PRE-FEASIBILITY REPORT

for

EXPANSION IN "PESTICIDE TECHNICAL AND PESTICIDE SPECIFIC INTERMEDIATES MANUFACTURING UNIT"

at

Existing Plot No/Survey no. 306/3, 306/2, 148, 304/2+305/1+305/2+305/3, 305/5, 300 & 301, 302/1-2-3, 302/4&5P, 302/5/2 & 302/6, 302/7-8, 302/10, 302/11-12, 387 (60/P3), 391 (60/P5), 392 (61/P1), 393 (61/P2), 414 (73/1), 435 (81/2/P1), 441 (85/1/P1), 442 (86/1/P1), 443 (87/2), 444 (91/P1), 446 (92/2/1), 575 (135/1/P), 1049 (143 to 147), Phase II, GIDC Estate,Vapi. District Valsad, Gujarat-396195

Type of Project	Brownfield Project
Category as per EIA notification 2006 and its amendments:	Schedule **5(b);** Pesticides industry and pesticide specific intermediates (excluding formulations) **Category A**
Total Plot Area	(Total Plant Area: 293706 m^2 + Addition Land for Green Belt: 54294 m^2) 34800 m^2 (34.800 Hectare)
Existing/Proposed Production Capacity	**Production after Expansion:** **Product: 30790 MT/Annum & Byproduct-17852 MT/Annum**
Cost of Proposed Expansion	₹ 125 Crores
NABET Acc. No.	NABET/EIA/1922/RA0197 valid till 23.11.2022

PROJECT PROPONENT

Bayer Vapi Pvt. Ltd.

Plot No. 306/3, Phase II, GIDC Estate, District- Valsad, Gujarat (India)

Email ID: narendra.shah@bayer.com ; Tel. No. : 0260-2407123

UID No.: EQMS/PFR/Bayer /5(b)A/PR-675/04072022

Report Release Date: 04/07/2022 **Revision No**: 01

ENVIRONMENTAL CONSULTANT:

(Approved Consultant)

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1 EXECUTIVE SUMMARY

M/s Bayer Vapi Pvt. Ltd. is a core manufacturing site for Bayer AG globally and the single largest synthetic pyrethroids production facility in the world. Being fully backward integrated, it is engaged in the manufacture of active ingredients and its intermediates for use in wide array of crop protection, animal health as well as home and garden application. Spread over 29.4 hectares of land, the site is self-sufficient with all the infrastructural facilities consisting of utilities, environment management, occupational health center, full-fledged safety department & emergency control center, quality assurance, active ingredient manufacturing innovation, warehousing, and site technical management.

Existing unit located at GIDC Estate Vapi is involved in manufacturing of Pesticide Technical and Pesticide Specific Intermediates products. Latest environmental clearance was issued to plant by MoEF&CC for expansion vide F. No. J-11011/300/2015-IA. II (I) dated 28.03.2017 and amended dated 21.02.2018 (***Attached as Annexure-1***). Thereafter, three amendments in CTO/CCA and one amendment in CTE was taken under no increase in pollution load from GPCB. As per latest change in product mix approval (under no increase in pollution load) dated 10.06.2022, Consent to establish has been obtained from GPCB vide CTE no. 118985 and consent to operate has been applied. Plant already has valid CTO issued by GPCB vide order no. AWH-115250 dated 18.10.2021. (***Attached as Annexure-2***). Chronology of project is given below in **Table 1.**

Table 1: Chronology of Project

S. No.	Type of Approval	F. No. / Order No.	Production	Remark
1	Latest Environmental Clearance	F. No. J-11011/300/2015-IA. II (I) dated 28.03.2017 (***Attached as Annexure-1***)	Product: 26572 MTPA	Expansion in Plant
2	Amendment in Environmental Clearance	F. No. J-11011/300/2015-IA. II (I) dated 21.02.2018 ***(Attached as Annexure-1).***	Product: 26572 MTPA	Only change in some conditions of EC
3	Amendment in CCA	F. No. GPCB/CCA-VSD-5(6)/ID:23225/506016 dated 10.05.2019	Product: 26307 MTPA	Amendment in CCA under no increase in pollution load
4	Amendment in CCA	F. No. GPCB/CCA-VSD-5(9)/ID: 23225 dated 26.12.2019	Product: 26292 MTPA	Amendment in CCA under no increase in pollution load
5	Amendment in CCA	F. No. GPCB/CCA-VSD-5(9)/ID:23225/560820 dated 29.05.2020	Product: 26292 MTPA	Amendment in CCA under no increase in pollution load

S. No.	Type of Approval	F. No. / Order No.	Production	Remark
6	Amendment in CTE	Order no. CTE-115251		Addition of two DG Set sets
7	Latest CCA	Order No. AWH-115250 dated 18.10.2021 (Valid upto 30.09.2026) ***(Attached as Annexure-2).***	Product: 26292 MTPA	Latest CCA
8	Amendment in CTE	Order no. CTE-118985 dated 10.06.2022	Product: 26272 MTPA	Amendment in CTE under no increase in pollution load
9	Amendment in CCA	Application has been submitted to GPCB	Product: 26272 MTPA	Application for Amendment in CCA has been submitted to GPCB as per latest amendment in CTE under no increase in pollution load and addition of standby DG sets as per CTE mentioned in Sr. No. 6

As per latest Environmental clearance issued by MoEF&CC, the total production capacity of plant is Product: 26572 MTPA and Byproduct: 13639 MTPA. ***Now, industry has proposed to expand the production of plant by introducing one new intermediate product and product mix. The total production of unit after expansion will be Product: 30790 MTPA and Byproduct: 17852 MTPA.***

As per the Government of India (Ministry of Environment, Forests & Climate Change (MoEF&CC),) EIA Notification 2006 and further amendments, the proposed project will be covered under ***Activity 5(b); Category A*** and hence requires environmental clearance from MoEF&CC, New Delhi. The project site is in a Notified Industrial Area i.e., GIDC Industrial Area, Vapi. Thus, in accordance with Clause 7(i) (III) of EIA notification 2006 & OM J-11011/321/2016-IA. II(I) dated 27.04.2018, **project is exempted from Public Hearing.**

Details of products and By-products are given below in **Table 2.**

Table 2: Details of Products and By-products

Sr No	Name of Products	Category	Subcategory	As per EC (MTPA) (I)	As per CCA (MTPA) (II)	Additional to EC (Proposed) (MTPA) (III)	Total after Expansion (MTPA) (IV= I + III)
Products							
1	Cypermethrin	Insecticides	Synthetic Pyrethroids	2496	3050	1024	4000
2	Alphamethrin	Insecticides	Synthetic Pyrethroids	480	660		
3	Deltamethrin	Insecticides	Synthetic Pyrethroids	504	600	216	900
4	Becisthemic Acid	Intermediate	-	180	180		
5	Permethrin	Insecticides	Synthetic Pyrethroids	1374	1600	226	1600
6	Transfluthrin	Insecticides	Synthetic Pyrethroids	(Either individual or total production of 2 products)			
7	Acrinathrin	Insecticides	Synthetic Pyrethroids	45	45	-45	0
8	Imidacloprid	Insecticides	Synthetic Pyrethroids	720	720	-720	0
9	Beta Cyfluthrin	Insecticides	Synthetic Pyrethroids	982.32	982	267.68	1250
10	Cyfluthrin	Insecticides	Synthetic Pyrethroids	(Either individual or total production of 2 products)			
11	Ethofumesate	Herbicide	-	3300	4500	1200	4500
12	NC 9770	Intermediate	-	(Either individual or total production of 3 products)			Removing NC 9770 from the group
13	Aclonifen	Herbicide	-				(Either individual or total production of 2 products)

Sr No	Name of Products	Category	Subcategory	As per EC (MTPA) (I)	As per CCA (MTPA) (II)	Additional to EC (Proposed) (MTPA) (III)	Total after Expansion (MTPA) (IV= I + III)
14	Triafamone	Herbicide	-	180	180	-180	0
15	Sulphonyl Indole	Intermediate	-	(Either individual or total production of 2 products)			
16	Triazoindolinon	Intermediate	-				
17	Metaphenoxy Benzaldehyde	Intermediate	-	3000	1800	-1200	1800
18	Pyma Acetate	Intermediate	-	0	0		(Either individual or total production of 2 products)
19	NaCMTS	Intermediate	-	1200	1000	0	1200
20	CPDM	Intermediate	-	0	175		(Either individual or total production of 2 products)
21	Cypermethric Acid Chloride (CMAC)/ Cypermethric Acid (CMA)	Intermediate	-	2400	3000	1100	3500
22	Cypermethric Acid Chloride from DV Ester	Intermediate	-	600	600	0	600
23	Acid Chloride Preparation (RTPAC)	Intermediate	-	(Either individual or total production of 2 products)			
24	Metaphenoxy Benzyl Alcohol	Intermediate	-	1200	1200	0	1200

Sr No	Name of Products	Category	Subcategory	As per EC (MTPA) (I)	As per CCA (MTPA) (II)	Additional to EC (Proposed) (MTPA) (III)	Total after Expansion (MTPA) (IV= I + III)
25	Chrysanthemic Acid	Intermediate	-	180	180	-180	0
26	Allethrolones	Intermediate	-	(Either individual or total production of 2 products)			(Either individual or total production of 2 products)
27	TCA	Intermediate	-	540	720	260	800
28	RTCMA	Intermediate	-	(Either individual or total production of 2 products)			
29	DM Base	Intermediate	-	50.4	0	-50.4	0
30	Fipronil	Insecticides	Pyrazoles	540	540	-540	0
31	Ethiprole	Insecticides	Pyrazoles	1020	1500	3480	4500
32	Pyrazole	Intermediate	Pyrazoles	0			(Either individual or total production of 2 products)
33	Fluopyram	Fungicide	Carbamate	3000	1200	-1800	1200
34	PYACN	Intermediate	-	(Either individual or total production of 2 products)			(Either individual or total production of 2 products)
35	Tembotrione	Herbicide	Others	1020	300	-1020	0
36	Pyrasulfotle	Herbicide	Others	300	300	-300	0
37	Amid Chloride	Intermediate	Intermediate	1020	1020	-1020	0
38	Flumethrin	Insecticides	Synthetic Pyrethroids	60	60	0	60

Sr No	Name of Products	Category	Subcategory	As per EC (MTPA) (I)	As per CCA (MTPA) (II)	Additional to EC (Proposed) (MTPA) (III)	Total after Expansion (MTPA) (IV= I + III)
39	BDCB	Intermediate	-	0	0	3500	3500
40	R & D Products	Not Specified	-	180	180	0	180
Total Product				**26572**	**26292**	**4218**	**30790**
Byproducts							
1	Recovered Methanol	-	-	811	-	-811	0
2	Potassium Chloride	-	-	540	-	1866	2406
3	Sodium Bisulphite/Sodium Bi Sulphite Solution	-	-	4051	-	1857	5908
4	Soduim Sulphite Solution	-	-	1575	-	-337	1238
5	Monobromo Toluene/Mix Isomer PBrODCB	-	-	2095	-	3525	5620
6	Ammonia Solution	-	-	0	-	0	0
7	Ammonium Chloride Crystal	-	-	1614	-	742	2356
8	Potassium Chloride Solution	-	-	2953	-	-2953	0
9	Sodium Fluoride	-	-	0	-	324	324
Total By-products				**13639**	**-**	**4213**	**17852**

The details of the project have been tabulated below in **Table 3** below.

