

EXECUTIVE SUMMARY

Of

ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

**FOR THE PROPOSED MANUFACTURING OF INORGANIC
& COMPLEX INORGANIC COLORED PIGMENTS
(6850 TPA)**

Promoted By

**M/s. ULTRAMARINE & PIGMENTS
LIMITED**

Located at

**Plot No. 38,39,40,41,42,43,44,46,47,50,51,52 & 53 in
Kannudaiyanpatti Village,
SIPCOT Industrial Park,
Manapparai Taluk,
Tiruchirappalli District, Tamil Nadu.**

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1. PROJECT DESCRIPTION

1.1 Introduction

M/s. ULTRAMARINE & PIGMENTS LIMITED is proposing a Chemical Manufacturing Unit for a production of Inorganic Pigments (5500 TPA) & Complex Inorganic Colored Pigments (1350 TPA) in Kannudaiyanpatti Village, SIPCOT Industrial Park, Manapparai Taluk, Tiruchirappalli District. The project comes under schedule 5(f) – Synthetic Organic Chemical Industry and Category B1. The total Project Cost is Rs. 110.19 Crores.

1.2 Project Location

M/s. ULTRAMARINE & PIGMENTS LIMITED is located at Plot No. 38,39,40,41,42,43,44,46,47,50,51,52&53 in Kannudaiyanpatti Village, SIPCOT Industrial Park, Manapparai Taluk, Tiruchirappalli District, Tamil Nadu. The nearest major human settlement is Manapparai (6 km). The nearest railway station and airport are Manapparai Junction (6 km) and Trichy Airport (32 km) respectively.

Connectivity

Railways

The nearest major railway station is Manapparai Junction – 6.0 km away from the project site.

Roads

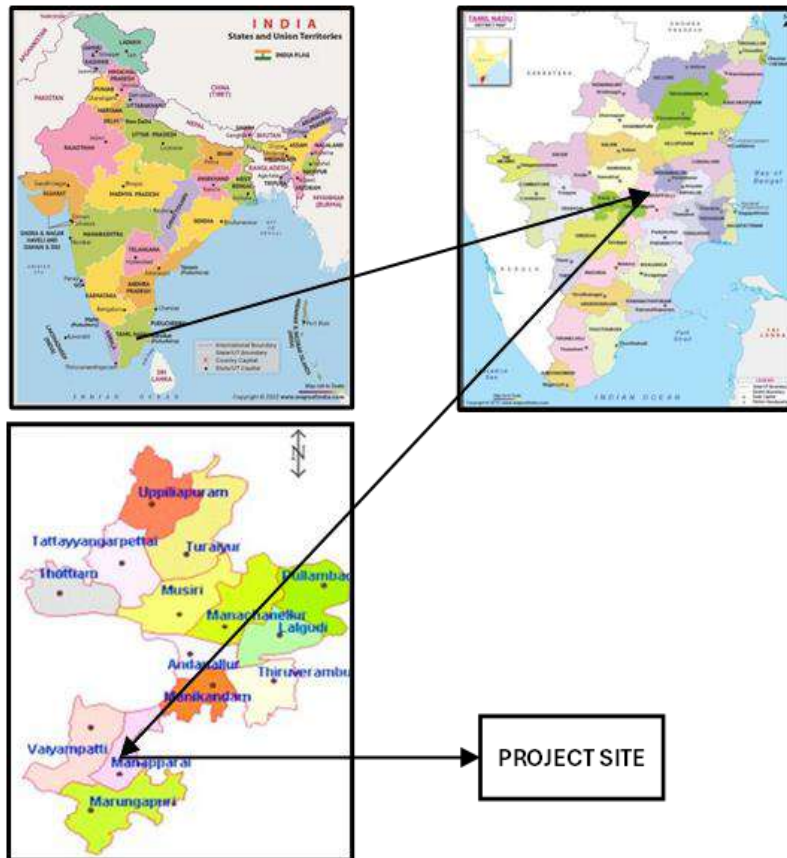
The proposed project site is located at 1.44 km towards North from National Highway (NH-83) and 2.15 km towards East from State Highway (SH-71). The raw materials can be conveniently transported via these roads.

