

Pre-Feasibility Report

For

**Environmental Clearance for Proposed Expansion of
Manufacturing of Foams of M/S Sheela Foam Ltd**

At

Kanchan Jangha Integrated Park, Siliguri, West Bengal

Prepared By

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&

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Sheela Group
ISO 9001 Certified

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1. INTRODUCTION AND JUSTIFICATION OF THE PROJECT

1.1 Identification of Project

M/s Sheela Foam Limited is currently producing and processing Poly-Urethane Foam (PU Foam) for various industrial consumers, furniture and bedding applications at Jalpaiguri. The major foam today is produced at Greater Noida plant and shipped to Jalpaiguri. As a commitment towards customer, industry and the state, they would like to expand the facility PU-Foam production from 300TPM to 600TPM at its Jalpaiguri Unit located at Kanchan Jangha Integrated Park, P.O - Jhanjupara, P.S - Rajgung, Jalpaiguri, WB- 735134

For the proposed expansion of the PU Foam production, the Project Proponent is willing to expand the storage of Toluene di isocyanate (TDI) which is one of the raw materials for production of PU Foam, from less than 10T to 60T. As per the MSHIC Rules 1989, the threshold Quantity of storage of TDI is 10MT. So as because the proposed storage quantity is exceeding the threshold limit, the proposed expansion requires the Environmental Clearance

The notification no. S. O. 1533 promulgated on 14th September 2006 had covered this industry as Synthetic Organic Chemicals which requires Environmental Clearance (EC) **as category 'A' project under clause 5 (f) as it is not situated** within Notified Industrial Estate .

1.2 Identification of Project Proponent

Sheela Foam Limited is the largest foam and mattress company of India. It has manufacturing facilities all over India. The Main promoter is Mr. Rahul Gautam, who is also the Managing Director of the Company. The Company is run by professionals under the guidance of the MD and Board of Directors.

The Company is famous for its SLEEPWELL brand of mattresses which is a household name in India. The foam of the company is sold under the famous brand of feather foam. The Company has foaming plants all over India . These are located in Greater Noida, Talwada, Hyderabad and Erode Further it has mattress making plants at 6 more locations spread all over India.

The winning brands of Sheela Group include

SLEEPWELL - The flagship brand for mattresses and comfort accessories

FEATHER FOAM - Pure PU Foam

LAMIFLEX - Superior quality polyether/polyester foam for lamination

These are ranked as the largest selling PU Foam in the country.

1.3 Need of Project and its Importance

Advancement in science and technology has created so many products that have enhanced the quality of human life in every passing year. The human race is largely dependent on industrialization for up gradation in quality of life. Progress of the nation is judged through its economic growth which is largely dependent on industrial productivity. PU Foam is used in a large number of strongly diversified applications, such as filler for seats, chairs and seat cushions, mattress centres, car seats, encapsulation of car windows, shoes and textiles, thermal insulation (buildings, industrial installations, refrigerators, etc.), sound insulation, adhesives and paints/coatings, etc. The great advantage of PU foam is its great flexibility in meeting the various applications and requirements. Polyurethane owns some extremely exceptional material qualities such as: density, elasticity, durability, weight, safety, design and of course its attractive price.

Since PUF is mainly used together with other materials, such as textiles, metal, wood and other polymers, it is not always visible in the end products. Polyurethanes are used throughout cars. In addition to the foam that makes car seats comfortable, bumpers, interior “headline” ceiling sections, the car body, spoilers, doors and windows all use polyurethanes. Polyurethane also enables manufacturers to provide drivers and passengers significantly more automobile “mileage” by reducing weight and increasing fuel economy, comfort, corrosion resistance, insulation and sound absorption.

Being a leader in Polyurethane (PU) Foam, Sheela Group is a multi-billion rupee entity. It has a nationwide presence in manufacturing PU Foam with a global marketing perspective and an impeccable track record, since 1971. The Company has foaming plants all over India. These are located in Greater Noida, Talwada, Hyderabad and Erode Further it has mattress making plants at 6 more locations spread all over India.

With growing complexities in the business and more demanding customers there is a need to explore setting up more plants at promising locations. For north/east zone, it is decided by the Company to locate the same at Jalpaiguri. Jalpaiguri is strategically located in chicken neck portion of India, connecting Northeast seven sisters with rest of the country.

As a commitment towards customer, industry and the state, they would like to expand the facility to include PU foam production from 300 MT/Month to 600 MT/Month along with curing and storage.

1.4 Demand Supply Gap:

Polyurethane foam (PU foam) is a very versatile material. Its open and elastic cell structures make it very resistant to oxidation and aging, especially if compared to rubber or latex foams. According to the additives and the manufacturing systems used, very different characteristics and foams for very different uses can be achieved.

Thanks to its diversity, it's present in all aspects of daily life. In order to compare the different foams we usually use the density, but it only serves as a comparative element when we're

talking about foams with the same composition. Their uses are multiple- the insulation capacity, the ease of profiling or shaping, the lightness, the rigidity, etc. The sectors that most use this raw material are:

- Rest area: in mattresses as main filling or as part of quilts.
- Furniture sector: in seats of sofas and chairs, padded fillers, etc.
- Construction sector: as thermal insulation, acoustic absorbent, etc.
- Automotive sector: in dashboards, seats, etc.
- In many toys, sponges, shoes, pillows, clothing, packaging and in general all kind of fillings and quilting.

Growth of polyurethane foam market can be attributed to increasing demand for polyurethane foam from bedding & furniture and building & construction end-use industries. Significant investments in new infrastructure development, new housing projects, and renovation of non-residential buildings in US, China, India, and Brazil have also influenced the growth of the polyurethane foam market.

India will consume 1 kg of polyurethane (PU) per capita by 2020 at 1200,000 TPA, as per a conservative estimate by the Chairman of the Indian Polyurethane Association (IPUA). Current per capita PU consumption in India is about 200 grams. The 1 kg per capita target will be possible, depending mainly on easing bureaucracy by the government that will speed up some of the processes and make it easy to set up factories and help to build infrastructure, as well as initiatives by the industry. At annual consumption levels of 180,000 tons of Polyurethane (PU) in 2007, India has just about 1.5% share of the global PU consumption of 11.25 million tons. In the last few years PU has grown at over 15% pa, and is expected to continue to be robust at an average rate of 15%. Regionally, polyurethane foam demand is relatively close to production because trade is not economic over larger distances. The production of flexible foam accounts for the largest share of the Indian polyurethane industry.

1.5 Import Vs. Indigenous Production

Polyurethane foam is an extensively used polymer and plastic. They are available in two forms i.e. rigid and flexible foams. Rigid foams are used for various insulation applications pertaining to refrigeration and construction. It is energy efficient and helps in cutting energy costs. Flexible foams are used mainly as a cushioning substance in end-use industries such as packaging, furniture, bedding and transportation.

North America and Europe have been traditionally the dominant consumers of such polymers owing to relatively stable industrial output. Although, strong economic development in India and China has shifted the equilibrium and Asia Pacific is expected to emerge as the leading consumer.

The shift of leading automotive manufacturers to countries such as India and Thailand, Vietnam and Malaysia from mature economies of North America and Europe has complimented region's industry growth.