Table 3: Project Details

S. No.	Particulars	Unit	As per EC (I)	As per CCA (II)	Additional to EC (Proposed) (III)	Total After Expansion (IV= I + III)	Remark
1	Total Project Cost	Rs. (In Crore)	582.46	-	125	707.46	Proposed Expansion cost is 125 Crores.
2	**AREA DETAILS**						
a.	Total Plot Area	m^2	(293706 m^2 + 54294 m^2) = 348000 m^2 (34.8 Hectare)	(293706 m^2 + 54294 m^2) = 348000 m^2 (34.8 Hectare)	0	(293706 m^2 + 54294 m^2) =348000 m^2 (34.8 Hectare)	No Change
b.	Green Area	m^2	106000	106000	9062	115062	Increase
3	**POPULATION**						
a.	Workers/ Staff	No.	1258	1216	(-) 28	1230	Decrease
4	**SERVICE DETAILS & ENVIRONMENTAL ASPECTS**						
a.	Fresh Water Requirement	KLD	2900	2883	(-) 370	2530	Decrease
b.	Wastewater Generation	KLD	1350	1316	(-) 100	1250	Decrease
	(Including Domestic Sewage & Industrial Effluent)		Industrial: 1285	Industrial: 1251	Industrial: (-)135	Industrial: 1150	Decrease
			Domestic: 65	Domestic: 65	Domestic: (+) 35	Domestic: 100	Increase
c.	Wastewater Treatment Schemes/Capacity	KLD	Evaporator: 380 KLD Fenton Oxidation Plant: 120 KLD Stripper: 25 KLD ETP: 1500 KLD RO: 500 KLD ATFD: 4500 Kg/hr				No Change
d.	Recycled Water Reuse	KLD	478	360	(-) 118	360	Decrease

S. No.	Particulars	Unit	As per EC (I)	As per CCA (II)	Additional to EC (Proposed) (III)	Total After Expansion (IV= I + III)	Remark
e.	Power Requirement	kVA	33000	8750	(-) 21000	12000	Decrease
f.	DG Sets (Backup)	kVA	1x1500, 2x 750, 2X1500*	1x1500, 2x 750	2x1500	5 x1500, 2x750	Increase
g.	DG Sets (Fire Hydrant Pumps)	kVA	3x325	3x325	-	3x325	No Change

**** As per CTE 115251 dated 16.11.2021***

1.1 Plant location and area classification

The Plant is located at Plot No/survey no. 306/3, 306/2, 148, 304/2+305/1+305/2+305/3, 305/5, 300 & 301, 302/1-2-3, 302/4&5P, 302/5/2 & 302/6, 302/7-8, 302/10, 302/11-12, 387 (60/P3), 391 (60/P5), 392 (61/P1), 393 (61/P2), 414 (73/1), 435 (81/2/P1), 441 (85/1/P1), 442 (86/1/P1), 443 (87/2), 444 (91/P1), 446 (92/2/1), 575 (135/1/P), 1049 (143 to 147), Phase II, GIDC Estate,Vapi. District Valsad, Gujarat-396195. It is a brown field project having total plot area of **34.800 Hectare**. Out of total land, 29.3706 Ha of land has been alloted by GIDC for industrial use and rest 5.4294 Ha land is private land which is developed as green area. No industrial activity is being carried out at private land.(***Land Documents have been attached as Annexure-3***). The land breakup of the project is shown in **Table 4.**

Table 4: Land Area Breakup Details

S. No.	Area Description	As per EC (Sqm)	Total after Expansion (Sqm)	Percentage (%)
1	Production plants including warehouse, utilities	1,04,354	72,820	24.79
2	Administration, QC, R& D, HSE, Security and welfare facilities	13,480	14,322	4.88
3	Open Areas, Roads, Pathway & Auxiliary	91,675	1,05,483	35.91
4	Central Tank Farm	5,595	6,150	2.09
5	Waste management facilities	19,720	20,208	6.88
6	Scrap yards	6,329	13,955	4.75
7	Green belt/Plantation (within GIDC land)	52,553	60,768	20.70
	Total Plot Area (M^2) with GIDC land	**293706**	**293706**	**100**
8	Additional Green Belt/Plantation (in Private Land)	54,294	54,294	-
	Total	**348000**	**348000**	**100**

1.2 Green belt

After proposed expansion, green belt area will increase to approx. 1,15,062 m^2 i.e., 39.17 % of total plant area. Wide green belt will be provided all around the boundary wall of project site.

1.3 Water requirement

Construction Stage: Approx. 17 KLD (Domestic use: 7 KLD + Construction use: 10 KLD) of water shall be required during construction phase. Water required for domestic purpose shall be met by GIDC supply and for construction purpose shall be taken from inhouse treated water.

***Operational Phase**:*

After expansion, total water requirement of the plant will be 2890 KLD out if which 2530 KLD freshwater requirement shall be met through GIDC supply and rest 360 KLD from in-house treatment schemes. Details have been provided in ***Section 3.8.***

1.4 Power requirement & supply/ source

Construction Phase: During the construction phase, existing power supply will be used i.e., DGVCL.

***Operational Phase*:** After expansion, total power requirement of plant will be 12000 KVA, being sourced through Dakshin Gujarat Vij Company Limited (DGVCL). For Power backup, DG sets of capacity 2x1500 kVA, will be installed in the unit along with existing DG sets of 3 x1500 kVA, 2x750 kVA.

1.5 Effluent Management

Construction Phase: 6 KLD of domestic sewage will be generated from construction workers and will be disposed into soak pit/septic tank and overflow of it shall be treated in ETP.

Operation Phase: After expansion, total wastewater generation from plant will be 1250 KLD (Domestic: 100 + Industrial: 1250 KLD).

The plant has full-fledged wastewater pre-treatment plant (WWPT) and effluent treatment plants to treat wastewater (Domestic + Industrial) generated from plant. The wastewater is segregated at source and treated based on its characteristics viz COD, TDS and BOD/COD Ratio.

The wastewater pre-treatment plant comprised of Evaporators and Agitated Thin Film Dryer (ATFD) for treatment of high COD and high TDS streams, Fenton oxidation plant to treat streams having low biodegradability, stripper to separate low boiling liquid organic components in the wastewater and H_2O_2 treatment for streams containing unreacted sodium cyanide.

The ETP plant consists of primary, secondary and tertiary treatment plants. A part of treated wastewater, 800 KLD will be discharged to Common Effluent Treatment Plant operated by Vapi Green Enviro Ltd. (VGEL) and balance 450 KLD will be treated in Reverse Osmosis (RO) plant to recover water for recycling and reuse (360 KLD). Reject from RO and Evaporator will be sent to common MEE. Domestic wastewater will be disposed into soak pit/septic tank and overflow of it shall be treated in ETP.

The details of effluent and sewage management plan are provided in ***Section 3.9.***

1.6 Air Emission & Management

***Construction Phase*:** The main sources of air emissions will be construction machinery like drills, cranes, DG sets and vehicular movement. To control air emissions during construction, following measures will be implemented: -

- Barricading will be done around the project boundary to control dust dispersion into the surroundings.
- Construction material vehicles will be covered during transportation.
- Dust suppression will be done by regular water sprinkling in and around the project site.
- Water Sprinkling shall be carried out to reduce the dust emission due to construction activity.
- Construction material movement (vehicular movement) shall be planned and carried out during non-peak hours to avoid traffic congestion.

***Operational Phase*:** The main source of air emissions is from process stacks and DG sets. The major pollutants are PM, SO_2, NOx from DG sets and HCl, Cl_2, HBr and SO_2 from process stacks. Natural gas is being used as fuel in Boilers, Thermic fluid heaters and Incinerators, thus flue gas emissions are very less from plant. All air pollution control techniques and systems are already installed in the plant to reduce the emissions. The plant is maintaining all emission norms prescribed by MoEF&CC/GPCB/CPCB. After proposed expansion, only two stacks of DG sets (1500 KVA each) are proposed to be installed. However, eight no. of process stacks shall be removed from plant as per product profile proposed in the plant. The plant will maintain all emission norms prescribed by MoEF&CC/GPCB/CPCB after expansion.

Fugitive Emissions

Fugitive emission from handling of construction material will be minimized by taking proper precautions. During operation phase, the Fugitive emissions from material handling, loading/ unloading and transport of material will be minimal due to closed loop system operated by trained workers.

Details of proposed stacks are given below in **Section 3.8.**

1.7 Solid & Hazardous Waste Management

Hazardous Waste Management

There is generation of different kind of Industrial hazardous wastes from production process and other activities. Waste is being segregated in salable and non-salable waste. Salable waste is being sent different recyclers/refiners/cement industries/authorized preprocessing facilities as per waste characteristics while non-salable waste is being disposed through TSDF site/incineration at captive incinerator/ Common Hazardous Wastes Incineration Facility. All waste is disposed as per The Hazardous & Other Waste (Management and Transboundary

Movement) Amendment Rules, 2021. After proposed expansion, there shall be increase in waste generation which will be disposed as per existing practices.

Solid Waste Management

Construction Phase: Waste generated from the construction activity shall be disposed as per C&D waste Management Rule. Non-recyclable waste shall be disposed at the nearby C&D waste disposal site. Recyclable waste shall be sold to recyclers. Solid waste will be generated from labours which will be handled by existing facility.

Operational Phase: The municipal solid waste generation at the project site which is being segregated in biodegradable waste and recyclable waste. Recyclable waste is being sold off to different authorized vendors. Biodegradable waste is being treated in Organic waste converter and vermi-composting. After expansion, municipal solid waste generated in the plant area will be disposed as per existing practices.

1.8 Noise Pollution Management

Construction Phase: - The main sources of noise will be construction machinery, DG sets and vehicular movement during establishment of the plant.

Mitigation Measures: -

- Construction machineries will be provided with acoustic pads for noise reduction during operation.
- PPE will be provided to labors.
- The construction activity will be carried out mostly during daytime.
- Proper maintenance of noise generating transport vehicles.

