DRAFT ENVIRONMENTAL IMPACT ASSESSMENT

Executive Summary of Draft Environmental Impact Assessment

for

Proposed Manufacturing of Ethyl Acetate

by

M/s. Pro Gro Bio Private Limited,

at

Gat No.: 158, Shiv Patti, Village: Tandali Wadgaon, Tehsil & District: Ahmednagar, Maharashtra

Project Proponent:

M/s. Pro Gro Bio Private Limited,

Gat No.: 158, Shiv Patti, Village: Tandali Wadgaon, Tehsil & District: Ahmednagar, Maharashtra

Consultant

Southern Enviro Engineers Pvt. Ltd.
Act Responsible Think Sustainable

Southern Enviro Engineers Pvt. Ltd.

(Certificate No.: NABET/EIA/2326/IA 0119, Validity: 29.03.2026)

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EXECUTIVE SUMMARY

1.0 Introduction

Environmental Impact Assessment (EIA) is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision-making tool, which guides the decision makers in taking appropriate decisions for proposed projects. EIA systematically examines both beneficial and adverse consequences of the Proposed project and ensure that these impacts are taken into account during the project designing.

M/s. Pro Gro Bio Pvt. Ltd. is interested in installing a process plant facility to produce Ethyl Acetate from esterification of SDS (Special Denatured Spirit)/Ethanol with Acetic Acid using reactive distillation coupled with tightly integrated product separation and purification. Experienced process engineers with extensive experience in simulation and design have developed a process for this ethyl acetate project, which will achieve zero carbon emissions using the latest state-of-the-art technology. The project has a planned production capacity of 65 metric tons per day.

M/s. Pro Gro Bio Pvt. Ltd. has proposed Manufacturing Ethyl Acetate facility at Gat No – 158, Shiv Patti, At- Tandali Wadgaon, Tal. & Dist. Ahmednagar - 414006. The technology of the products is developed by the promoters and is well established. The total cost of the project is 12 Crore.

1.1 Purpose of the Report

The purpose of this Environmental Impact Assessment (EIA) study is to provide information on the nature and extent of environmental impact which might arise from the production of “To manufacture organic and inorganic chemical Industry”.

EIA study is in particular essential for the industries causing significant environmental impacts. Ministry of Environment, Forests & Climate Change (MoEF&CC), Government of India has issued EIA Notification dated 14th September, 2006 in which guidelines are given for conduct of EIA study and also the list of industries attracting the said notification.

7/12 of the Land is avaliable. There is a change in land use. The NOC from Tehsildar order bearing file no. क्र.कावि/जमीन/एनएएसआर/०८/२०२४ dated 27th May 2024 is received. The industry falls under category B1 schedule 5(f) i.e., Synthetic Organic Chemicals Industry, as per EIA Notification dated 14th September, 2006 and its amendments made time to time as it is “Zero Liquid Discharge” (ZLD) concept project.

Accordingly, EIA studies were conducted and the report was prepared for submission to Authorities. The proposed Project is not situated in MIDC notified industrial area of Govt. of Maharashtra. Hence, public hearing is required for this project.

1.2 Environmental Clearance

As per G.O.I Notification dated 14.09.2006 any project covered under Schedule I said notification requires Environmental Clearance before starting any construction at project site. It is a Category 'B1' project under schedule 5(f) in EIA Notification, 2006. This EIA-EMP report has been prepared to assess the likely impact of the proposed project on various factors which may be affected with the implementation of the programme and to carry out public hearing as per TOR issued by SEIAA, MoEF&CC, Maharashtra.

M/s. Pro Gro Bio Private Limited has received Consent to Established from MPCB on Dated 13.06.2023.

1.3 Terms of Reference

For grant of Terms of references from SEAC for conduct of EIA studies, an application was submitted by M/s. Pro Gro Bio Pvt. Ltd. on 1st July 2024. The auto generated ToR as received vide no. TO24B0202MH5510081N on 6th August 2024.

1.4 Brief Description of Nature, Size and Location of the project

M/s. Pro Gro Bio Pvt Ltd has proposed Manufacturing of Ethyl Acetate facility at Gat No.: 158, Shiv Patti, At: Tandali Wadgaon, Tal. & Dist.: Ahmednagar - 414006. The technology of the products is developed by the promoters and is well established. Brief description about the nature, size and location of the project is given in **Table 1**. The project location map is given in **Figure 1**, 10 km study area map is given in **Figure 2**, Google image of the project is given in **Figure 3** and project layout map is given in **Figure 4**.

Table 1: Project Details & Environmental Setting in 10 km Study Area of the Project Site

<table>
<tr><th>S. N.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1.1</td><td>Products</td><td>
<table>
<tr><th>S. N.</th><th>Name of the Product</th><th>UOM</th><th>Qty.</th></tr>
<tr><td>1</td><td>Ethyl Acetate</td><td>TPD</td><td>65</td></tr>
</table>
</td></tr>
<tr><td>1.2</td><td>Working days</td><td>350 working days</td></tr>
<tr><td>2.</td><td>Location details</td><td>
<table>
<tr><td>Village/Plot No.</td><td>Tandali Wadgaon, Gat No. – 158, Shiv Patti</td></tr>
<tr><td>Tehsil</td><td>Ahmednagar</td></tr>
<tr><td>District</td><td>Ahmednagar</td></tr>
<tr><td>State</td><td>Maharashtra</td></tr>
<tr><td>Pin code</td><td>414006</td></tr>
</table>
</td></tr>
<tr><td>2.1</td><td>Latitude/ Longitude</td><td>
<table>
<tr><th>S. N.</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>1</td><td>18°55'48.17"N</td><td>74°46'3.42"E</td></tr>
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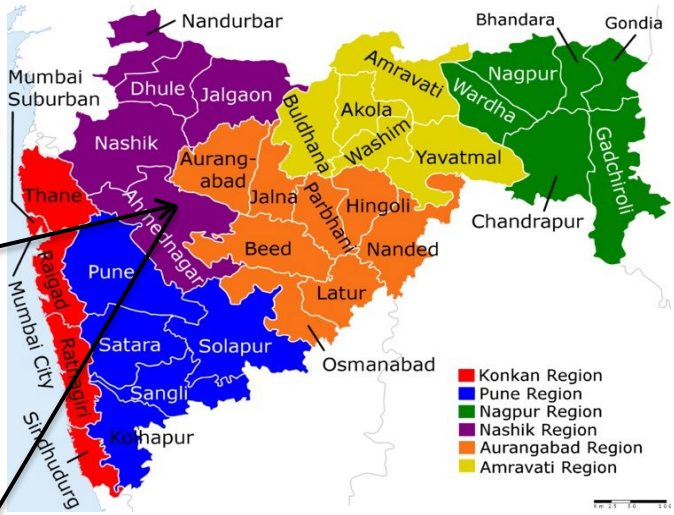
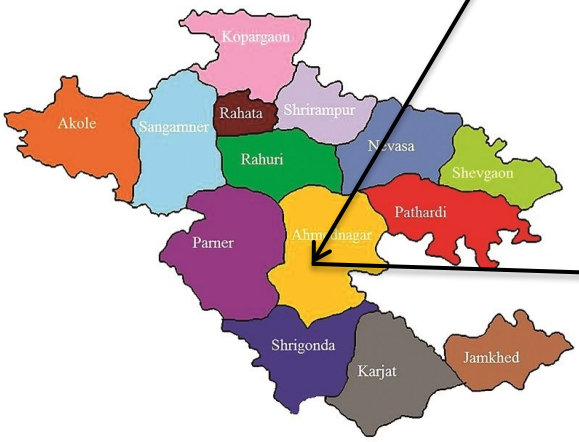
<tr><td></td><td></td><td>
<table>
<tr><td>2</td><td>18°55'45.69"N</td><td>74°46'2.82"E</td></tr>
<tr><td>3</td><td>18°55'46.43"N</td><td>74°45'57.77"E</td></tr>
<tr><td>4</td><td>18°55'48.65"N</td><td>74°45'59.97"E</td></tr>
</table>
</td></tr>
<tr><td>2.2</td><td>Toposheet No</td><td>E43I13_47J13</td></tr>
<tr><td>3.</td><td>Area Details</td><td>
<table>
<tr><td>1</td><td>Plot area mention in 7/12 abstract</td><td>37,550</td><td>m^2</td></tr>
<tr><td>2</td><td>Plot area mention in NA order dated 27.05.2024</td><td>23,253</td><td>m^2</td></tr>
<tr><td>3</td><td>In this Phase, we will utilize a portion of the plot area</td><td>2,788.90</td><td>m^2</td></tr>
<tr><td>4</td><td>Proposed Green belt area (35% of utilize a portion of the plot area)</td><td>983.89</td><td>m^2</td></tr>
</table>
</td></tr>
<tr><td>4.</td><td colspan="2">Environmental Setting Details (with approximate aerial distance and direction from the project site)</td></tr>
<tr><td></td><td>Nearest City</td><td>Ahmednagar: 17 km (Direction w.r.to project site)</td></tr>
<tr><td></td><td>Nearest Highway</td><td>Solapur – Pune Highway: 5.84 km (Direction w.r.to project site)</td></tr>
<tr><td></td><td>Nearest Railway Station</td><td>Ahmednagar Railway Station: 15 km (Direction w.r.to project site)</td></tr>
<tr><td></td><td>Nearest Airport</td><td>Pune International Airport: 98 km (Direction w.r.to project site)</td></tr>
<tr><td></td><td>National Parks/ Wild Life Sanctuaries/ Biosphere Reserves/ RF and PF within 10km radius</td><td>No National Parks/ Wild Life Sanctuaries/ Biosphere Reserves exist within 10 km radius.</td></tr>
<tr><td></td><td>Nearest Water Bodies</td><td>Valumba River: 4.00 km
Seena River: 24.36 km
Hanga River: 21.37 km</td></tr>
<tr><td></td><td>Nearest Police Station</td><td>Police station Arangaon: 12.5 km</td></tr>
<tr><td></td><td>Nearest Medical Facility</td><td>Shiv Hospital: 3.92 km</td></tr>
<tr><td></td><td>Defence Installations</td><td>No cantonment within 10 km distance of project site</td></tr>
</table>