Airways

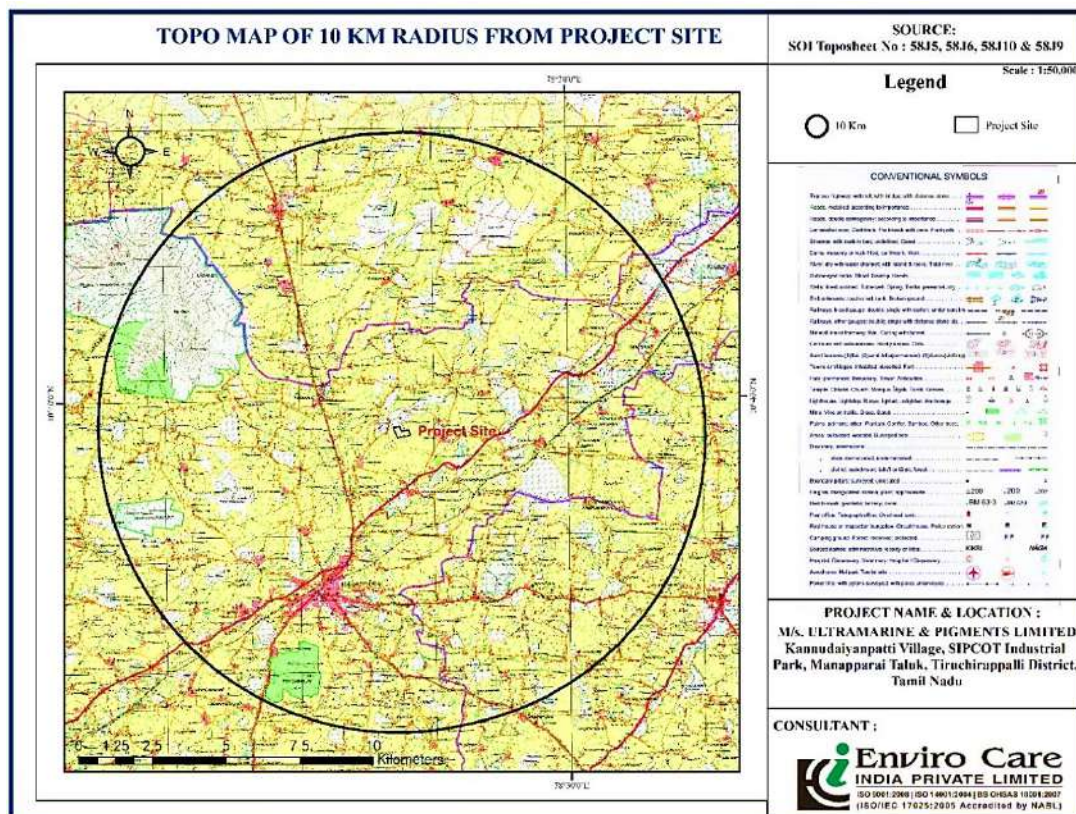
The nearest airport is at Trichy which is 32 km away from the site.

Communication

Already this area is well connected with the district headquarters by roads and mobile towers are installed and there may not be any constraints for communication.



Location Map of the Project Site



Topo Map of the Project Site within 10 km Radius



Satellite Imagery of the Project Site

LABEL	LATITUDE	LONGITUDE
Project Site Coordinates		
A	10°39'29.41"N	78°26'44.65"E
B	10°39'30.29"N	78°26'52.14"E
C	10°39'25.66"N	78°26'54.30"E
D	10°39'26.82"N	78°27'1.76"E
E	10°39'20.87"N	78°27'3.96"E
F	10°39'17.87"N	78°26'49.86"E
Greenbelt Coordinates		
G1	10°39'27.64"N	78°26'46.84"E
G2	10°39'27.85"N	78°26'50.66"E
G3	10°39'22.76"N	78°27'0.03"E

1.3 Salient Features of the Project

Promoter	M/s. ULTRAMARINE & PIGMENTS LIMITED
Name of the Project	Proposed Manufacturing of Inorganic & Complex Inorganic Colored Pigments by M/s. ULTRAMARINE & PIGMENTS LIMITED located at Kannudaiyanpatti Village, SIPCOT Industrial Park, Manapparai Taluk, Tiruchirappalli District, Tamil Nadu.
Location	Village: Kannudaiyanpatti, SIPCOT Industrial Park Taluk: Manapparai District: Tiruchirappalli State: Tamil Nadu
Land Area	32.72 Acres (13.24 Hectares)
Greenbelt Area	10.80 Acres (4.37 Hectares – 33.01%)
Geographical Location	Latitude: 10°39'29.11"N Longitude: 78°26'44.49"E
Mean Sea Level (MSL)	166 m
Land Use Classification	Industrial Area (SIPCOT Industrial Park, Manapparai)
Proposed Capacity	Inorganic Pigments – 5500 TPA Complex Inorganic Colored Pigments – 1350 TPA
Raw Materials	China Clay, Sulphur, Sodium Carbonate, Silica, Tar Pitch
Water Consumption	Freshwater – 101 KLD Recycled Water – 254 KLD Total Water Requirement – 355 KLD
Source of Water	Water supply from SIPCOT Industrial Park, Manapparai.
Wastewater Generation	Sewage – 23 KLD Effluent – 248 KLD
Mode of Disposal for Wastewater	Sewage – Will be treated by proposed STP of capacity 25 KLD. Treated sewage will be used for greenbelt. Effluent – Will be treated by proposed ETP of capacity 300 KLD. Recovery water to be used in process and ATFD salt will be used as a Raw material or Disposal through authorized user as a raw material.
Solid Waste Generation	Broken Refractory Waste – 70 TPM Used empty HDPE Bags – 0.60 TPM ATFD salt – 100 TPM STP Sludge – 0.04 TPM
Mode of Disposal for Solid Wastes	Broken Refractory Waste – Reused in the process Used empty HDPE Bags – Disposal through authorized vendor ATFD salt – Used as a raw material STP Sludge – Used as manure
Hazardous Waste Generation & Disposal	Scum from Pigment Washing – 12 TPM Wastes or Residues Containing Oil – 0.05 TPM Used or Spent Oil – 0.10 TPM ETP Sludge – 24 TPM All hazardous wastes are disposed through authorized vendor