***Operation Phase*:** Generally, noise level of working place is within the limit as specified in the standard of MoEF&CC. Industry has taken adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standards in respect to noise to less than 75 dB(A) during daytime and 70 dB(A) during nighttime. Noise measurement is being carried out periodically. Silencers are provided for all the Vents/ Venting exhaust gases (during startup/shutdown) to effectively curb the noise pollution. In general, from the plant layout stage, sufficient care is taken to restrict noise pollution problem within the standard limits. The equipment like Compressors, blowers, fans, various drums and elevators are provided with vibration pad / Acoustic enclosures to limit the noise level as per the standard of MoEF&CC. Noise level at Boundary Fence are controlled by providing green belt throughout the boundary wall of plant. Unit have issued earmuffs / plugs to all the employees and usage of earmuffs / plugs while working in noisy environment is already in practice. Same shall be followed further.

2 INTRODUCTION

Environment and Social Standard 5 (E & SS5) by Food and Agriculture Organization (FAO) defines pesticide as:

"As any substance, or mixture of substances of chemical or biological ingredients intended for repelling, destroying, or controlling any pest, or regulating plant growth. E&SS5 recognizes that pesticides can contribute to effective crop and food protection during production and in storage. Pesticides are also used in forestry, livestock production and aquaculture to control pests and diseases. At the same time pesticides are designed to be toxic to living organisms, if intentionally dispersed in the environment and are applied to food crops."

Agriculture is the backbone of the India's economy as it employs approximately half of the India's workforce contribution ~17% to India's GDP. Despite this, farmers in India continues to face challenges such as lack of irrigation facilities, depleting water table levels and fragmentation of land. Farmers lose a significant part of their income as their crop are being attacked by pests and weeds. Crop protection chemicals can play a vital role when judiciously applied protects the crop and produce from pests and increase the farm productivity. In India, pests and diseases, on an average eat away around 20-25% of the total food produced.

Being cognizant of the latest trends in pesticide industry and market demand in the country, Bayer has planned to expand to their existing manufacturing unit. The project will be involved in production of pesticides and related intermediates.

2.1 Identification of Project & Project Proponent

2.1.1 Identification of Project

Bayer existing unit located at GIDC Estate Vapi is involved in manufacturing of Pesticide Technical and Pesticide Specific Intermediates products. **Now, industry has proposed to expand the production of plant by introducing one new intermediate product and product mix. The total production of unit after expansion will be Product: 30790 MTPA and Byproduct: 17852 MTPA.**

Production Details are given in **Table 2.**

2.1.2 Identification of Project Proponent

M/s Bayer Vapi Pvt. Ltd. is a core manufacturing site for Bayer AG globally and the single largest synthetic pyrethroids production facility in the world. Being fully backward integrated, it is engaged in the manufacture of active ingredients and its intermediates for use in wide array of crop protection, animal health as well as home and garden application. Spread over 29.4 hectare of land, the site is self-sufficient with all the infrastructural facilities consisting of utilities, environment management, occupational health center, full-fledged

safety department & emergency control center, quality assurance, active ingredient manufacturing innovation, warehousing, and site technical management.

Bayer is a Life Science company with more than 150-year history and core competencies in the areas of health care and agriculture. With our innovative products, we are contributing to finding solutions to some of the major challenges.

Guided by our purpose "Science for a better life", we deliver breakthrough innovations in agriculture and health care. We contribute to a world in which diseases are not only treated but effectively prevented or cured, in which people can take better care of their own health needs, and in which enough agriculture products are produced while respecting our planet's natural resources. That's because at Bayer, we believe that growth and sustainability should go hand in hand. In short, we are working to make our vision "Health for all, hunger for none" a reality.

The Bayer as a life science company and a global leader in healthcare and nutrition comprising of three divisions – Pharmaceuticals, Consumer Health and Crop Science, which are also reporting segments. The Enabling Functions support the operational business and have wide competencies in various services. In 2021, the Bayer Group comprised 374 consolidated companies in 83 countries.

As a microcosm of Bayer global, the country (India) hosts all 3 business divisions - Crop Science, Pharmaceuticals and Consumer Health. Today, we have over 13,000 employees & associates working at various locations across India including 6 manufacturing sites, 3 research & development/crop breeding units, centers of excellence for IT, Finance, Procurement, Data Science and Analytics, and Shared Services that provide worldwide support.

Our Crop Science division is the largest for Bayer in India with businesses in seeds & traits, crop protection, digital farming and environmental science (non-agricultural pest control). Our robust crop protection portfolio includes products to manage insects, pests, weeds and diseases. It also includes biological solutions, that use nature's own defenses to protect crops. Our broad range of high-quality hybrid seeds includes cutting-edge traits for high-yielding crops with improved weed management and superior insect control. Our expertise and innovations in digital farming provide farmers with a deeper understanding of their fields so they can utilize their inputs and natural resources as efficiently as possible. We also have products that focus on non-agricultural applications in the form of products and services for vector control and professional pest control.

The Bayer Vapi site has 13 manufacturing plants for 12 active ingredients and 14 intermediates and R & D Products. It has excellent infrastructure including utilities, energies, incinerator, ETP (Effluent Treatment Plant), OHC (Occupational Health Center), raw material & goods warehouse, safety, engineering and related functions. Bayer Vapi accords topmost priority to sustainable development, safety of employees, environment as well as the neighboring

communities. The sites which are more than 26 years old has over 1200 Full Time Employees. Bayer Vapi Private Limited is a 100% owned subsidiary of Bayer SAS France. Site is ISO 45001:2018, ISO 9001:2015, ISO 14001:2015 certified.

The Corporate Societal Engagement projects undertaken by Bayer Vapi include support towards the renovation and construction of a modernized extension at Audhyogik Vasahat Primary School at GIDC Vapi together with MAA Foundation; modernization of the ICU Centre and set up of a state-of-the-art Neuro-Physiotherapy Centre at a local hospital and set-up of an oxygen plant in 2021 at the LG Haria Hospital in Vapi.

Awards

- Awarded by Rotary Club of Vapi for donating medical grade oxygen Plant in 2021
- Awarded by Confederation of Indian Industry (CII) for SHE Excellence and Innovation award in 2020.
- Indian Chemical Council (ICC) – Responsible Care® award for 'Pollution Prevention' and 'Emergency Response' in 2020.
- Indian Chemical Council (ICC) Certificate of Merit for 'Excellence in Human Resource Management' in a chemical industry in 2019
- HR Excellence Awards (2nd runner up) for "Leading Practices in HR Transformation" by People First in 2019
- Gujarat State CSR Award for "Cohesive & Strategic CSR Partnership Project" in 2018
- 'Strong Excellence Commitment to HR Excellence' award by Confederation of Indian Industry (CII) in 2017
- 'Commitment to Excellence in Human Relations' award by Employer's Federation of India in 2017
- Sustainability Award for 'Excellence in Safety in Chemical Sector' by FICCI in 2015
- 'The Most Environment Friendly Company in Chemicals Sector' by Federation of Indian Chamber of Commerce and Industry (FICCI) in 2015
- 'LEEDTM India NC Gold' by IGBC (Indian Green Building Council) in 2015
- HR Best Practices by Dun & Bradstreet India in association with Sodexo India in 2015
- 'Best Boiler User Industry' at SteamTech in 2015

Contact detail of the project proponent is as mentioned below:

Table 5: Details of Authorized Signatory

Project Proponent	M/s Bayer Vapi Pvt. Ltd.
Authorized Signatory	Mr. Narendra K Shah
Correspondence Address	Plot No. 306/3, Phase II, GIDC Estate, District Valsad, Gujarat
Designation:	Director & Site Manager

Phone No	0260-2407123
Email Id	narendra.shah@bayer.com

2.2 Brief Description of Nature of Project

As per the Government of India (Ministry of Environment, Forests & Climate Change (MoEF&CC),) EIA Notification 2006 and further amendments, the proposed project will be covered under **Activity 5(b); Category A** and hence requires environmental clearance from MoEF&CC, New Delhi.

The project site is in a Notified Industrial Area i.e., GIDC Industrial Area, Vapi. Thus, in accordance with Clause 7(i) (III) of EIA notification 2006 & OM J-11011/321/2016-IA. II(I) dated 27.04.2018, **project is exempted from Public Hearing.**

2.3 Need for the project and its importance to the country:

Indian Agrochemicals Market

The Indian pesticides market was worth INR 232 billion in 2020. Looking forward, the Indian pesticides market to exhibit moderate growth during the next five years.

With the growing global populations constantly challenging food production, agrochemicals offer a means towards meeting the challenge of more food, less land. The role of agrochemicals is not limited to protection from pests and diseases that threaten our food supply; they help in yield enhancement as well.

The agrochemicals industry has played a great role since first green revolution to transform India's ship-to mouth economy to a farm-to ship economy. At an estimated size of 2.8 billion USD in 2019, Indian agrochemicals is the second largest and a fast-growing segment in the Indian agri-input industry.

Vision of Indian Economy by 2025

Use of agrochemicals contributes not only to healthy growth of crops but also to improved farm work efficiency and stable supply of tasty agricultural produce. The onset of agrochemicals era transformed Indian agriculture from food deficient to food surplus country. Going ahead, increase in agricultural yields itself will contribute ~60% towards the vision of doubling farmer income by 2025 (NITI Aayog). Doubling of farmer income will result in a significant increase in rural disposable income and hence spending, which is integral to push economic growth. Also, exports of agrochemicals in India have been growing at a CAGR of 12.8% during 2014-18. Furthermore, agrochemicals worth USD 4.1 Billion USD will be off patent by 2020, which will further boost Indian generic agrochemical production ability. Therefore, agrochemicals industry, through increase in yields and contribution to exports will play a major role in achieving the vision of 5 trillion USD economy.

Need of Pesticides

The global population currently stands at 7.2 billion and is expected to rise to 9.3 billion by 2050. This will lead to an increased demand for food. The dietary needs in emerging countries will change as economy grows. To meet the food & nutrition needs of a growing population a sustainable approach is required, that puts thrust on increasing productivity against the background of lower yields & decreasing farm sizes. It requires a push from all stakeholders – the farmer, the government and the agrochemical/agro industry collectively so that the changing needs of the society are met. Around 25% of the global crop output is lost due to attacks by pests, weeds and diseases which doesn't augur well for farming given the critical challenges ahead and thus agrochemicals have an increasing role to play. The proposed project will provide the appropriate pesticide in the market to increase the crop output.

Benefits of the proposed project

- It will fulfill the demand supply gap of pesticides and related intermediates.
- It will maintain stability in Indigenous / domestic market for pesticides.
- It will ease the dependency of import of pesticides within the country.

2.4 Demand/Supply Gap

The global population currently stands at 7.2 billion and is expected to rise to 9.3 billion by 2050. This will lead to an increased demand for food. The dietary needs in emerging countries will change as economy grows. To meet the food & nutrition needs of a growing population requires a sustainable approach that puts thrust on increasing productivity against the background of lower yields & decreasing farm sizes. It requires a push from all stakeholders – the farmer, the government and the agrochemical/agro industry collectively so that the changing needs of the society are met. Around 25% of the global crop output is lost due to attacks by pests, weeds and diseases which doesn't augur well for farming given the critical challenges ahead and thus agrochemicals have an increasing role to play.