Environmental benefits of this product include high recyclability and clean incineration for pollutant filtration, reduced wastage, and greater sustainability. However, several governments and federal agencies are increasingly being concerned with detrimental health effects of isocyanates utilized in PU production.

Growing need in automotive components including dashboards, armrests, airbags, other vehicular components, and exteriors is anticipated to drive consumption. Strengthening economies, improvements in sovereign balance sheets, and positive demographic outlook, mainly in Southeast Asian countries such as India, Vietnam, Indonesia, and Thailand are likely to contribute to high growth in demand.

1.6. Export Potential

There may be large opportunities to become a global supplier of quality PU Foam. Increasing construction spending in countries such as India, Indonesia, Korea, UAE and Qatar due to strong industrial sector growth coupled with rising urban population is anticipated to fuel growth in export market

1.7 Employment Generation:

➤ Direct Employment

M/s Sheela Foams Limited has already employed 176 nos. of manpower to its production facility at Kanchan Jangha Integrated Park, Siliguri. Upon expansion it will be increased to 206 as proposed. The local population will be given preference for employment as per their qualifications; this will improve their living standards and livelihood.

Table 1.1: Manpower Details

Sl. No.	Manpower	Existing	Proposed
1	Associate	139	160
2	Staff	17	26
3	General Manager	1	1
4	Security	19	19
5	Total	176	206

➤ Indirect Employment

It will generate employment for local people in associated services like transportation, various maintenance contracts of the location during operation, dhabas, workshops plying from/to the locations & other ancillary industries.

2. SITE INFORMATION

2.1 Location

Sheela Foam Limited is located at Kanchan Janga Integrated Industrial Hub, located at Vill- Jhajhupara, P.O.- Fatapukur, P.S-Rajgung, Dist- Jalpaiguri, PIN -735134. The geographical location and Environmental Setting of the project is as mentioned in **Table 2.1**. The industry has following favourable conditions of the proposed unit:

- Vicinity to Market
- Availability of Land Area
- Availability of Water supply
- Availability of Local Labour
- Availability of Power
- Well developed Transport Infrastructure

The connectivity maps has been shown in **Fig 2.1 A, B, C** and Location map is shown below in **Fig 2.2** Google image of the project is shown in **Fig 2.3**.

Table 2.1: Geographical Location and Environmental Setting of the project

SN	Component	Description
1	Plant Location	Kanchan Janga Integrated Industrial Hub,Vill- Jhajhupara, P.O.- Fatapukur, P.S-Rajgung, Dist- Jalpaiguri, PIN -735134
2	Approx Site Centre Point Coordinates	26°34'34.64"N 88°32'20.92"E
3	Village/District/State	Vill- Jhajhupara, P.O.- Fatapukur, P.S-Rajgung, Dist- Jalpaiguri
4	Climatic conditions at Bagdogra IMD station (2018)	
5	Maximum temperature	31°C
6	Minimum temperature	11°C
7	Annual rainfall (total)	3430 mm
8	Relative humidity	70.8%
9	Predominant wind directions	North, North East
10	Plant site elevation above MSL	86 m
11	Present land use at the site	Land use pattern is industrial
12	Nearest highway	NH 31D- 666 m (S)
13	Nearest Railway Station	Belakoba Railway Station (BLK) 5 Kms (road distance)-NE direction Ambari Falakata Railway Station, 11.2 Kms (Road Distance)- NW Direction New Jalpaiguri Railway Station 23.1 Kms (Road Distance)- NW direction
14	Nearest Airport	Bagdogra Airport, Approx : 32 km (Road

		Distance) NW Direction
15	Nearest major water bodies	Chauli River: 2.40 KMS E Karatoya River: 6.36 KMS W Mahananda River : 16 KMS W
16	Nearest town/City	Siliguri, 25 Kms NW Direction Jalpaiguri- 18.45 Kms SE Direction
17	Nearest village	Jhajhupara
18	Protected areas as per Wildlife Protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves)	Not Available within 10 km
19	Reserved / Protected Forests	Not Available within 10 km
20	Defence Installations	Not Available within 10 km

The break-up of the plot area is as mentioned below in table 2.2:

Table 2.2: Plot Break-Up Details

Particulars	Existing		After Expansion	
	Area (SQM)	Percentage (%)	Area (SQM)	Percentage (%)
Plant Area & Office Area	12124.65	27.60	12124.65	27.60
Curing & Storage Area	5154.76	11.74	5154.76	11.74
Road & Parking Area	9600	21.86	9600	21.86
Green Belt Area with pond	16643.97	37.89	16643.97	37.89
Open Area and others	400.62	0.91	400.62	0.91
Total Plot Area	43924	100%	43924	100%

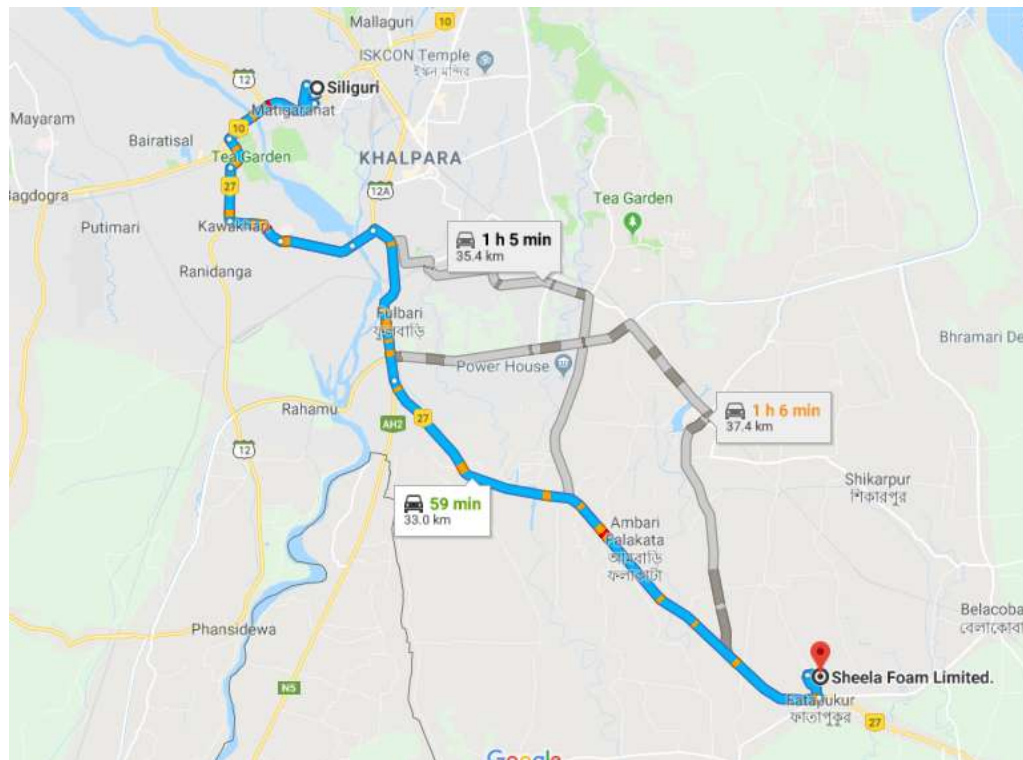


Fig: 2.1 A Connectivity to nearest town (By Road)