S. N.	Particulars	Details
	Seismic Zone	Zone III Source-as per IS 1893 – 2002
5.	Cost Details	
	Project Cost	12 Crore (1200 Lakh)
	EMP Cost	Total EMP Cost: 0.45 Crore (45.04 Lakh) Capital Cost: 39.50 Lakh Recurring Cost: 5.54 Lakh
	CER Cost	0.24 Crore (24.0 Lakh)
6.	Basic Requirements of the Project	
	Fresh Water	26.5 KLD
	Fuel	LPG/PNG will be used in thermic fluid heater and diesel will be used for DG set.
	Manpower	25 persons will be required in operation phase

Location of Maharashtra State at Political Map of India



Location of Ahmednagar District on Maharashtra Map



Location of Project Site on Ahmednagar District Map

Location of Project Site on Google Earth

Figure 1: Location Map of the Project Site

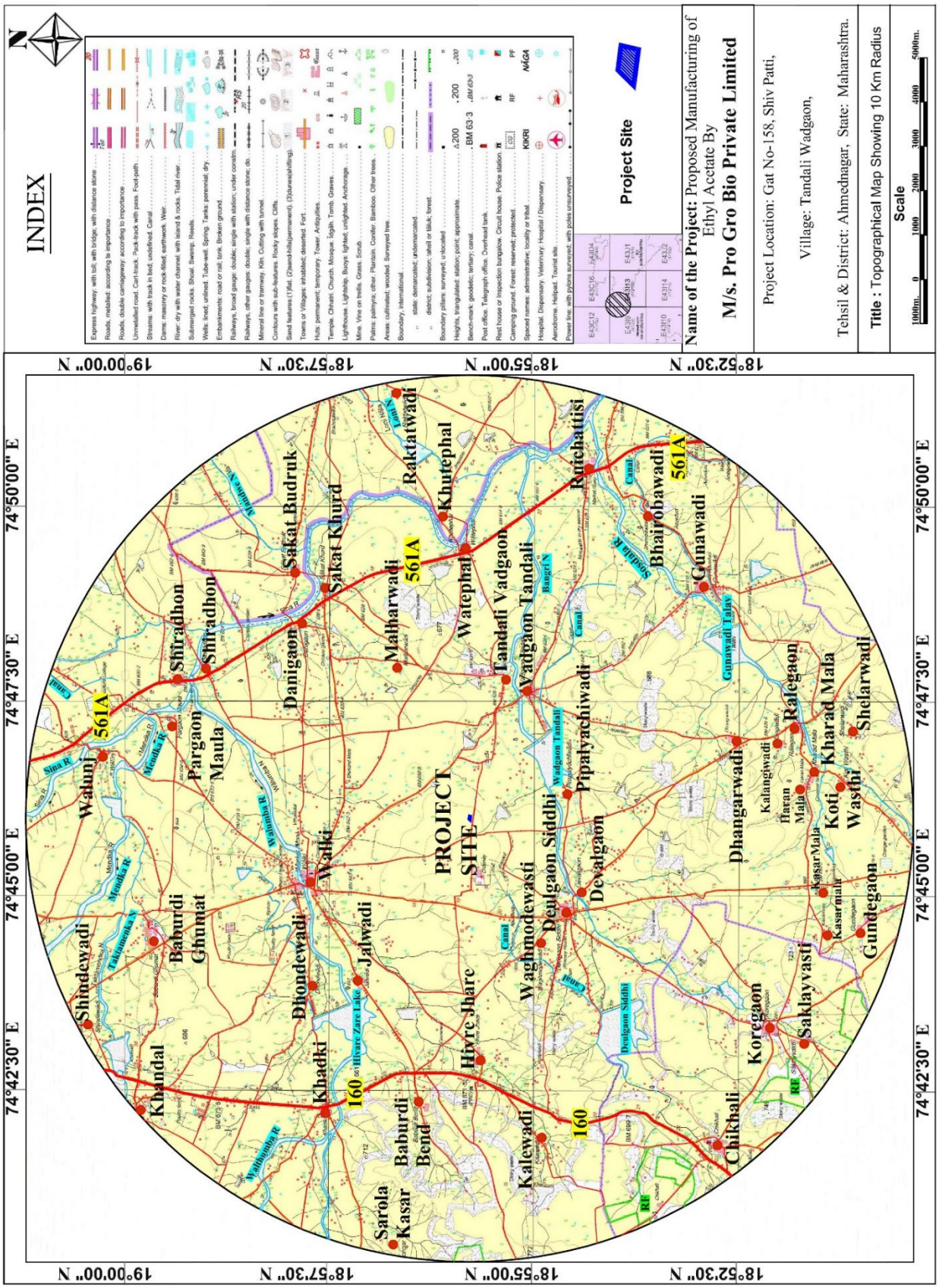


Figure 2: 10 km Topographic Study Area Map of the Project Site

S. N.	Latitude	Longitude
1	18°55'48.17"N	74°46'3.42"E
2	18°55'45.69"N	74°46'2.82"E
3	18°55'46.43"N	74°45'57.77"E
4	18°55'48.65"N	74°45'59.97"E