2.5 Imports vs. Indigenous Production

The proposed project will help in decreased dependency on import for the pesticides and chemical products and shall also elevate the status of country in the agricultural and related markets worldwide.

India imports agrochemicals mainly from China (55%), USA (11%), Germany (6%) and Israel (5%). China also sources India most of the raw materials needed to manufacture agrochemicals. In the current financial year there has been an increase in exports of insecticides and herbicides by 18.9% and 20.5% respectively. Fungicide imports have fallen by 2.6%. The figures will be able to get improvised due to increased production within the country.

2.6 Export possibility

Bayer proposes to provide supply of pesticides to every corner of the country and would thrive for satisfaction of intra-national demands of agrochemical products.

2.7 Domestic/Export Markets

The products shall cater to major domestic markets.

2.8 Employment Generation (Direct and Indirect) due to the project

Construction Phase: Approx. **150 no.** of construction employment will be hired for the construction works of the proposed plant. Labors will be hired from local areas that will provide employment and socio-economic stability to nearby people.

Operation Phase: After expansion, total employment in plant will be 1230 nos. Local workforce/labour will be hired in the plant. In addition to direct employment, indirect employment shall generate ancillary business to some extent for local population.

3 PROJECT DESCRIPTION

Being cognizant of the latest trends in pesticide industry and market demand in the country, Bayer has planned to expand their existing manufacturing unit. The project will be involved in production of pesticides and pesticide specific intermediates. The total production capacity of plant after expansion will be Product: 30790 MTPA and Byproduct: 17852 MTPA.

3.1 Type of Project including interlinked and interdependent projects if any.

Proposed project is a brownfield project. There is no interlinked project.

3.2 Location (specific location and project boundary & project lay out) with coordinates.

The Plant is located at Plot No/survey no. 306/3, 306/2, 148, 304/2+305/1+305/2+305/3, 305/5, 300 & 301, 302/1-2-3, 302/4&5P, 302/5/2 & 302/6, 302/7-8, 302/10, 302/11-12, 387 (60/P3), 391 (60/P5), 392 (61/P1), 393 (61/P2), 414 (73/1), 435 (81/2/P1), 441 (85/1/P1), 442 (86/1/P1), 443 (87/2), 444 (91/P1), 446 (92/2/1), 575 (135/1/P), 1049 (143 to 147), Phase II, GIDC Estate, Vapi. District Valsad, Gujarat-396195. It is a brown field project having total plot area of **34.8 Hectare**. Out of total land, 29.3706 Ha of land has been alloted by GIDC for industrial use and rest 5.4294 Ha land is private land which is developed as green area. No industrial activity is being carried out at private land. The coordinates from centre of the project are **Latitude**: 20°22'14.58"N; **Longitude**: 72°56'6.16"E. Google map showing coordinates of the site have been depicted as ***Figure 1*** below. Location Map and layout map of the proposed site has been provided in ***Figure 2*** & ***Figure 3*** respectively.

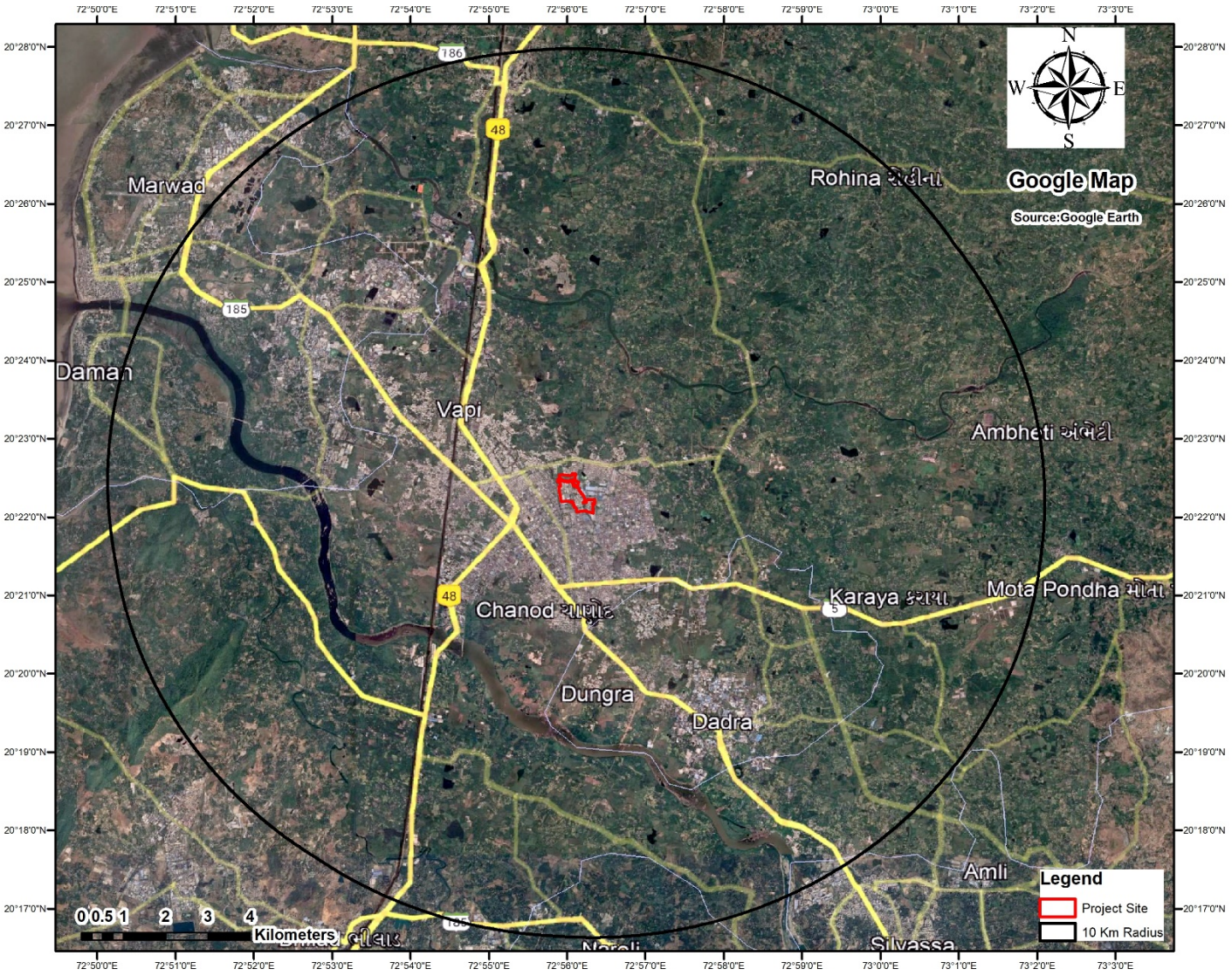


Figure 1: Project Boundary Map

Figure 2: Plant Photographs

Figure 3: Plant Layout Map

3.3 Details of alternate sites considered and the basis of selecting the proposed site, particularly the environmental considerations gone into should be highlighted.

This being brown field project proposing expansion within the existing unit, no alternative site is examined. Accordingly, site infrastructure and utilities are available. Unit has sufficient space within the existing premises for proposed expansion. The site is well connected and has advantage of good infrastructure facilities like roads, water, power, manpower, etc. The location of expansion is currently available within the existing premises, which makes integration of utilities like power and water with existing production line with cost effective manner. Existing infrastructure will be used most optimally, resulting in increase of productivity of existing operations as well as reduction of overall cost of new project. Further, the impact on environment will be minimal compared to the project being set up on a new green field site.

The site is in GIDC Vapi industrial area located in District-Valsad of Gujarat. The project is connected to National Highway-48 via internal roads of industrial area. NH-48 is located at 1 km, W. The nearest railway station is Vapi Railway Station located at distance of 2.4 km, W. The nearest town is Vapi at 0.5 km, W. The project is not likely to cause any significant impact to the ecology of the area since adequate preventive measures are proposed to be adopted to control various pollutants within permissible limits.

Table 6: Environmental Sensitivity of Project

S. No.	Environmental Features	Within 500 m-2 km area around Project Site	Within 2-5 km area around Project Site	Within 5-10 km area around Project Site
1.	**Ecological Environment**			
A	Presence of Wildlife Sanctuary/ National Park/Biosphere Reserves	None	None	None
B	Reserved /Protected Forests	None	None	Reserved Forest (7.5 Km, SW)
C	Mangroves	None	None	None
D	Critically Polluted Area	None	None	None
2.	**Physical Environment**			
E	Road Connectivity	Vapi-Ambach Road (0.35 Km, N), NH-48 (1 Km, W), SH-185 (1.4 Km, W), SH-5 (1.75 Km, S)	-	-
F	Rail Connectivity	Vapi Railway Station (2.4 Km, W)		
G	Defence Installation	None	None	None
H	Densely Populated Area	Vapi (0.5 Km, W)	Ajit Nagar (2.91 Km, NW)	Rentlav (9 Km, NNW)
I	Seismicity	Seismic Zone-III (Moderate Risk Zone)		

S. No.	Environmental Features	Within 500 m-2 km area around Project Site	Within 2-5 km area around Project Site	Within 5-10 km area around Project Site
J	Surface Water Resources	Kolal River Tributary (Within Site)	Kolak river (2.7 Km, NE), Daman Ganga (4 Km, SW)	Kalu River (7.5 Km, SW)
3.	**Social Environment**			
K	Physical Setting	Industrial, Residential, Agricultural	Industrial, Residential, Agricultural	Industrial, Residential, Agricultural
L	Physical Sensitive Receptors	***Schools*** • Mother of Hope School: 1.53 Km, W • St. Mary's School: 2.68 Km, S ***Hospitals*** • 21st Century Hospital Vapi: 1 Km, W		
M	Archaeological Monuments	None	None	None

3.4 Project description with process details (a schematic diagram/flow chart showing the project layout, components of the project etc. should be given)

1. Cypermethrin

The solution of Sodium Cyanide in water reacts with Meta Phenoxy Benzaldehyde (MPBD) to form MPB cyanohydrin which then reacts with Cypermethric Acid Chloride (CMAC) in presence of phase transfer catalyst. Hexane is used as a solvent. After reaction, Organic layer and Cyanide layer is separated. The separated cyanide layer is detoxified with Hydrogen Peroxide in Wastewater Pretreatment Plant. The organic mass is washed with Soda Ash, Sodium Hypochlorite, Acetic Acid and Water to remove impurities and solvent is recovered from organic to produce Cypermethrin.