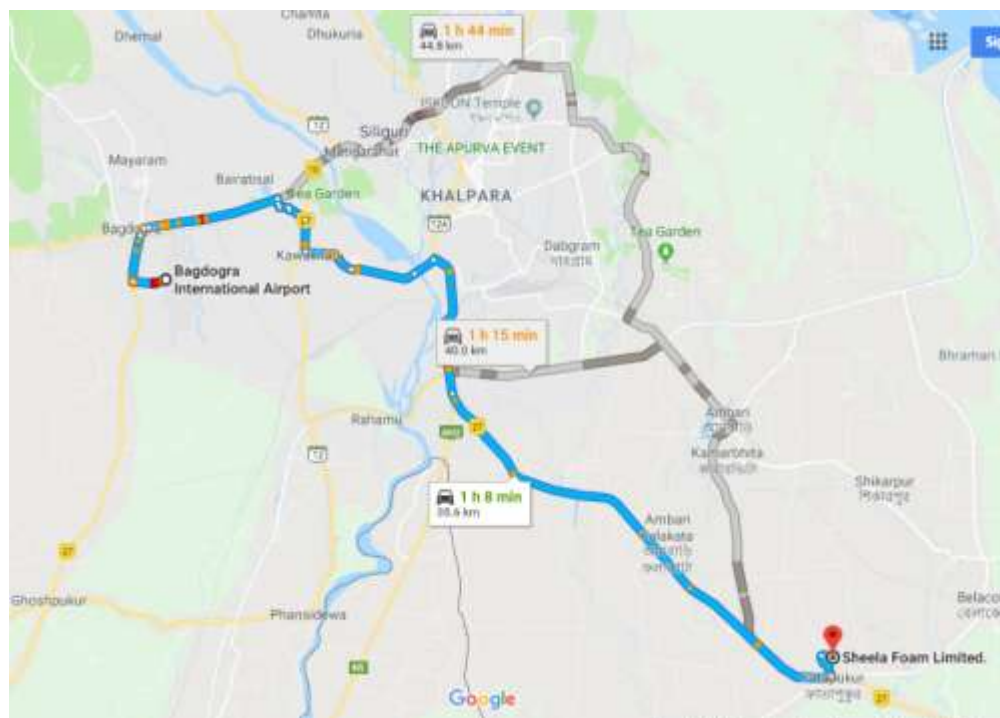


Fig: 2.1B Connectivity to nearest Airport (By Road)

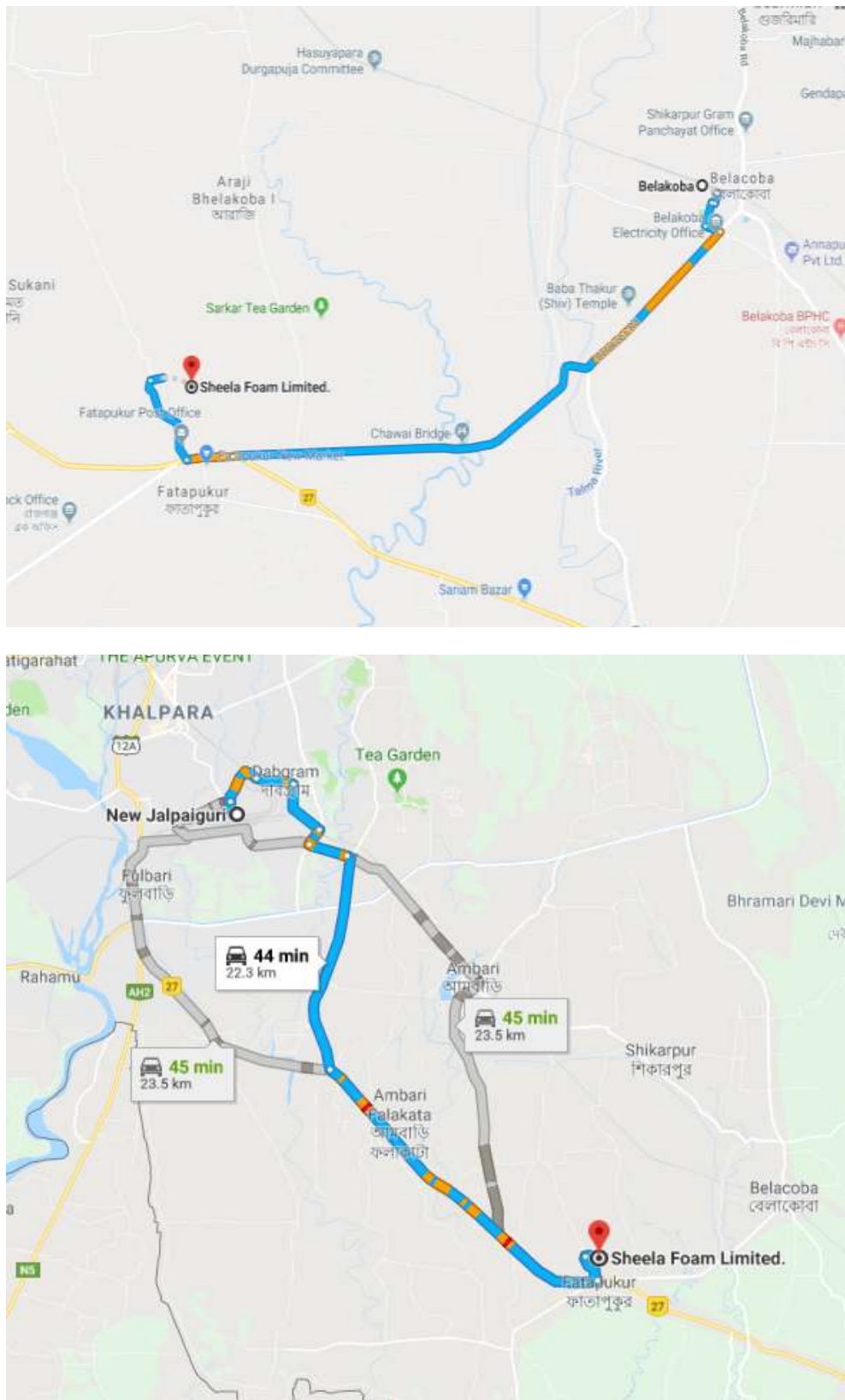


Fig: 2.1C Connectivity to nearest Railway Station (By Road)