Figure 3: Google Image of the Project

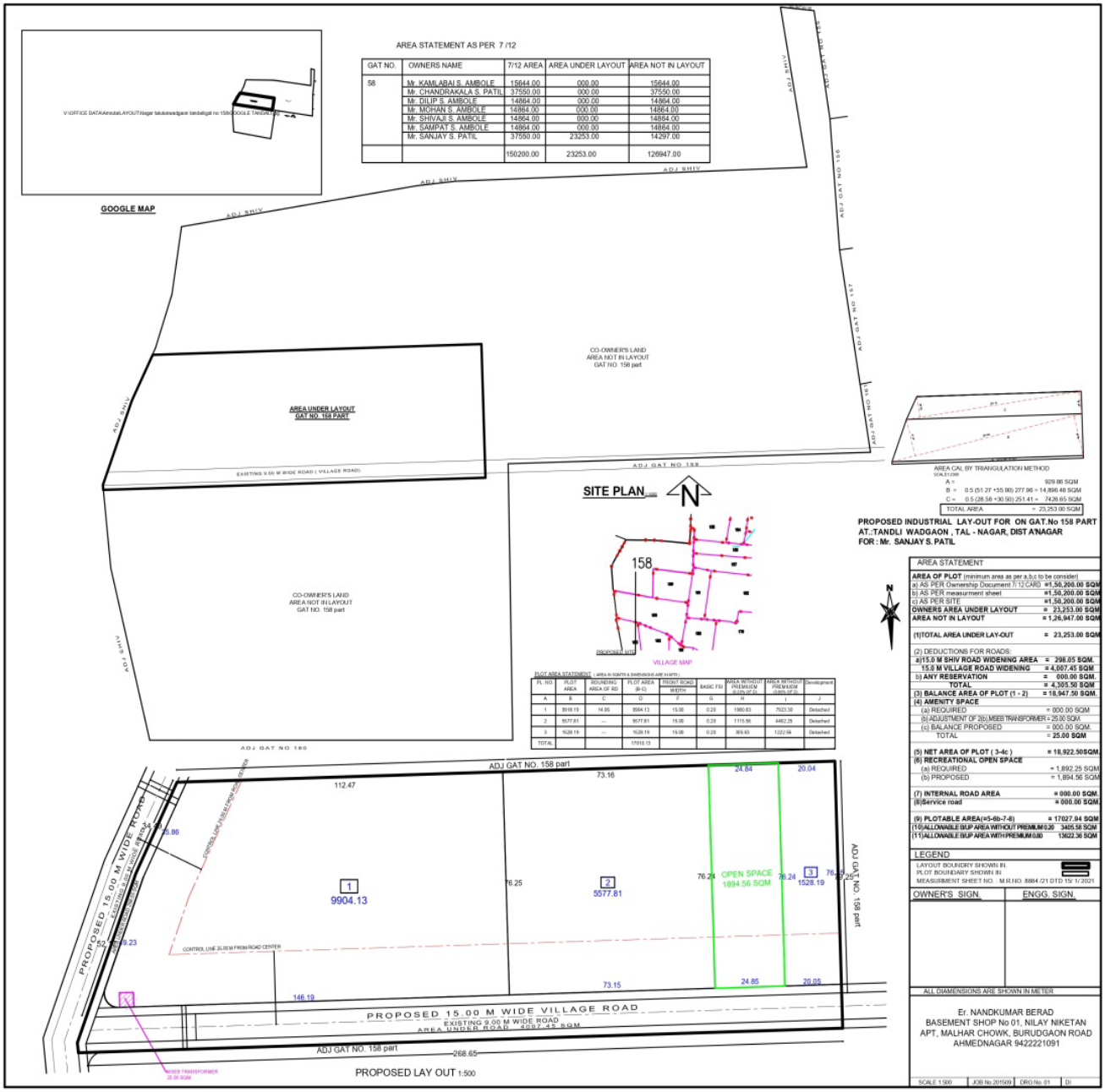


Figure 4: Project Layout Map

2.0 Project Description

2.1 Brief Description of Project

M/s. Pro Gro Bio Pvt. Ltd. has proposed Manufacturing of Ethyl Acetate facility at Gat No.: 158, Shiv Patti, At: Tandali Wadgaon, Tal. & Dist.: Ahmednagar - 414006. The technology of the products is developed by the promoters and is well established.

The Details of Ethyl Acetate is given in **Table 2**.

Table 2: Details of Ethyl Acetate

S. N.	Description	UOM	Details
1	Quantity per day	TPD	65
2	No of days per Month	No.	30
3	Batch Output	Tonne	18,655
4	No of batches per hour	TPH	2.71

Project Proponents

The Company has dedicated and experienced promoters and the director have capability of running the business with good reputation, dignity, dedication and devotion and hence are proposing to start the Manufacturing of Ethyl Acetate, Gat No.: 158, Shiv Patti, At: Tandali Wadgaon, Tal. & Dist.: Ahmednagar, Maharashtra – 414006.

S. N.	Name	Designation
1	Sanjay Sahebrao Patil	Director
2	Surekha Sanjay Patil	Director
3	Sanket Prakash Jadhav	Director
4	Priyanka Shivaji Deshmukh	Director

2.2 Raw Material Requirement

The raw material required for the manufacturing of above said products are sourced from the local market as well as import. Indicative list is included in **Table 3.**

Table 3: Details of Raw Materials

S. N.	Name of Raw Material	UOM	Quantity	Purity	State
1	Acetic acid	kg/hr.	1900	98%	Liquid
2	Ethanol	kg/hr.	1520	94%	Liquid

2.3 Water Requirement

The requirement of water shall be approx. 26.5 KLD. The water supply from the Ghospuri Yojana has been approved. We received the No Objection Certificate (NOC) for the water supply from the Wadgaon Tandali Gram panchayat on Dated: 09.09.2024. The entire waste

water will be recycled/reused within the industry. Consumption & discharge of water is given below in **Table 4** & Water Balance Diagram for the proposed project activity is shown in below **Figure 5.**

Table 4: Water Requirement

S. N.	User Source	Water Consumption (KLD)	Waste – Water Generation (KLD)
1.	Process	0	5
2.	Cooling Tower (Make-up water)	23.5	5
3.	Domestic use	1.13	0.9
4.	Greenbelt	1.25	0
5.	Dust Suppression	0.6	0
	Total	**26.48**	**10.9**
	Rounded off	**26.5**	

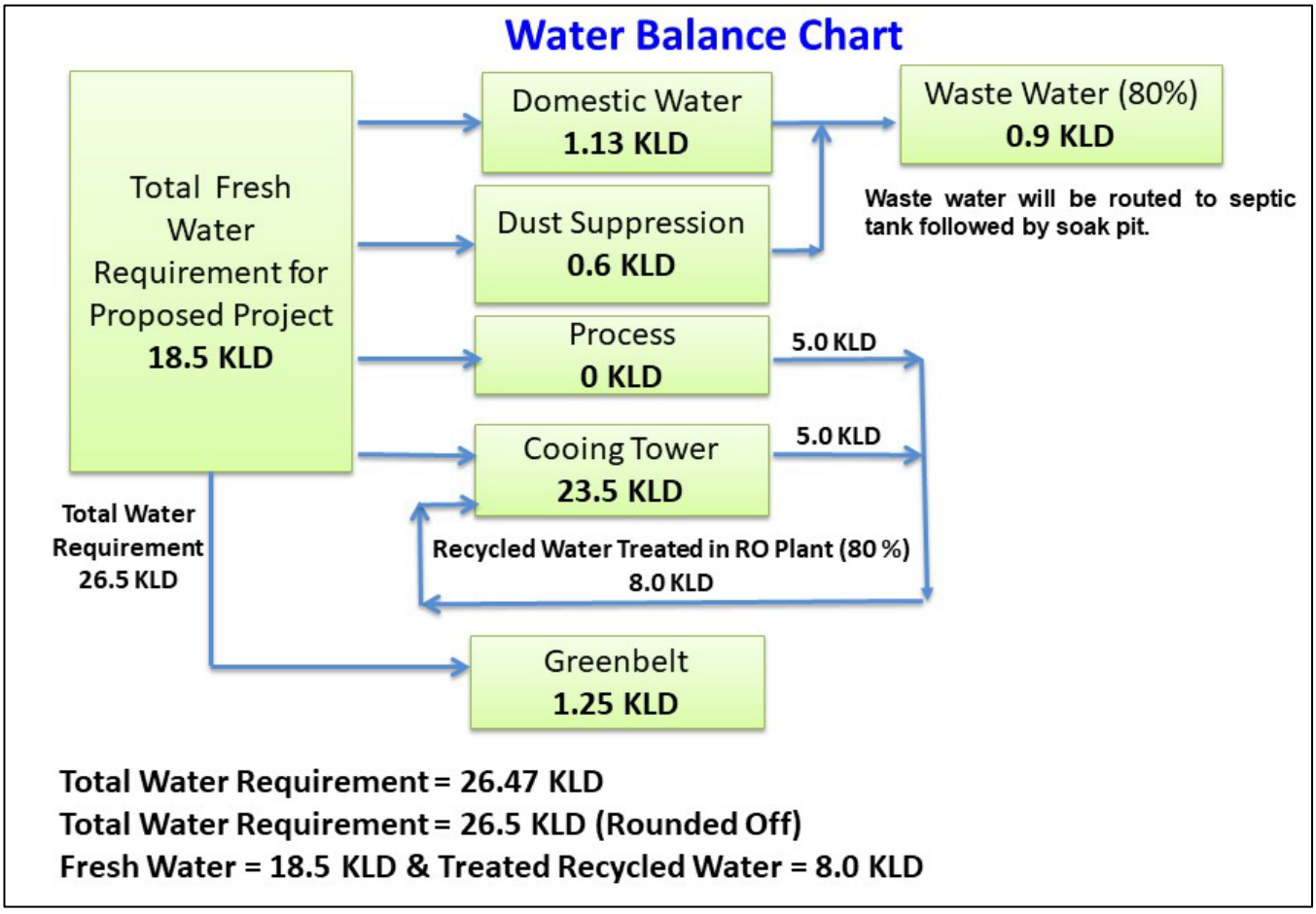


Figure 5: Water Balance Diagram

2.4 Land Requirement

The project site is located at agricultural land. There is a change in land use. Details of land requirement given in **Table 5.**

Table 5: Details of Land Requirement

S. N.	Description	Area	Unit
1	Plot area mention in 7/12 abstract	37,550	m^2
2	Plot area mention in NA order dated 27.05.2024	23,253	m^2
3	In this Phase, we will utilize a portion of the plot area	2,788.90	m^2
4	Proposed Green belt area (35% of utilize a portion of the plot area)	983.89	m^2

The land breakup details are presented in **Table 5.** Greenbelt will be developed in 35 % area which is being 9,572.03 sq. m.