APC Measures	Kiln Process (Pigment Plant) - Stack with wet scrubber at a height of 55m. Boiler (6 TPH) - Stack with a height of 30m. DG Set (1100 KVA) - Stack with a height of 30m Thermic Fluid Heater - Stack with a height of 12m Drying Process - Dust Collector with wet scrubber connected with stack at a height of 15m. Dust Collectors (4 Nos.) - Bag filter connected to stack with a height of 15m
Power Consumption with source	1000 KWH (Source - TNEB)
Manpower Requirement	80 Employees (330 days)
Nearest City	Manapparai – 6.00 km
Populated Areas	Sathirapatti – 0.97 km (SE) Udayapatti – 1.38 km (SW) Muthapudyanpatti – 1.51 km (S)
Reserve Forests	No notified reserve forests within 10 km radius. However, following unnotified reserve forests are present within 10 km radius, Veeramalai Reserve Forest – 5.62 km (NW) Amayapuram Reserve Forest – 5.73 km (W) Poigai Malai Reserve Forest – 8.02 km (SW)
Eco-Sensitive Areas	No eco-sensitive zones within 10 km radius
Water Bodies within 10km radius	Pond near Samudram – 4.67 km (SE) Vengaikurichi Kulam – 9.0 km (SW)
Project Cost	Rs. 110.19 Crores

1.4 Production Details

S. No.	Description	Quantity (TPA)
A. Inorganic Pigments		
1	Pigment Blue - 29	5000
2	Pigment Violet - 15	400
3	Pink under Pigment Violet - 15	100
Sub-Total		5500
B. Complex Inorganic Coloured Pigments (Mixed Metal Oxides)		
1	Pigment Yellow - 119	700
2	Pigment Yellow - 184	250
3	Pigment Yellow - 53	50
4	Pigment Yellow - 164	50
5	Pigment Brown - 29	150
6	Pigment Green - 17	150
Sub-Total		1350
GRAND TOTAL		6850

1.5 Raw Materials

S. No.	Raw material	CAS No.	HSN Code	Quantity (TPA)
1	Sulphur	7704-34-9	2503	3399.00
2	Sodium Carbonate	497-19-8	28362010	3792.00
3	China Clay	1332-58-7	2507	4470.00
4	Tar pitch	7631-86-9	250510	390.00
5	Silica	65996-93-2	2708	672.00
6	Ammonium Chloride	12125-02-9	28271000	69.00
7	Hydrogen Chloride Gas	7647-01-0	28061000	10.50
8	Iron (III) oxide Fe_2O_3	1309-37-1	28211020	489.24
9	Zinc Oxide-ZnO	1314-13-2	28170010	249.41
10	Titanium dioxide- TiO_2	13463-67-7	28230010	22.22
11	Bismuth trioxide	1304-76-3	28259090	179.50
12	Vanadium pentoxide	1314-62-1	28253010	70.50
13	Con. Nitric acid (60%)	7697-37-2	28080010	175.00
14	Aluminum sulphate	17927-65-0	28332210	1.37
15	Sodium Hexa Meta Phosphate- (NaPO_3) ₆	68915-31-1	28352940	2.50
16	Ortho phosphoric acid - H_3PO_4	7664-38-2	28092010	4.75
17	Titanium Dioxide - Anatase- TiO_2	13463-67-7	28080010	42.78
18	Nickel Carbonate - NiCO_3	39430-27-8	28369990	4.37
19	Antimony Trioxide - Sb_2O_3	1309-64-4	28258000	6.80
20	Potassium Chloride - KCl	7447-40-7	31042000	0.95
21	Potassium Carbonate - K_2CO_3	584-08-7	28364000	0.65
22	Titanium Dioxide - Anatase- TiO_2	13463-67-7	28080010	32.54
23	Manganese carbonate- MnCO_3	598-62-9	28369990	9.36
24	Antimony Trioxide - Sb_2O_3	1309-64-4	28258000	12.02
25	Iron oxide (III) Fe_2O_3	1309-37-1	28211020	0.42
26	Iron (III) oxide Fe_2O_3	1309-37-1	28211020	130.64
27	Manganese carbonate- MnCO_3	598-62-9	28369990	1.92
28	Chromium Trioxide - Cr_2O_3	1308-38-9	28191000	41.86
29	Chromium Trioxide - Cr_2O_3	1308-38-9	28191000	142.02
30	Aluminium Tri Hydrate-ATH - $\text{Al}(\text{OH})_3$	21645-51-2	28183000	11.17
31	Magnetite iron oxide – Fe_3O_4	1309-38-2	28211010	3.99
32	Magnesium oxide - MgO	1309-48-4	25199040	1.51
33	Tungsten trioxide – WO_3	1314-35-8	28259090	0.80
TOTAL				14440.79