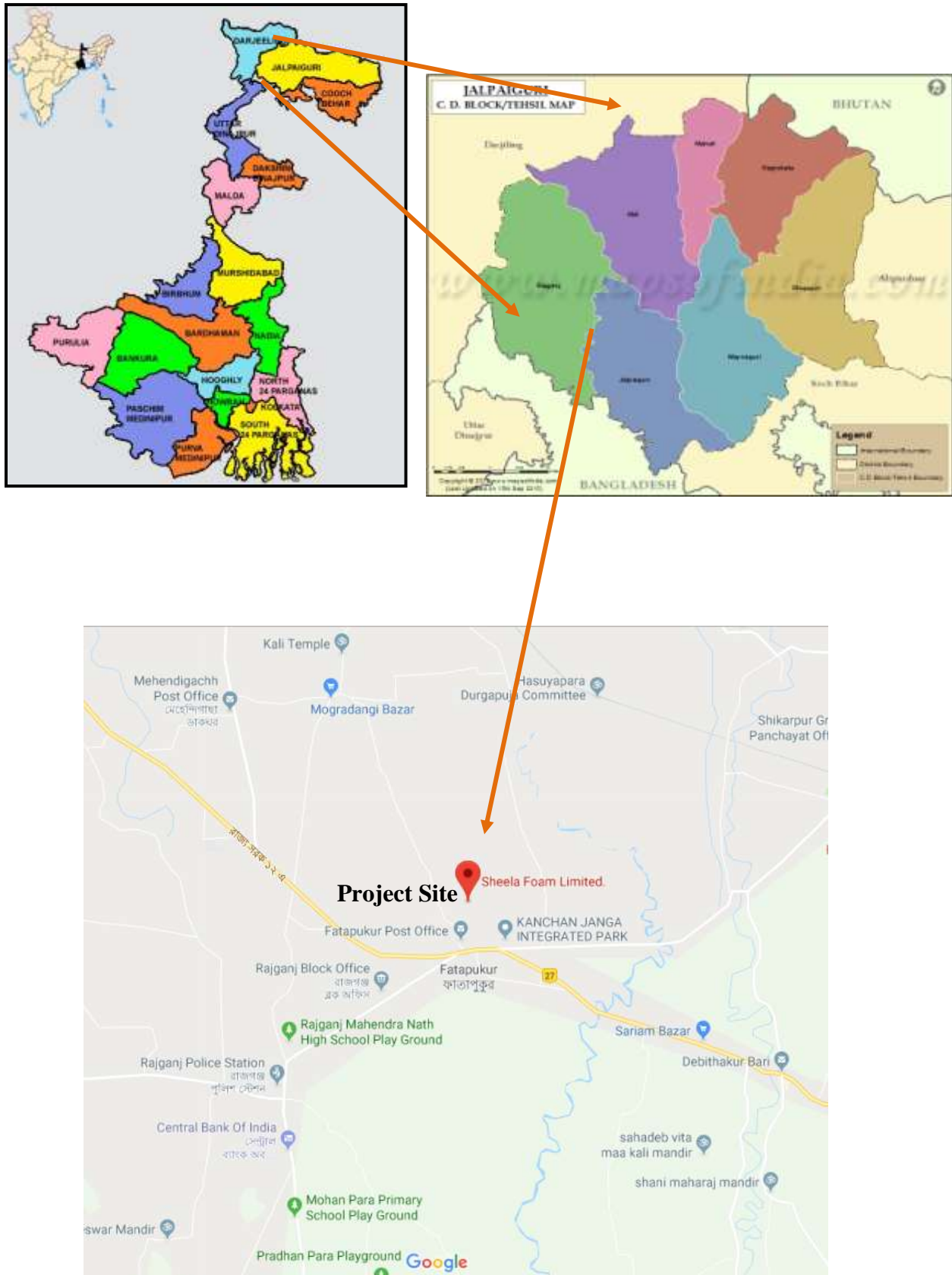


Figure 2.2: Location Map

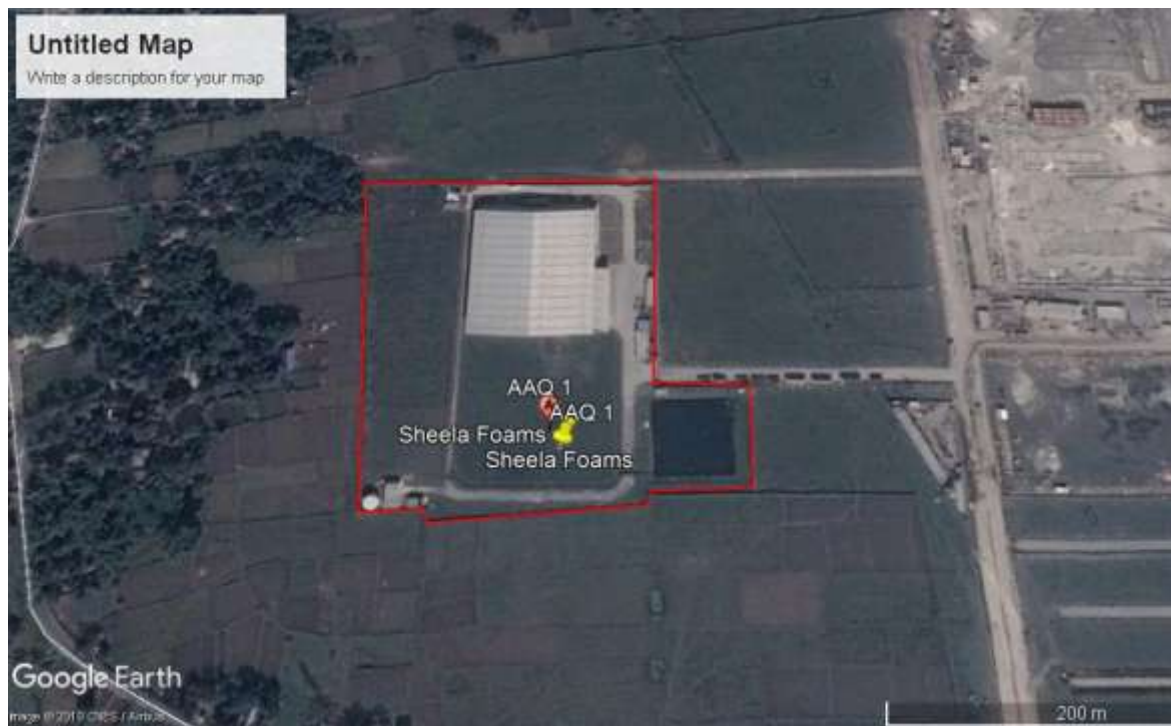


Figure 2.3: Google Image of Project Site

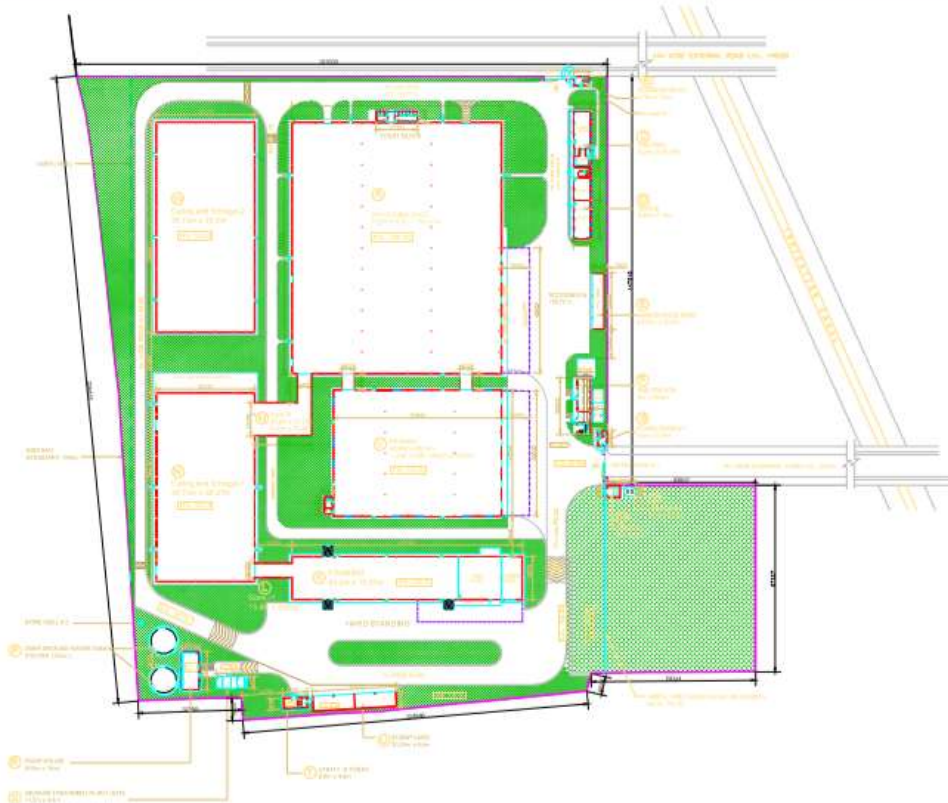


Figure 2.4: Schematic Plant Layout

2.2 Topography

The topography of the project site is relatively flat. The soil is moderately alluvial. Loamy sand is predominant. The soil structure can be described as neither granular nor angular.