Table 6: Land Use/Land Cover Area Statistics

LU/LC Classification System within 10 km Radius				
S. N.	**Level-I**	**Level-II**	**Area (km²)**	**Percentage (%)**
1	Built-up land	Settlement	20.40	6.41
		Industrial Settlement	6.45	2.03
		Road Infrastructure	4.93	1.55
		Railway Line	1.12	0.35
2	Agricultural Land/ Crop Land	Single Crop	163.77	51.47
		Double Crop	92.48	29.06
3	Scrubs/Wastelands	Open Scrub	8.40	2.64
		Wasteland	6.25	1.96
4	Water bodies	River/Nala/Stream/Canal	7.22	2.27
		Pond/Lake/Dam	7.17	2.25
		Total	**318.19**	**100**

2.5 Power Requirement

The total power demand for the unit will be 500 KW which will be supplied by Maharashtra State Electricity Board MSEB. Power backup will be done by providing 1 DG set of capacity 320 KVA. Solar panel for outer lighting, LED lights for inner lighting will be used as power saver. Total Power requirement is given in **Table 7.**

Table 7: Power Requirement

Description	Requirement
Power Requirement	500 KW
Source	MSEDCL

Energy requirements & savings:

Indicate the Energy saving measures like use of solar energy etc.

Street lighting shall be done completely with solar energy, likely saving of energy will be as follows:

Load Distribution:

1. Total Internal Lighting Load = 15 KW
2. Outer Lighting Load = 15 KW
3. Other Power load = 470 KW

Total Load = 500 KW

Saving: By using LEDs with tube lights = 20 KW

By adopting solar energy for Lighting (100%) = 30 KW

Percentage (30/500X100) = 6%

2.6 Man Power Requirement

The total manpower required for the proposed project will be 25 nos.

The skilled/semiskilled/unskilled manpower required for the proposed project. The man power requirement will be fulfilled from the local area, to help for the improvement of the socio-economic status in the surrounding rural areas. The details of employment are given in **Table 8.**

Table 8: Man Power Requirement

Particulars	No. of Employees	Functional Area
Key managerial staff	3	Finance, Marketing, Production, Quality control, R&D, Logistics etc.
Administration	3	Office work
Skilled and semi-skilled	19	Production Process, Maintenance, stores, Safety & Un skilled workers
Total	**25**	

2.7 Process Description and Technology

Manufacturing of Ethyl acetate is a continuous process. The detailed manufacturing process is outlined below; Process consists of following Steps;

Ethyl Acetate is produced by simultaneous reaction and distillation in presence of a catalyst (Sulfuric Acid or Para toluene Sulphonic Acid. The esterification reaction is reversible and hence complete conversion is not possible as the reaction would reach to equilibrium at some concentration level. However, we have designed an Innovative scheme with smart heat integration and recycle configuration which dramatically reduce capex and operating cost and ensure 100% conversion, high purity product and low operating cost. Simplified Process Flow diagram is shown in **Figure 6** below.

Flow controlled quantity of 98% Acetic Acid is fed from Acetic Acid day tank T-100 by pump P-100 A/B to upper Section of C-100 which is bubble cap type distillation column. Catalyst (Sulfuric Acid or PTA) is also fed to the same tray of the column. A liquid level is maintained in each tray by an overflow weir. Similarly, controlled quantity of 94% SDS (Special Denatured Spirit) is fed from SDS (Special Denatured Spirit) day tank T-101 by pump P-101A/B at the bottom section of the reactive distillation column. Following reaction takes place in liquid phase in each of the dray simultaneously with distillation to separate ethyl acetate from water.

CH_3COOH	+	C_2H_5OH	$\longleftrightarrow$	$CH_3COOC_2H_5$	+	H_2O
(60 kg)	+	(46 kg)	$\longleftrightarrow$	(88 kg)	+	(18 kg)

Heat is supplied to the reboiler which provides require energy for the distillation. A vapor mixture containing about 67% Ethyl Acetate, 28% SDS (Special Denatured Spirit) and 5% water from the top of the reactive distillation column is send to E-101 which is the reboiler of the extractive distillation column C-101. Effluent water from the reactive distillation column, afterheat recovery in heat Exchanger E-105 is fed toward top section of the Extractive distillation column. Small quantity of water is removed continuously as wastewater and sent to effluent treatment section. Un-condensed vapor of the reactive distillation column is further condensed in E-102 and the condensate is collected in V-101. Part of the condensate is refluxed back to top of the reactive distillation column using pump P-104A/B while part is fed middle of the extractive distillation column.

In the extractive distillation (ED) column, unreacted SDS (Special Denatured Spirit) from the reactive distillation column is extracted using water and recycles back to the bottom section of reactive distillation column. Top vapor from the ED column contains about 85% ethyl acetate, 10% water and 5% SDS (Special Denatured Spirit). This vapor is compressed using K-101 compressor. This high-pressure vapor contains amount of heat required to drive Reactive Column Reboiler E-100 and

Dehydration Column Reboiler E-104. The uncondensed vapor of extractive column after heat recovery is then condensed in condenser E- 103, the condensed liquid is collected in reflux vessel V-102 from which part is refluxed back to ED column top tray and part is fed to top of the dehydration column C-102. Bottom product of the dehydration column is pure ethyl acetate which is pumped using pump P-105 A/B to product day tank T-102 after heat is recovered in product cooler E-106.

The process flow diagram is shown in **Figure 6.** The details of Manufacturing of Ethyl acetate are given in **Table 9**.

Table 9: Details of Ethyl Acetate

S. N.	Description	UOM	Details
1	Quantity per day	TPD	65
2	No of days per Month	No.	30
3	Batch Output	Tonne	18,655
4	No of batches per Hour	TPH	2.71