2. Alphamethrin

The solution of Sodium Cyanide in water reacts with Meta Phenoxy Benzaldehyde (MPBD) to form MPB Cyanohydrin which then reacts with Cypermethric Acid Chloride (CMAC) in presence of phase transfer catalyst. Hexane is used as a solvent. After reaction, Organic layer and Cyanide layer is separated. The separated Cyanide layer is detoxified with Hydrogen Peroxide in Wastewater Pretreatment Plant. The organic mass is washed with Soda Ash, Sodium Hypochlorite, Acetic Acid, and Water to remove impurities and solvent is recovered from organic to produce Alpha Cypermethrin. Alpha Cypermethrin is crystalized in presence of DEA is called inversion. Then crystallized mass is filtered & washed with Hexane to form slurry. The slurry is taken in washing reactor where after Acetic Acid & Water wash, mass is recrystallized and taken back into ANF for filtration. After filtration and drying, Alphamethrin powder is discharged and packed.

3. Deltamethrin

TCA is dissolved in dehydrated EDC and reacted in presence of AlCl3 with HBr (generated through reaction of Liquid bromine and Toluene/ Ortho Di Choro Benzene in presence of FeCl3 catalyst). The resulted TBA mass is then washed with water and converted to Sodium salt of Dibromo Acid via

dehydrohalogenation reaction in presence of Sodium Hydroxide. Sodium salt is acidified by Sulfuric Acid in presence of Toluene. Toluene is recovered and Crude DBA is esterified with Methanol in presence of concentrated Sulfuric Acid. Esterified mass is treated with Soda Ash & Toluene is added & mass is washed with water to get crude DB Ester which is further concentrated & fractionated to get Pure DB Ester as top product. DB Ester is saponified with Sodium Hydroxide in presence of TEBA Chloride, the sodium salt is further acidified with 30% HCl, the DBA is isolated in EDC. Acid Chloride reaction is carried out by addition of Thionyl Chloride, DMF is used as Catalyst. HCl gas & SO2 is scrubbed in scrubber. This DB Acid chloride is used for Condensation reaction in Deltamethrin manufacturing. The solution of Sodium Cyanide in water reacts with Meta phenoxy Benzaldehyde (MPB) to form Cyanohydrin which then reacts with DBAC in presence of phase transfer catalyst TEA. EDC is used as a solvent. Organic & Cyanide aqueous layers are separated. Cyanide aqueous layer is detoxified with the help of hydrogen peroxide in Wastewater Pretreatment Plant. The organic mass is washed by Soda Ash, Sodium Hypo Chlorite, Acetic Acid & Water to remove impurities. Solvent is recovered from organic mass. Inversion of crude Deltamethrin is carried out in presence of IPA & TEA. Inverted mass is purified, crystallized, filtered, and dried to produce Deltamethrin. IPA & TEA are recovered from ML & recycled. Residual mass is treated with Methanol to recover Crude Deltamethrin.

4. Becisthemic Acid

TCA is dissolved in dehydrated EDC and reacted in presence of AlCl3 with HBr (generated through reaction of Liquid bromine and Toluene in presence of FeCl3 catalyst). Vent HBr gas is again purged through secondary reactor to optimize the Bromine consumption. The resulted TBA mass is then washed with water and converted to sodium salt of Dibromo Acid via dehydrohalogenation reaction in presence of sodium hydroxide. EDC is recovered and sodium salt is acidified by sulfuric acid in presence of Toluene as a solvent. Toluene is recovered and Crude DBA is esterified with Methanol in presence of concentrated Sulfuric Acid. Esterified mass is treated with Soda Ash. Excess Methanol is recovered. Toluene is added & mass is washed with water to get crude DB Ester which is further concentrated & fractionated to get Pure DB ester as top product. The LB cut (CB ester) is re brominated and recycled. DB Ester is saponified with Sodium Hydroxide in presence of TEBA chloride, the sodium salt is further acidified with 30% HCl, DBA is isolated in solvent EDC and it is further water washed. EDC is recovered in presence of water and DBA is filtered and Wet DBA cake is water washed and Dried in Rotary Vacuum Drier, Dry Becisthemic Acid is packed in Fiber board drums with 25 Kg pack size and analyzed as per the specifications.

5. Permethrin

The Hydrogenation is carried out with Meta Phenoxy Benzaldehyde in presence of Raney Nickel catalyst which is then filtered. Crude Meta Phenoxy Benzyl Alcohol distilled out in fractionating column to get required purity. MPB Alcohol is reacted with Cypermethric Acid Chloride. HCI gas evolved is scrubbed to get 30% solution which is sold/recycled. Reaction mass is washed with water and Soda Ash. The washed organic layer is distilled to recover solvent. The residual mass is Permethrin which is packed in drums.

6. Transfluthrin

The Isomer of CMA is reacted with Thionyl Chloride in presence of Toluene and catalyst DMF. HCl and SO2 generated are first taken to water scrubber where HCl gas is scrubbed to get 30% HCl which is internally recycled/Sold. Off gases containing SO2 is scrubbed in dilute Sodium Hydroxide

to get Sodium Sulfite solution which is being treated in evaporator. After concentration Toluene and Thionyl chloride is treated with soda ash solution to get Toluene. Organic mass is further distilled to produce Acid Chloride (RTPAC). R Trans Permethric Acid Chloride (RTPAC) is reacted with Tetrafluoro Benzyl Alcohol for esterification in Toluene medium. The HCl gas resulting from the reaction is scrubbed in Sodium Hydroxide solution. After completion of the reaction, the reaction mass is washed with Soda Ash Solution, followed by Acetic Acid and water wash. The organic layer is filtered through Filter Aid & Carbon followed by solvent distillation to get Transfluthrin. The impure toluene is washed with water and Soda Ash solution.

7. Beta cyfluthrin

Cyfluthrin is produced by reaction of Cypermethric Acid Chloride (CMAC) with 4-Fluro, 3-phenoxy benzaldehyde (FMPB), Sodium Cyanide (NaCN) and Sodium Bisulfite in Toluene. TBAB is used as Catalyst. Cyfluthrin reaction mass is washed with water. The Cyanide aqueous layer is sent to WWPT for detoxification. The organic phase is washed with Soda Ash solution followed by Sodium Hypochlorite, water, and Acetic Acid wash. Toluene is recovered from organic mass to get Cyfluthrin. Beta Cyfluthrin is prepared by Isomerization of Cyfluthrin using solvent Isopropyl Alcohol (IPA) and TEA as a phase transfer catalyst which is then filtered & washed with IPA followed by drying and packing. The Mother liquor is treated with Sulfuric Acid and then distilled out to separate IPA and residual mass send to incinerator.

8. Cyfluthrin

Cyfluthrin is produced by reaction of Cypermethric Acid Chloride (CMAC) with cyanohydrin complex (of 4-Fluro, 3-phenoxy benzaldehyde (FMPB) & Sodium cyanide (NaCN)) at specified temperature. The Sodium bisulfite (NaHSO3) is added to get appropriate isomer ratio. This reaction is carried out in Toluene. TBAB is used as Catalyst. Cyfluthrin reaction mass is washed with water. The cyanide aqueous layer is detoxified by Hydrogen Peroxide in wastewater pretreatment plant to remove unreacted cyanide. The organic phase is washed with Soda Ash solution followed by Sodium Hypochlorite, Water, and dilute Acetic Acid wash. Cyfluthrin is obtained by recovering toluene.

9. Ethofumesate

Iso butyraldehyde is reacted with Morpholine using Toluene as a solvent. During the reaction, water is removed azeotropically. The product of condensation in Toluene is taken in subsequent step. Above product is reacted with Benzoquinone under elevated temperature. Reaction mass is cooled to obtain crystals. The mass is filtered, and the cake is washed with Toluene. The cake is then taken for next step. The filtrate is taken for recovery of solvent and Iso butyraldehyde. Recovered Iso butyraldehyde and Toluene are recycled. The cake is charged in Toluene and reacted with Methane Sulphonyl Chloride (Mesyl Chloride) and Triethylamine to form Mesylate. The reaction mass is washed with water to get a clear organic layer of Mesylate in Toluene. The aqueous layer is treated with Caustic Soda Lye to recover Triethylamine. The recovered Triethylamine is recycled. Aqueous layer is sent to evaporator. The organic layer is reacted with Ethanol and Hydrochloric acid to form Ethofumesate. The reaction mass then settled, and the organic phase is separated from the aqueous phase. The aqueous layer contains Ethanol, HCl and Morpholine Hydrochloride. Ethanol is recovered and recycled, whereas dilute HCl is sent to Evaporator. Left over bottom aqueous phase is treated with Caustic Soda Lye to recover Morpholine and recycled. The organic mass, which contains Ethofumesate, is neutralized with soda ash solution.

From Organic phase Ethanol and Solvent Toluene is recovered and recycled. Ethofumesate purification in Soda Ash solution followed by aqueous layer separation to ETP. Left over organic mass is Ethofumesate which is packed in Jumbo Bags.

10. Aclonifen

Aclonifen is prepared by adding DCONA to a mixture of Phenol and Monochlorobenzene in the presence of Potassium Hydroxide at higher temperature. After completion of reaction, Water and CS Lye is added to the reaction mixture. Two phases are separated. Organic layer washed with water and combined aqueous layer sent for Phenol recovery. Organic layer concentrated under vacuum to get crude Aclonifen. The crude Aclonifen is crystallized in Methanol. The slurry is filtered and washed with methanol and water to give technical Aclonifen.

11. Meta phenoxy Benzaldehyde

Meta phenoxy Benzaldehyde is manufactured in multiple step process. In first step, Benzaldehyde is reacted with Bromine - Chlorine mixture in Ethylene dichloride (EDC) as solvent containing Aluminum Chloride. The reaction mass is drowned in water. The layers are then separated. Aqueous layer is taken to storage tank. Organic layer is washed with Hydrochloric acid, Formic acid, Sodium Thiosulphate and with water. Some washes are recycled, and rest is sent to ETP. The washed organic layer is fractionally distilled to recover EDC and MBB. Distilled MBB is taken to next step. HCI evolved is scrubbed in water to get 30% HCI and sent to storage tank for recycling. Tail gases are scrubbed in Sodium Hydroxide and Soda Ash. MBB is reacted with MEG in presence of catalyst (PTSA) to produce MBBA. The MBBA obtained in step-2 is reacted with Phenol and KOH flakes in Toluene (solvent) in presence of a catalyst to form MPBA. MPBA is dissolved in solvent while KBr formed is removed by extracting and washing with Water and Sodium Hydroxide solution. Further KBr solution is acidified by Hydrochloric Acid and extracted by Toluene to separate excess unreacted phenol. The clear KBr Aqueous sent for bromine recovery. MPBA in solvent is hydrolyzed in dilute H2SO4 to form MPB (which remains in solvent) and MEG is liberated which goes to aqueous layer. Aqueous layer is neutralized with Sodium Hydroxide and distilled to recover MEG. The organic layer is washed and neutralized by Soda Ash and then fractionally distilled under vacuum to get toluene and product MPB. Crude phenol is neutralized, washed, and distilled to recycle phenol.