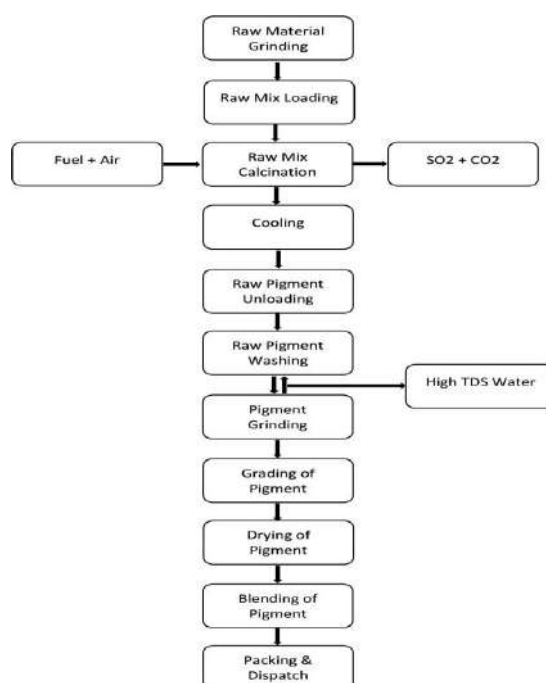
1.6 Project description with Process Details

A. Inorganic Pigments (Ultramarine Blue)

Raw materials like China Clay, Sulphur, Soda Ash, Silica Powder and Tar pitch are mixed and grinded to the required particle size in dry ball mill using grinding media like pebble or ceramic balls. After grinding, this raw mix is filled in refractory pots and loaded in the batch kilns.

These kilns are heated using fuels like coal & Coke or LPG/LNG to the required temperature and the same is maintained to particular time. After this the kiln is allowed for natural cooling which will take min 25 to 30 days depending upon the atmospheric conditions. Then the kilns are opened to unload raw blue (Pigment + By Product) and washed in the washing tanks / equipment's to remove the water-soluble salts.

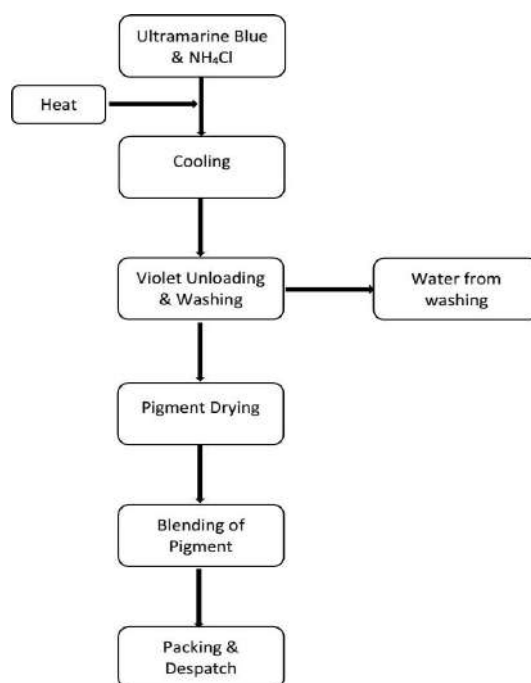
After washing or before washing the pigment is grinded using wet mills to get desired particle size followed by natural settling to separate the pigment based on the particle size. After settling separation wet pigment is taken to the different type of dryers where hot air or oil is circulated to remove the moisture. Final dried pigment is de-agglomerated using high speed turbo grinders and blended to get the desired shade and strength. Then the final product is packed based on the customer requirement.



Process Flow Chart (Ultramarine Blue)

B. Inorganic Pigments (Ultramarine Violet)

Ultramarine violet is produced by heating the Ultramarine Blue pigment along with Ammonium Chloride to the specific temperature in a Heating equipment like Tray dryer or Blender. During heating sodium is removed from Ultramarine Blue pigment and producing Ultramarine Violet which is washed, dried, grinded and blended to get desired shades.



Process Flow Chart (Ultramarine Violet)

C. Inorganic Pigments (Ultramarine Pink)

Reaction Type: Solid Gas Fluidization.

Heating Method: Indirect Heating.

Ultramarine Violet is heated to 180°C with the help of indirectly heated jacket using Thermic fluid oil. Then HCl Gas will be purged inside the reactor with pressurized for Colour conversion in physical as well as chemical changes. After conversion the pigment goes for washing stage to remove impurities associated with it.

D. Complex Inorganic-Colored Pigments (Bismuth Vanadate Pigment)

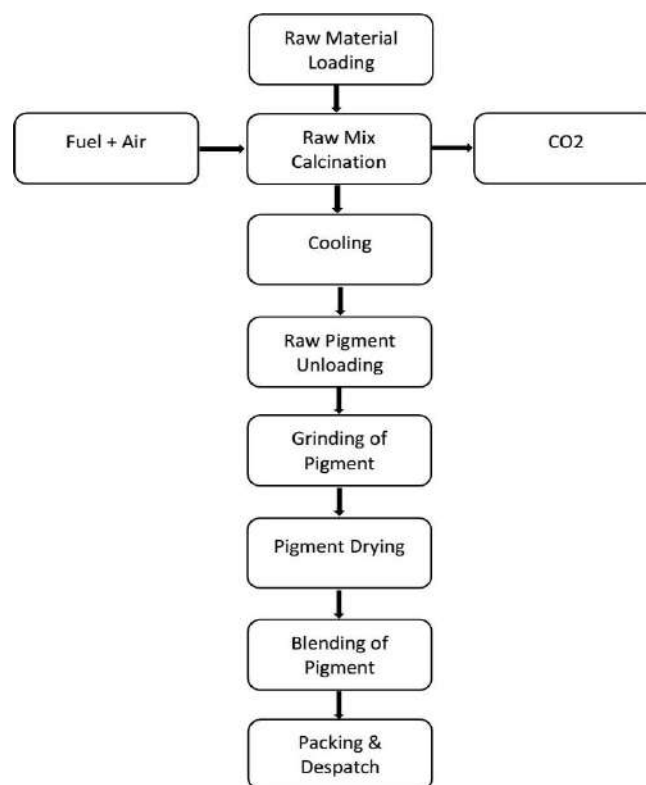
Bismuth vanadate pigment is produced in two methods; one is by high temperature calcination of Bismuth Tri Oxide with Vanadium Pentoxide and another one is by wet milling the Bismuth tri oxide & Vanadium pentoxide in suitable acidic medium. In calcination process, the raw yellow pigment is wet grinded in the wet mill / bead mills to