The proposed project is located in Seismic Zone IV as per IS: 1893 and all designs will be as per IS Codes.

2.3 Land-use Pattern

The project is located at Kanchan Jangha Integrated Park, Siliguri in the same premises under the possession by Sheela Foam Limited where existing plant is in operation. Hence, no change in land use is envisaged.

3. PROJECT DESCRIPTION

3.1 Type of Project

M/s Sheela Foam Limited, is manufacturing and processing polyurethane foam for various industrial consumers, furniture and bedding applications at Jalpaiguri. The major foam today is produced at Greater Noida plant and shipped to Jalpaiguri. As a commitment towards customer, industry and the state, they would like to expand the facility to include foam production, curing and storage.

The machine and plant is located at Kanchan Jangha Integrated Park, P.O - Jhanjupara, P.S - Rajgung, Jalpaiguri, WB- 735134 near Fatapukur bus stand, where a unit of the group is already operational. This is to utilize existing infrastructure for proposed expansion.

10.85 acres of land has already been procured for this purpose at proposed site. The land will be suitable for downstream operation of foam blocks, including manufacturing of mattresses of all types (foam, spring, coir, composite) and other comfort products. The project cost towards the expansion of the proposed project is around Rs. **1890 lakhs**.

The unit is categorized under Category 'A' of Schedule no. 5(f) for "Synthetic organic chemicals industry" as per EIA notification and its latest amendment.

3.2 Size and Magnitude of Operation

The unit is currently involved in production of PU Foam with a capacity of 300MT/Month and using the PU Foam as raw material the unit is engaged to produce different materials like PU Sheet / cushion / rolls, cover mattress, Coir Cover mattress, Spring mattress, Puf Pillow etc.

Now the unit is proposing to expand the capacity of production of PU Foam from 300MT/Month to 600MT/Month and for which the storage of Toluene di isocyanate (TDI) which is being used as raw material of PU Foam production, is proposed to be increased from <10MT to 60MT.

The proposed unit will install international standard foaming equipment, with state of the art productivity and safety features. The estimated foam production capacity of this facility will be around 600 MT/Month.

The list of raw materials and plant machinery is as mentioned in Table 3.1.

Table 3.1: List of Raw Materials for production of PU Foam

Sr. No.	Name of Chemical	Chemical Name	Quantity (MT/ Month)	Qty (MT /Day)	State	Source	Mode of Transport	Maximum Storage MT	Mode of Storage
1.	Polyol	Polyol	300	7	Liquid	Dow/Inter unit transfer/	Road	Existing: 90 MT (3x30MT) Proposed: 120 MT (4x30MT)	Iron Tank
2.	TDI	Toluene diisocyanate	120	3	Liquid	Dow/Inter unit transfer/BSF/GNFC	Road	Existing: <10 MT Proposed: 60 MT (2x30MT)	Iron Tank
3.	MCL	Methylene Chloride	3	0.038	Liquid	Inter unit transfer	Road	3	SS Tank
4.	Silicone	Silicone	2	0.076	Crystal/ Flat Plates	Inter unit transfer	Road	Existing: 1 MT Proposed: 2 MT	SS Tank
5.	Stannous Octate	Stannous Octate	0.2	0.002	Liquid	Inter unit transfer	Road	Existing: 0.3 MT Proposed: 0.6 MT	SS Tank
6.	Amine	Amine	0.185	0.001		Inter unit transfer	Road	Existing: 0.30 MT Proposed: 1 MT	SS Tank

Table: 3.2 List of Existing Plant Machinery

SL No.	LIST OF PLANT AND MACHINERIES -JALPAIGURI	NUMBERS
1	Cutting Machines-Circular	3
2	Cutting Machines-Vertical	4
3	Horizontal Cutting Machine	1
4	Stitching Machines	8
5	Laser Etching Machine	2
6	Tape Edge Machines	5
7	Quilting Machines	2
8	Bag Closing Machines	6
9	Hot Melt Applicator	2
10	Fork Lift	2
11	Baler Machine	1
12	Diesel Generators	3
13	Auto Sealing Machine	1
14	Air Compressor	2
15	Air Dryer	1

Table 3.3: List of Proposed Machinery

SL No.	LIST OF PLANT AND MACHINERIES -JALPAIGURI	NUMBERS
1	Foaming Machinery	1
2	Crane	1
3	Conveyor	2
4	Chilling machine	1

3.3 Project Description with Process Details:

Currently Sheela Foam Limited is processing polyurethane foam for various industrial consumers, furniture and bedding applications at Jalpaiguri. The major foam today is produced at Greater Noida plant and shipped to Jalpaiguri. As a commitment towards customer, industry and the state, they would like to expand the facility to include foam production, curing and storage by installing international standard foaming equipment, with state of the art productivity and safety features. Presently the production capacity of the plant is 300 MT/month. The estimated foam production capacity of this facility will be around 600 MT/Month. A brief description comprising of manufacturing process along with mass balance of the Product is mentioned herewith as follows:

3.3.1 Manufacturing Process:

The raw materials Polyol, TDI (Toluene Di Isocyanate), Catalysts (Silicon, SO), Filler and MCL (Methylene Chloride) are pumped from their own storage tank in required proportions to a common mixing chamber where the materials are mixed at high speed and flows as cream on to a conveyor. While passing on the conveyor the cream expands to full height to make foam blocks. Continuous foamed blocks are cut into required block sizes by the block cutter and the cut blocks are left for sufficient time in open atmosphere for curing. The blocks are further cut into sheets of required size by horizontal and/or vertical cutting machines and are packed for dispatch or cut into rolls by peeling machine.