12. PYMA Acetate

Cyanation of PYF (2-Fluoro-3-Chloro- 5-trifluoromethyl Pyridine) done by using Sodium Cyanide in presence of catalyst -TBAB (Tetra-n-butylammonium bromide) to produce Crude PYCN(2-Cyano-3-Chloro- 5-trifluoromethyl Pyridine). Reaction mass is filtered to remove Sodium fluoride. Mother liquor is further washed with water and Crude PYCN organic phase is fractionated to get Pure PYCN. Pure PYCN is being used for Hydrogenation. Hydrogenation of PyCN (2-Cyano-3-Chloro- 5-trifluoromethyl Pyridine) is carried out in Acetic Acid solvent using catalyst-Raney nickel to produce Crude PYMA Acetate(3-chloro-5-(trifluoromethyl)pyridin-2-yl]methylamine acetate). Catalyst is removed by decantation & filtration. Filtrate is taken for Acetic acid recovery. Traces of Acetic acid removed by solvent exchange with Xylene from mass after acetic acid recovery. PYMA acetate (3-chloro-5-(trifluoromethyl)pyridin-2-yl] methylamine acetate) is isolated by crystallization, filtration, washing and drying.

13. NaCMTS

NaCMTS is manufactured through three different steps: In first step, Methanolic KOH solution is prepared by charging of KOH in methanol which is then feed to DMM which will form KMM salt. In second Step, KMM is then dehydrated followed by condensation with MCA using TBAB as phase transfer catalyst and Xylene as a solvent. The condensed output is MAMM. The byproduct produced during this step is Potassium Chloride (KCl) which separated by filtration and dried under vacuum. Finally KCl is packed in bags through packing machine. In third Step, NaCMTS is prepared by Cyclization of MAMM. This MAMM is taken for cyclization using Sodium Methoxide to form the final product NaCMTS in form of wet cake which is filtered through ANF followed by drying in RVD. Finally it is packed in FIBC bags.

14. CPDM

Dimethyl Cyclopropane-1,1-Dicarboxylate (CPDM) is prepared by reaction of Dimethylmalonate (DMM) with EDC in Dimethyl formamide (DMF) solvent in presence of Potassium Carbonate in a single step. TBAB is used as a phase transfer catalyst. DMM, EDC, DMF, Potassium carbonate and aqueous TBAB are charged in a reactor. Mass is heated to reflux. Maintained reflux temperature with continuous water removal until complete conversion of DMM. Reaction is monitored by in-process analysis. Potassium chloride, Carbon dioxide and Water formed as a by-product during the reaction. After complete conversion mass is cooled and EDC is added to reaction mixture. Reaction mass is filtered to isolate KCl salts. Salt wet cake is washed twice with EDC to remove trapped organic product. EDC and DMF recovered from Mother liquor under controlled temperature and vacuum conditions. Recovered EDC & DMF are recycled back to system. Residual crude CPDM mass is fractionated under controlled vacuum and temperature conditions to get pure CPDM. All distillation cuts are recycled in subsequent batches. Residue is subject to incinerator.

15. Cypermethric Acid Chloride (CMAC)/ Cypermethric Acid (CMA)

This is multiple steps process. In which first Tetra Chloro Butyro Nitrile (TBN) is prepared by using Acrylonitrile (ACN) and Carbon Tetrachloride (CTC) in presence of Cupric Chloride Acetonitrile and DEA Hydrochloride. Excess Acrylonitrile (ACN), Carbon tetrachloride (CTC) and acetonitrile (ACT) are distilled out and recycled in next batch. TBN is use in next step after water wash. In next step, Tetra Chloro Butyric Acid (TBA) is prepared by reaction of Washed TBN with dilute Hydrochloric acid. This Dry TBA is further reacted with Thionyl Chloride in presence of Dimethyl Formamide (DMF) and produce pure TBAC by distillation. Distilled TBAC is further reacted with Isobutylene in presence of Hexane and Tri Ethyl Amine (TEA) to give 2- Chloro Cyclo Butanone (2CB). After processing distilled Hexane is recycle and TEA is recovered after neutralizing with Sodium Hydroxide. In next step, 2CB is then isomerized to 4-Chloro Cyclo Butanone (4CB) by adding TEA and Boron trifluoride etherate. 4-Chloro Cyclo Butanone (4CB) is further reacted with Caustic Soda Lye to form Permethric Acid (PA). PA is drowned in mixture of Hexane, Water and Sulfuric Acid to get crude Cypermethric acid (CMA) in Hexane. Crude Cypermethric acid (CMA) in Hexane is purified by adding Sodium Hydroxide in presence of water to get Sodium salt of CMA. Sodium salt of CMA is acidified by using Concentrated Sulfuric acid in presence of Hexane to get Pure CMA in Hexane (CMA HEX). Finally, this acid is reacted with Thionyl Chloride after removing Hexane and crude Cypermethric acid chloride (CMAC) formed, which is then distilled to get CMAC.

16. Cypermethric Acid Chloride from DV Ester

DV Ester is saponified with CS Lye Solution to get sodium salt, which is then acidified using Sulfuric Acid to get DV Acid in Toluene. This organic layer is then washed with water followed by solvent recovery. Concentrated Acid Mass is reacted with Thionyl Chloride and NMP as a catalyst to form Crude CMAC. Excess Thionyl Chloride is recovered through Vacuum Pulling followed by distillation to get Pure CMAC. During this process HCl and SO2 is generated which is scrubbed in Water and CS Lye solution respectively.

17. Acid Chloride Preparation (RTPAC)

RTPA is reacted with thionyl chloride and DMF as a catalyst in Toluene to form Crude RTPAC. Excess Thionyl Chloride and Toluene is recovered through Vacuum Pulling followed by distillation to get Pure RTPAC. During this process HCl and SO2 is generated which is scrubbed in Water and CS Lye solution respectively.

18. Metaphenoxy Benzyl Alcohol

It is one-step process. In this hydrogenation is carried out with m-Phenoxy Benzaldehyde in presence of Raney Nickel catalyst. Crude Meta phenoxy benzyl Alcohol distilled out in fractionating column to get required purity of Meta phenoxy benzyl Alcohol.

19. TCA

Resolution of High Cis CMA is done with Base solution using EDC as a solvent. Resoluted mass contains desired optical isomers. Separation of isomers is done using filtration and washing. Non desired isomer in the form of mother liquor is further processed for recovery of HCMA and Ephedrine. TCA in the form of complex with Ephedrine is separated using HCl solution. Ephedrine-HCl aqueous is separated and used to Base (Ephedrine) recovery. TCA is extracted in EDC. Washing to TCA organic solution and EDC recovery from organic mass gives Product TCA. Complex breaking is carried out using dilute HCl. Ephedrine-HCl aqueous is separated transferred to Base recovery and HCMA organic phase in EDC is used for High Cis CMA and HCMA recovery. Ephedrine Hydrochloride is used for complex formation with CMA. Base (Ephedrine) is recovered from Aqueous layers (Ephedrine) using C. S. Lye . Extraction is carried out using EDC. Recovered Base solution is recycled and used in Resolution. Aqueous effluent transferred to WWPT. EDC is recovered from Washed organic HCMA. Hexane is added to HCMA, Crystallization done in Hexane. It is filtered. High Cis CMA is then dried and used. HCMA from mother liquor is recovered in the form of Aqueous HCMA Salt using C. S. Lye and transferred to CMA plant. Impure Hexane is distilled, and residue is incinerated.

20. RTCMA

Trans CMAC hydrolysis is done in water using TEBA as phase transfer catalyst. High Trans CMA is extracted in EDC. Byproduct dilute HCl separated and reused. Washed organic phase High Trans CMA+EDC is used for Resolution. Ephedrine Hydrochloride is used for complex formation with CMA. Base (Ephedrine) is recovered from Aqueous layers (Ephedrine) using C. S. Lye . Extraction is carried out using EDC. Recovered Base solution is recycled and used in Resolution. Aqueous effluent transferred to WWPT. Resolution of High Trans CMA is done with Base (Ephedrine-EDC) solution using EDC as a solvent. Resolute mass contains desired optical isomers. Separation of isomers is done using filtration and washing. Undesired isomer in the form of mother liquor is further processed for recovery of TCMA and Ephedrine.1 R Trans CMA in the form of complex with Ephedrine is separated using HCl solution. Ephedrine-HCl aqueous is separated and used to Base

(Ephedrine) recovery. l R Trans CMA is extracted in EDC. Washing to l R Trans CMA organic solution and EDC recovery from organic mass gives Product l R Trans CMA ML Complex breaking is carried out using dilute HCl. Ephedrine-HCl aqueous is separated and used for Base recovery (Ephedrine). TCMA organic phase in EDC is used for TCMA recovery. TCMA is recovered from Mother Liquor using C. S. Lye in the form of Aqueous Sodium salt send to CMA Plant. Impure EDC from the process is distilled and recycled and residue is incinerated.

21. Ethiprole

Diethyl disulfide (DEDS) in Dichloromethane (DCM) solution is treated with chlorine at low temperature to prepare ethane sulfinyl chloride (CES). Intermediate 5- Amino-3-cyano N-(2,6 dichloro-4-trifluoromethyl phenyl) pyrazole is treated with above CES mass to give Pyrazole sulfide as an intermediate. HCl (g) is by-product of reaction which is scrubbed in a suitable scrubbing medium. After completion of reaction, solvent is recovered, Acetic Acid & Aq. Hydrogen Peroxide is added to the above reaction mass under controlled condition & mass is further stirred till the completion of reaction. After completion of reaction, Aq. solution of sodium bi sulfite is added for destruction of unreacted Hydrogen Peroxide. Slurry mass is crystallized by gradual cooling followed by, filtration & cake washing with water. Wet product is dried and packed.

22. Pyrazole: DCTFMA is diazotized and coupled with DCPE by parallel addition of ethanolic solution of DCTFMA hydrochloride and aqueous Sodium Nitrite solution to Ethanol + DCPE solution. Excess of nitrous acid is then neutralized with aqueous Sodium Sulfamate solution. Then it is further cyclized by addition of the ammonia solution. Excess of ammonia is then neutralized with hydrochloric acid; Ethanol is then removed by distillation. Water is added to residual mass and product is extracted in Toluene. Aqueous layer is again extracted with Toluene. Organic layers are mixed, and Toluene is partially recovered, and further cooled to crystallize. Suspension is filtered and washed with Toluene. Dried Pyrazole under vacuum. The recovered distilled ethanol is further purified by distillation under alkaline condition for recycling.
23. Fluopyram: TFMB acetate is a key intermediate for the preparation of Fluopyram. TFMB amide reacts with Aq. Formaldehyde to give TFMB- hydroxy methyl which in turn is treated with acetic anhydride to form TFMB-acetate. Fluopyram preparation of is a four-stage process. In a suitable flask equipped with a distillation apparatus DMAC, Toluene, KOH, PyCl and Dimethyl malonate are added and maintained at reflux temperature under vacuum to give step-1 product (malon ester). TFMB acetate is added in the reaction mass of step-1 to give step-2 product i.e. Di-ester intermediate which is then Saponified & treated with H2SO4 to give Fluopyram. Product is isolated by filtration, washed, and dried to give Fluopyram as white to grey-beige solid.
24. PYACN: It is single stage process. In a suitable flask equipped with a distillation apparatus DMAC, Toluene, NaOH are heated under vacuum & PyCl and Methyl cyanoacetate are added slowly to the mass to produce PYACN-A as an intermediate. Intermediate-A is treated with H2SO4 at elevated temperature to give PYACN as crude product. Pure product is obtained by further distillation process.
25. Flumethrin: The Flumethrin manufactured in two steps process. Bayticol P Acid chloride is manufactured by reacting Bayticol P Acid with Thionyl chloride in solvent Toluene in presence of a catalyst. Excess Thionyl chloride is distilled off along with toluene. Recovered

Toluene is washed and recycled in subsequent batches. Flumethrin is synthesized by condensation of Bayticol P acid chloride, sodium cyanide and 4-fluoro-3-phenoxybenzaldehyde in Toluene in presence of a catalyst. The product is washed with water to remove cyanide content. The Organic mass is distilled out to remove Toluene and remaining mass is packed as Flumethrin. Aqueous washes transferred for cyanide treatment in wastewater pretreatment plant.

