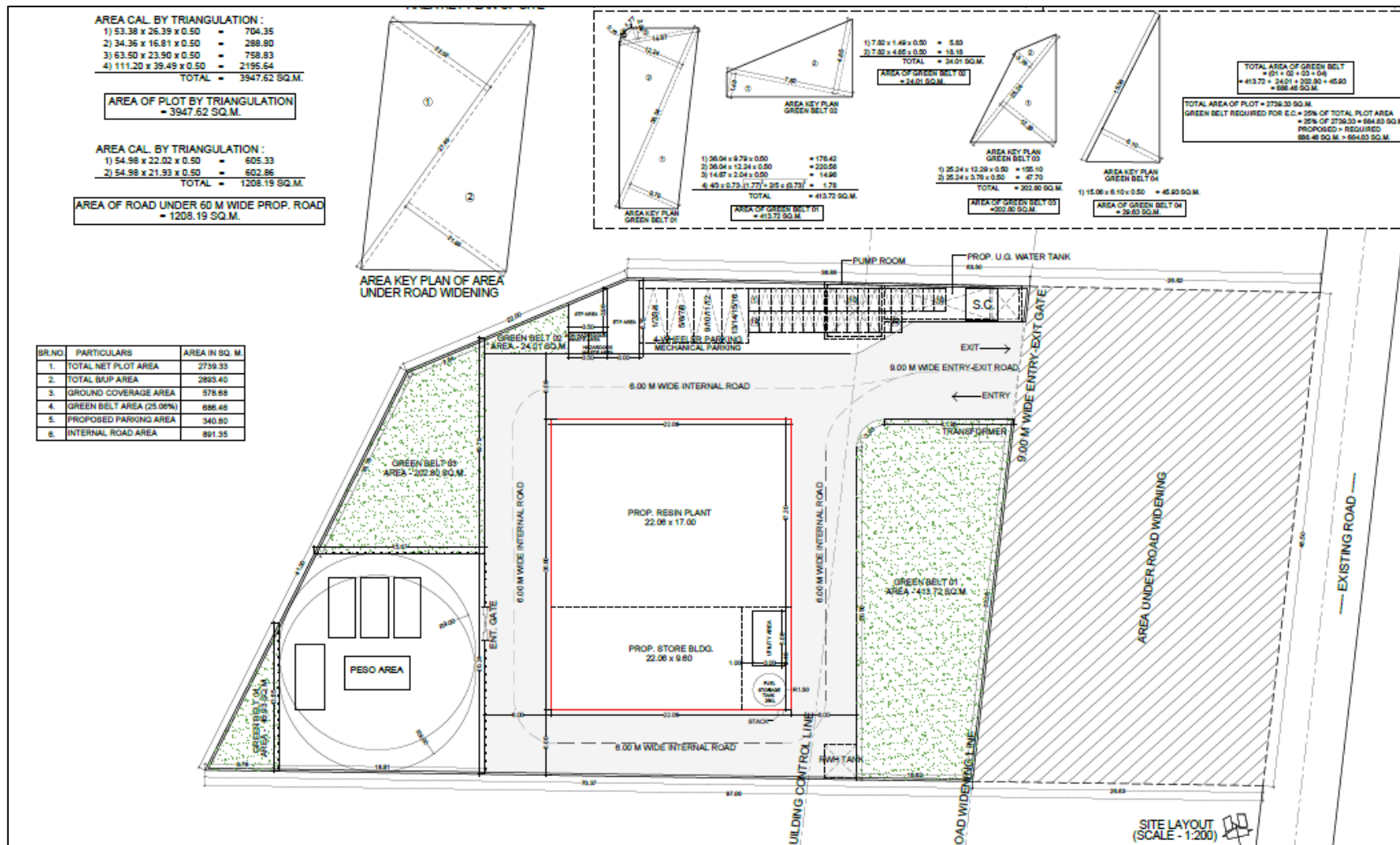


Figure 4: Master Layout Plan

Table 3: Area Statement

Sr.No.	Particulars	Area in sqm
1	Total Plot Area	2739.33
2	Total BUP Area	2893.40
3	Ground Coverage Area	578.68
4	Green Belt Area (25.06%)	686.46
5	Proposed Parking Area	340.80
6	Internal Road Area	891.35

7. Project Description with Project Details

Project information brief is given in **Table 4** below –

Table 4: Magnitude of Project Operation

Sr. No.	Particulars	Details																					
1	Ownership of land	The non-agricultural land is owned by M/s. Teknovace Wood Coatings Pvt. Ltd.																					
2	Type/Category	5(f), Category “B1”																					
3	Production details	<table> <tr> <th>Sr.</th><th>Name of Chemical</th><th>Proposed Production Quantity (MT/A)</th></tr> <tr> <td>1</td><td>Alkyd Resin</td><td>3600</td></tr> <tr> <td>2</td><td>Acrylic Resin</td><td>2400</td></tr> <tr> <td>3</td><td>Polyester Resin</td><td>1500</td></tr> <tr> <td>4</td><td>Water Based Resin</td><td>3000</td></tr> <tr> <td>5</td><td>UV Resin</td><td>1500</td></tr> <tr> <td colspan="2">Total</td><td>12,000 MT/A</td></tr> </table>	Sr.	Name of Chemical	Proposed Production Quantity (MT/A)	1	Alkyd Resin	3600	2	Acrylic Resin	2400	3	Polyester Resin	1500	4	Water Based Resin	3000	5	UV Resin	1500	Total		12,000 MT/A
Sr.	Name of Chemical	Proposed Production Quantity (MT/A)																					
1	Alkyd Resin	3600																					
2	Acrylic Resin	2400																					
3	Polyester Resin	1500																					
4	Water Based Resin	3000																					
5	UV Resin	1500																					
Total		12,000 MT/A																					
4	Water Consumption	<u>Construction Phase-</u> Proposed Water Requirement- 5 KLD <u>Operation Phase-</u> Proposed Water Requirement –24 KLD (Fresh- 16.5 KLD + Recycle- 7.5 KLD) (Source – Ground water)																					
5	Wastewater generation	Sewage <u>Construction Phase-</u> 2.5 KLD <u>Operation Phase-</u> 2.2 KLD																					
		Effluent <u>Operation Phase –</u> 7.2 KLD																					
6	Wastewater Treatment Facility	Sewage <u>Proposed Sewage treatment-</u> 2.2 KLD of domestic sewage will be treated in STP of 3 KLD.																					
		Effluent The total wastewater generation will be 7.2 KLD, which will be treated in the ETP																					

M/s. Teknovace Wood Coatings Pvt. Ltd	Proposed Manufacturing of Synthetic Organic Chemicals by M/s. Teknovace Wood Coatings Pvt. Ltd. at Gut No. 358, Village – Dhamane, Tal: Maval, Dist: Pune – 410506, Maharashtra.	Executive Summary
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			followed by a RO system and MEE. The treated effluent will be recycled for cooling tower makeup, while the RO reject will be sent to the MEE for further treatment. ETP sludge and MEE salts will be sent to the CHWTSDF for authorized disposal. Thus, the proposed system will achieve Zero Liquid Discharge (ZLD) with no wastewater discharge outside the premises.
7	Thermic Fluid Heater	22 Lakh Kcal (LDO Fired Thermic fluid Heater)	
	Cooling Tower	300 TR	
8	DG Set	1 no. of 300 kVA	
9	Stack Details	Stack Attached to	Stack Height
		Thermic Fluid Heater	30 m
		DG set	8 m
10	Fuel	For TFH – LDO- 250 Kg/hr	
		For DG Set- HSD- 70 Lit/hr	
11	Air Emissions	Process emissions in the form of Volatile Organic Compound (VOCs) are envisaged from the manufacturing process & storage. PM Nox and SO ₂ emissions are envisaged from LDO Fired TFH. 30 m Stack & wet Scrubber will be provided for effective dispersion of pollutants PM and SO ₂ emissions are envisaged from DG set. 8 m Stack will be provided for effective dispersion of pollutants DG sets shall act as stand by source of electricity for the site.	
12	Power Requirement	Total Requirement - 253 kW Renewable Energy –26 kW (10.27 % of total power requirement)	
13	Manpower	Construction Phase – 60 nos. Operation Phase –55 nos.	
14	Project Cost	Rs. 8 Cr.	
15	EMP Cost	Construction Phase: Capital Cost- Rs. 11.83 Lakhs Recurring Cost- Rs. 6.27 lakhs/Annum Operation Phase – Capital Cost – Rs. 100.66 Lakhs Recurring Cost – Rs 18.90 lakhs/Annum	
16	CER Cost	Rs. 16 Lakhs	

7.1 Process Details

Process Details of few products have been given below-

1 Manufacturing process of Alkyd Resin

I Process Description

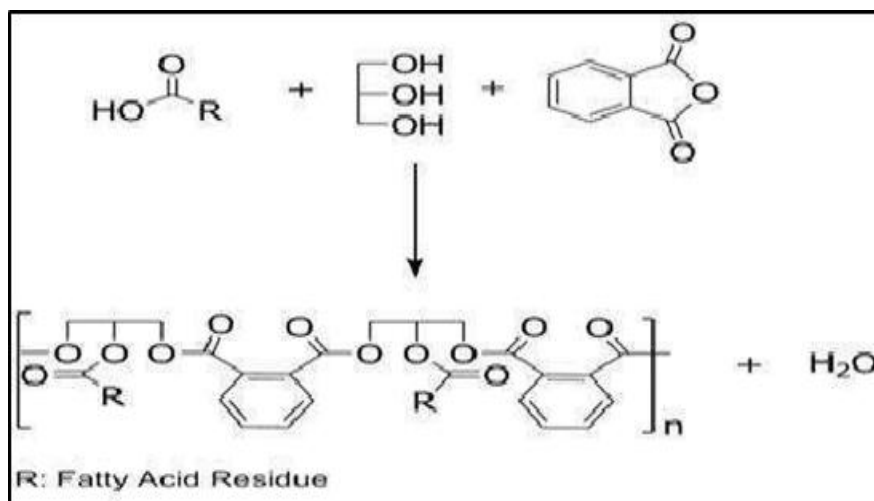
The alkyd resin manufacturing process begins with charging raw materials oils, fatty acids, Di-Carboxylic acid, Mono carboxylic acid and polyols and catalysts like lithium stearate or

dibutyltin oxide (DBTO) into a reactor. Solvent is used as the reaction solvent.

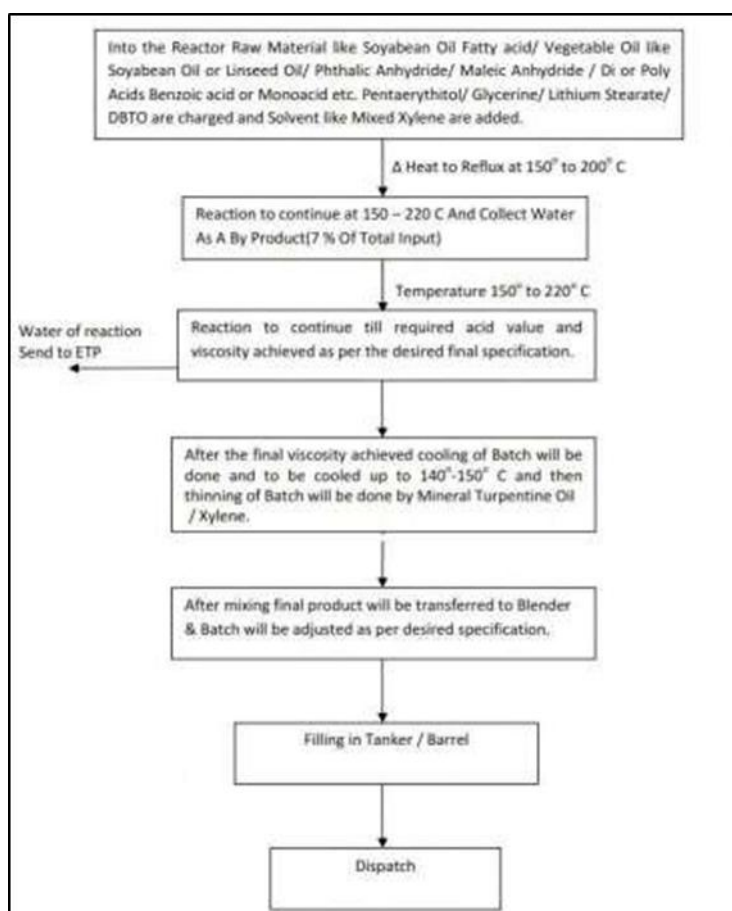
The reaction mixture is gradually heated to a temperature range of approximately 150–220°C. During the reaction, water is generated as a byproduct and removed continuously. The process is maintained until the desired acid value and viscosity are achieved, indicating completion of the resin formation.

After completion of the reaction, the batch is cooled and diluted with solvents to obtain the required solids content and viscosity. The thinned resin is then transferred to a blending vessel, where final adjustments are carried out to meet product specifications and quality requirements. Finally, the finished alkyd resin is filtered, filled into barrels or tankers, and dispatched for storage or commercial supply.