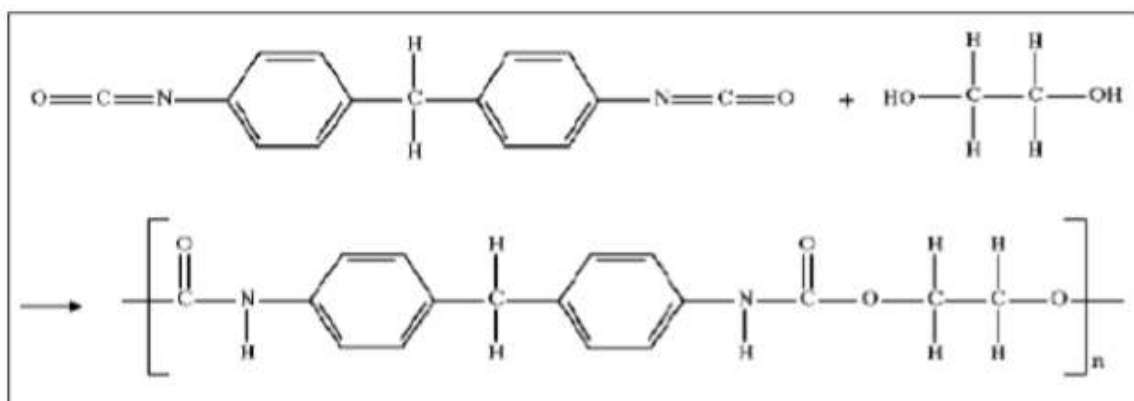
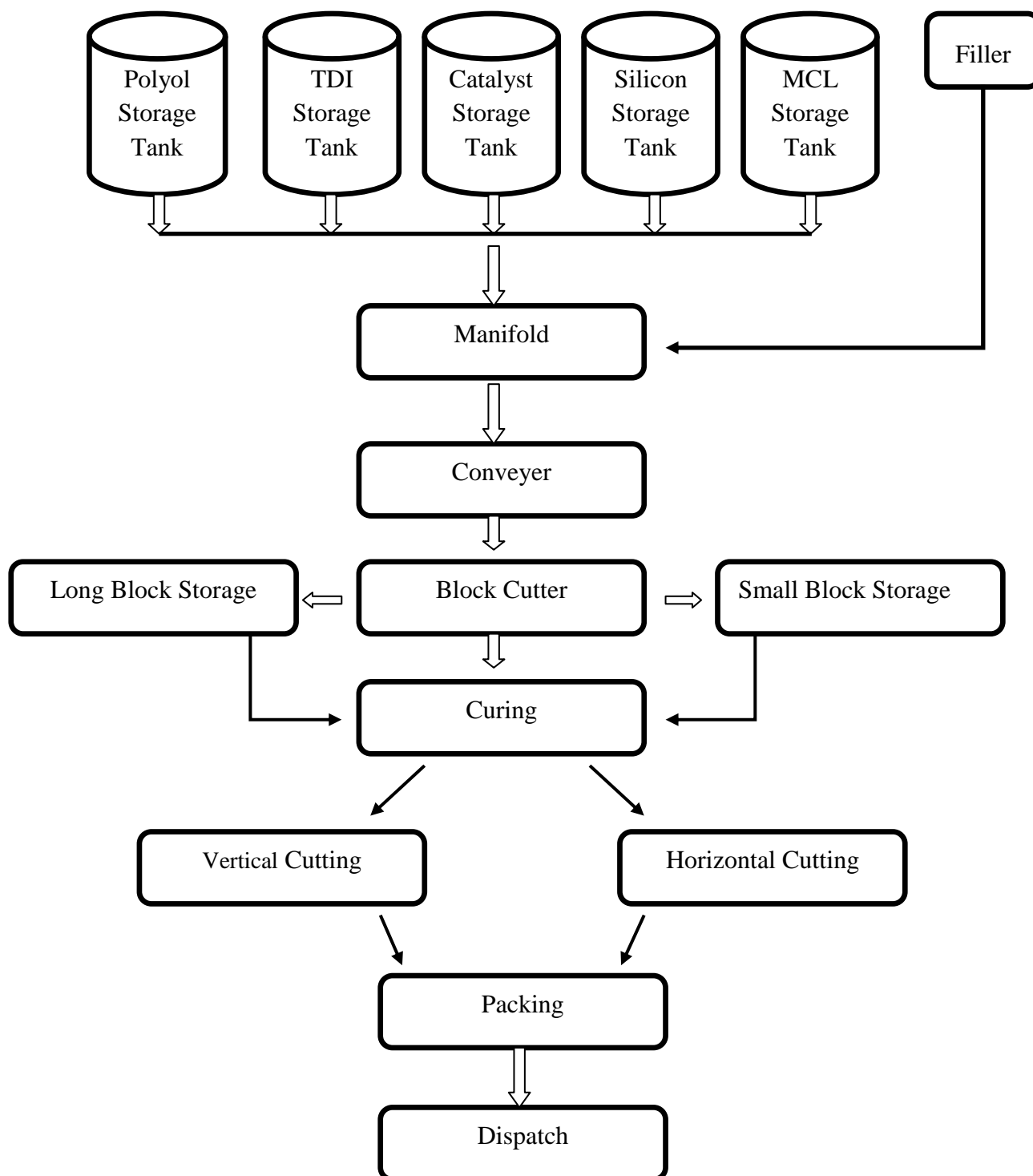