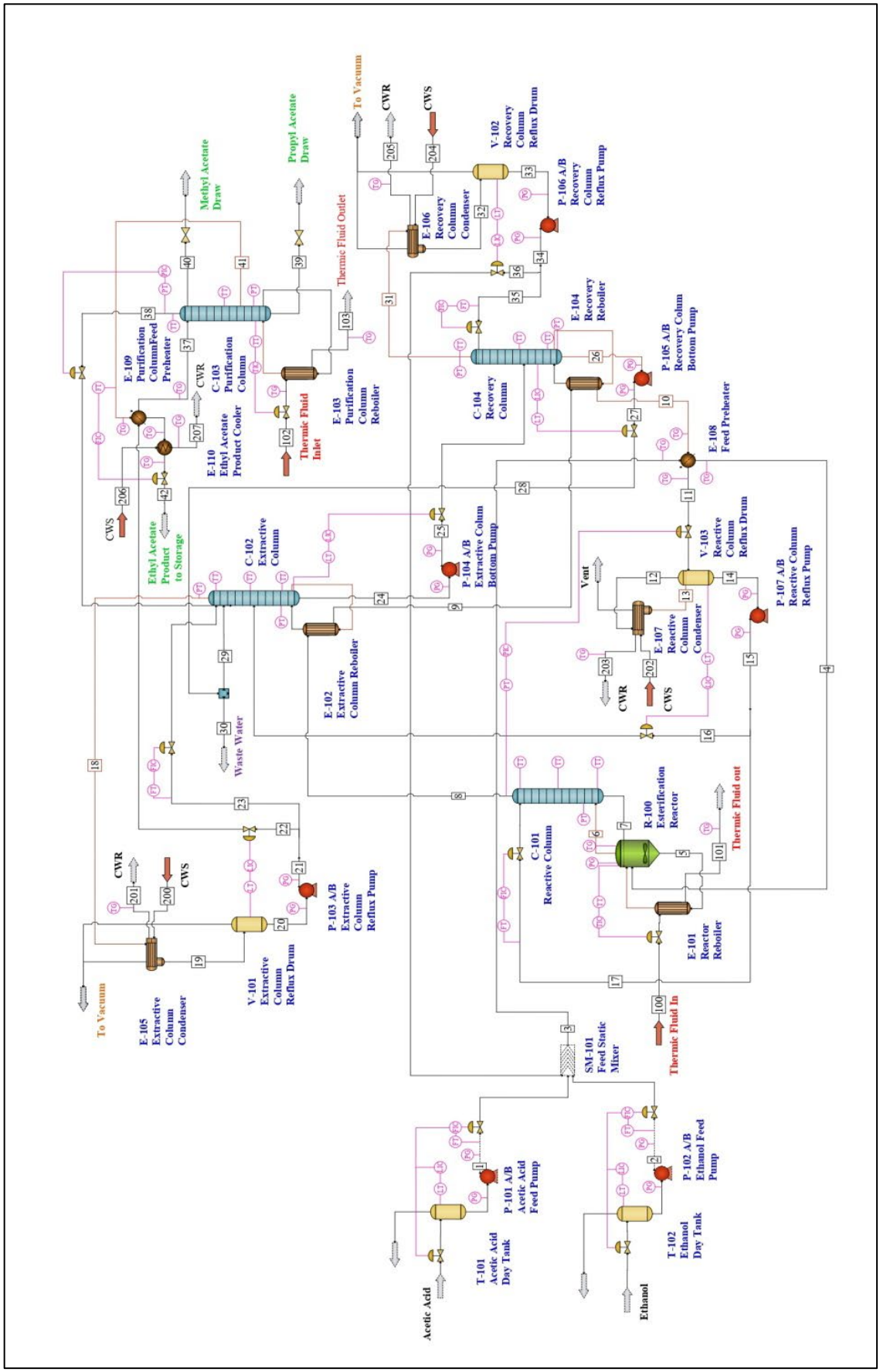


Figure 6: Process Flow Chart

3.0 Study Period (Baseline Environmental Studies)

The environmental monitoring for the EIA study, for the proposed new unit for manufacturing of Chemicals, has been conducted for the post monsoon season i.e.; October to December 2024. Initially, a reconnaissance survey of the study area was carried out and then field monitoring for measuring meteorological parameters, ambient air quality, water quality, soil quality and noise levels was carried out from 1st October to 31st December 2024. In addition, certain aspects like land area, socio-economic status, past meteorological conditions etc. have been analyzed based on secondary information available from sources like district census reports, district gazetteers, Indian meteorological department, etc. The baseline status of various environmental components is described in the succeeding sections.

Components of Study

This chapter contains information on existing environmental scenario for the following parameters.

1. Land Environment
2. Meteorology
3. Air Environment
4. Noise Environment
5. Water Environment
6. Soil Environment
7. Biological Environment
8. Socio-economic Environment

3.1 Meteorology

3.1.1 Climatic conditions

The climate of the district is characterized by dryness except a brief spell of monsoon season, a very hot summer and a bracing winter. The cold season extends from mid-November to the early part of March. The succeeding period up-to the end of June is the hot season. July, August and half of September constitute the southwest monsoon. The period from October to December is considered as post monsoon. June is generally the hottest month. Hot and scorching dust laden winds blow during summer season.

In order to study the meteorology of the project area, site specific Post Monsoon season meteorological data was collected. Annual Weather Averages & Windrose diagram is provided.

Temperature

May and June are the hottest months with daily average temperature going up to 40°C and minimum average daily temperature as 24°C. Hot scorching dust laden winds blow during the summer season and on individual day the temperature sometimes goes up-to 45°C to 47°C. With the on-set of monsoons in July there is appreciable drop in temperature but due to increased moisture in the air the weather becomes uncomfortable. After monsoon in September the night temperature drops appreciably. December and January are the coldest months when the maximum average daily temperature is around 22°C and minimum about 6°C. The yearly variation is from 4.0°C min to 45°C max.

Rainfall

The normal annual rainfall of the district is 621 mm which is unevenly distributed. The south west monsoon sets in from last week of June and withdraws in end of September, contributory about 80% of annual rainfall. July and August are the wettest months. Rest 22% rainfall is received during non-monsoon period in the wake of western disturbances and thunder storms. Generally, rainfall in the district increases from southwest to northeast.

3.2 Ambient Air Quality Status

The ambient air quality monitoring was done to assess the current status of air quality in the study area. Monitoring was carried out at eight stations for 1st October to 31st December 2024.

Total 8 sampling locations were selected based on the meteorological conditions considering upwind and downwind directions. The levels of Respirable Particulate Matter (PM_{10}), Fine Particulates ($PM_{2.5}$), Sulphur Dioxide (SO_2,) and Oxides of Nitrogen (NO_X) and Carbon Monoxide (CO) were monitored. Based on the above, the AAQ stations have been identified and locations of ambient air quality stations are presented in **Table 10**. The minimum and maximum values of PM_{10}, $PM_{2.5}$, SO_2, NOx & CO are summarized in **Table 11, 12, 13, 14 & 15.**

Table 10: Ambient Air Quality Monitoring Stations

Code	Monitoring Locations	Distance (km) /Dir. w.r.to Plant	Coordinates	Justification
AAQ1	Project site (Plant Area)	---	18°55'45.84"N 74°46'2.02"E	Reference
AAQ2	Walki	3.92 km/NW	18°57'37.16"N 74°44'55.75"E	Downwind Direction
AAQ3	Ralegan	5.32 km/SSE	18°52'58.73"N 74°46'39.75"E	Upwind Direction
AAQ4	Sarola Kasar	9.50 km/WNW	18°56'39.63"N 74°40'34.34"E	Downwind Direction
AAQ5	Tandali Wadgaon	1.30 km/SE	18°55'32.46"N 74°46'44.86"E	Nearest Habitation
AAQ6	Khadki	7.25 km/NW	18°57'31.31"N 74°42'17.08"E	Downwind Direction

AAQ7	Sakat	6.81 km/NE	18°57'52.16"N 74°49'13.19"E	Downwind Direction
AAQ8	Chikhali	8.93 km/SW	18°52'49.82"N 74°41'51.26"E	Upwind Direction

Summary of Ambient Air Quality Results

Table 11: Particulate Matter – PM_{10}

Location Name	A1	A2	A3	A4	A5	A6	A7	A8
Minimum	50.3	44.9	41.5	38.2	42.9	49.5	47.6	48.5
Maximum	60.3	54.0	49.7	48.0	52.0	58.6	57.0	58.0
Average	55.5	49.4	45.5	43.9	47.5	53.8	52.1	53.4
98th Percentile	57.4	57.4	57.4	57.4	57.4	57.4	57.4	57.4
CPCB Standards	**100**							

All Values are in µg/m^3

Table 12: Particulate Matter – PM2.5

Location Name	A1	A2	A3	A4	A5	A6	A7	A8
Minimum	25.9	21.9	17.3	15.7	18.3	24.8	23.5	23.5
Maximum	35.0	29.8	26.1	25.0	28.6	34.0	31.7	33.0
Average	29.9	26.4	22.6	21.0	24.0	29.1	27.6	27.7
98th Percentile	34.3	34.3	34.3	34.3	34.3	34.3	34.3	34.3
CPCB Standards	**60**							

All Values are in µg/m^3

Table 13: Sulphur Dioxide - SO_2

Location Name	A1	A2	A3	A4	A5	A6	A7	A8
Minimum	21.3	14.8	11.7	10.5	13.2	19.3	17.8	18.4
Maximum	24.9	19.0	16.0	15.0	18.0	24.0	21.0	22.0
Average	23.3	17.1	13.9	13.6	15.7	21.8	19.5	20.6
98th Percentile	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
CPCB Standards	**80**							

All Values are in µg/m^3

Table 14: Oxides of Nitrogen – NOx

Location Name	A1	A2	A3	A4	A5	A6	A7	A8
Minimum	25.1	18.3	16.1	15.3	18.0	23.5	21.0	22.4
Maximum	29.1	23.9	20.9	19.6	22.3	28.9	25.8	26.4
Average	27.3	21.2	18.0	17.7	19.9	26.0	23.7	24.7
98th Percentile	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5

CPCB Standards	80

All Values are in $\mu g/m^3$

Table 15: Carbon Monoxide – CO

Location Name	A1	A2	A3	A4	A5	A6	A7	A8
Minimum	1.0	0.2	0.6	0.1	0.1	0.8	0.6	0.7
Maximum	1.5	0.9	0.8	0.5	0.9	1.3	1.1	1.2
Average	1.3	0.5	0.7	0.3	0.5	1.1	0.8	0.9
98^{th} Percentile	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4

All Values are in mg/m^3

Conclusion

From the above results, it is observed that the ambient air quality with respect to PM_{10}, $PM_{2.5}$, SO_2, NOx and CO at all the monitoring locations was within the permissible limits specified by CPCB.