II Chemical Reaction - Esterification reaction



III. Process Flow Chart - Alkyd Resin from Fatty Acid Method



IV Mass Balance

Sr. No.	Name of Raw Material (RM)	Input RM Qty.	Name of Output	Output Qty.
	Input		Output	
1	Oils or Fatty acids	366 Kg	Alkyd Resin	1000.00 Kg
2	Di- Carboxylic acid	205.1 Kg	Effluent	51 kg
3	Mono carboxylic acid	29.3 Kg		
4	Metal Catalyst like Li (OH) ₂ , KOH, NaOH	0.365 Kg		
5	Polyols	131.5 Kg		
6	Add- solvents (Thinning up to 43.5%)	318.73 Kg		
	Total	1051 Kg	Total	1051 Kg

2 Manufacturing process of Acrylic Resin

I Process Description

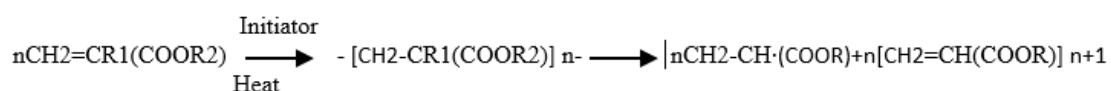
The Acrylic resin manufacturing process begins with charging raw materials from Monomers, Acrylic acid and Solvent is used as the reaction solvent.

The reaction mixture is gradually heated to a temperature range of approximately 120-180°C. Add initiator as per batch quantity. The process is maintained until the desired acid value and viscosity are achieved, indicating completion of the resin formation.

After completion of the reaction, the batch is cooled and diluted with solvents to obtain the required solids content and viscosity. The thinned resin is then transferred to a blending vessel, where final adjustments are carried out to meet product specifications and quality requirements.

Finally, the finished Acrylic resin is filled into barrels or tankers, and dispatched for storage or commercial supply.

II Chemical Reaction -



III Process Flow Chart - Acrylic Resin

Charge the reactor with the solvent, monomers, acrylic acid then heat the mixture to 120–180 °C and add initiator as per batch quantity.



The process will continue until the desired acid value and viscosity are achieved.



Then transfer the material to the dilution tank and dilute it with solvent. After that, cool it down and transfer it into a vessel or drum.

IV Mass Balance

Sr. No.	Name of Raw Material (RM)	Input RM	Name of Output	Output Qty.
	Input		Output	
1	Monomers	560 Kg		
2	Acrylic acid	40 Kg		
3	Initiators or chain transfer agent	8 Kg	Acrylic Resin	1000.00 Kg
4	Solvent	192 Kg		
5	Add- solvents (Thinning up to 25%)	200 Kg		
	Total	1000 Kg		1000 Kg

3 Manufacturing process of Polyester resin**I Process Description**

The Polyester resin manufacturing process begins with charging raw materials, Di- Carboxylic acid, Mono carboxylic acid and polyols and catalysts like lithium stearate or dibutyltin oxide (DBTO) into a reactor. Solvent is used as the reaction solvent.

The reaction mixture is gradually heated to a temperature range of approximately 150–220°C. During the reaction, water is generated as a byproduct and removed continuously. The process is maintained until the desired acid value and viscosity are achieved, indicating completion of the resin formation.

After completion of the reaction, the batch is cooled and diluted with solvents to obtain the required solids content and viscosity. The thinned resin is then transferred to a blending vessel, where final adjustments are carried out to meet product specifications and quality requirements. Finally, the finished Polyester resin is filled into barrels or tankers and dispatched for storage or commercial supply.

II Chemical Reaction**II Process Flow Chart**

Charge the reactor with the Polyols, Di-carboxylic acid, mono-basic acid, catalyst and solvents. then heat it 150-200°C till reflux



The process will continue and collect water as by product



Reaction to be continued till required acid value and viscosity achieved.



After the final viscosity is achieved, the batch will be cooled to 120–160°C. Then, the batch will be thinned using a solvent.



After mixing, the final product will be transferred to a blender, cooled down, and then transferred into a vessel or drum.

IV Mass Balance

Sr. No.	Name of Raw Material (RM)	Input RM Qty.	Name of Output	Output Qty.
	Input		Output	
1	Di- Carboxylic acid	493 Kg	Polyester Resin	1000.00 Kg
2	Mono carboxylic acid	59.5 Kg	Effluent	62.5 kg
3	Metal Catalyst like Li (OH) ₂ , KOH, NaOH	0.85 Kg		
4	Polyols	296.65 Kg		
5	Add- solvents (Thinning up to 25%)	212.5 Kg		
	Total	1062.5Kg	Total	1062.5 Kg

8. Description of the Environment

Field monitoring was done for primary data collection of various environment components such as air quality, water quality, soil quality, noise and others. Also, secondary data such as micrometeorology, flora and fauna, socio-economic, hydro-geological study, traffic study etc. from authenticated sources was used as a guideline and reference material. The entire data has been collected through actual physical surveys and observations, literature surveys, interaction with locals, government agencies, and departments. The baseline study begins with site visits and reconnaissance survey in the study area.

The guiding factors for the present baseline study are the requirements prescribed by the guidelines given in the EIA Manual of the MoEFCC and methodologies mentioned in Technical EIA Guidelines Manual for Synthetic Organic Industries by IL&FS Ecosmart Ltd., approved by MoEFCC.

The studies were conducted during the pre-monsoon season for the period of 1st March 2026 to 31st May 2026.

Frequency and summary of results of environment monitoring is given in **Table 5**

Table 5: Frequency of primary data collection and its results

Environmental Attributes	Frequency of monitoring	Parameters	Observed Results
Meteorology	Microprocessor based Weather Monitoring Station Continuous hourly recording	Wind speed,	2.8 m/s
		Wind direction	West
		Max. Temp.	37.9 °C
		Mini. Temp.	16°C
		Relative Humidity	58 %- 22 %
		Precipitation	29.7
Ambient Air Quality	8 Locations 24 hourly samples Twice a week for 3 months (in µg/m ³)	PM _{2.5}	14–31 µg/m ³
		PM ₁₀	43–79 µg/m ³
		SO ₂	5–19 µg/m ³
		NO _x	11–27 µg/m ³
Water Quality (Ground water)	Once in season at 8 locations (Physical, chemical and biological parameters)	Colour	Below acceptable standards
		pH	Within the CPCB-prescribed range of 7.2 to 7.8
		TDS	TDS ranged from 293 to 482 mg/L. The IS:

			10500:2018 standard of 500 mg/L
		COD	BDL
Water Quality (Surface Water)	Once in season at 8 locations (Physical, chemical and biological parameters)	Colour	Below acceptable standards
		pH	Within the CPCB- prescribed range of 7.2 to 7.7
		TDS	TDS ranged from 276 to 416 mg/L. The IS: 10500:2018 standard of 500 mg/L
		COD	COD ranged from 16 to 136 mg/L.
Soil Quality	Once in season at 8 locations	Soil type and texture, Physico- chemical properties, NPK	The soils are Silty loam, neutral to slightly alkaline, and non-saline. They have good structure, moderate water-holding capacity, and adequate organic matter. Nutrient levels are generally sufficient, with potassium being moderate. Overall, the soils are fertile and suitable for cultivation.
Noise Quality	Once in season at 8 Locations (Noise levels in dB(A))	Max & Min Day	56.4 & 48.3 dB(A)
		Max & Min Night	46.3 & 39.5 dB(A)
Land use Pattern	One time visit of the study area for ground truthing	Identification and classification of land use	The study area is predominantly characterized by industrial and mixed land use, with patches of agricultural land and reserved forest areas. The project site falls within designated industrial (NA) land, with no forest land involved. Nearest waterbody is located at a

			safe distance (~1.1 km), and surrounding land use supports industrial development.
Geology and hydrogeology	Primary observation during visit and sec. data	Geology and hydrogeology of the study area	Geologically, study area is predominantly underlain by Deccan Trap basalt formations, whose weathering and erosion have created diverse hills, plateaus, valleys, and plains. Located between the Western Ghats and Deccan Plateau, the district has three physiographic belts: rugged western terrain, undulating central terrain, and gentler eastern plains. Major landforms include hills and Ghats, foothills, plateaus, and plains. The district is drained by the Bhima–Ghod, Mula–Mutha, and Nira river systems, with predominantly semi-dendritic drainage. Based on geomorphology and drainage patterns, Pune District has been delineated into 71 watersheds.
Ecology	General in 10 km radial study area and data collected around the project site through field visits.	Flora	Flora: The core zone supports poor and disturbed vegetation, dominated by grasses, ruderal herbs, and a few disturbance-tolerant shrubs, indicating long-term anthropogenic influence and absence of

			natural tree cover. In the 10 km buffer zone shows high floral diversity, comprising dry deciduous species, agricultural plantations, orchards, roadside trees, and riparian vegetation. Most plant species belong to the Least Concern category, reflecting stable and common vegetation types typical of semi-arid central Maharashtra. A few RET species (e.g., <i>Tectona grandis</i> , <i>Mangifera indica</i> , <i>Gloriosa superba</i>) occur sparsely in the wider landscape but are absent from the project site, indicating low ecological sensitivity of the core area.
		Fauna	Fauna: The study area supports a moderate and diverse faunal assemblage, dominated by common, widespread, and disturbance-tolerant species, especially birds. Most recorded fauna fall under Schedule II of the Wildlife (Protection) Act and are categorized as Least Concern (LC) by IUCN. No Schedule-I, endangered, critically endangered, or endemic species were recorded within the core or buffer zones. Faunal presence is

			largely associated with agricultural fields, water bodies, and human-modified habitats, indicating that the area does not represent a critical or sensitive wildlife habitat.
Socioeconomic Data	Primary and sec data in 10 km radial study area and data collected around the project site through field visits	Socio-economic characteristics of the affected area	Sanitation facilities are average. Power supply facility is available in almost villages and town. The water supply in the region is mostly through wells and hand pumps. For drinking purpose people are using only ground water supply, but very few hand pumps are available for drinking water, medical facilities in terms of primary health center and primary health sub centers in the rural areas are good.

9. Potential Impacts and Remedial Plans

Environmental impact identification is based on stage of project and the type, scale and location of proposed project activity. Environmental components that may be affected negatively and positively due to proposed activity are identified for construction and operation phase are presented in **Table 6**.

Table 6: Environmental aspects and impacts of Project

Sr. No	Step/ Activity	Environmental Aspect	Impact	
			Description	Severity
1	Construction of buildings	Emission to air (dust)	Air Pollution	Temporary
		Use of water, energy and materials.	Natural resources, conservation	Temporary
		Use of manpower	Employment	Temporary

		Hazardous and non-hazardous waste disposal on land.	Land pollution	Permanent
2	Commissioning	Use of Thermic fluid heater, DG Set, Raw material and Finished product Transportation, Handling of chemicals	Air Pollution	Permanent
		Use & storage of hazardous chemicals	Land Pollution, Safety, Occupational Hazards	Permanent
		Waste Water discharge	Water Pollution Land Pollution	Permanent
		Hazardous and Non-hazardous Waste Disposal on land	Land Pollution	Permanent
		Use of Water	Natural resources/ conservation	Permanent
		Use of manpower	Employment	Permanent
		Production of goods	Revenue Generation	Permanent
		Operation of Plant and machinery	Noise Pollution	Permanent
3	Closure and Decommissioning	Stoppage of New product	Revenue & employment loss	Permanent
		Decommissioning	Land pollution	Permanent

9.1 Prediction of Impacts during Construction Phase

Table No. 7 presents a description of the potential environmental impacts that may arise during the construction phase. It also outlines the proposed mitigation measures to address issues

related to land, air quality, water, ecosystems, noise, occupational health, and socio-economic aspects. These measures also take into consideration specific aspects associated with small-scale construction activities.