get desired particle size and shade. After grinding, the pigment is filtered using vacuum filters followed by drying in tray dryers. Dried pigment is pulverized to disintegrate the particles and then blended to get desired shade.

E. Complex Inorganic-Colored Pigments (Mixed Metal Oxide (MMO) Pigments)

Mixed metal oxide pigments are produced by calcining the parent metal oxide powder along with colouring metal oxide (Chromophores / Dopants) at very high temperature of 1100 deg C plus. During calcination the dopants are doped inside the lattice of parent metal oxides and thus colour is obtained. The colour of the final product will vary based on the parent metal oxide, dopants and their quantity.

After calcination the raw pigment is wet grinded using ball mills / bead mills to get desired colour shade and particle size followed by filtration and drying. Drying is done using tray driers / drying cum blending equipment's which is preheated using Thermic Fluid Heaters. After drying pigment is disintegrated using high speed Turbo Mills and then blended to get desired colour shade.



Process Flow Chart (Mixed Metal Oxide Pigments)

1.7 Source of Water/ Energy and Power requirement

The total water requirement for the unit is around 355 KLD. In which 101 KLD of fresh water will be obtained from SIPCOT Water Supply, and 254 KLD will be recycled water within premises. The total power requirement is 1000 KWH which is met from Tamil Nadu Electricity Board (TNEB).

1.8 Land Requirement

The table below shows the requirement of land for various purposes.

Land Requirement for the Project

Description	Area		
	Acres	Hectares	(%)
Building Area	8.55	3.46	26.13
Roads and Pavement Area	3.39	1.37	10.36
Green belt Area	10.8	4.37	33.01
Solid Waste Storage Area	0.07	0.03	0.21
Parking Area	1.45	0.59	4.43
Vacant Area	8.46	3.42	25.86
Total area	32.72	13.24	100.00

1.9 Topography

The topography is plain and will not lead to disaster by accumulation of air pollutants. The average elevation of the area is about 166m from Mean Sea Level.

1.10 Existing Infrastructure

The nearest railway station is at Manapparai which is 6.00 km away from the site. The proposed project site is located at 1.44 km towards North from National Highway (NH-83) and 2.15 km towards East from State Highway (SH-71). The nearest airport is at Tiruchirappalli around 32 km from the site.

1.11 Soil Classification

The district of Trichy is covered by reddish-brown, dark grey, and deep black, while soil textures range from loamy to clayey, with sandy textures present near riverbeds.

2. DESCRIPTION OF THE ENVIRONMENT

2.1 Climate

The maximum temperature recorded was 31.8°C and the minimum temperature was 22.2°C at the weather monitoring station at the project site. Relative humidity at site ranged from 40% to 55%. The total rainfall recorded during the study period is NIL. Wind speed and direction are recorded at site every hour. The predominant winds during this season are mostly from W to E.

2.2 Ecology

There are no notified reserve forests within 10 km radius of the study area. However, the following unnotified reserve forests and waterbodies are present within 10 km radius of the site,

- Veeramalai Reserve Forest – 5.62 km (NW)
- Amayapuram Reserve Forest – 5.73 km (W)
- Poigai Malai Reserve Forest – 8.02 km (SW)
- Pond near Samudram – 4.67 km (SE)
- Vengaikurichi Kulam – 9 km (SW)

The area does not shelter any specific wildlife. There is no tree cutting or removal of plantations, etc. involved. Adequate separation from rivers and canals is ensured.

2.3 Ambient Air Quality

Ambient air quality monitoring was conducted at eight locations — Project Site, Amayapuram, Manapparai, Periapatty, Kalarampatty, Samudram, Porundalur, and Rajalipatty — representing the core and buffer zones of the study area.

The results indicate that PM₁₀ concentrations ranged from 41.9 to 60.4 µg/m³, PM_{2.5} from 20.95 to 30.20 µg/m³, SO₂ from 5.70 to 7.90 µg/m³, and NO_x from 10.83 to 15.01 µg/m³, while CO remained below 0.02 mg/m³ at all stations.

All measured values are well within the limits prescribed by the National Ambient Air Quality Standards (NAAQS, 2009), indicating good air quality conditions in the project area. The results confirm that the site and its surroundings have clean baseline air quality, suitable for the establishment of the proposed Ultramarine & Pigments Limited project.