26. BDCB: Crude BDCB is fractionated and purified by crystallization in Methanol followed by filtration and washed with Methanol. Wet cake is melted and transferred to another reactor for methanol recovery. This pure BDCB is transferred to main storage tank. Mother liquor of first crystallization process is recycled back for recrystallization separately and recycled in fractionation step.

3.5 Raw material required along with estimated quantity, likely source, marketing area of final products, mode of transport of raw material and finished product.

Storage

The raw materials are procured and stored as per market requirement of the products and production schedule.

- Solid raw materials are stored in warehouse.
- Liquid raw materials are stored in storage tanks or drums.
- Gaseous raw materials are stored in cylinder.

Details of raw material and consumption for product is given below in **Table 7.**

Table 7: List of Raw Materials and Consumption

Name of Products	Name of Raw Materials	Physical State of RM	Raw Material consumption in MT/Annum		Mode of Handling	CAS no	Sources of Raw Materials	Mode of Transportation
			Per ton of product	Proposed				
Cypermethrin	Sodium cyanide	Solid	0.125	500	Drums	143-33-9	Indigenous/Imported	Road
	Metaphenoxy Benzaldehyde (MPBD)	Liquid	0.480	1920	Tanker	39515-51-0	Indigenous	Road
	Triethyl Amine	Liquid	0.022	87	Tanker	121-44-8	Indigenous	Road
	Hexane	Liquid	0.020	80	Tanker	110-54-3	Indigenous/Imported	Road
	Cypermethric Acid Chloride (CMAC)	Liquid	0.562	2248	Drums	52314-67-7	Indigenous	Road
	Sodium Hydroxide	Liquid	0.047	188	Tanker	1310-73-2	Indigenous	Road
	Ferrous Sulphate	Solid	0.002	8	Bag	13463-43-9	Indigenous	Road
	Sodium Hypochlorite	Liquid	0.100	400	Tanker	7681-52-9	Indigenous	Road
	Soda Ash	Solid	0.007	28	Bag	497-19-8	Indigenous	Road
	Acetic acid	Liquid	0.009	36	Tanker	64-19-7	Indigenous	Road
Alphamethrin	Metaphenoxy Benzaldehyde (MPBD)	Liquid	0.609	2436	Drums/Tanker	39515-59	Indigenous	Road
	Cypermethric Acid Chloride (CMAC)	Liquid	0.713	2852	Drums	52314-67-7	Indigenous	Road
	Diethyl Amine (DEA)	Liquid	0.137	548	Drums	109-89-7	Indigenous	Road
	Hexane	Liquid	0.152	608	Tanker	110-54-3	Indigenous	Road
	Sodium Hydroxide	Liquid	0.060	240	Tanker	1310-73-2	Indigenous	Road
	Soda Ash	Solid	0.009	36	Bag	497-19-8	Indigenous	Road
	Sodium Cyanide	Liquid	0.159	636	Drums	143-33-9	Indigenous/Imported	Road
	Acetic Acid	Liquid	0.063	252	Tanker	64-19-7	Indigenous	Road
	Try Ethyl Amine (TEA)	Liquid	0.028	112	Tanker	121-44-8	Indigenous	Road
	Sodium Hypochlorite	Solid	0.127	508	Bag	7681-52-9	Indigenous	Road
	Ferrous Sulphate	Solid	0.003	10	Bag	13463-43-9	Indigenous	Road
Deltamethrin	ODCB/Toluene	Liquid	3.833	3450	Tanker	95-50-1	Indigenous	Road

Name of Products	Name of Raw Materials	Physical State of RM	Raw Material consumption in MT/Annum		Mode of Handling	CAS no	Sources of Raw Materials	Mode of Transportation
			Per ton of product	Proposed				
	Ferric Chloride (FeCl3)	Solid	0.020	18	Bag	7705-08-0	Indigenous	Road
	Ethylene Dichloride (EDC)	Liquid	0.341	307	Tanker	107-06-2	Indigenous	Road
	Toluene	Liquid	0.137	123	Tanker	108-88-3	Indigenous	Road
	Bromine	Liquid	3.200	2880	Tanker	7726-95-6	Indigenous	Road
	Trichloro Acid (TCA)	Solid	0.635	572	Drum	0	Indigenous	Road
	Aluminimum Chloride (AlCl3)	Liquid	0.567	510	Tanker	7446-70-0	Indigenous	Road
	Sodium Hydroxide	Liquid	2.791	2512	Tanker	7681-52-9	Indigenous	Road
	Sulphuric Acid (H2So4)	Liquid	0.399	360	Tanker	7664-93-9	Indigenous	Road
	Methanol	Liquid	0.214	193	Tanker	67-56-1	Indigenous	Road
	Soda Ash	Solid	0.086	77	Drum	497-19-8	Indigenous	Road
	Triethyl Benzyl Ammonium chloride	Solid	0.008	7	Tanker	1643-19-2	Indigenous	Road
	Dimethylformamide (DMF)	Liquid	0.000	0	Tanker	68-12-2	Indigenous	Road
	Thionyl Chloride (TC)	Liquid	0.320	288	Tanker	1719-09-07	Indigenous	Road
	Sodium Cyanide	Solid	0.124	112	Drums	143-33-9	Indigenous	Road
	Triethyl Amine (TEA)	Liquid	0.041	37	Tanker	121-44-8	Indigenous	Road
	Metaphenoxy Benzaldehyde	Liquid	0.445	401	Drum	39515-51-0	Indigenous	Road
	Ferrous Sulphate	Liquid	0.001	1	Drum	13463-43-9	Indigenous	Road
	Acetic Acid	Liquid	0.012	11	Tanker	64-19-7	Indigenous	Road
	Isopropyl alcohol	Liquid	0.060	54	Tanker	67-63-0	Indigenous	Road
	Hydrochloric Acid (30 %)	Liquid	0.394	355	Tanker	7647-01-34	Indigenous	Road
	Sodium Hypochlorite	Liquid	0.400	360	Tanker	7681-52-9	Indigenous	Road

Name of Products	Name of Raw Materials	Physical State of RM	Raw Material consumption in MT/Annum		Mode of Handling	CAS no	Sources of Raw Materials	Mode of Transportation
			Per ton of product	Proposed				
Metaphenoxy Benzyl Alcohol	Metaphenoxy Benzaldehyde (MPBD)	Liquid	1.044	1253	Drums/Tanker	39515-51-0	Indigenous	Road
	Raney Nickle	Liquid	0.002	2	Drums	7440-02-0	Indigenous	Road
	Hydrogen	Gas	0.013	16	Cylinder	1333-74-0	Indigenous	Road
Permethrin	Metaphenoxy Benzaldehyde (MPBD)	Liquid	0.548	877	Drums/Tanker	39515-51-0	Indigenous	Road
	Raney Nickel	Liquid	0.001	2	Drums	7440-02-0	Indigenous	Road
	Hydrogen	Gas	0.007	11	Tanker	1333-74-0	Indigenous	Road
	Cypermethric acid chloride(CMAC)	Liquid	0.588	941	Drum	52314-67-7	Indigenous	Road
	Hexane	Liquid	0.010	16	Tanker	110-54-3	Indigenous	Road
	Sodium Hydroxide	Liquid	0.010	16	Tanker	7681-52-9	Indigenous	Road
	Soda Ash	Solid	0.012	19	Bag	497-19-8	Indigenous	Road
	Sulphuric Acid	Liquid	0.002	3	Tanker	7664-93-9	Indigenous	Road
Transfluthrin	RTPAC	Liquid	0.589	942	Drums	61914-47-4	Indigenous	Road
	Dimethylformamide (DMF)	Liquid	0.001	1	Tanker	68-12-2	Indigenous	Road
	Thionyl Chloride (TC)	Liquid	0.377	604	Tanker	2125597	Indigenous	Road
	Toluene	Liquid	0.140	224	Tanker	108-88-3	Indigenous	Road
	Sodium Hydroxide	Liquid	0.755	1208	Tanker	1310-73-2	Indigenous	Road
	Soda Ash	Solid	0.049	78	Bag	497-19-8	Indigenous	Road
	Tetrafluoro Benzyl alcohol (TFBA)	Liquid	0.493	788	Drums	4084-38-2	Indigenous/Imported	Road
	Acetic Acid	Liquid	0.000	1	Drums	64-19-7	Indigenous	Road
	Filter aid	Solid	0.004	6	Bag	0	Indigenous	Road
	Carbon	Solid	0.005	8	Bag	7440-44-0	Indigenous	Road