Table 7: Summary of Impacts and Mitigation Measures during Construction phase

Sr. No.	Environmental Aspect	Potential Source of Impact	Proposed Mitigation Measures
1	Land Environment	Site clearing, excavation, grading, topsoil removal, storage of construction materials and generation of construction debris	• Strip and separately store topsoil for subsequent use in greenbelt/landscaping. • Minimize the area of disturbance and excavation to the extent practicable. • Reuse suitable excavated earth within the site for grading and filling. • Store construction materials in designated areas on impervious surfaces, wherever required. • Provide proper drainage to prevent water stagnation and soil erosion. • Prevent spillage of oil, fuel, cement slurry and other materials onto soil. • Properly collect and dispose/recycle construction and demolition waste as per applicable requirements.
2	Air Quality	Excavation, grading, construction activities, material handling and movement of vehicles/construction equipment	• Regularly sprinkle water on unpaved roads, stockpiles and exposed surfaces. • Cover trucks transporting loose construction materials and construction debris. • Provide dust screens/barriers around major construction areas, wherever required. • Maintain construction equipment and vehicles in good operating condition and ensure valid PUC certificates for applicable vehicles. • Avoid unnecessary idling of vehicles and equipment. • Control vehicle speed within the project premises. • Minimize exposed areas and complete construction activities in a phased manner.
3	Water Environment	Domestic sewage from workers, stormwater runoff from exposed soil, concrete/cement wash water and accidental spillage of fuels/oils	• Provide adequate temporary sanitation facilities for construction workers. • Domestic sewage shall be managed through suitable temporary sanitation arrangements; no untreated sewage shall be discharged outside the site. • Provide silt traps/sedimentation arrangements for runoff from construction areas. • Provide proper stormwater drainage during construction. • Concrete/cement wash water shall be

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			collected and managed appropriately and shall not be discharged into natural drains. • Store fuels, oils and other potentially contaminating materials in designated areas with appropriate containment. • Avoid direct discharge of construction wastewater or contaminated runoff to nearby water bodies/drains.
4	Ecology & Biological Environment	Site preparation, vegetation clearance, dust deposition, vehicular movement and construction activities	• Minimize vegetation clearance and disturbance to the extent practicable. • Existing trees/vegetation, wherever retained, shall be protected during construction. • No unnecessary disturbance to surrounding vegetation or natural drainage shall be permitted. • Control dust emissions through regular water sprinkling and covering of material stockpiles. • Greenbelt/landscaping shall be developed progressively as per the approved project plan. • No hunting, trapping or disturbance of wildlife shall be permitted within the project premises.
5	Noise & Vibration Environment	Operation of construction machinery, excavation, drilling, piling, vehicle movement and material handling	• Use properly maintained and low-noise construction equipment, wherever practicable. • Restrict major construction activities to daytime hours. • Provide acoustic enclosures/barriers for high-noise equipment, wherever required. • Avoid unnecessary honking and idling of construction vehicles. • Provide appropriate hearing protection to workers exposed to high noise levels. • Undertake periodic noise monitoring at the project boundary and work areas.
6	Construction & Demolition Waste	Generation of excavated material, concrete waste, bricks, steel scrap, wood, packaging materials and other construction debris	• Segregate construction waste at source into recyclable, reusable and other categories. • Reuse suitable excavated material and construction materials within the site, wherever feasible. • Recycle materials such as steel, concrete, bricks, glass and plastics through authorized recyclers. • Store construction waste in designated areas to prevent littering and obstruction of drainage. • Dispose of residual waste through authorized agencies/facilities in accordance with applicable requirements.
7	Occupational Health & Safety	Work at height, excavation, lifting operations, electrical work, operation of machinery, vehicular	• Prepare and implement a construction-phase Health, Safety and Environment (HSE) plan. • Conduct job-specific risk assessments and toolbox talks before

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		movement and handling of construction materials	hazardous activities. • Provide appropriate PPE such as helmets, safety shoes, gloves, eye protection, reflective jackets, harnesses and hearing protection, as applicable. • Provide safe access, barricading and warning signage around excavations and hazardous areas. • Implement work-at-height, electrical safety and lifting safety procedures. • Provide first-aid facilities and emergency arrangements at the site. • Ensure regular safety training and supervision of workers and contractors.
8	Traffic & Transportation	Movement of construction vehicles, transportation of construction materials and increased traffic near the project site	• Plan material transportation to minimize traffic congestion and disturbance to local traffic. • Use roadworthy and properly maintained vehicles. • Cover vehicles carrying loose materials. • Maintain controlled vehicle speeds within the project premises and approach roads. • Avoid parking of construction vehicles on public roads. • Schedule heavy vehicle movement, wherever practicable, to avoid peak local traffic periods. • Provide adequate signage and traffic management within the site.
9	Socio-Economic Environment	Temporary influx of construction workers, employment generation, vehicle movement and interaction with nearby communities	• Give preference to suitably qualified local manpower for construction activities, wherever feasible. • Provide appropriate sanitation, drinking water and welfare facilities for workers. • Ensure that construction activities do not obstruct access to nearby properties, roads or public facilities. • Maintain good housekeeping and prevent littering outside the project premises. • Provide grievance redressal mechanism for construction-related complaints. • Encourage procurement of locally available goods and services, wherever feasible.

9.2 Prediction of impacts during operational phase

Significant Impacts from the project activities and its mitigation measures are summarized in Table 8 below –

Table 8: Summary of Impacts and Mitigation Measures during Operation Phase

Sr. No.	Environment Aspect	Potential Source of Impact	Proposed Mitigation Measures
1	Air Environment	Manufacturing process emissions,	• A suitable packed column/absorption system will be provided for control and recovery of VOC

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		handling of raw materials/products, storage and transfer of chemicals, vehicular movement, operation of Thermic Fluid Heater (TFH) and DG Set emissions from relevant process operations. • VOC monitoring/sensors will be provided at identified emission-prone areas, as applicable, for monitoring and control of fugitive emissions. • Raw materials and products will be stored in designated and appropriately closed/contained storage systems. • Appropriate measures will be adopted during transfer and handling of volatile chemicals to minimize fugitive emissions. • The 22 Lakh kcal/hr Thermic Fluid Heater will be provided with an adequate stack and wet scrubber as proposed. • The DG Set will be provided with an adequate stack as per applicable CPCB/MPCB requirements. • Regular inspection and preventive maintenance of the TFH, DG Set, process equipment and air pollution control systems will be undertaken. • Only vehicles having valid PUC certificates will be permitted within the premises. • A maximum vehicle speed of 20 km/hr will be maintained within the plant premises. • Internal roads will be paved/asphalted and water sprinkling will be undertaken, wherever required, to control dust from vehicular movement. • Workplace air quality monitoring will be undertaken periodically as per the Environmental Monitoring Programme.
2	Water Environment	Industrial wastewater generation, domestic wastewater generation, process/utility operations and stormwater runoff • Approximately 7.2 KLD of industrial wastewater will be treated in the proposed 10 KLD ETP, followed by RO system and MEE, as proposed. • RO permeate will be reused for designated utility applications such as cooling tower makeup, while RO reject will be sent to the MEE for further treatment. • ETP sludge and MEE salts will be collected, stored and disposed of through authorized agencies/facilities as per applicable requirements. • Approximately 2.2 KLD of domestic wastewater will be treated in the proposed 3 KLD STP and treated water will be reused for gardening within the premises. • No untreated industrial or domestic wastewater will be discharged outside the premises. • Separate stormwater drainage will be provided to prevent mixing of stormwater with contaminated wastewater. • Rainwater harvesting/recharge arrangement will be provided as proposed. • Regular monitoring of water quality, wastewater quality and treatment system performance will be carried out as per the Environmental Monitoring Programme.

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3	Land & Soil Environment	Storage and handling of raw materials, chemicals and hazardous substances; accidental spills/leakages; storage and handling of hazardous waste and used oil	• Production, maintenance and storage areas for raw materials, finished products and hazardous wastes will be provided with suitable impervious flooring. • Bulk chemical storage tanks will be provided with appropriate dyke/secondary containment arrangements to prevent the spread of accidental spills or leakages. • Standard Operating Procedures (SOPs) for chemical handling, spill prevention and spill response will be implemented. • Used oil and other applicable hazardous wastes will be collected in suitable containers and stored in designated areas with proper secondary containment. • Hazardous waste will be handled, stored, transported and disposed of through authorized agencies/facilities in accordance with applicable statutory requirements. • Empty chemical containers/drums will be managed through authorized recyclers/return-to-supplier arrangements, as applicable. • Spill control kits and appropriate emergency response materials will be provided at identified locations. • Soil quality monitoring will be undertaken at identified locations as per the Environmental Monitoring Programme.
4	Hazardous & Other Waste Management	Generation of ETP sludge, MEE salts, used oil, contaminated containers, process residues and other hazardous wastes	• Hazardous waste will be segregated at source and stored in a designated, covered and impervious hazardous waste storage area. • Hazardous waste will be disposed of through authorized CHWTSDF/recyclers/reprocessors, as applicable. • Used oil and other recyclable hazardous wastes will be handed over only to authorized recyclers/reprocessors. • Waste transportation will be undertaken through authorized agencies in appropriate vehicles with required documentation. • Records of generation, storage, transportation and disposal of hazardous waste will be maintained as per applicable statutory requirements. • Empty chemical containers will be decontaminated and reused/recycled or returned to suppliers, wherever feasible and permissible.
5	Noise & Vibration Environment	Process equipment, pumps, motors, compressors, DG Set, TFH, material handling and vehicular movement	• Low-noise equipment will be selected and properly maintained. • Preventive maintenance and regular lubrication of machinery and equipment will be undertaken. • Static and dynamic balancing of rotating equipment will be carried out periodically to control vibration and associated noise. • Acoustic enclosures/acoustic treatment will be provided for high-noise equipment, wherever required. • Ear plugs/ear muffs will be

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			provided to workers exposed to elevated occupational noise levels. • Regular noise monitoring will be undertaken at the workplace and project boundary as per the Environmental Monitoring Programme. • Periodic audiometric examination will be conducted for employees exposed to high occupational noise levels. • Unnecessary honking and idling of vehicles within the premises will be avoided.
6	Ecology & Biological Environment	Air emissions, fugitive emissions, wastewater, noise, lighting and movement of vehicles	• Emissions and wastewater will be controlled through the proposed pollution control and treatment systems to minimize impacts on the surrounding environment. • Greenbelt/landscaping will be developed and maintained within the project premises as per the approved plan. • Fugitive dust and VOC emissions will be controlled through appropriate containment, handling and monitoring measures. • No untreated wastewater or hazardous waste will be discharged into the surrounding environment. • Excessive outdoor lighting will be avoided and lighting will be appropriately directed to minimize unnecessary disturbance to surrounding areas. • Unnecessary disturbance to existing vegetation and surrounding ecological features will be avoided.
7	Socio-Economic Environment	Employment generation, movement of workers and vehicles, procurement of raw materials/services and operation of the industrial facility	• The project will generate direct and indirect employment opportunities. • Preference will be given to suitably qualified local persons, wherever feasible. • Local suppliers, contractors and service providers will be engaged, wherever practicable. • The project proponent will undertake applicable CSR/community development activities in accordance with statutory requirements and the approved CSR plan. • Necessary grievance redressal arrangements will be maintained for addressing environment- and operation-related concerns.
8	Occupational Health & Safety	Handling of chemicals, exposure to process emissions, operation of machinery, electrical equipment, working at height, fire and chemical spill hazards	• A comprehensive Occupational Health and Safety Management Plan will be implemented. • Appropriate PPE such as safety helmets, safety shoes, gloves, goggles/face shields, respiratory protection and other task-specific PPE will be provided. • Safety training and toolbox talks will be conducted periodically for employees and contract workers. • Chemical handling and storage will be carried out as per established SOPs and Material Safety Data Sheets/SDS. • Emergency showers, eyewash facilities, spill control kits and other required emergency equipment will be

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			provided at identified locations. • Periodic health check-ups will be conducted for employees, including occupational health surveillance based on exposure. • Regular inspection and maintenance of machinery, electrical installations and safety systems will be undertaken. • An on-site emergency preparedness and response plan will be implemented and periodic mock drills will be conducted.
9	Traffic & Transportation	Transportation of raw materials, finished products, hazardous materials and waste; movement of employees and other vehicles	• Only roadworthy and properly maintained vehicles will be engaged for transportation. • Vehicles transporting loose/potentially dusty materials will be appropriately covered. • Vehicles transporting hazardous materials/wastes will comply with applicable statutory requirements and shall be operated through authorized agencies, wherever applicable. • A maximum internal vehicle speed of 20 km/hr will be maintained. • Adequate internal traffic management, signage and designated loading/unloading areas will be provided. • Unnecessary idling and honking of vehicles within the premises will be avoided.
10	Resource & Energy Conservation	Consumption of water, electricity, fuel and other resources during plant operation	• Treated wastewater will be reused to the extent technically feasible to minimize fresh water consumption. • Water-efficient practices will be adopted for utility and domestic requirements. • Energy-efficient motors, pumps and other equipment will be selected wherever feasible. • Preventive maintenance of equipment will be undertaken to maintain operational efficiency. • Energy consumption will be monitored and opportunities for energy conservation will be identified periodically.

10. Site and Technology Alternative Analysis

The Proposed project is located at Gut No. 358, Village – Dhamane, Tal: Maval, Dist: Pune – 410506, Maharashtra. Required infrastructure such as Water, Electricity, Roads, Solid Waste Disposal Facility, etc. are already available. Site is well connected via an internal road (Dhamane Road) that links to the NH 48 - Mumbai Satara Highway in Urse Village approximately 3.73 km to the NNE, Pune International Airport at 29.11 km in ESE, Pune Railway Station 28.50 km southeast from project site. The site selected also has the following merits –

- Land use of the site is already earmarked as industrial use.
- Required infrastructure like road, transport, water, electricity, etc. are already available in the area.
- No resettlement & rehabilitation is involved.
- Site is easily accessible to local markets.

Matrix of Alternative site Analysis is given in **Table 9** below whereas Technology alternatives is given in **Table 10** below.