As per the baseline data collection, the maximum value of the PM_{10} was recorded at Project Site – 60.3 $\mu g/m^3$ and minimum value at Sarola Kasar – 38.2 $\mu g/m^3$. As per the baseline data collection, the maximum value of the $PM_{2.5}$ was recorded at Project site – 35.0 $\mu g/m^3$ and minimum value at Sarola Kasar Village – 15.7 $\mu g/m^3$. As per the baseline data collection, the maximum value of the SO_2 was recorded at Project Site – 24.9 $\mu g/m^3$ and minimum value at Sarola Kasar Village – 10.5 $\mu g/m^3$. As per the baseline data collection, the maximum value of the NOx was recorded at Project Site – 29.1 $\mu g/m^3$ and minimum value at Sarola Kasar Village – 15.3 $\mu g/m^3$.

3.3 Ambient Noise Levels

Ambient noise level monitoring was carried out at the 8 monitoring locations; those were selected for ambient air quality monitoring. The noise recording stations are shown in **Table 16**. The monitoring results are summarized in **Table 17.**

Table 16: Ambient Noise Quality Monitoring Stations

Code	Monitoring Locations	Distance (km) / Dir. w.r.t Plant	Coordinates	Monitoring Zone
N1	Project site (Plant Area)	---	18°55'45.84"N 74°46'2.02"E	-
N2	Walki	3.92 km/NW	18°57'37.16"N 74°44'55.75"E	Residential Area
N3	Ralegan	5.32 km/SSE	18°52'58.73"N74°46'39.75"E	Residential Area
N4	Sarola Kasar	9.50 km/WNW	18°56'39.63"N 74°40'34.34"E	Residential Area
N5	Tandali Wadgaon	1.30 km/SE	18°55'32.46"N 74°46'44.86"E	Residential Area
N6	Khadki	7.25 km/NW	18°57'31.31"N 74°42'17.08"E	Residential Area
N7	Sakat	6.81 km/NE	18°57'52.16"N 74°49'13.19"E	Residential Area

N8	Chikhali	8.93 km/SW	18°52'49.82"N 74°41'51.26"E	Residential Area

Table 17: Noise Level Results Leq dB (A) in and Around Project Area

S. N.	Location No.	Day Time (Hourly Equivalent)	Night Time (Hourly Equivalent)
1.	Project site (Plant Area)	51.2	46.5
2.	Walki	52.3	45.7
3.	Ralegan	51.9	46.5
4.	Sarola Kasar	52.2	46.1
5.	Tandali Wadgaon	52.4	44.2
6.	Khadki	51.4	44.7
7.	Sakat	50.9	43.5
8.	Chikhali	51.6	45.9

Table 18: Noise Standards (Source-CPCB)

Area Code	Category of Area	Noise dB(A) Leq	
		Day Time (6.0 am-10 pm)	Night Time (10.0 pm-6.0 am)
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

3.4 Surface and Ground Water Resources & Quality

Ground Water Sampling Locations:

Ground water sampling locations were selected surrounding within 10 km study area. Total 8 ground water samples were collected and analyzed from the study area. The locations of ground water sampling with its distance and direction w.r.to the project site are given in **Table 19.**

Table 19: Details of Ground Water Monitoring Stations

S. N.	Location	Distance/Dir. w.r.to project site	Latitude & Longitude
Ground Water (Tube Well/ Open Dug Well)			
1	Project site (Plant Area)	---	18°55'45.84"N 74°46'2.02"E
2	Walki	3.92 km/NW	18°57'37.16"N 74°44'55.75"E
3	Ralegan	5.32 km/ SSE	18°52'58.73"N 74°46'39.75"E
4	Sarola Kasar	9.50 km/WNW	18°56'39.63"N 74°40'34.34"E
5	Tandali Wadgaon	1.30 km/SE	18°55'32.46"N 74°46'44.86"E
6	Khadki	7.25 km/NW	18°57'31.31"N 74°42'17.08"E
7	Sakat	6.81 km/NE	18°57'52.16"N 74°49'13.19"E

8	Chikhali	8.93 km/SW	18°52'49.82"N 74°41'51.26"E

Conclusion:

- The pH of all the ground water samples was in the range of 7.31 – 7.53.
- Iron was observed in the Range of < 0.05.
- Total Hardness were found in the range of 135.4 – 152.6 mg/l.
- All the heavy metals were not detectable

Surface Water

2 Surface water sampling locations were selected within 10 km study area. The locations of surface water sampling with its distance and directions w.r.to the project site given in **Table 20.** Sampling and analysis were carried out, as per standard applicable methods. The summary of the results is presented below:

Table 20: Surface Water Sampling Locations

S. N.	Location	Distance/Dir. w.r.to project site	Latitude & Longitude
Surface Water			
1	Sina River Upstream – Near Village Watephal	5.88 NE	18°55'53.89"N 74°49'31.35"E
2	Sina River Downstream – Near Village Ruichattisi	8.91 SE	18°54'29.28"N 74°50'54.88"E

Conclusion:

- pH of the surface water collected ranged from 7.23 – 7.52
- TDS was found to be 286.3 – 364.3 mg/l. The tolerance limit is 1,500 mg/l as per IS:2296
- Total hardness was found to be 142.6 – 164.4 mg/l.
- Nitrate was found 13.6 – 22.6 mg/l.
- Total Coliform in water was 10 - 18 MPN/100 ml.
- All the heavy metals were not detectable

3.5 Soil Quality

The soil samples were collected from 8 sampling locations within an area of 10 km radius around the project for analysis of the physico-chemical characteristics of the soil quality. The locations of soil sampling stations are given in **Table 21.**

Table 21: Soil Sampling Locations

Code	Monitoring Locations	Distance (km) / Dir. w.r.t Plant	Coordinates	Soil sampling area

S1	Project site (Plant Area)	---	18°55'45.84"N 74°46'2.02"E	-
S2	Walki	3.92 km/NW	18°57'37.16"N 74°44'55.75"E	Residential Area
S3	Ralegan	5.32 km/S	18°52'58.73"N 74°46'39.75"E	Residential Area
S4	Sarola Kasar	9.50 km/NW	18°56'39.63"N 74°40'34.34"E	Residential Area
S5	Tandali Wadgaon	1.30 km/SE	18°55'32.46"N 74°46'44.86"E	Residential Area
S6	Khadki	7.25 km/NW	18°57'31.31"N 74°42'17.08"E	Residential Area
S7	Sakat	6.81 km/NE	18°57'52.16"N 74°49'13.19"E	Residential Area
S8	Chikhali	8.93 km/SW	18°52'49.82"N 74°41'51.26"E	Residential Area

Conclusion:

- pH of the soil samples was found to be in the range of 7.34 – 7.68.
- Organic Corbon of the soil samples was found to be medium exhibiting in the range of 1.26 % - 3.96 % and average fertility
- Soils are sandy loam predominantly.
- Nitrogen as N is varying from 246.3 – 325.6 mg/kg.
- Phosphorus was found in the range of 51.4 – 64.32 mg/kg.
- Potassium was found in the range of 0.52 – 1.55 Meq/100g
- Conductivity was observed in the range of 1125.3 – 1298.3 μS/cm.

3.6 Land Use / Land Cover Study

The land use land cover study has been done through digital image processing and visual interpretation technique to generate output of Land use / Land cover map of study area on 1:50,000 scale. The Land Cover classes and their coverage are summarized in **Table 22** and the same is shown in **Figure 7**.