2.4 Noise Levels

Noise monitoring conducted at eight locations around the project site showed daytime Leq levels between 60.6 and 62.9 dB(A) and nighttime Leq levels between 47.3 and 52.2 dB(A). All values are within CPCB prescribed limits for industrial and mixed-use areas. The data confirms that the existing ambient noise environment is satisfactory and poses no concern for establishing the proposed Ultramarine & Pigments Limited unit.

2.5 Water Quality

Groundwater

Groundwater analysis from six locations (Project Site, Amayapuram, Periapatty, Kalarampatty, Porundalur, and Rajalipatty) confirms that all parameters comply with IS 10500:2012 standards.

The analytical results indicate that all parameters are within the acceptable limits of IS 10500:2012, confirming good overall water quality. The pH values (6.9–7.6) show neutral to slightly alkaline conditions, while total dissolved solids (385–935 mg/L) and total hardness (205–445 mg/L) indicate moderate mineral content. Major ions such as chlorides (355–460 mg/L) and sulphates (120–221 mg/L) are well within permissible limits. Nutrient concentrations, including nitrates (2.8–4.8 mg/L) and fluorides (0.2–0.5 mg/L), are low, suggesting minimal influence from agricultural or domestic sources. Heavy metals like iron, lead, arsenic, and chromium were below detectable limits, confirming the absence of toxic contamination.

Surface Water

Surface water samples from two locations—SW1 (Pond near Manapparai) and SW2 (Pond near Samudram)—were analyzed to assess existing water quality status. The results reveal that pH, TDS, hardness, chlorides, and DO are within acceptable ranges, while BOD and COD values indicate no organic or industrial contamination. All heavy metals were below detectable limits, and microbiological quality was found satisfactory.

2.6 Soil Quality

The soil quality in and around the proposed project area (Project Site and surrounding villages – Amayapuram, Manapparai, Periapatty, Kalarampatty, Samudram, Porundalur, and Rajalipatty) reflects moderate fertility with no significant pollution indicators.

The soils are sandy loam in texture, slightly acidic to neutral in nature, and nutrient-rich, particularly in nitrogen, phosphorus, and potassium. Organic carbon levels are moderate to high, suggesting favorable conditions for vegetation.

Heavy metals such as cadmium, chromium, lead, and nickel were below detectable limits, confirming the absence of industrial contamination. The soils exhibit good physical characteristics, including acceptable bulk density, porosity, and permeability.

Overall, the soil environment within the study area is healthy, non-contaminated, supporting sustainable land use and greenbelt development around the project site.

3. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

3.1 Air Environment

Construction Phase

During construction, emissions will mainly arise from earthwork, site clearance, and vehicle movement, generating temporary dust ($PM_{10}/PM_{2.5}$) and minor exhaust from machinery. The impacts will be short-term and confined within the project site.

Operation Phase

In operation, key emission sources will include the pigment kiln, 6 TPH boiler, thermic fluid heater, drying units, dust collectors, and 1100 kVA DG set. Fuels used—LPG/LNG/PNG (2000 TPA), SKO (50 TPA), and diesel (500 L/hr)—will release PM, SO_2 , NO_x , and CO, depending on pigment composition. All stacks, ranging 12–55 m in height, are equipped with bag filters and wet scrubbers to ensure effective dispersion and compliance with NAAQS standards.

Mitigation Measures

Dust suppression through water sprinkling and vehicle covering will control construction emissions. During operation, efficient air pollution control devices (APCDs), continuous monitoring, paved roads, and a thick greenbelt will minimize residual impacts.

3.2 Water Environment

Construction Phase

Water will be used mainly for curing, domestic use, and dust suppression, supplied by SIPCOT. Wastewater from labor camps will be managed through septic tanks and soak pits, ensuring no discharge to surface bodies.

Operation Phase

During operation, total water demand will be 355 KLD (101 KLD fresh and 254 KLD recycled). Sewage (23 KLD) will be treated in a 25 KLD STP, while 248 KLD of process effluent will be treated in a 300 KLD ETP with an ATFD to achieve Zero Liquid Discharge. Treated water will be fully reused, and ATFD salts recycled or sent to authorized users.

Mitigation Measures

All wastewater systems will be leak-proof and flow monitoring. Roof and stormwater runoff will be collected and harvested. No untreated discharge will leave the premises.

3.3 Land Environment

Construction Phase

Site preparation may cause minor soil erosion and compaction, while excavated topsoil will be preserved for landscaping. The site falls within the SIPCOT industrial estate, requiring no change in land use.

Operation Phase

The developed area will host process blocks, utilities, greenbelt, and internal roads. Solid wastes such as refractory scrap, HDPE bags, and ATFD salt will be handled in paved areas to prevent soil contamination.

Mitigation Measures

Lined drains, stable slopes, and reuse of waste will minimize erosion and contamination. A 33 % greenbelt will improve soil quality and aesthetics.

3.4 Noise Environment

Construction Phase

Noise from vehicles and construction machinery will be temporary and restricted to daytime.

Operation Phase

Noise will mainly come from the kiln, boiler, compressors, and DG set. These sources are confined within the premises and will have limited off-site impact.

Mitigation Measures

Acoustic enclosures, silencers, anti-vibration mounts, and PPE will be used. A greenbelt buffer will reduce propagation, and periodic monitoring will ensure compliance with CPCB limits.