Table 9: Matrix of Alternative Site Analysis

Sr. No.	Site Selection Criteria	Proposed Site
1.	Non-Agricultural Land	✓
2.	No R & R Issue	✓
3.	Topography (Slope)	✓
4.	Site Connectivity (Approach Road)	✓
5.	No Notified Wildlife Sanctuary, National Park, Biosphere Reserve, etc. within 5 km radius	✓
6.	No Notified Critically Polluted Area as per CPCB within 5 km radius	✓
7.	No Archaeological Monuments within 5 km radius	✓
8.	Availability of Electricity (MSDCL)	✓
9.	Availability of Raw Material	✓
10.	Availability of labour force	✓
11.	Availability of Local Market for finished products	✓

Table 10: Analysis of alternative technology

Sr. No.	Parameters	Indicator	Selected / Proposed Technology	Remarks
i	Process Technology	Continuous / Batch	Batch	Batch processing provides flexibility in controlling reaction parameters such as temperature, reaction time, addition of raw materials and other process conditions. It is suitable for manufacturing different resin grades and product formulations as proposed for the project.
ii	Thermic Fluid Heater – Fuel	Coal / Furnace Oil / LDO / PNG	LDO	LDO has relatively low ash content and is suitable for the proposed thermic fluid heating requirement. The TFH will be provided with appropriate air pollution control measures, including a wet scrubber followed by an adequate-height stack, for control and dispersion of flue gas emissions.

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iii	Wastewater Management	ETP / ZLD	ZLD	The proposed Zero Liquid Discharge (ZLD) system comprises a 10 KLD ETP followed by RO system and MEE. The industrial effluent generation of approximately 7.2 KLD will be treated through the proposed system, with treated/recovered water reused within the plant and concentrated reject further treated through MEE.
iv	Domestic Sewage Treatment	Package STP	Package STP	A 3 KLD Package STP will be provided for treatment of approximately 2.2 KLD of domestic sewage. The treated water will be reused for gardening within the premises, thereby reducing fresh water requirement.
v	ETP Treatment Technology	Conventional / Advanced treatment	Physico-chemical treatment with tertiary treatment	The ETP treatment scheme will be designed considering the characteristics of the industrial effluent. The treated effluent will subsequently undergo two-stage RO treatment followed by MEE, enabling recovery and reuse of treated water and achieving ZLD.
vi	Chemical Charging / Handling	Manual / Automatic	Automatic	Automatic/closed chemical charging and transfer systems, wherever technically feasible, will minimize operator exposure and reduce the potential for fugitive emissions and accidental spillage during handling of raw materials.
vii	Electrical Power	Conventional / Solar	Solar + Grid Power	Solar power will be utilized to meet a portion of the project's electricity requirement, thereby reducing dependence on conventional grid electricity and contributing to energy conservation and reduction in associated greenhouse gas emissions.

11. Environment Monitoring Plan

The regular monitoring of different environmental parameters is of immense importance to assess the present environment conditions as well as impacts of the proposed project on the environment. A proper monitoring program will be required to ensure effectiveness of

implementation of suggested mitigation measures. The environmental monitoring will help in assessing the changes in environmental conditions by monitoring the effective implementation of mitigation measures, and measuring deteriorations in environmental quality for further preventive actions. Environmental Monitoring program during revamping and retrofitting phase is given in **Table 11** whereas Environmental Monitoring program for operation phase is given in **Table 12** below –

Table 11: Environmental Monitoring during Project – Construction Phase

Sr. No.	Potential Impact	Action to be Followed	Parameters for Monitoring	Frequency of Monitoring
1	Air Environment	Construction equipment and machinery shall be operated and maintained as per manufacturer specifications. Vehicle movement shall be minimized and construction activities shall be managed to control fugitive dust emissions. DG set emissions shall comply with applicable CPCB/SPCB requirements.	Equipment maintenance /logs; vehicle movement records; DG set emissions (PM, SO ₂ , NO _x , CO, as applicable); ambient air quality – PM ₁₀ , PM _{2.5} , SO ₂ , NO _x and other applicable parameters.	Equipment/vehicle records – weekly; DG set emission monitoring – as per applicable CPCB/SPCB requirements; ambient air quality – monthly or as per applicable regulatory requirements, whichever is more stringent.
2	Noise Environment	Noise-generating equipment shall be maintained in good working condition. Night-time construction activities shall be minimized. Appropriate hearing protection shall be provided to workers exposed to elevated noise levels.	Equipment noise levels; ambient noise levels; equipment maintenance records; working-hour records.	Equipment/ambient noise monitoring – monthly during construction or as per applicable requirements; working-hour records – daily.
3	Wastewater / Water Environment	No untreated wastewater shall be discharged onto land or into surface water or groundwater. Temporary sanitation facilities shall be provided and wastewater shall be managed through an approved system. No discharge hoses or wastewater outlets shall	Visual inspection of wastewater management arrangements; records of wastewater generation and disposal.	Monthly during construction activities and after any significant incident.

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		be located near watercourses/drainage channels.		
4	Soil Erosion	Topsoil generated during excavation shall be separately stored, protected from erosion and preserved for subsequent use in landscaping/greenbelt development, wherever practicable. Excavated soil shall be managed to prevent runoff and siltation.	Condition and stability of topsoil/excavated soil stockpiles; evidence of erosion or silt runoff.	Periodic inspection during construction, particularly during and after heavy rainfall.
5	Drainage Management	Temporary and permanent drainage arrangements shall be maintained to avoid obstruction of natural drainage patterns and prevent waterlogging and uncontrolled runoff from the construction area.	Visual inspection of drains, stormwater flow paths, silt traps and drainage arrangements; inspection records.	Monthly and after significant rainfall events during construction.
6	Waste Management	A construction waste management system shall be implemented for segregation, collection, storage, reuse and authorized disposal of construction and other wastes. Construction and demolition waste, domestic waste and any hazardous waste shall be managed in accordance with applicable statutory requirements.	Waste generation records; segregation/storage arrangements; disposal/reuse records; authorized agency records, wherever applicable.	Fortnightly inspection during construction and as required based on waste generation.
7	Non-routine Events / Accidental Releases	An emergency response procedure shall be established for spills, leaks, fire and other construction-related emergencies. Suitable spill-control materials and emergency equipment shall be readily available. Mock drills shall be conducted as per the site	Emergency records; spill/incident records; mock-drill records; availability of emergency equipment.	Monthly inspection and after every incident/emergency. Mock drills as per the emergency preparedness programme.

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		emergency preparedness programme.		
8	Occupational Health & Safety	Workers, including migrant labour, shall be provided with appropriate PPE, safe drinking water, sanitation facilities and first-aid arrangements. Periodic health check-ups shall be conducted based on occupational exposure and applicable requirements.	Health check-up records; PPE compliance; first-aid records; occupational health parameters as applicable to the work activity.	Periodic health check-up as per applicable occupational health requirements; PPE and safety compliance – regular/daily site supervision.
9	Environmental Management Cell / Unit	The Environmental Management Cell/Unit shall be responsible for implementation, supervision and monitoring of environmental safeguards during construction. Roles and responsibilities shall be defined before commencement of construction activities.	Environmental inspection records; compliance records; monitoring reports; grievance/ incident records, wherever applicable.	Throughout the construction phase, with periodic review by the designated environmental representative.
10	Flora and Fauna	Site clearance shall be restricted to the area required for the proposed development. Existing vegetation, wherever feasible, shall be retained/protected. Greenbelt and landscaping shall be developed progressively as per the approved site development plan.	Number and type of trees /plants retained/ removed, wherever applicable; plantation/ greenbelt records; survival of planted vegetation.	During site clearance and periodically during construction/landscaping activities.

Table 12: Environmental Monitoring Schedule during Operation Phase

Sr. No	Particulate	Parameters	Number of locations	Frequency
Air Environment				
1.	Ambient air quality	PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , CO, and other parameters as applicable.	Ambien air quality at minimum 3 location. 1 location within the plant premises, 1 location in	Monthly

			upwind, 1 location in downwind direction.	
2.	DG Set Emissions	PM / particulate matter, SO ₂ , NO _x , CO and other applicable parameters	Stacks of 1 x 300 KVA	Quarterly
3.	Indoor / Workplace Air Quality	PM _{2.5} , PM ₁₀ , CO, SO ₂ , NO ₂ and other parameters based on workplace exposure	Representative locations in production/chemical handling areas, as applicable	Quarterly
4.	Thermic Fluid Heater Emission	PM, SO ₂ , NO _x , CO and other applicable parameters	Stack of 1 x 22 Lakh kcal Thermic Fluid Heater	Monthly
Water Environment				
5.	Industrial Wastewater	pH, EC, TSS, TDS, Oil & Grease, BOD, COD, Chloride, Sulphide, Ammoniacal Nitrogen and other parameters as applicable to the effluent characteristics	ETP inlet and treated effluent outlet; additional locations for RO/MEE system as required	Quarterly
6.	Drinking Water Quality	Parameters as per IS 10500:2012 and applicable amendments/ revisions	Each drinking-water source / representative drinking-water distribution location	Once every 3 Month
Noise Environment				
7.	Ambient Noise	Leq (Day & Night)	Minimum 3 locations near the project boundary and 1 location at the nearest habitation, where applicable	Once every 3 Month
Biological Environment				
8.	Greenbelt / Plantation	Number of plants/trees planted, survival rate, mortality/replacement and overall condition of plantation	Designated greenbelt and landscaped areas within the project premises	Half yearly
Land Contamination				
9.	Soil	pH, electrical conductivity, texture, organic matter,	At least 1 representative location near the hazardous/solid waste	Half yearly

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		available nutrients, CEC, SAR and other relevant parameters based on site-specific requirements	storage area and other locations as considered necessary	
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12. Rehabilitation And Resettlement Plan

The proposed project of M/s. Teknovace Wood Coatings Pvt. Ltd. is a greenfield manufacturing project proposed at Gut No. 358, Village – Dhamane, Taluka – Maval, District – Pune, Maharashtra. The land identified for the proposed project is owned by the Project Proponent, as per the relevant land ownership documents. Therefore, the proposed project will not affect any social settlements, infrastructure, or community establishments. Hence, the Rehabilitation and Resettlement (R&R) Plan is not applicable to the proposed project.

13. Project Benefits

- Improvement in Physical infrastructure
- Improvement in Social infrastructure
- Employment generation
- Likely indirect employment opportunities
- The proposed project will generate an additional revenue to the local Gram panchayat.
- Additional taxes shall be paid to Government of Maharashtra.
- Availability of raw material to local manufacturing industry at reasonable costs which results in reduction of the cost of finished products.
- Economic benefits of the proposed project will result in further benefits in terms of the Literacy level, primary and middle level education and on health facilities.
- Many small businesses will induce such as Mess, Hotels, Tea Stall, Grocery Market, Vegetable Market, Automobile workshop etc.
- Improvement in local amenities
- Improvement in road link facilities as transportation through truck and other vehicles will be increased due to proposed project.

Under Corporate Environmental Responsibility (CER), as per the Ministry's O.M. No. 22-65/2017-IA. II (M) dated May 1, 2018, Rs. 16 lakhs (2% of the Total Project cost) are allocated for physical infrastructure improvements. These initiatives aim to enhance sustainability and community welfare, as detailed in **Table No. 13**.

Table 13: Details of CER Activity

Sr. No.	CER Activity	Proposed Location	Details of Activity	Capital Cost 1 st year (₹ Lakhs)	Maintenance Cost in 2 nd year (₹ Lakhs)	Total (₹Lakhs)
1	Installation of Drinking Water Purification Systems	Z.P. Primary School, Chandanwadi & Z.P. Primary School, Jambe	Installation of one 100 LPH RO water purification unit with 500 L storage tank, plumbing, electrical connection, stainless steel drinking station and commissioning at each location	1.80	0.18	1.98
2	Improvement of Sanitation Facilities	Z.P. Primary School, Bebadohol	Renovation of toilet blocks for boys and girls, provision of handwashing station, plumbing, sanitation fittings, overhead water storage tank, and minor civil repairs to improve hygiene and sanitation facilities in the school.	2.00	0.20	2.20
3	Strengthening Primary Healthcare Facilities	Primary Health Sub-Centre, Dhamane	Provision of basic diagnostic equipment (BP apparatus, glucometer, weighing machine, pulse oximeter, nebulizer, examination table, emergency medical kit), medicine cabinet and essential medicines.	2.67	0.26	2.93
4	Installation of Solar LED Street Lights	Grampanchayat Dhamane, Grampanchayat Adhale Budruk and Grampanchayat Pimpal Khute	Installation of approximately 30 Nos of solar LED street lights at village roads, public spaces, bus stops and community gathering places to improve public safety and energy efficiency.	6.60	0.65	7.25
5	Tree Plantation & Green Belt Development	Grampanchayat Gadumbare & Grampanchayat Darumbare	Plantation of approximately 150 Nos of native tree saplings with tree guards, watering arrangements, manure application and one-year maintenance to improve green cover.	1.46	0.18	1.64
Grand Total				14.53	1.47	16.00

14. Environment Management Plan

The EMP is,

- Prepared in accordance with rules and requirements of the MoEFCC and the State Pollution Control Board.
- Prepared to ensure that the component of facility is operated in accordance with the design.
- A process that confirms proper orientation through supervision and monitoring.
- A system that addresses public complaints during construction and operation phase.
- A plan that ensures remedial measures are implemented immediately.

The key benefits of the EMP are that, it provides the organization with means of managing its environmental performance thereby allowing it to contribute to improved environment quality. The other benefits include cost control and improved relation to stakeholders.