Figure 3.1: Chemical Reaction of Polyurethane formation using TDI & Polyol

3.3.2 Process Flow Diagram:



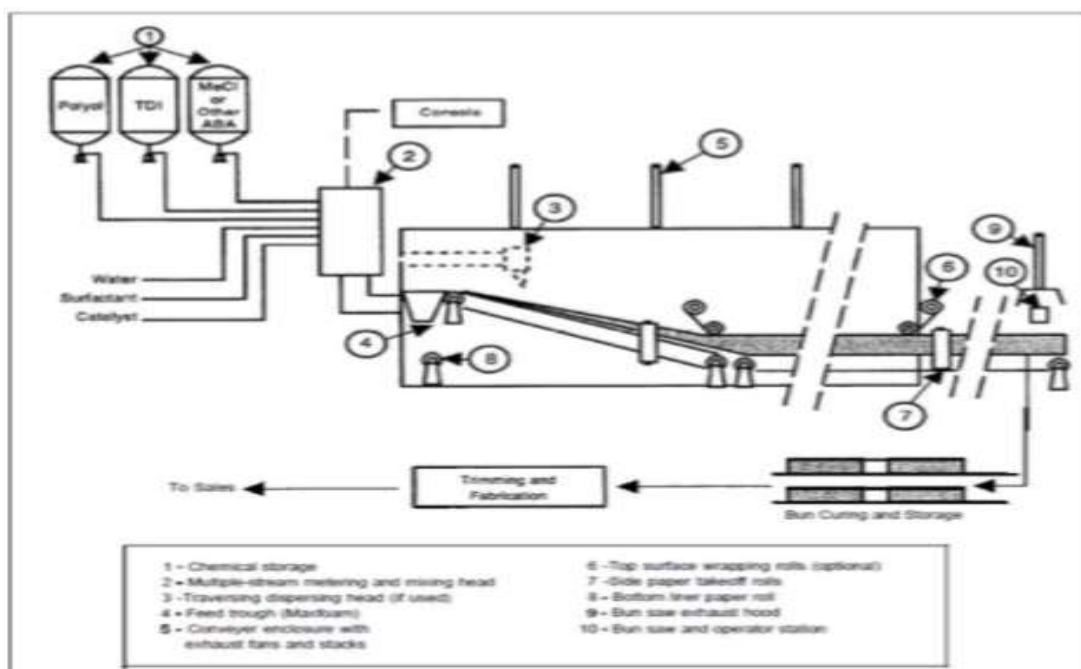


Figure 3.2. Process Flow Diagram

3.3.3. Material and Water Balance:

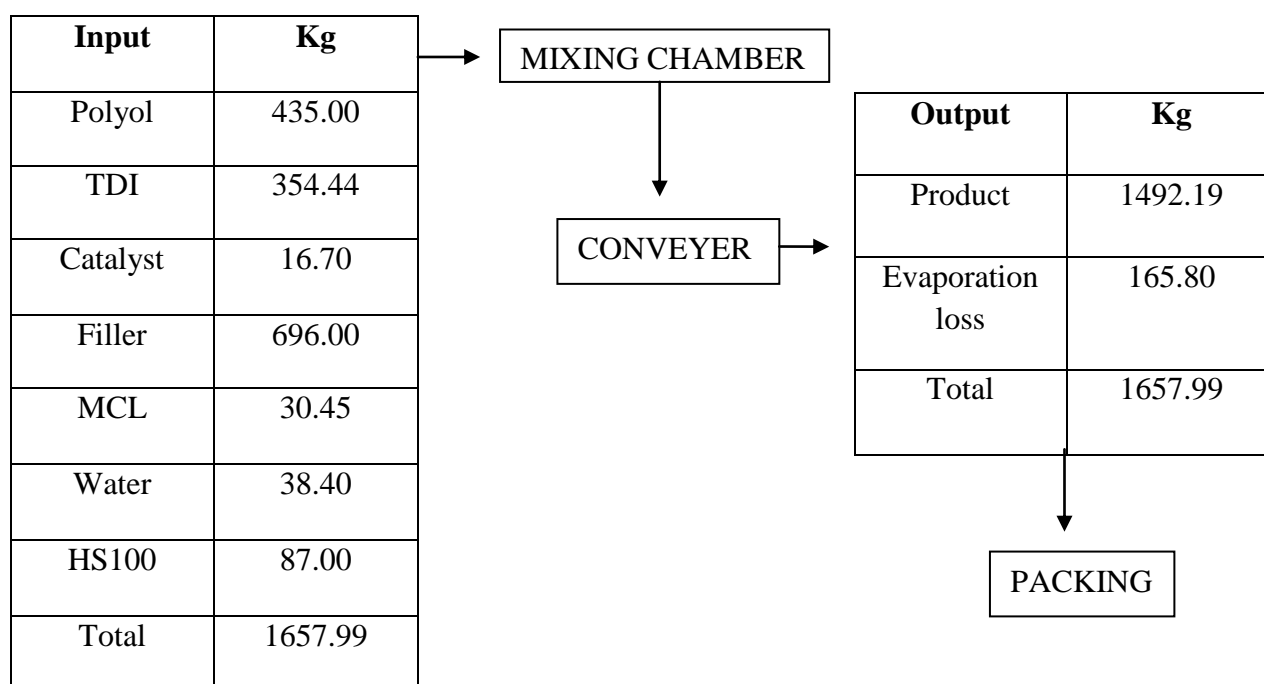


Table 3.4: Batch Details

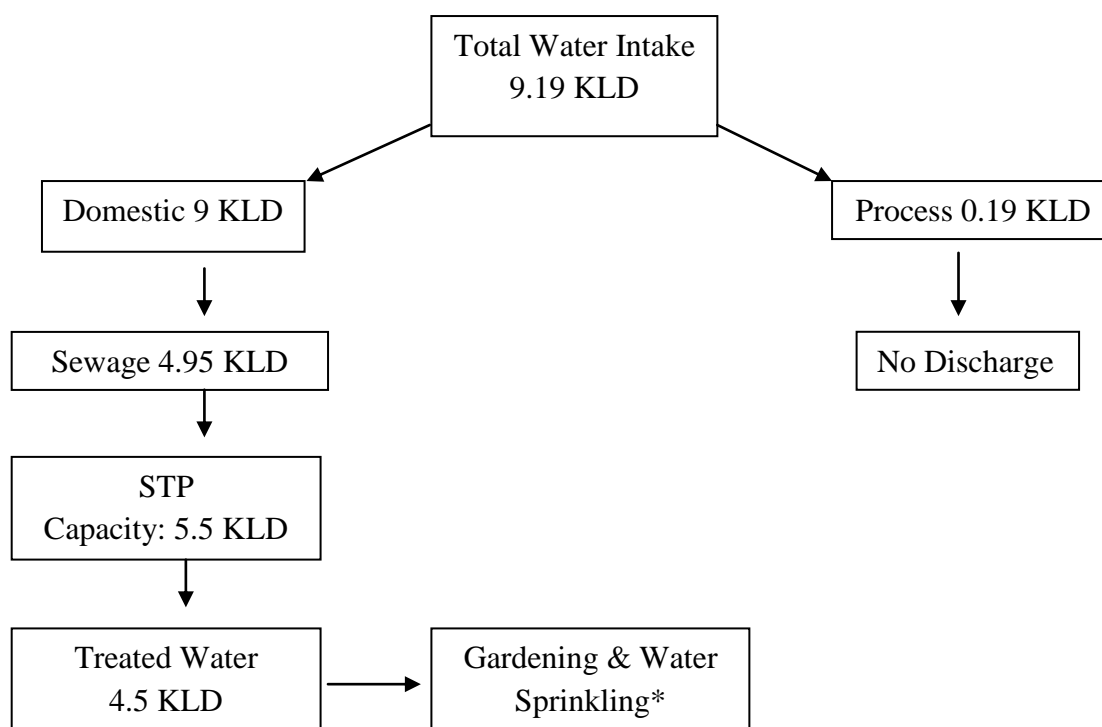
Batch Size	1658	Kg/MT
Batch Duration	15	Minutes
No. of Batch/day	5	Batches

3.4 Utilities

The details of the utilities for the proposed project are as mentioned in the below sections.

3.4.1 Water Demand & its Source

Process will require about 0.19 KLD water and 9.0 KLD water will be required for domestic purposes which will be sourced from 2 nos. of bore wells within the premises.



*Additional water required for plantation & sprinkling will be sourced from existing RWH pond of (40x50x2)m³ capacity

Figure 3.3: Water Balance diagram

3.4.2 Power Demand & its Source

The unit requires 180 KVA power load which is supplied by WBSEB. Additional sources of power include 3 DG sets of 180 KVA, 380 KVA & 45 KVA which requires approximately 200 LPM diesel.

4. RESPONSIBLE CARE FOR WASTES

4.1 Water Regime

Water requirement for the proposed PU Foam manufacturing unit is negligible as no water is used in the process. Hence, no waste water is likely to be generated during manufacturing process. No waste water will be discharged outside the plant premises. Therefore, operation of proposed expansion of assembly unit will not pose any adverse impact on the ground water resources of the area.

Water Requirement (Domestic & Industrial) & Source accounts to 6 KL and will be sourced from bore-well installed with water meter.

Facility available for treatment of Waste Water is STP having MBBR Technology with a capacity of 5.5 KLD.

Domestic waste generated from the toilets is being / will be treated in existing STP & treated water is being / will be recycled back for gardening and green belt development. Rain water harvesting is being practiced at plant area. Regular monitoring of water quality is being / will be carried out.

The STP technology proposed for the expansion is as shown in Figure 4.1.