3.5 Solid and Hazardous Waste Management

Construction Phase

Construction activities will produce small quantities of debris, metal scrap, and packaging waste, which will be segregated and reused where possible.

Operation Phase

Solid wastes like refractory scrap (70 TPM), HDPE bags (0.6 TPM), ATFD salt (100 TPM), and STP sludge (0.04 TPM) will be reused or disposed of safely. Hazardous wastes such as pigment washing scum (12 TPM), ETP sludge (24 TPM), and used oil (0.1 TPM) will be sent to TNPCB-authorized recyclers or TSDF.

Mitigation Measures

Waste segregation, reuse, and proper storage on impervious floors will prevent contamination. All hazardous waste will comply with the norms, with records and annual returns maintained.

3.6 Occupational Health and Safety

Construction Phase

Workers will be exposed to risks from height work and equipment operation. Proper PPE, safety supervision, and first-aid facilities will be ensured.

Operation Phase

Operational risks involve exposure to dust, chemicals, and heat. Adequate ventilation, local exhausts, and automation will reduce exposure, supported by regular health check-ups.

Mitigation Measures

A dedicated EHS team will ensure compliance with the Factories Act. Safety signage, fire-fighting systems, gas detectors, and emergency response plans will be implemented.

3.7 Ecology and Biodiversity

Construction Phase

The site lies within an existing industrial park with minimal vegetation and fauna. Ecological impacts will be negligible.

Operation Phase

Since there will be no external effluent or emission discharge, ecological effects will be insignificant. The nearest reserve forests are located beyond 5 km.

Mitigation Measures

A 10.8-acre greenbelt (33 % area) with native species will be developed along the periphery and roads, enhancing biodiversity and acting as a dust and noise barrier.

3.8 Socio-Economic Environment

Construction Phase

The project will generate temporary employment and benefit local suppliers and service providers.

Operation Phase

During operation, around 80 persons will be employed directly, with indirect jobs in transport and maintenance. The project will boost the regional economy and infrastructure.

Mitigation Measures

Local people will be prioritized for employment. CSR initiatives will support health, sanitation, and education in nearby villages, improving social well-being.

4. ENVIRONMENTAL MANAGEMENT PLAN

4.1 Water Consumption

S. No.	Source	Quantity (KLD)
1.	Process	265.00
2.	Cooling Tower Make-Up	20.00
3.	Boiler Make-Up	25.00
4.	Domestic Usage	25.00
5.	Greenbelt	20.00
Total Water Requirement		355.00
Freshwater from SIPCOT		101.00
Recycled Water (Greenbelt & Process)		254.00

4.2 Wastewater generation

S. No.	Particulars	Quantity (KLD)	Method of Treatment
1	Sewage	23.00	Will be treated by proposed STP of capacity 25 KLD. Treated sewage will be used for greenbelt.
2	Trade Effluent from process	243.00	Will be treated by proposed ETP of capacity 300 KLD. Recovery water to be used in process and ATFD salt will be used as a Raw material or Disposal through authorized user as a raw material.
3	Boiler Blowdown	2.00	
4	Cooling Tower Blowdown	3.00	

4.3 Solid Waste Generation

S. No.	Description	Quantity (TPM)	Method of Disposal
1	Broken Refractory Waste	70.00	Reused in the process
2	Used empty HDPE Bags	0.60	Disposal through authorized vendor
3	ATFD salt (Sodium Sulphate)	100.00	Used as a Raw material or Disposal through authorized user as a raw material
4	STP Sludge	0.04	Used as manure

4.4 Hazardous Waste Generation

S. No.	Description	Quantity (TPM)	Method of Disposal
1	Scum from Pigment Washing	12.00	Disposal through authorized vendor
2	Wastes or Residues Containing Oil	0.05	Disposal through authorized recycling facility
3	Used or Spent Oil	0.10	Disposal through authorized recycling facility
4	ETP Sludge	24.00	Disposal through authorized recycling facility

4.5 Air Pollution Control Measure

S. No.	Source of Emission Source	APC Measures	No. of Stacks
1	Kiln Process (Pigment Plant)	Stack with wet scrubber at a height of 55m.	2
2	Boiler – 6TPH	Stack with a height of 30m.	1
3	DG Set (1100 KVA)	Stack with a height of 30m	2
4	Thermic Fluid Heater	Stack with a height of 12m	6
5	Drying Process	Dust Collector with wet scrubber connected with stack at a height of 15m.	2
6	Dust Collectors (4 Nos.)	Bag filter connected to stack with a height of 15m	4

4.6 Greenbelt Development

Greenbelt will be developed inside the factory premises covering a total area of about 4.37 Hectares (33.01% of total area). The inter-spaces are laid with shrubs. The inter-space between trees planted is about 5 m.

Greenbelt Development

S. No.	Categories	To be Provided (Nos.)
1	Punga Maram	950
2	Veppa Maram	920
3	Arasa Maram	920
4	Vengai Maram	930
5	Poovarasu Maram	950
6	Vilva Maram	950
7	Vaagai Maram	880
TOTAL		6500

5. ENVIRONMENTAL MONITORING PLAN

5.1 Environmental Monitoring

- (a) A technical plan which spells out in detail the methodologies for measurement, the required frequencies of measurement, the planned location of measurement, data storage and analysis, reporting schedules and emergency procedures, and
- (b) Detailed budgets and procurement schedules for, necessary equipment and supplies, technical and administrative manpower.