EMP includes four major element –

- **Commitment and Policy:** of proposed project will strive to provide and implement the Environmental Management Plan that incorporates all issues related to air, land and water.
- **Planning:** This includes identification of environmental impacts, legal requirements and setting environmental objectives.
- **Implementation:** This comprises of resources available to the developers, accountability of contractors, training of operational staff associated with environmental control facilities and documentation of measures to be taken
- **Measurement and Evaluation:** This includes monitoring, corrective actions, and record keeping.

During study of the environmental attributes, it was seen that all the aspects would be considered to promote the better development in case of future aspects of project as well as environmental aspects.

14.1 Environment Management Plan during Construction Phase

The proposed project involves the construction activity. The following mitigation measures will be implemented during the construction phase to minimize environmental impacts:

- Regular water sprinkling will be carried out in construction areas to suppress dust emissions.
- Construction materials will be transported only in covered trucks to prevent the dispersion of dust.
- Equipment installation activities will be carried out on concrete impervious surfaces to prevent seepage of oil and lubricants into the soil.
- Separate areas will be earmarked for the storage of solid waste generated during construction phase.

- Personal Protective Equipment (PPE), such as safety helmets, gloves, safety shoes, dust masks, and goggles, will be provided to all construction workers.
- Temporary arrangements for the supply of safe and clean drinking water will be made for construction workers.
- Adequate toilet facilities will be provided for use by construction personnel.
- Approximately 2.5 KLD of sewage generated during the construction phase will be treated in package STP.
- Periodic housekeeping will be carried out to maintain a clean and safe construction site.
- Construction activities will be carried out during daytime hours to minimize noise disturbance, and all machinery and equipment will be regularly maintained to control noise emissions.

Table 14: EMP for Construction Phase

S. N.	Activity	Aspect	Impact	Mitigation Measures	Approximate Budget (₹)	Timeframe	Responsibility
1	Site levelling, excavation, material handling. Use of machineries (crowbars, excavators, dumpers, cranes, welding, cutting tools). Equipment installation (TFH, Cooling Tower, DG Set). Transportation of construction materials.	Fugitive dust emissions (PM10, PM2.5). Exhaust emissions from machinery and vehicles (CO, NOX, CO2). Dust deposition on vegetation	1. Excavation, levelling, earthwork, vehicle movement, and material unloading will generate fugitive dust (PM ₁₀ and PM _{2.5}), causing temporary localized reduction in air quality. 2. Combustion emissions (NO _x , CO, SO ₂) from diesel equipment (excavators, cranes, tippers) may slightly elevate localized pollutant concentrations near the worksite. 3. Dust settling on vegetation may cause temporary reduction in photosynthetic efficiency. 4. Workers near dust-generating activities	1. Water sprinkling shall be conducted 2–3 times per day on unpaved roads, excavation zones, and material handling areas to reduce dust emissions. 2. All fine materials (cement, sand) shall be stored in covered sheds and transported only in fully tarpaulin-covered trucks. 3.5-meter-high barricading shall be installed around the site boundary to minimize dust dispersion. 3. Construction vehicles and machinery shall undergo regular preventive maintenance to reduce exhaust emissions. 4. Workers shall be equipped with N95 dust masks, safety goggles, and face shields during high-dust activities.	Capital Cost: ₹ 6,29,000 Recurring Cost: ₹2,92,630	Entire Construction Phase	Contractor / EHS Team / Site Supervisor

			may experience respiratory discomfort, eye irritation, and reduced visibility.	Stockpiles of loose soil shall be compacted or covered to prevent wind-blown dust. 5. Vehicle speeds shall be restricted to 10 km/h inside the site to minimize dust lift-off.			
2	Operation of excavators, cranes, cutting/welding tools. Vehicle movement and equipment installation	Noise emission 70–85 dB(A). Vibration from equipment.	1. Construction machinery will generate noise in the range of: • Excavators: 80–85 dB(A) • Concrete mixers: 75–80 dB(A) • Cranes: 72–78 dB(A) • Welding/cutting: 70–75 dB(A) • DG set (with enclosure): 75 dB(A) at 1 meter. 2. Workers in close proximity may experience short-term hearing discomfort or irritation. 3. Noise and vibration during activities like hammering or	1. Restrict high-noise activities to daytime working hours (08:00–18:00 hrs). 2. Provide noise barriers or metal sheet barricades around areas with high noise generation. 3. Use low-noise equipment fitted with silencers wherever possible. 4. Provide workers with earplugs or earmuffs in noise-prone areas. 5. Conduct monthly noise monitoring during construction to ensure compliance with CPCB norms. 6. Maintain equipment regularly to minimize noise output.	Capital Cost: ₹ 1,50,000 Recurring Cost: ₹15000	Entire Construction Phase	Contractor / EHS Team

			excavation may cause temporary disturbance to nearby structures and receptors.				
3	Water usage for dust suppression. Equipment installation at tank farm. Domestic activities of workers.	Runoff with sediment. Possible leakage of oil or fuel. Domestic wastewater generation.	1. Construction runoff may carry sediments, soil particles, and suspended solids, potentially affect the quality of nearby soil or drainage channels if not control. 2. Improper storage of fuel and lubricants may lead to localized oil or grease contamination of soil. 3. Approx. 2.5 KLD of Domestic wastewater from onsite workers may lead to localized organic loading and odour issues if untreated. 4. Excess use of water for dust suppression may result in unnecessary wastage	1. Provide temporary silt traps, berms, and sediment barriers at locations prone to runoff. 2. Store fuels, oils, and chemicals in bunded, impervious platforms to avoid soil or groundwater contamination. 3. Ensure domestic wastewater is collected and treated in a Package STP before disposal or reuse. 4. Implement strict controls to avoid overuse of water for dust suppression. 5. Prevent direct discharge of any construction or domestic wastewater into surrounding soil or drains. 6. Conduct routine inspection of storage areas to detect leaks or seepage early.	Capital Cost: ₹ 1,10,000 Recurring Cost: ₹1,82,000	Construction Phase	EHS Team / Site Supervisor

			of freshwater resources.				
4	Debris generation (concrete, brick, steel, plaster). Welding & cutting scraps. Packaging waste (wood, plastics, cardboard). Domestic waste from 60 workers. Hazardous waste from fuels, oils.	Solid waste, debris, scraps. Domestic wet waste. Hazardous spills.	1. Construction activities will generate 87.39 TPA of C&D waste, including concrete, bricks, plaster, and stones. Excavation will generate 37.22 TPA of soil, which can be reused onsite. 2. Packaging waste such as plastic, cardboard, and wood will generate 21.85 TPA of waste. 3. Domestic activities by 60 workers will generate 5.4 kg/day of dry waste and 3.6 kg/day of wet waste. 4. Improper waste management may cause clogged drains, pest attraction, odour, dust generation, and visual pollution. 5. Fuel/oil spills from machinery may cause	1. All waste shall be segregated onsite into recyclable, reusable, and disposable categories. 2. C&D waste shall be reused for backfilling or levelling wherever feasible; remaining waste shall be sent to authorized recyclers. 3. Metal scraps, wood, plastics, and packaging waste shall be handed over to authorized scrap dealers. 4. Domestic waste shall be collected in color-coded bins and handed over to municipal collection services. 5. Hazardous waste (oily rags, waste oil) shall be stored in banded hazardous waste storage areas and disposed of through authorized CHWTSDF. 6. Spill kits shall be provided at fuel storage and equipment maintenance areas.	Capital Cost: ₹ 56,000 Recurring Cost: ₹ 25,000	Entire Construction Period	Contractor / EHS Team

			localized soil contamination if unmanaged.																				
		The construction waste will be segregated as<table><tr><th>S. N.</th><th>Type of Waste</th><th>Quantity (TPA)</th><th>Mode of disposal</th></tr><tr><td>1</td><td>C&D Waste</td><td>87.39</td><td>Concrete, bricks, plaster, & stone will be reused on site; wood & Metal to authorized vendor</td></tr><tr><td>2</td><td>Excavated Soil</td><td>37.22</td><td>Reuse for gardening within plot. Other soil- reuse for on-site levelling/road construction.</td></tr><tr><td>3</td><td>Packaging Waste</td><td>21.85</td><td>Plastic / Cardboard: Recycle via authorized facilities. Wood: Reuse or send to authorized vendor.</td></tr></table>						S. N.	Type of Waste	Quantity (TPA)	Mode of disposal	1	C&D Waste	87.39	Concrete, bricks, plaster, & stone will be reused on site; wood & Metal to authorized vendor	2	Excavated Soil	37.22	Reuse for gardening within plot. Other soil- reuse for on-site levelling/road construction.	3	Packaging Waste	21.85	Plastic / Cardboard: Recycle via authorized facilities. Wood: Reuse or send to authorized vendor.
S. N.	Type of Waste	Quantity (TPA)	Mode of disposal																				
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3	Packaging Waste	21.85	Plastic / Cardboard: Recycle via authorized facilities. Wood: Reuse or send to authorized vendor.																				
5	Overall construction-phase environmental management	Need for systematic monitoring, documentation, compliance verification, and corrective action implementation	1. Construction activities may temporarily influence air quality, noise levels, soil characteristics, and water quality if not continually monitored. 2. Lack of monitoring may result in regulatory non-compliance.	1. Air quality monitoring (PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , CO) shall be carried out quarterly by NABL/MoEFCC-accredited laboratories. 2. Ambient noise monitoring shall be conducted quarterly during daytime and nighttime. 3. Drinking water quality shall be tested quarterly as per IS 10500:2012. 4. Soil quality shall be tested once every six months for heavy metals, pH, and oil & grease. 5. All monitoring data shall be recorded, analysed, and	Capital Cost: ₹ 0 Recurring Cost: ₹ 32,400	During Construction Period	EHS Manager / External Laboratory																

				submitted to regulatory authorities where required.			
6	Welding, gas cutting, equipment installation. Storage of oils, fuels, chemicals.	Presence of flammable materials. Sparks from welding.	1. Welding, cutting, grinding, fuel storage, and electrical installations may pose a risk of fire ignition. 2. Fire incidents may cause property damage, worker injury, and operational delays.	1. All flammable materials shall be stored in bunded, ventilated, marked fire-safe enclosures. 2. Fire extinguishers (ABC, CO ₂) shall be installed at strategic locations near welding and fuel storage areas. 3. Welding and gas-cutting operations shall be carried out with fire blankets, spark arresters, and hot-work permits. 4. Regular mock fire drills, evacuation drills, and emergency response training shall be conducted. 5. Only trained workers shall be permitted to carry out hot work.	Capital Cost: ₹ 1,81,655 Recurring Cost: ₹ 55,300	During Construction Period	Contractor / EHS Manager / Safety Officer
7	Manual handling, machinery operation, welding, working at height.	Exposure to dust, noise. Use of sharp tools & heavy materials.	1. Workers are exposed to dust, noise (up to 85 dB(A)), heat, sharp objects, manual lifting, and equipment movement, creating risks of injury,	1. Mandatory PPE shall include N95 masks, helmets, gloves, safety boots, reflective jackets, ear protection, welding shields, and harnesses. 2. Pre-employment and periodic medical	Capital Cost: ₹ 56,000 Recurring Cost: ₹ 25,100	During Construction Period	Contractor / EHS Team / Site Supervisor

			respiratory discomfort, and fatigue. 2. Lack of safety awareness increases the potential for accidents and near-miss incidents.	examinations shall be conducted for all workers. 3. Toolbox talks and monthly safety training shall be organized covering site hazards, fall protection, and equipment handling. 4. A Permit-to-Work (PTW) system shall be implemented for high-risk activities (hot work, confined space, working at height). 5. A well-equipped first aid station shall be maintained with trained first-aid responders.			
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14.2 Environment Management Plan for Operation Phase

Factory proposes comprehensive environment management plan to combat pollution arising from the project activities. Detailed EMP is described below for various environmental parameters. EMP for operation phase is given in **Table 15** below –