Table 22: Land Use/Land Cover Area Statistics

LU/LC Classification System within 10 km radius				
S. N.	**Level-I**	**Level-II**	**Area (km²)**	**Percentage (%)**
1	Built-up land	Settlement	20.40	6.41
		Industrial Settlement	6.45	2.03
		Road Infrastructure	4.93	1.55
		Railway Line	1.12	0.35
2	Agricultural Land/ Crop Land	Single Crop	163.77	51.47
		Double Crop	92.48	29.06

3	Scrubs/Wastelands	Open Scrub	8.40	2.64
		Wasteland	6.25	1.96
4	Water bodies	River/Nala/Stream/Canal	7.22	2.27
		Pond/Lake/Dam	7.17	2.25
		Total	**318.19**	**100**

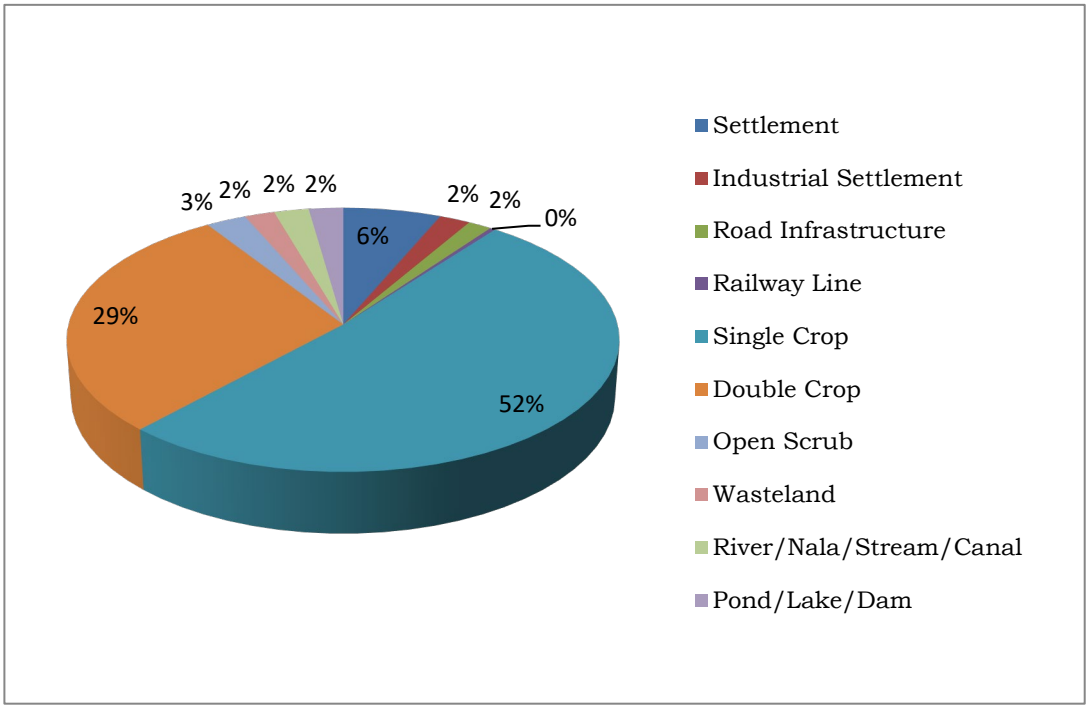


Figure 7: LULC Classification

3.7 Biological Environment

A natural ecosystem is a structural and functional unit of nature. It has different biological and physical components, which are interrelated to each other and survive by interdependence. An ecosystem has self-sustaining ability and controls the number of organisms at any level by cybernetic rules. The main objectives of the ecological survey were aimed at assessing the existing flora and fauna components in the study area, to understand the possible impacts on the biological environment caused by the proposed project activities, and to formulate, if necessary, the appropriate mitigation/preventive measures for such impacts. Data has been collected through secondary sources and by site visits.

3.8 Socio-economic Environment

Information on socio-demographic status and the trends of the communities in the 10 km radius was collected through primary social survey and secondary data from census 2011 & village directory 2011. Summary of the socio-economic status of the study area is given in **Table 23.**

Table 23: Population Details

S. N.	Particulars	0-10 km
1	Number of households	9375
2	Male population	28656
3	Female population	26722
4	**Total population**	**55378**
5	SC population	8952
6	ST population	1754
7	Average household size	6
8	% Of males to the total Population	52
9	% Of females to the total population	48
10	**Total Literates**	**40764**
11	Male Literates	22064
12	Female Literates	18700

4.0 Impacts during Construction Phase and Mitigation Measures

4.1 Air Environment

Anticipated Impacts

Impact on air environment will be due to dust generation and will be highly localized and confined to plant boundaries. Particulate emissions may cause occupational health like respiratory problems i.e. allergic asthma and watering of eyes etc.

Mitigation Measures

- Provision of PPE (dust masks, goggles) for onsite workers.
- Screening of construction area at boundary with tin sheets
- Periodic water sprinkling in the construction area.

Table 24: Incremental Emission Load due to Construction Activity Contributing in Existing Baseline Values

S. N.	Sampling Location Code & Name	PM_{10} (ug/m^3)			SO_2 (ug/m^3)			NOx (ug/m^3)			CO (mg/m^3)		
		BV	IV	RV	BV	IV	RV	BV	IV	RV	BV	IV	RV
1	*A1	40.7	0.19	40.89	8.8	0.19	8.99	14.3	0.16	14.46	0.02	0.28	0.3
2	A2	56.3	-		24.6	-		29.4	-		1.6	-	0
3	A3	59.6	-		26.8	-		31.6	-		1.8	-	0
4	A4	60.2	-		27.2	-		32.5	-		1.9	-	0
5	A5	58.4	-		28.1	-		35.2	-		1.8	-	0
6	A6	55.6	-		25.4	-		32.4	-		1.5	-	0
7	A7	59.4	-		29.3	-		14.3	-		1.9	-	0
8	A8	59.7	-		25.8	-		29.4	-		1.3	-	0
NAAQS Standards		100 (24 hourly)			80 (24 hourly)			80 (24 hourly)			4 (1 Hour)		

***** Note: BV- Baseline Value, IV- Incremental Value, RV- Resultant Value***

Table 25: Incremental Emission Load Due to Operation Activity Contributing in Existing Baseline Values

*****Note: BV- Baseline Value, IV- Incremental Value, RV- Resultant Value***

S. N.	Sampling Location Code & Name	PM_{10} (ug/m^3)			SO_2 (ug/m^3)			NOx (ug/m^3)			CO (mg/m^3)		
		BV	IV	RV	BV	IV	RV	BV	IV	RV	BV	IV	RV
1	*A1	40.7	0.26	40.96	8.8	0.23	9.03	14.3	0.21	14.51	0.02	0.33	0.29
2	A2	56.3	-		24.6	-		29.4	-		1.6	-	0
3	A3	59.6	-		26.8	-		31.6	-		1.8	-	0
4	A4	60.2	-		27.2	-		32.5	-		1.9	-	0
5	A5	58.4	-		28.1	-		35.2	-		1.8	-	0
6	A6	55.6	-		25.4	-		32.4	-		1.5	-	0
7	A7	59.4	-		29.3	-		14.3	-		1.9	-	0
8	A8	59.7	-		25.8	-		29.4	-		1.3	-	0
NAAQS Standards		100 (24 hourly)			80 (24 hourly)			80 (24 hourly)			4 (1 Hour)		

4.2 Water Environment

Anticipated Impacts

Fresh Water required will be supplied from well located near the project site.

Mitigation Measures

- Temporary arrangement of clean drinking water will be provided for workers
- Toilets will be provided and connected to septic tanks discharging to soak pits (during construction phase).

4.3 Noise & Vibration Environment

Anticipated Impacts

Noise and vibrations will be generated in construction phase. As the phase of construction and plant erection will be of temporary nature, noise pollution will be confined to plant boundaries only.

Mitigation Measures

- Adequate PPE (ear muffs, ear plugs) for construction workers.
- Adequate barrier will be provided to prevent noise propagation
- Use construction machinery meeting in EP Act norms for noise.

4.4 Land Environment

Anticipated Impacts

Plant erection involves levelling of land and excavation. Solid waste generated will include demolition rubble, substratum removed during foundation, broken concrete, glass, bricks and scrap iron pieces, insulation, packaging materials, plastic drums etc. Hazardous waste generated includes paint drums, glass wool insulation, etc. Improper waste disposal can lead to unhygienic conditions and hazards to nearby populace.

Mitigation Measures

- Separate area will be earmarked for storage of solid wastes generated while hazardous wastes will be stored in covered area earmarked for the purpose.
- Substratum removed during foundation, broken pieces of concrete, bricks will be given for levelling.
- Wastes like broken glass, plastic drum/ bags / iron scrap etc. will be sold to scrap dealers for recycle.
- Waste paint cans, brushes and filters, glass wool material and packing will be stored separately and disposed of to CHWTSDF facility.

4.5 Ecological & Biological Environment

Anticipated Impacts

There is no wild life sanctuary/national park located within study area. There is considerable agricultural fallow and urban area in study area. No mass nesting was observed within site during site visit, owing construction activity there will be insignificant adverse impact on fauna also.