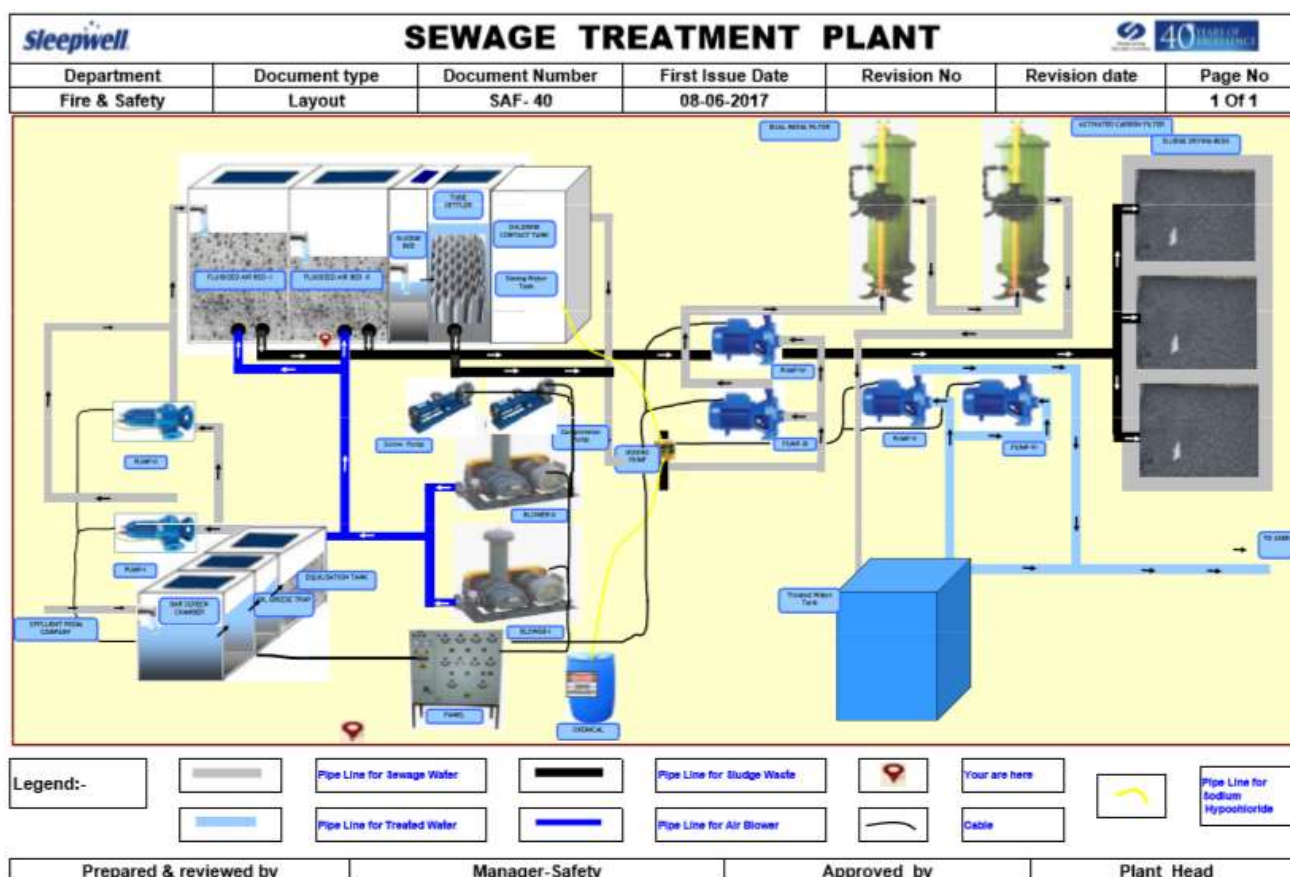


Fig 4.1: STP Diagram

4.1.1. Treatment Process

The STP facility available at the plant uses MBBR Technology with capacity of 5.5 KLD. MBBR technology employs thousands of polyethylene bio-film carriers operating in mixed motion within an aerated wastewater treatment basin. Each individual bio-carrier increases productivity through providing protected surface area to support the growth of heterotrophic and autotrophic bacteria within its cells. It is this high-density population of bacteria that achieves high-rate biodegradation within the system, while also offering process reliability and ease of operation.

This technology provides cost-effective treatment with minimal maintenance since MBBR processes self-maintain an optimum level of productive bio-film. Additionally, the bio-film attached to the mobile bio-carriers within the system automatically responds to load fluctuations

4.2 Air Pollution

The unit will have 3 DG sets of 180 KVA, 380 KVA & 45 KVA, which will be kept as a standby and used in case of main power failure. The Diesel will be used as fuel for the DG Set and adequate stack height of 2.7 m, 3.9 m, 1.3 m will be provided.

4.3 Noise Pollution

The only source of noise generation may be from the D.G. Sets, which will be kept as standby and no other source of noise and vibration from the proposed manufacturing activity except Plant machineries. The adequate precautions will be taken for abatement of noise pollutions

All the measures would be taken to limit the noise levels at the plant boundary within 75dB(A) as per the stipulated limits.

4.4 Waste Management

No solid waste is being generated from the assembly and PU Foam manufacturing process except scraps. Water requirement for the proposed PU Foam manufacturing unit is negligible as no water is used in the process. Hence, no waste water is likely to be generated during manufacturing process.

However 'waste foam' is generated during cutting process of quantity 3875 Kg/Month, which is being collected and reused again.

TDI drums will be disposed off to the parties authorized in this regard.

The details of solid waste generation and handling / Management are given in **Table 4.2**.

Table 4.1: Details of Hazardous Waste generation and Disposal

Sr. No.	Types of Waste	Source	Quantity	Mode of Disposal
1.	Used Oil	DG Set	0.045 MT/Year	Collection, Storage, Transportation, Disposal by selling to Registered Re-refiners, approved by SPCB/CPCB or reused as lubricant for machinery within the factory.
2	Waste Foam	Process	3875 kg/Month	Collection & reuse again in process
3	Discarded Containers/Bags		60 Nos./Month	Collection, Storage, Transportation, Disposal by selling to Registered recycler approved by SPCB/CPCB

5. PROJECT COST ESTIMATES

5.1 Project Cost Estimates

Total cost of the project will be around 1890.00 lacs. Budgetary break up is as follows:

Table 5.1: Break-up Cost of the Project

PROJECT COST	(RS. LACS)
SITE DEVELOPMENT	100
BUILDING	800
MACHINERY	700
MISC. FIXED ASSETS	200
SUB TOTAL	1800
CONTINGENCY-5%	90
TOTAL PROJECT COST	1890

6. ANALYSIS OF PROPOSAL & RECOMMENDATIONS

The technical feasibility and financial viability of the project has been reviewed with reference to the expansion project with reference to overall company as a whole. Our review has been done on the basis of the present scenario and documents made available to us by the company. We have made the assessment afresh and made the changes in assumptions wherever felt required.

Based on our analysis it may be inferred that

- ✓ The project is technically feasible and financially viable.
- ✓ The overall financial liquidity and profitability parameters of the project appeared to reasonable and satisfactory.
- ✓ We conclude the capital expenditure of the company as a viable option subject to the weakness and threats associated with a business venture.
- ✓ The operation of plant has significant positive impact on the socio-economic environment of the area. It helps to sustain the development of this area including further development of physical infrastructure facilities.

In the interest of development and improve the social conditions of the local habitants this project should be allowed after considering all the environment aspects.