Table 15: EMP during Operation Phase

S. N.	Activity	Aspects	Impact	Mitigation Measures	Budget	Timeframe	Responsibility
1	- Operation of 22 Lakh Kcal LDO-fired Thermic Fluid Heater & 300 kVA HSD Fired DG Set. - Resin manufacturing process - Resin blending, finishing and packaging. - Storage and Handling of solvent & Chemicals. - Truck (3-4 Nos.) & Tempo (2-3 No) Transportation for movement of Raw Material	- The LDO-fired TFH is estimated to generate emissions of 0.0166 g/s of PM, 0.070 g/s of NO_x, 0.1388 g/s of SO₂, and 0.044 g/s of CO. The DG set is estimated to generate emissions of 0.003 g/s of PM, 0.016 g/s of NO_x, 0.0016 g/s of SO₂, and 0.010 g/s of CO. - VOC emissions (styrene and solvent vapors) from reactors, storage tanks, and handling operations. - Fugitive emissions from pumps,	- Combustion Emissions (DG Set): Stack emissions from Thermic Fluid Heater & DG set may cause localized incremental contribution to PM, NO_x, SO₂, and CO levels within the plant boundary. - Greenhouse Gas (GHG) Emissions: GHG emissions from fuel combustion in Thermic fluid heaters & DG set operation will contribute to regional and global	TFH & DG Set: - Use BS-VI grade LDO (≤10 ppm sulfur) to limit PM10 (<50 mg/Nm³), SO₂ (<10 mg/Nm³), NO_x (<300 mg/Nm³), and CO (<150 mg/Nm³), complying with CPCB/SPCB norms - For TFH, provide 30m stack height & wet scrubbers as ACP measures. - For DG set, provide 8 m stack height as per CPCB guidelines. - Use low-sulphur HSD; perform routine maintenance and operate DG only during power failure or emergency situations.	Capital Cost: ₹. 22,00,000/- + Recurring Cost: ₹. 2,50,000/-	Continuous operation; quarterly maintenance of stacks, LEV; daily checks for combustion efficiency	Plant Environmental Officer (PEO) Maintenance In-charge Shift-in-charge

and Finished Good.	flanges, valves, and tank vents. - Odour emissions characteristic of styrene. - Vehicular exhaust emissions. - Indirect transport- related emissions.	climate change impacts. - VOC & Styrene Emissions: Resin manufacturing involves styrene, which may lead to process-related VOC emissions if uncontrolled. - Storage & Handling of Chemicals: Fugitive emissions from storage tanks, pumps, and valves may increase on- site VOC concentrations relative to baseline ND levels. - Vehicular Movement & Transportation: Additional truck, tempo, and employee vehicle movement may cause marginal increase in exhaust emissions and dust	Process Reaction (VOC/HAP Control): - Two Stage Condenser shall be provided to recover styrene and solvent vapors. - Closed reactor charging and closed-loop transfer systems shall be implemented to minimize fugitive VOC emissions. - Nitrogen blanketing shall be provided for styrene storage tanks to suppress vapor release and reduce oxidation. - Local Exhaust Ventilation (LEV) with activated carbon adsorption shall be installed at high-risk emission points. - Exhaust streams containing styrene shall be routed through condensers followed by adsorption systems. Storage & Handling of Chemicals:			
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			resuspension within the premises. - Styrene shall be stored in fixed roof tanks with vapor-tight fittings. - Storage tanks shall be equipped with breather valves with carbon filters. - Mechanical seals shall be provided for pumps handling styrene and solvents. - Routine Leak Detection and Repair (LDAR) inspections shall be carried out. Odour Control: - Good housekeeping practices shall be maintained to prevent spillage and open handling. - Prompt collection and neutralization of resin spills shall be ensured. - Activated carbon filters shall be replaced periodically to maintain odour control efficiency. Vehicular Movement & Transportation:			
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				- Only PUC-certified and BS-VI compliant vehicles shall be permitted inside the premises. - Speed limits shall be enforced to reduce emissions and dust re-suspension. - Vehicle idling within the premises shall be discouraged. - Delivery schedules shall be optimized to avoid congestion.			
	Details of point sources of flue emission (stack) with APCM						
	Usage of Fuel	Fuel	Quantity	Storage	Fuel Characteristics		Storage
					GCV (kCal/kg)	Sulphur	Ash
	LDO-Fired Thermic Fluid Heater	LDO	250 kg/hr	Tanks	10700	0.7 %	0.02 %
	D. G. Set (300 kVA)	HSD	70 Lit/Hr	Tanks	10,700	<0.25%	<0.1%
2	- Water consumption for process operations, cooling tower make-up,	- Freshwater abstraction - Effluent generation with dissolved solids, organics, and chemical residues	Freshwater Consumption: - Withdrawal of 24 KLD of freshwater may exert localized pressure on regional water resources.	Water conservation & reuse: - 3.6 KLD water, shall be reused for cooling tower make-up.	Capital Cost: ₹. 32,00,000 Recurring Cost: ₹. 3,95,000/-	Continuous during operation; weekly checks for water recycling systems;	Plant Environmental Officer (PEO) Shift-in-charge for water systems

washing, domestic use, and gardening - Effluent generation from cooling tower blowdown, process washing, - Sewage generation from domestic activities - Collection of roof-top rainwater and surface runoff.	- Domestic sewage generation with organic load - Stormwater runoff from roofs and paved areas - Risk of soil and groundwater contamination from leaks or improper handling	particularly during lean seasons, if reuse is not maximized. Industrial Effluent Generation: - Generation of 7.2 KLD of industrial effluent containing dissolved salts, process chemicals, and residual organics poses a risk of surface water and groundwater contamination if discharged untreated. - Cooling tower blowdown may increase salinity and TDS loading, while process wastewater may contribute chemical oxygen demand (COD). Domestic Sewage: - Generation of 2.2 KLD of domestic sewage, if untreated, can cause	- 2 KLD of STP-treated sewage shall be reused for greenbelt development. - These measures reduce freshwater abstraction and improve water-use efficiency. Effluent treatment & recycling: - Entire 7.2 KLD industrial effluent shall be routed to a ETP comprising- primary, secondary and tertiary treatment followed by RO & MEE- Treated effluent shall be fully reused for cooling tower make-up. - Zero Liquid Discharge (ZLD) approach shall be maintained (no effluent discharge outside premises). Domestic Sewage Management: - Install 3 KLD MBBR / packaged STP for treatment of domestic sewage. - Treated sewage shall comply with reuse	monthly checks for ETP/STP operations	
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			organic pollution and nutrient enrichment, potentially leading to eutrophication in receiving environments. Stormwater & Rainwater: - Roof-top runoff of up to 8 m³/day during peak rainfall represents a resource recovery opportunity. - Mixing of stormwater with effluent or chemical spills could degrade water quality and cause off-site contamination. Soil & Groundwater Risk: - Leakage or spillage from chemical storage, tank farms, or pipelines may lead to localized soil and	standards and be utilized for gardening (2 KLD). Stormwater & Rainwater Management: - Provide separate stormwater drainage network with no interconnection to effluent lines. Construct: one underground RCC rainwater harvesting tanks (total 27 m³) & Surface runoff collection reservoir (lined). - Harvested rainwater shall be reused for cooling tower make-up. Oil/sediment control: - Install silt traps and oil interceptors at yard drains and tank farm areas. - Interceptor effluent shall be routed to ETP. - Provide bunded, impervious platforms for chemical and oil storage. Operation, Maintenance			
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groundwater contamination if preventive controls are absent.

& Administrative Controls:

- Regular desludging and maintenance of ETP/STP units.
- Periodic cleaning of rainwater tanks and drains.
- SOPs for reactor and equipment washing to minimize water and solvent use.
- Training on spill response and record keeping of water consumption and reuse volumes.

Water Consumption, Wastewater Generation and Management During Non-monsoon –

Sr. No.	Particulars	Water Requirement – Make up (KLD)				Loss (KLD)	Effluent Generation (KLD)
		Fresh	WTP Treated Water	Recycle	Total		
1	Water Treatment Plant	14	0	0	14	0	3
	Domestic	2.5	0	0	2.5	0.3	2.2
2	Process	0	2.5	0	2.5	2.3	0.2
3	Washing	0	1	0	1	0.0	1.0
4	CT Makeup	0	6.5	5.5	12	10	2
5	Scrubber	0	1	0	1	0	1
6	Gardening	0	0	2	2	2	0

Total**16.5****11****7.5****24****14.6****9.4****Water Consumption, Wastewater Generation and Management During Monsoon –**

Sr. No.	Particulars	Water Requirement – Make up (KLD)					Loss (KLD)	Effluent Generation (KLD)
		Fresh	WTP Treated Water	Recycle	Harvested Rain water	Total		
1	Water Treatment Plant	6	0	0	8	14	0	3
	Domestic	2.5	0	0	0	2.5	0.3	2.2
2	Process	0	2.5	0	0	2.5	2.3	0.2
3	Washing	0	1	0	0	1	0.0	1.0
4	CT Makeup	0	6.5	5.5	0	12	10	2
5	Scrubber	0	1	0	0	1	0	1
6	Gardening	0	0	2	0	2	2	0
	Total	8.5	11	7.5	8	24	14.6	9.4

Characteristic of Domestic Wastewater – STP Technology (MBBR)

Characteristics of Domestic Wastewater - STP Technology (MBBR)				
Sr. No.	Parameter	Unit	Inlet	Outlet
			(mg/l, except pH)	
Quantity (KLD)			2.83	2.55
1	pH	--	6.5-8.5	6.5-8.5
2	TSS	mg/L	100-500	<50
3	BOD	mg/L	150-400	<10

4	COD	mg/L	250-600	<30
5	Total Coliform	CFU/100ml	10^6 - 10^8	<1000CFU/100 ML

Characteristic of Effluent-ETP

Parameters	Inlet ETP	Outlet ETP
pH	7.5-8.5	6.5- 8.5
TSS mg/l	600-800	<50
TDS mg/l	2500-3000	<2100
BOD mg/l	5500	<30
COD mg/l	12,000	<250

Rainwater Harvesting Details:

Parameter	Value
Peak Rainfall Intensity	130 mm/hr (0.1 m/hr)
Peak Rainfall Duration	15 minutes
Total Catchment Area	578.68 m ²
Peak Hourly Runoff (Q)	168.83 m ³ /hr
Runoff Volume (15 min)	42.20 m ³
Annual Rainfall	841.2 mm/year
Average Daily Roof-top Rainfall	8.065 m ³ /year
Annual Harvesting Potential	413.76 m ³ /year

Tank Capacity & Requirement

Parameter	Value
Proposed Tank Size	3 m × 3 m × 3 m = 27 m ³
Number of Tanks Required	1
3-Day Roof-top Storage	24.19 m ³

		Tanks for 3-Day Storage	24.91/27 = 0.89 ≈ 1				
3	- Operation of LDO - fired Thermic fluid heater (22 Lakh Kcal) - Operation of HSD fired DG Sets (300 KVA) during power failure to supply electricity. - Truck (5-6 Nos.) & Tempo (2-3 No) Transportation for movement of Raw Material and Finished Good	- Noise generated during Thermic Fluid Heater operation. (60 dB – 80 dB) - ID/FD Fans, Blowers, Air Compressors. - Steam Venting & Safety Valve Testing. - Noise Pollution (DG Set & Exhaust System). - Noise Pollution: Due to engine operation and honking horns	- Continuous exposure to 80–100 dB(A) may cause hearing loss, fatigue, and discomfort among workers near equipment. - Vibrations may affect structural stability and worker comfort. - Ambient noise at site boundary may exceed CPCB industrial area limits (75 dB(A) day, 70 dB(A) night). - Transport noise can disturb nearby receptors and increase occupational stress.	Engineering Controls: - Install acoustic enclosures for Thermic Fluid Heater and DG sets to achieve <75 dB(A) at 1 m from source and <70 dB(A) at boundary. - Use sound-absorbing panels (mineral wool or perforated GI) inside TFH and compressor rooms. - Mount ID/FD fans, blowers, compressors on anti-vibration pads/isolation mounts to reduce vibration transmission. - Install silencers / mufflers at air intake & exhaust points. Administrative Controls: - Schedule steam venting and valve testing during daytime only. - Restrict DG operation to power failure hours only and ensure proper maintenance.	Capital Cost: ₹. 9,50,000/- Recurring Cost: ₹. 1,70,000/-	Continuous operation; quarterly noise monitoring; daily operational checks	Maintenance In-charge PEO / Safety Officer

				- Restrict truck/tempo movement to daytime (8 AM–8 PM) and maintain PUC certification. - Maintain boundary noise within CPCB norms: 75 dB(A) day / 70 dB(A) night. Occupational Safety Controls: - Ensure workplace noise exposure <85 dB(A) for 8-hour shift (OSHA/CPCB). - Provide ear protection (earplugs / muffs) for workers near high-noise equipment. Maintenance: - Lubricate moving parts, maintain fan balance, check acoustic panels quarterly. - Conduct quarterly ambient noise monitoring at strategic points (near DG, TFH, unloading area).			
4	Manufacturing process, Maintenance activity, Raw	- Generation of Hazardous waste such as- Used Oil/Spent Oil, ETP	- Soil and groundwater contamination if	- Hazardous Waste Management as per Hazardous and Other Wastes (Management and	Capital Cost: ₹. 2,80,000/-	During Operation Phase	Maintenance Department, Environmental Officer,