The environmental monitoring for the project activity shall be conducted as follows:

- Air quality;
- Water and wastewater quality;
- Noise levels;
- Soil Quality; and
- Greenbelt Development.

5.2 Environmental Monitoring Cell

A Centralized environmental monitoring cell will be established for monitoring of important and crucial environmental parameters which are of immense importance to assess the status of environment during Plant operation. With the knowledge of baseline conditions, the monitoring program can serve as an indicator for any deterioration in environmental conditions due to operation of the plant, and helps in planning suitable mitigatory steps that of control of pollution since the efficiency of control measures can only be determined by monitoring. The following routine monitoring program will be implemented under the post-project monitoring in the project activity. The Monitoring program proposed to be implemented is given below.

5.3 Post Project Monitoring Plan

The environment, safety and health monitoring program in the factory are as follows:

Particulars	Parameter	Frequency of Monitoring
Stack Emissions	SPM, SO ₂ , NO _x , CO	Once in a month
Ambient Air Quality	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂	Once in a month
Waste water	pH, TDS	Continuous
Noise monitoring	Noise Levels	Monthly (Industrial Noise) Seasonal (Ambient Noise)
Ecology	Vegetation density and Biodiversity	Once a year
Safety and Occupational Health	--	Once a year

5.4 Environmental Management Reviews

The senior management shall periodically review the Environmental Management System (EMS) to ensure its suitability and effectiveness. The need for possible changes in the environmental policy and objectives for continuous improvement shall be ascertained and revisions made accordingly.

5.5 Emergency Preparedness Plan

Whoever notices an emergency situation such as fire, growth of fire, leakage etc. would inform his immediate superior and Emergency Control Center. The person on duty in the Emergency Control Centre would appraise the site controller. Site controller verifies the situation from the Incident Controller of that area or the shift In charge and takes a decision about an implementing on Site Emergency. This would be communicated to all the Incident Controllers, Emergency Coordinators. Simultaneously, the emergency warning system would be activated on the instructions of the Site Controller.

Fire Fighting Facilities

First Aid Firefighting equipment suitable for emergency should be maintained as per stationary requirements as well as per TAC Regulations. Fire hydrant line converting major areas would be laid. It would be maintained as 6 kg / sq. cm. Pressure.

Emergency Medical Facilities

Gas masks and general first aid materials for dealing with chemical burns, fire burns etc. would be maintained in the medical center as well as in the emergency control room. Private medical practitioners help would be sought. Government hospital would be approached for emergency help.

Responsible Persons available during Emergency

1. Site Controller or, Chief Coordinator
2. Incident Controller
3. Administrative Coordinator
4. Communication and Maintenance Coordinator
5. Fire & Safety Coordinator
6. Security Controller

5.6 Occupational Health and Safety

The project proponent strongly believes in the safety and health of the workers. The company will conduct regular medical check-ups of the workers and for the safer side there will always be a rotation of the workers where the exposure to dust and chemicals is high.

Provision of all necessary equipment like portable detectors, online detectors and other laboratory equipment for regular monitoring of workplace air and other conditions (temperature, humidity and light intensity etc.) shall be made. All the work places will be provided with MSDS of chemicals & materials being handled. The concerned employees will be trained and all the employees will be made aware of the hazards in handling chemicals.

Occupational health center for medical examination of employees with all the basic facilities will be established within the factory. The noise levels in critical area will be monitored regularly and the workers at high noise level generating areas should undergo audiometric tests once in six months.

Safety training is being provided by the safety officers to all the employees with the assistance of faculty members called from professional safety institutions and universities. In addition to regular employees, limited contractor labors are also provided with safety training.

5.7 Budgetary Allocation for Environmental Management Programme

S. No.	Particulars	Capital Cost in Crores	Annual Recurring Cost in Crores
1	Air Pollution Management	2.00	0.50
2	Continuous Emission Monitoring	0.75	0.05
3	Noise Reduction System	0.25	0.02
4	Water and Wastewater Management	6.50	1.50
5	Solid Waste Management	1.15	0.02
6	Green Belt Development	0.15	0.01
7	Rainwater Harvesting Systems	0.60	0.01
8	Environment Monitoring & Training	0.10	0.05
9	Occupational Health & Safety	0.50	0.15
TOTAL		12.00	2.31

5.8 Budgetary Allocation for CER Activities

S. No.	Description	Rs. In Crores
1	Development Facilities for Government Higher Secondary in Udayapatti. ➤ Tree Plantation ➤ Renovation & Maintenance of Toilets ➤ Establishment of Library	0.55
2	Development Facilities for Government Higher Secondary School in Sathirapatti. ➤ Tree Plantation ➤ Renovation & Maintenance of Toilets ➤ Establishment of Library	0.55
3	Development Facilities for Government Higher Secondary School in Muthapudyanpatti. ➤ Tree Plantation ➤ Renovation & Maintenance of Toilets ➤ Establishment of Library	0.55
TOTAL		1.65