Mitigation Measures

- Provide barriers around site with water sprinkling to reduce particulate dust generation
- Relatable number of trees will be planted around new plant boundary and on road sides adjoining plot

4.6 Occupational Health & safety

Anticipated Impacts

Health of workers may be affected due to dust and noise and possibility of accidents.

Mitigation Measures

- Adequate provision of PPE (helmets, safety shoes, harness, ear plugs, muffs, dust masks) for construction workers.
- Insurance for construction workers and extending medical facilities to all concerned.

4.7 Socio- Economic Environment

Impacts on socio-economic environment due to proposed project during construction phase are envisaged due to direct and indirect employment which will be beneficial.

Anticipated Impact

There will be temporary employment for about 25 persons over about 8 - 12 months. It will create business opportunities to suppliers of construction material, fabricators, manpower suppliers, civil contractors etc. Local labours will be employed during construction phase.

Mitigation Measures

- Engage local contractors for non-specialized work
- Provide adequate water supply and sanitation for onsite workers.
- Employ local labours and youth for construction work

5.0 Impacts during Operation phase

5.1 Land Environment

- Spill and leak during transport, handling, storage activity of chemicals
- Spill of oil and greases during maintenance of equipment, machineries and vehicles
- Improper storage/dumping of hazardous wastes, resulting in leachate contaminating the soil

Mitigation Measures

- Residues shall be disposed to CHWTSDF facility
- Production, maintenance area and warehouses for storage of raw materials, finished products and hazardous wastes will be provided with impervious flooring
- All bulk storage tanks will be provided with adequate dyke walls to prevent spreading of spill or leaked chemicals causing contamination of soil.

5.2 Water Environment

Total water requirement during operation phase will be 26.5 KLD. The proposed project will result in generation of effluents from process, cooling tower blow town, equipment / floor wash, and domestic sewage. Impacts on water resources may also occur as secondary impacts of soil contamination.

Mitigation Measures Water Environment

- The Effluent water is neutralized with 10% caustic solution in a small vessel to bring the pH to about 7. This neutralized water is sent to a RO Unit to recover 80% of the water which is recycled back to the process. The domestic wastewater 1.3 m^3/day shall be discharged onto land for plantation after Septic Tank.
- There shall be no discharge on land or outside factory premises.

5.3 Air Environment

Operational phase activities may have impacts minor or major, positive or negative on environmental discipline such as soils, surface and ground water hydrology, micro meteorology, water use, water and air quality, ecology, socio economics & noise environment.

Mitigation Measures Air Environment

- The source of dust emissions is loading/unloading, transportation and storage of raw material & finished product.
- Adequate pollution control measures will be taken to keep the emissions from all sources within the statutory norms. Spraying of water on roads will be done to control such emissions.
- In a plant, the major emission from stack is Particulate Matter (PM) emissions In addition
- Gaseous pollutants (SO_2, NO_x and CO) are also anticipated from stack emissions and vehicular emissions

5.4 Green Belt Development Plan

Total Greenbelt Area: 0.1 Ha.

Total plant should be planted as per ToR Issued.

0.1 Ha. x 2500= 250 nos. of trees required.

5.5 Solid and Hazardous Waste Generation and Management

The details of solid and other waste generation are given below in **Table 26**.

Table 26: Solid & Other Waste Generation Details

Category	Type of Waste	Colour of Bins	Disposal Method	Total Waste (Kg/day)
Bio Degradable	Organic Waste	Green	Recycler	2.0
Non-Biodegradable	Recyclable Waste	Blue	Recycler	3.0
	Total			**5.0**

Fuel consumption details for the proposed project are given in **Table 27.**

Table 27: Fuel requirement

S. N.	Type of Fuel	Quantity	Used in
1	LPG/PNG	750 kg/Hr.	Thermic Fluid Heater
2	Diesel	30 kg/Hr.	1 No. DG Set of 320 kVA (Stand By)

5.6 Environment Management Plan

Details of environment management plan is given in **Table 28.**

Table 28: EMP Budget

S. N.	Details	Capital Cost (In Lakh)	Recurring Cost (In Lakh/Annum)
1	Air Pollution Control Facility	10.0	0.5
2	Water Pollution Control	15.0	0.2
3	Rainwater Harvesting Pits	2.0	0.5
4	Noise Pollution Control	1.0	0.2
5	Solid Waste Management	1.0	0.3
6	Environment Monitoring and Management	6.0	2.34
7	Occupational Health	0.7	0.5
8	Greenbelt Development	1.3	0.5
9	Safety Management	1.0	0.3
10	Renewable Energy	1.5	0.2
	Total	**39.50**	**5.54**
	Total Amount (Capital Cost & Recurring Cost)	**45.04 Lakh**	
	Total Amount (Capital Cost & Recurring Cost)	**0.45 Crore**	

5.7 Corporate Environment Responsibility

The company has earmarked 2 % of the project cost for "Corporate Environment Responsibility" CER as per OM of MoEF&CC F.No.22-65/2017-IA.III Dated 30th September 2020. Fund Allocation for the CER as per Office Memorandum is given in **Table 29**. The total project cost is Rs. 12 Crore. 2% of the total cost it becomes Rs. 0.24 Crore approx. This amount will be spent within first 2 years. CER budget is developed as per our understanding. However, it will be modified after completion of public hearing as per the needs/demands of the peoples in the public hearing and instruction of the Chairperson of the proposed public hearing. Proposed CER activities as per preliminary understanding is given in **Table 30**.

Table 29: Fund Allocation for the CER as per Office Memorandum

S. N.	Capital Investment/ Additional Capital Investment (in Rs.)	Greenfield Project - % of Capital Investment	Brownfield Project - % of Capital Investment
I	II	III	IV
1	≤ 100 Crores	2.0 %	1.0 %
2	> 100 Crores to ≤ 500 Crores	1.5 %	0.75 %
3	> 500 Crores to ≤ 1000 Crores	1.0 %	0.5 %
4	> 1000 Crores to ≤ 10000 Crores	0.5 %	0.25 %
5	> 10000 Crores	0.25 %	0.125 %

Table 30: Proposed CER Activities

S. N.	Planned Activities under CER as per specific needs	Amount in Rs. Lakhs	Period of Implementation from the Date of Start of Proposed Activity
1	**Community Health Improvement** • Organization of Six-Monthly Health Camp for Eye Check Up of villagers residing in 10 km periphery of the project site. • Organization of Annual Health Camp for Cardiac of villagers residing in 10 km periphery of the project site • Advertising and awareness of organizing Health Camps in villages falling in 10 km periphery.	5.0	24 Months
2	**Community Education Facilities** • To provide desktop computer to 20 primary/secondary schools of villages falling in immediate vicinity of 10 km periphery ➢ Ist Year – 4 Schools • IInd Year – 4 Schools	2.5	24 Months

	• To provide funds as per needs of village school Headmaster & Sarpanch of Supa village for their school in village Supa		
3	**Infrastructural Development** • Repairing & maintenance of internal village roads of Tandali Wadgaon, Deulgaon Siddhi, Waghmodewasti and Hivre Jhare villages in consultation with concerned Gram Panchayat ➢ Ist Year – 2 Villages ➢ IInd Year – 2 Villages • To provide drinking water facility by digging & installation of bore well in villages falling in 0 - 5 km radius in consultation with concerned Gram Panchayat ➢ Ist Year – 2 Villages ➢ IInd Year – 2 Villages	5.0	24 Months
4	**Afforestation Programs** • Plantation of trees on both sides of approachable road from Tandali Wadgaon Village to National Highway 561 A. • Total Length – approx. 4.0 km Both Side Road Length – 8.0 km ➢ Ist Year – 4.0 km • IInd Year – 4.0 km	5.0	24 Months
5	**Community Welfare Activities** • To provide and install 75 nos. Solar Street Lights for common community area and village main approach roads as per the instruction of concerned Gram Panchayat in Tandali Wadgaon, Deulgaon Siddhi, Waghmodewasti and Hivre Jhare villages. ➢ Ist Year – 40 Nos. ➢ IInd Year – 35 Nos.	6.5	24 Months
	Total Amount (Rs. in Lakhs)	**24.0**	
	Total Amount (Rs. in Crores)	**0.24**	

6.0 Conclusion

Major potential environmental impacts from proposed project will be from Hazardous waste generation, wastewater generation. However, an effective environment management plan and its implementation reduce level of significant impact on the environment. Factory will implement effective occupational health and safety measures.

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