	Material and Packaging, ETP Operation, STP Operation, Domestic Activity	Sludge, Process Residue and Distillation bottoms Discarded Plastic Bags and Drums, Filters and Filter Material Containing Organic Liquids, and Off-Specification Products. - Generation of non-hazardous waste such as- Metal and Paper Scrap, STP Sludge, Wastepaper Boxes and Polyethylene Bags, Paper, Cartons, and Non-Contaminated Bags, as well as Wooden Waste-Generation of Domestic Solid Waste	improperly disposed. - Odor and vector nuisance if not disposed properly. - Solid waste can become attraction of rodents and pests.	Transboundary Movement) Rules, 2016 and amendment thereof. - Ensure proper labelling, leak-proof containers, and disposal at authorized reprocessor as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and amendment thereof.	Recurring Cost: ₹. 2,60,000/-		Operation Manager, Waste Management Team, Horticulture Team													
		Operation Phase – Hazardous Waste																		
		<table><tr><th>S. N.</th><th>Schedule /Category</th><th>Type of Waste</th><th>Quantity</th><th>Mode of Disposal</th></tr><tr><td>1.</td><td>Schedule I /5.1</td><td>Used Oil/ Spent Oil</td><td>0.2 KL/A</td><td>Collection, storage, transportation and dispose at authorized recyclers.</td></tr><tr><td>2.</td><td>Schedule I /35.3</td><td>ETP Sludge</td><td>15 MTA</td><td>Send to CHWTSDf</td></tr></table>						S. N.	Schedule /Category	Type of Waste	Quantity	Mode of Disposal	1.	Schedule I /5.1	Used Oil/ Spent Oil	0.2 KL/A	Collection, storage, transportation and dispose at authorized recyclers.	2.	Schedule I /35.3	ETP Sludge
S. N.	Schedule /Category	Type of Waste	Quantity	Mode of Disposal																
1.	Schedule I /5.1	Used Oil/ Spent Oil	0.2 KL/A	Collection, storage, transportation and dispose at authorized recyclers.																
2.	Schedule I /35.3	ETP Sludge	15 MTA	Send to CHWTSDf																

3.	Schedule I /28.1	Process Residue	70 MTA	Send to CHWTSDF
4.	Schedule I /33.1	Discarded Plastic Bags / Drums	12 MTA	Collection, storage, transportation and dispose at authorized recyclers or authorized decontamination Facility.
5.	Schedule I /29.3	Off-specification Products	25 MTA	Sent to CHWTSDF
6.	Schedule I /20.3	Spent Solvents	35 MTA	Generation, Collection, Storage, Transportation and Disposal at Authorized Distillatory facility under Rule-9. /Disposal to Authorized pre-processor for coprocessing.
7.	Schedule I /35.3	MEE Salts	4.2 MTA	Sent to CHWTSDF

Operation Phase -Non-Hazardous Waste

Type of Waste	Quantity (MT/M)	Mode of Management / Disposal
Metal Waste	0.60 MT/A	Sold to authorized scrap vendor/recycler
Wooden Waste	3.00 MT/A	Reused for packing/storage or handed over to authorized recycler
Packaging Waste	4.80 MT/A	Sent to authorized recycler/reprocessor
Glass Waste	60 Kg/A	Disposed through authorized scrap/recycling vendor
Paper Waste	300 Kg/A	Sent for recycling through authorized paper recycler
Plastic Waste	1.80 MT/A	Sent to authorized plastic waste recycler/reprocessor
STP Sludge	16 kg/M	Used as manure for greenbelt development

Domestic Solid Waste

Manpower	55	Type	Quantity (Kg/Day)	Treatment
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Total Solid Waste	8.25	Wet waste	4.95	Wet Waste will be treated in Organic Waste Processor of capacity 10 Kg/day.
		Dry Waste	3.3	Dry waste will be sent to authorized recyclers.

E-Waste Generation & Management

Sr. No.	Description	Total	UOM	Treatment
1.	E-waste	36	Kg/A	Segregate and disposal as per E-Waste Management Rules, 2022 and amendment thereof.

Bio-Medical Generation & Management

Sr. No.	Description	Total	UOM	Treatment
1.	Contaminated materials like bandages, Cotton swabs, Expired medications and gloves	10	Kg/A	Segregation of contaminated materials should be done in color-coded bags, followed by disposal to an authorized biomedical waste management facility as prescribed under Schedule-I of BMW Rules, 2016

Battery Waste Management

Sr. No.	Description	Total	UOM	Treatment
1.	Batteries from UPS backups, forklifts, and emergency backup systems	5	Kg/A	Disposed through authorized battery recycler

5	Combustion process of LDO-Fired Thermic Fluid Heater & DG set operations. Chemical reactions and processing operations. Noise from machinery and operations. Effluent generation and wastewater discharge. Chemical storage and handling	Environment monitoring and management	- Air pollution: releases particulates, gases (SO₂, NO_x, CO), VOCs, harmful fumes impacting air quality and public health. - Noise pollution: affects human health - Water pollution: contamination from effluents, chemicals, and wastewater affecting aquatic ecosystems, soil, and groundwater. - Soil contamination: leaks, spills of chemicals, hazardous wastes affecting land health.	- Ensure regular Ambient air quarterly sampling at minimum 4 locations using NABL-accredited labs. - Conduct quarterly monitoring of stacks (1 no. of DG set and Process vent Stack). - Monthly monitoring of Indoor Air Quality. - Quarterly noise monitoring at plant boundary, DG set, and nearby habitats. - Monthly monitoring of ETP inlet/outlet and STP outlet. - Perform half-yearly Ground Water and quarterly Surface Water monitoring respectively to detect any contamination. - Quarterly monitoring of drinking water sources. - Half-yearly soil sampling near hazardous waste storage. - Install real-time leak detection sensors (ultrasonic/VOC).	Capital Cost: ₹. 0/- Recurring Cost: ₹. 2,04,000/-	As per monitoring schedule (monthly, quarterly, half-yearly)	PEO / External NABL-accredited Labs EHS Officer
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				- Maintain logbooks and incident records for spills and corrective actions.			
6	Development & Maintenance of Greenbelt in an area of 686.46 sq. m.	- Air Pollution Control - Noise Reduction - Soil Conservation - Water Management - Biodiversity Enhancement	- Green belt acts as a sink for air pollutants by trapping particulate matter and absorbing gaseous pollutants like CO₂, SO₂, and NO_x. This improves overall local air quality. - Trees and shrubs reduce noise levels by deflecting, refracting, and absorbing sound waves, lowering ambient noise pollution around the plant.	- Plant native, pollution-tolerant tree species in a tier arrangement; maintain healthy vegetation cover; regular watering and care to ensure plant survival. - Green Belt to be developed within 1 Year. - Develop a green belt with a density of 2500 trees per hectare. - Planting saplings with a height above 6 ft. - Maintain dense greenbelt around plant boundary to act as a natural barrier for fugitive emissions.	Capital Cost: ₹. 2,26,800/- Recurring Cost: ₹. 1,90,800/-	Planting: first 12 months; maintenance: continuous, monthly inspections	PEO / Greenbelt In-charge Gardening Staff / Shift-in-charge
❖ Plant Species Selection for Green Belt Development ❖ Total Green Belt Area – 686.46 Sq.m. (25.06 % of total plot area) ❖ No. of Plant species to be planted – 216 nos. ❖ Tree density per/ha – 2500 nos. ❖ Survival Rate – 80% ❖ Sapling Height- 5-6 ft. Green Belt Development Approach ❖ Planting Process							

Spacing:
Trees: 2x2 meters apart
Shrubs: 1.5-2 meters apart
Ground Covers: 0.5-1 meter apart

Pitting: Prepare pits of appropriate size based on plant root structure. For trees, dig 60x60x60 cm pits, and for shrubs, 30x30x30 cm pits.

Mulching: Apply organic mulch around the plants to retain soil moisture, reduce weed growth, and improve soil fertility.

Irrigation and Soil Management

Establish a drip irrigation system for efficient water use, especially during the initial growth phase.

Enhance soil quality by adding organic manure, compost, and bio-fertilizers, which are well-suited to medium black and shallow black soils.

Planned schedule for 1 Year

Sr. No	Activity	Timeline	Details
1	Site Preparation	1 st Month	Clear the area, prepare the soil, and create planting pits.
2	Planting	2 nd Month	Plant 216 saplings with proper spacing (2X2 meters apart).
3	Irrigation	Weekly (1 st to 12 th Month)	Ensure regular watering, especially during dry months.
4	Weeding and Mulching	Every 2 months	Remove weeds, apply mulch to retain moisture.
5	Fertilization	4 th and 8 th Month	Apply organic manure for healthy growth.
6	Pruning and Trimming	6 th and 12 th Month	Remove dead or damaged branches to promote healthy growth.
7	Survival Monitoring	End of each quarter	Record survival rate, growth, and health of the saplings.

Capital Budget allocation for Greenbelt development

		Estimated Time for Plantation: 1 year (2026-2027)					
		Total greenbelt area: 686.46 sq.m. Trees for Plantation: 216 (173 + 80% survival rate) Height of Saplings: 5-6 ft.					
		Sr. No.	Items	Cost per plan (Rs.)		Total Cost (Rs.)	
		Capital Budget					
		1	Pit digging & alignment	50		10,800	
		2	Sapling purchase (avg. 5–6 ft)	650		140,400	
		3	Tree planting cost	50		10,800	
		4	Miscellaneous	300		64,800	
		Total		1050		2,26,800	
		Recurring Budget					
		1	Watering cost (drip O & M)	45		9,720	
		2	Manure/pesticide (per year)/tree	55		11,880	
		3	Weeding/Mulching/tree	20		4,320	
		4	Misc. cost /tree	50		10,800	
		5	Labour (1 person)	15,000/Person		180000	
		Total		15170		1,90,800	
		Maintenance and Monitoring					
		Watering					
		Water the plants regularly during the first two years to ensure proper establishment, especially in dry months.					
		Fertilization					
		Apply organic compost or vermicompost every 6 months to maintain soil fertility.					
		Pruning and Weeding					
		Prune dead or damaged branches regularly and remove weeds to avoid competition for nutrients					
		7	Storage and Handling of Chemicals (Di ethylene glycol, Butyl acetate,	- Fire/explosion risk (pool fire, thermal radiation up to 48.3 m)	- Fire / explosion risk (pool fire, thermal radiation up to 48.3 m) causing damage to property,	Storage & Handling: - Follow PESO guidelines for storage of Hazardous chemicals.	Capital Cost: ₹. 2,60,000/-

Phthalic anhydride, Mixed xylene, Isophthalic acid, Methyl Metha Acrylate Monomer, Maleic anhydride, Styrene monomer, Bisphenol A-type- Epoxy resin.)		workers, and environment - Corrosion/leakage causing environmental contamination. - Odor from hazardous chemicals.	- Store chemicals in MS drums, HDPE bags and Canes per MSDS - Tanks fabricated as per IS 10987 - Dip sticks of brass with dip pipe. - Hydrostatic testing: water at 0.25 kg/cm² pressure - Tanks painted with anticorrosive paint and properly earthed as per relevant Indian standards - All fittings flameproof, suitable for Group II gases as per IS 2148 - Maintain safe distance from ignition sources (MSIHC Rules 1989) - Grounding / bonding of drums / tanks during transfer to prevent static sparks - Use flameproof equipment for solvent / amine storage Fire Protection Systems: - Maintain 200 m³ firewater tank with fire	Recurring Cost: ₹. 53,250/-	monthly major drills	
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				hydrant system; test monthly. - Class B & C fire extinguishers: 1) Dry Chemical Powder / ABC 2) CO₂ 3) Mechanical foam. - Extinguishers inspected quarterly VOC & Leak Controls: - Install LEV with activated carbon adsorption (>95% VOC removal) - Install real-time VOC/leak sensors with alarms Training & Emergency Preparedness: - Monthly fire drills and safety training - Maintain SOPs, logbooks, and incident records. - Provide No Smoking and Danger sign boards. - PPE for chemical handling and fire hazards.			
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8	Occupational Exposure of workers - Chemical manufacturing and handling - Loading / unloading of raw materials - Operation of heavy machinery (pumps, compressors, generators). - Material handling and transportation in plant areas. - Cleaning and maintenance of chemical tanks and pipelines. - Working near hot reactors. - Handling wastewater from ETP / STP. - Manual lifting and carrying of chemical drums.	Worker exposure to airborne hazards such as dust, fumes, VOCs, toxic gases Noise exposure affecting hearing and overall health. Chemical exposure risks through inhalation, dermal contact, or ingestion Physical hazards including heat, radiation, and vibration impacting worker well-being. Biological hazards from infectious agents Ergonomic stressors from repetitive or strenuous tasks. Psychological stress due to workplace conditions and workload.	- Respiratory / dermal exposure to chemicals during reactions, cleaning, or maintenance, causing acute irritation or chronic health effects; indoor air pollution from fugitive VOCs affecting worker health. -Spill/fire hazards. - Worker exposure to toxic fumes or skin burns.	Engineering & Administrative Controls: - Automated handling systems (pumps, conveyors, mechanical drum handlers) to minimize manual exposure. - Safety signages and SOPs for high-risk activities - Emergency spill response plan as per HWM Rules 2016. - Monthly inspections for leaks, corrosion, and hazards. - Disaster Management Plan (DMP) with 6-monthly mock drills for spills/fires. Personal Protective Equipment (PPE): - Chemical-resistant gloves, suits, aprons, boots, face shields, goggles, helmets. - Respirators for VOCs, half-mask or full-face, P100 cartridges).	Capital Cost: ₹. 3,49,275/- Recurring Cost: ₹. 2,66,652/-	Continuous PPE use; weekly safety checks; quarterly medical tests and drills; biannual health check-ups	OHS Officer / EHS Officer Shift-in-charge
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				- Hearing protection (earplugs/earmuffs). - Heat-resistant gloves and flame-retardant clothing near hot surfaces. - Cut-resistant gloves for manual handling. - High-visibility vests for plant movement areas. - Fall protection harnesses and lanyards for work at height. Safety Infrastructure: - Safety showers and eyewash stations at chemical handling, mixing, and reactor zones; ANSI/IS compliant; tested weekly. - First aid boxes at production floor, storage, loading/unloading, lab, admin, control rooms, and emergency assembly points. - Spill kits (absorbent pads, neutralizers, booms). - Fire extinguishers, fire blankets, hydrants, firewater tank as per fire			
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EMP.

Medical Monitoring & Health Check-ups:

- Pre-employment and biannual health check-ups: lung function, pulmonary function, radiology, audiometric, general clinical examination.

- Quarterly health tests at PHC, Pune for all 55 employees

Training & Awareness:

- Training on chemical handling, PPE usage, emergency spill/fire response, ergonomics, and stress management.

- Regular drills for fire, spill, and chemical emergencies.

Medical Facilities

The following quarterly tests will be conducted for each worker:

Sr. No.	Test	Venue
1	Lung Function Test	Primary Health Centre, Pune, MH
2	Radiology – X-ray	
3	Pulmonary Function Test	
4	Audiometric Test	
5	General clinical examination with emphasis on respiratory system	

		6	Pre-employment examinations				
		Details of First Aid Box to be provided:					
		Sr. No.	Equipment's	Placement			
		1	Sterile adhesive bandages (various sizes)	Production Floor, Storage Area, Loading/Unloading Zone, Laboratory, Admin office and control rooms, Emergency assembly point			
		2	Sterile gauze pads and rolls				
		3	Adhesive tape				
		4	Antiseptic wipes and solution				
		5	Antibiotic ointment/burnt ointments				
		6	Scissors (blunt-tipped)				
		7	Tweezers				
		8	Disposable gloves				
		9	Cotton balls and swabs				
		10	Pain relievers				
9	CER activity	Providing Solar lights, maintaining greenery in the nearby villages, and irrigation system for green belt.	- Potential impacts on local environment and community due to inadequate environmental infrastructure or lack of sustainable practices.	- Implementation of CER initiatives as per Ministry of Environment, Forest and Climate Change O.M. No. 22-65/2017-IA II(M) dated 01.05.2018.	Capital Cost: ₹. 16,00,000/- Recurring Cost: ₹. 0/-	Within the first 2 years of project commissioning	Project Proponent / CSR/CER Team in coordination with local Gram Panchayat / school authorities
10	Energy Utilization (253 kW) for manufacturing processes, utilities (Thermic Fluid Heaters, cooling	High electrical load.	- Increased electricity demand. - Higher operational costs. - Consumption of 253 kW of electricity is estimated to	- Industry has proposed the installation of 26 kW of solar PV, which will lead to an emissions saving of tCO ₂ e/day, reducing reliance on fossil fuels.	Capital Cost: ₹. 10,00,000/- Recurring Cost: ₹. 1,00,000/-	During Operation Phase	Plant Manager, Maintenance Team

	towers), lighting, and other electrical systems.		generate GHG Emissions, contributing significantly to the facility's carbon footprint and climate change.	- Implementation of energy-efficient lighting (LEDs) and appliances to reduce power consumption. - Maintain PF above 0.95 using capacitor banks. - Install SCADA-based real-time energy tracking system.			
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14.3 Implementation of EMP

The implementation mainly comprises of resources available to the project proponent, accountability of contractors, training of operational staff associated with environmental control facilities and documentation of measures to be taken. It is proposed to create Environment Management Cell under EHS Manager for effective implementation of EMP. The Cell will have following functions:

- To implement the environmental management plan,
- To assure regulatory compliance with all relevant rules and regulations,
- To ensure regular operation and maintenance of pollution control devices,
- To minimize environmental impacts of operations as by strict adherence to the EMP,
- To initiate environmental monitoring as per approved schedule.
- Review and interpretation of monitored results and corrective measures in case monitored results are above the specified limit.
- Maintain environmental related records; and
- Coordination with regulatory agencies, external consultants, monitoring laboratories.

The schematic organizational set up of Environment Management Cell for operation phase is given in **Figure 9**.

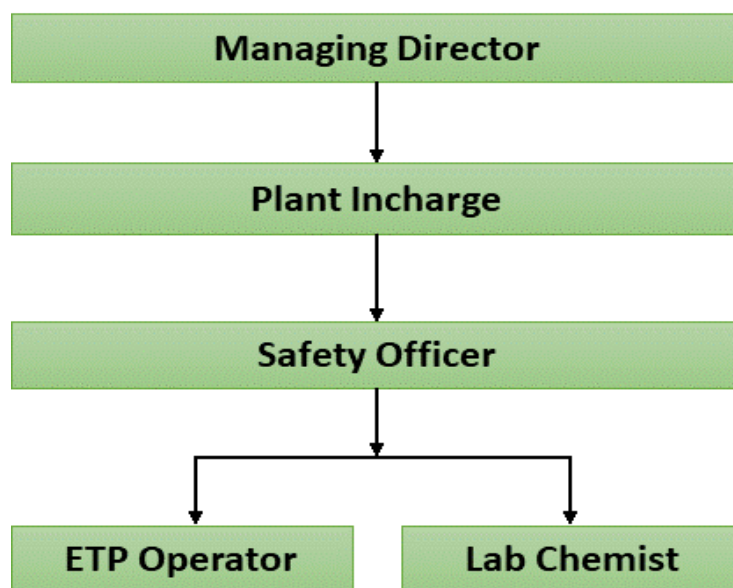


Figure 9: Environment Monitoring Cell

14.4 EMP Review and Amendments

The EMP serves as a vital tool for environmental management and must be reviewed periodically to accommodate changes in the organization, processes, or regulatory requirements. After each review, the EHS Manager will be responsible for updating the EMP and obtaining approval from senior management. The revised EMP will then be communicated to all relevant staff.

The EHS Manager will identify and conduct training needs based on the specific requirements of the EMP and the capability of site and project personnel to implement the necessary

management actions and monitoring activities. Additionally, general environmental awareness will be promoted among the project team to foster the adoption of environmentally sound practices and ensure compliance with project activities. This approach will help minimize adverse environmental impacts, ensure adherence to applicable regulations and standards, and achieve performance that exceeds compliance requirements.

An environmental management training program will be conducted for project related activities. This will ensure capacity building for effective implementation of the management and control measures on various project activities. The training program will ensure that all concerned members of the team understand the following aspects:

- Purpose of management plan for the project activities;
- Requirements of the management plan and specific Action Plans;
- Understanding of the sensitive environmental and social features in the immediate vicinity of the Project site.; and Awareness of the potential risks from the Project activities.

15. Environment Management Cost

The capital expenditure is approximately 8 crores. The project cost estimates include civil, plant and machinery, other expenses, contingencies @2% on building, margin money of working capital. Environment management cost for construction phase will be Rs. 11.83 lakhs. whereas for operation phase capital cost will be around Rs. 100.66 lakhs with a recurring annual cost of Rs. 18.90 lakhs per year. The details of EMP cost are given in **Table 16 and Table 17**

Table 16: Environment Management Cost during Construction Phase

Sr. No.	Component	Description	Capital Cost (₹)	Recurring Cost (₹)/ Year
1	Air Pollution Control	Provision of water sprinkling for dust suppression, tarpaulin covering of construction materials and vehicles, supply of dust masks and goggles to workers, preventive maintenance of construction equipment, and temporary dust control measures within the site. Installation of temporary metal sheet barricading.	6,29,300	2,92,630
2	Water Pollution Control	Installation of temporary silt traps and sediment barriers, construction of bunded fuel and oil storage with impervious flooring, provision of portable toilets for construction workers, and availability of spill prevention and control materials.	1,10,000	1,82,000
3	Noise pollution Control	Installation of temporary metal sheet barricading around high-noise construction and equipment installation areas, and provision of personal hearing protection (earplugs/earmuffs) to construction workers.	1,50,000	15,000
4	Solid & Hazardous	Provision of color-coded bins for waste segregation, creation of temporary waste storage area, handling and transportation of construction waste, segregation and	56,000	25,000

M/s. Teknovace Wood Coatings Pvt. Ltd		Proposed Manufacturing of Synthetic Organic Chemicals by M/s. Teknovace Wood Coatings Pvt. Ltd. at Gut No. 358, Village – Dhamane, Tal: Maval, Dist: Pune – 410506, Maharashtra.	Executive Summary	
	Waste Management	disposal of recyclable waste, and spill kits for hazardous waste management.		
5	Environmental Monitoring and Management	Quarterly monitoring of ambient air quality, ambient noise levels, and drinking water quality, half-yearly soil quality monitoring through MoEFCC/NABL-accredited laboratories, maintenance of monitoring records, and implementation of corrective actions where required.	0	32,400.00
6	Fire & Safety	Provision of fire extinguishers, fire blankets, sand buckets, safety signage, emergency preparedness arrangements, and periodic fire safety training and mock drills during the construction phase.	1,81,655	55,300
6	Occupational Health and Others	Provision of personal protective equipment (helmets, safety shoes, gloves, jackets, harnesses), first-aid facilities, safety training and toolbox talks, and periodic health check-ups for construction workers.	56,000	25,100
Total			11,82,955.00	6,27,430.00

Table 17: Environment Management Cost during Operation Phase

Sr. No.	Component	Description	Capital cost Rs. In lacs	Recurring Cost (Rs. In Lacs/year)
1	Air Pollution Control	30 m stack & wet Scrubber for 22 Lakh Kcal LDO – Fired TFH & 8 m stack for 300 kVA DG set, LEV with activated carbon adsorption, closed loop system, nitrogen purging.	22,00,000	2,50,000
2	Water Pollution Control	10 KLD ETP (primary, secondary, tertiary treatment), 3 KLD MBBR STP, neutralization tanks, solvent recovery (distillation). Rainwater harvesting- underground RCC tanks of 27 m ³ for rooftop rainwater harvesting, and construct a single-lined reservoir for surface runoff collection.	32,00,000	3,95,000
3	Noise pollution Control	Acoustic enclosures, sound-absorbing panels, vibration isolators, silencers for thermic fluid heaters, acoustic enclosures, mufflers, anti-vibration pads for DG set.	9,50,000	1,70,000
4	Solid and Hazardous Waste Management	Segregation bins, leak-proof containers, OWC for wet waste & garden waste, storage for process waste, used oil, spent solvent, ETP sludge, contaminated containers, STP sludge (manure), e-waste, biomedical, battery waste disposal per HWM, E-Waste, BMWM Rules.	2,80,000	2,60,000

M/s. Teknovace Wood Coatings Pvt. Ltd	Proposed Manufacturing of Synthetic Organic Chemicals by M/s. Teknovace Wood Coatings Pvt. Ltd. at Gut No. 358, Village – Dhamane, Tal: Maval, Dist: Pune – 410506, Maharashtra.	Executive Summary
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5	Environmental Monitoring and Management	Real-time VOC/leak sensors, quarterly ambient air quality (PM10, PM2.5, SO ₂ , NO _x , CO, HC at 4 locations), stack monitoring (thermic fluid heaters, DG set), indoor air (1 locations), monthly wastewater (ETP inlet/outlet, STP outlet), drinking water (IS 10500:2012), noise (3 boundary locations), semi-annual soil (1 location).	0	2,04,000
6	Green Belt	Green belt development & maintenance	2,26,800	1,90,800
7	Fire and safety measures	200 m ³ firewater tank, CO ₂ /DCP extinguishers, flameproof equipment, MS/SS316L/HDPE storage for chemicals, grounding/bonding systems, spill containment kits, real-time VOC/leak sensors, monthly fire drills, DMP with 6-monthly drills for spill/fire response.	2,60,000	53,250
8	Occupational Health and Others	First aid kits (sterile bandages, gauze, antiseptic, gloves, etc.) across production, storage, lab, admin areas, safety signages, SOPs, quarterly safety training, pre-employment/biannual health check-ups (lung function, radiology, audiometry, respiratory exams) for 55 workers. PPE'S- N95/P100 respirators, chemical-resistant gloves, goggles, suits, earplugs/earmuffs for 55 employees	3,49,275	2,66,652
9	CER	Improvement of irrigation facilities, providing Solar lights and maintaining greenery in the nearby villages as per CER OM 2018/2020.	16,000,00	0
10	Renewable Energy	Solar PV panels, LED lighting, capacitor banks for PF >0.95, SCADA-based real-time energy tracking system to reduce tCO ₂ e/yr from 253 KW consumption.	10,00,000	1,00,000
Total			₹ 1,00,66,075	₹ 18,89,702.50

16. Conclusion

Considering the potential impacts of the proposed project, M/s. Teknovace Wood Coatings Pvt. Ltd. has prepared adequate remedial measures and an Environmental Management Plan for their implementation. Overall, the proposed project will generate direct and indirect employment opportunities as well as increase in physical resources. Similarly, M/s. Teknovace Wood Coatings Pvt. Ltd. has planned to implement various activities under the Companies Act such as rain water harvesting, solar lights, green belt development etc. which will result in positive effects from the project site to the surrounding area and create a thriving environment. It can be concluded that strict adherence to mitigation measures during the construction and operational phases will result in negligible impact on the environment.