Name of Products	Name of Raw Materials	Physical State of RM	Raw Material consumption in MT/Annum		Mode of Handling	CAS no	Sources of Raw Materials	Mode of Transportation
			Per ton of product	Proposed				
Beta Cyfluthrin	Fluorinated Metaphenoxy Benzaldehyde (FMPB)	Liquid	0.584	730	Drums	0	Indigenous/Imported	Road
	Cypermethric Acid Chloride	Liquid	0.628	785	Drums	52314-67-7	Indigenous	Road
	Toluene	Liquid	0.047	58	Tanker	108-88-3	Indigenous	Road
	Sodium Hydroxide	Liquid	0.175	219	Tanker	1310-73-2	Indigenous	Road
	Soda Ash	Solid	0.016	20	Bag	497-19-8	Indigenous	Road
	Sodium Cyanide	Solid	0.186	232	Drums	143-33-9	Indigenous/Imported	Road
	Acetic Acid	Liquid	0.007	8	Tanker	64-19-7	Indigenous	Road
	Try Ethyl Amine (TEA)	Liquid	0.059	74	Tanker	121-44-8	Indigenous	Road
	Sodium Hypochlorite	Liquid	0.223	278	Tanker	7681-52-9	Indigenous	Road
	Ferrous Sulphate	Solid	0.002	3	Bag	13463-43-9	Indigenous	Road
	Sulphuric Acid	Liquid	0.059	74	Tanker	7664-93-9	Indigenous	Road
	ISO Propyl Alcohol (IPA)	Liquid	0.058	73	Tanker	67-63-0	Indigenous	Road
	Sodium Bisulphite (NaHSO3)	Solid	0.292	365	Tanker	7631-90-5	Indigenous	Road
	Tetrabutylammonium Bromide (TBAB)	Solid	0.004	4	Drums	1643-19-2	Indigenous	Road
	Caustic Flakes	Solid	0.002	2	Bag	1310-73-2	Indigenous	Road
Cyfluthrin	Fluorinated Metaphenoxy Benzaldehyde (FMPB)	Liquid	0.503	628	Drums	68359-57-9	Indigenous/Imported	Road
	Cypermethric Acid Chloride	Liquid	0.541	676	Drums	52314-67-7	Indigenous	Road
	Toluene	Liquid	0.041	51	Tanker	108-88-3	Indigenous	Road
	Sodium Hydroxide	Liquid	0.151	188	Tanker	1310-73-2	Indigenous	Road

Name of Products	Name of Raw Materials	Physical State of RM	Raw Material consumption in MT/Annum		Mode of Handling	CAS no	Sources of Raw Materials	Mode of Transportation
			Per ton of product	Proposed				
	Soda Ash	Solid	0.014	17	Bag	497-19-8	Indigenous	Road
	Sodium Cyanide	Solid	0.160	200	Drums	143-33-9	Indigenous/Imported	Road
	Acetic Acid	Liquid	0.001	1	Tanker	64-19-7	Indigenous	Road
	Sodium Hypochlorite	Liquid	0.192	239	Tanker	7681-52-9	Indigenous	Road
	Ferrous Sulphate	Solid	0.002	2	Bag	13463-43-9	Indigenous	Road
	Sodium Bisulphite (NaHSO3)	Solid	0.251	314	Bag	7631-90-5	Indigenous	Road
	Tetrabutylammonium Bromide (TBAB)	Solid	0.003	4	Drums	1643-19-2	Indigenous	Road
Ethofumesate	Benzoquinone (BQ)	Solid	0.435	1958	Bag	106-51-4	Imported	Road
	Ethanol	Liquid	0.356	1602	Tanker	64-17-5	Indigenous	Road
	Isobutyraldehyde (IBAL)	Liquid	0.371	1670	Tanker	78-84-2	Indigenous/Imported	Road
	Methanesulfonyl chloride (MSC)	Liquid	0.461	2075	Tanker	124-63-0	Imported	Road
	Morpholine	Liquid	0.092	414	Tanker	110-91-8	Indigenous/Imported	Road
	Soda Ash	Solid	0.02	90	Bag	497-19-8	Indigenous	Road
	Sodium Hydroxide	Liquid	0.872	3924	Tanker	1310-73-2	Indigenous	Road
	Toluene	Liquid	0.13	585	Tanker	108-88-3	Indigenous	Road
	Try Ethyl Amine (TEA)	Liquid	0.02	90	Tanker	121-44-8	Indigenous	Road
	Hydrochloric Acid (30 %)	Liquid	1.062	4779	Tanker	7647-01-0 34	Indigenous	Road
Aclonifen	2,3-Dichloro-6-Niroanile (DCONA)	Solid	0.798	3591	Bag	2683-43-4	Indigenous	Road
	Monochlorobenzene (MCB)	Liquid	0.043	194	Tanker	108-90-7	Indigenous	Road

Name of Products	Name of Raw Materials	Physical State of RM	Raw Material consumption in MT/Annum		Mode of Handling	CAS no	Sources of Raw Materials	Mode of Transportation
			Per ton of product	Proposed				
	Phenol	Liquid	0.421	1895	Tanker	108-95-2	Indigenous	Road
	Methanol	Liquid	0.151	680	Tanker	67-56-1	Indigenous	Road
	Potassium Hydroxide	Liquid	0.528	2376	Tanker	1310-58-3	Indigenous	Road
	Sodium Hydroxide	Liquid	0.04	180	Tanker	7681-52-9	Indigenous	Road
	Hydrochloric Acid (30 %)	Liquid	0.143	644	Tanker	7647-01-0 34	Indigenous	Road
Metaphenoxy Benzaldehyde	Ethylene Dichloride (EDC)	Liquid	0.086	155	Tanker	107-06-2	Indigenous	Road
	Aluminium Chloride	Solid	1.092	1966	Bag	7446-70-0	Indigenous	Road
	Benzaldehyde	Liquid	0.638	1148	Tanker	100-52-7	Indigenous	Road
	Bromine	Liquid	0.603	1085	Tanker	7726-95-6	Indigenous	Road
	Hydrochloric Acid (30 %)	Liquid	0.301	542	Tanker	7647-01-34	Indigenous	Road
	Sodium Hydroxide	Liquid	0.208	374	Tanker	7681-52-9	Indigenous	Road
	Chlorine	Gas	0.224	403	Tonner	7782-50-5	Indigenous	Road
	Soda Ash	Solid	0.049	88	Bag	497-19-8	Indigenous	Road
	Formic Acid	Liquid	0.046	83	Tanker	64-18-6	Indigenous	Road
	Sodium Thiosulphate	Solid	0.032	58	Bag	7726-95-6	Indigenous	Road
	Dimethylformamide (DMF)	Liquid	0.029	52	Tanker	68-12-2	Indigenous	Road
	Monoethylene glycol (MEG)	Liquid	0.057	103	Tanker	107 –21-1	Indigenous	Road
	Paratolunesulphonic Acid	Solid	0.003	5	Bag	104-15-4	Indigenous	Road
	Phenol	Liquid	0.57	1026	Tanker	108-95-2	Indigenous	Road
	Potassium Hydroxide	Solid	0.387	697	Tanker	1310-58-3	Indigenous	Road

Name of Products	Name of Raw Materials	Physical State of RM	Raw Material consumption in MT/Annum		Mode of Handling	CAS no	Sources of Raw Materials	Mode of Transportation
			Per ton of product	Proposed				
	Hyflow Powder	Solid	0.001	2	Bag	61790-53-2	Indigenous	Road
	Toluene	Liquid	0.045	81	Tanker	108-88-3	Indigenous	Road
	Cuprous chloride	Solid	0.012	22	Bag	7758-89-6	Indigenous	Road
	Sulphuric Acid	Liquid	0.033	59	Tanker	7664-93-9	Indigenous	Road
	Sodium Chloride	Solid	0.04	72	Bag	7647-14-5	Indigenous	Road
Pyma Acetate	Sodium Cyanide	Solid	0.265	477	Drums	143-33-9	Indigenous/Imported	Road
	Tetra-n-butyl ammonium bromide	Liquid	0.05	90	Drums	1643-19-2	Indigenous	Road
	2-fluoro-3-chloro-5-Trifluoromethyl pyridine	Liquid	1.03	1854	Tanker	72537-17-8	Indigenous	Road
	Xylene	Liquid	0.203	365	Tanker	1330-20-7	Indigenous	Road
	Acetic Acid	Liquid	0.61	1098	Tanker	64-19-7	Indigenous	Road
	Hydrogen	Liquid	0.021	38	Cylinder	1333-74-0	Indigenous	Road
	Raney Nickel	Liquid	0.073	131	Drums	7440-02-0	Indigenous	Road
NaCMTS	Potassium Hydroxide Flakes	Solid	0.411	493	Bag	1310-58-3	Indigenous	Road
	Dimethyl Melonate (DMM)	Liquid	0.822	986	Tanker	108-59-8	Imported	Road
	Xylene	Liquid	0.113	136	Tanker	1330-20-7	Indigenous	Road
	Tetrabutylammonium Bromide (TBAB)	Solid	0.046	55	Drums	1643-19-2	Indigenous	Road
	Methylchloroacetate (MCA)	Liquid	0.706	847	Tanker	96-34-4	Indigenous	Road
	Sodium Methoxide	Liquid	1.13	1356	Tanker	124-41-4	Indigenous	Road
CPDM	Dimethyl Melonate (DMM)	Liquid	1.075	1290	Tanker	108-59-8	Imported	Road
	Ethylene Dichloride (EDC)	Liquid	1.553	1864	Tanker	107-06-2	Indigenous/Imported	Road

Name of Products	Name of Raw Materials	Physical State of RM	Raw Material consumption in MT/Annum		Mode of Handling	CAS no	Sources of Raw Materials	Mode of Transportation
			Per ton of product	Proposed				
	Potassium Carbonate	Solid	1.859	2231	Bag	584-08-7	Indigenous/Imported	Road
	Dimethyl Formamide (DMF)	Liquid	0.109	131	Tanker	68-12-2	Indigenous/Imported	Road
	Tetrabutylammonium Bromide (TBAB)	Solid	0.014	17	Drums	1643-19-2	Indigenous	Road
Cypermethric Acid Chloride (CMAC)/ Cypermethric Acid (CMA)	Sulphuric Acid	Liquid	0.302	1055	Tanker	7664-93-9	Indigenous	Road
	Di Methyl Formamide (DMF)	Liquid	0.023	82	Tanker	68-12-2	Indigenous	Road
	Thinoyl Chloride (TC)	Liquid	1.531	5359	Tanker	2125597	Indigenous	Road
	Sodium Hydroxide	Liquid	3.948	13818	Tanker	1310-73-2	Indigenous	Road
	Acrylonitrile	Liquid	0.401	1404	Tanker	107-13-1	Indigenous	Road
	Hyflow	Solid	0.030	104	Bag	0	Indigenous	Road
	DiEthyl Amine (DEA)	Liquid	0.007	24	Drums	109-89-7	Indigenous	Road
	TriEthyl Amine (TEA)	Liquid	0.015	53	Tanker	121-44-8	Indigenous	Road
	HydroChloric Acid	Liquid	0.289	1011	Tanker	7647-01-34	Indigenous	Road
	Acetonitrile	Liquid	0.024	83	Drums	75-05-08	Indigenous	Road
	CarbonTetra Chloride	Liquid	1.165	4077	Tanker	56-23-5	Indigenous	Road
	Cupric Chloride	Solid	0.007	25	Bag	7758-89-6	Indigenous	Road
	Hexane	Liquid	0.183	639	Tanker	110-54-3	Indigenous	Road
	Iso Butyulene	Liquid	0.475	1663	Tanker	115-11-7	Indigenous	Road
	Boron F3 Etherate	Solid	0.015	53	Drums	109-63-7	Indigenous	Road
	Soda Ash	Solid	0.214	749	Bag	497-19-8	Indigenous	Road
	DV Ester	Liquid	1.046	628	Drums	61898-95-1	Imported	Road
	Sodium Hydroxide	Liquid	1.231	738	Tanker	1310-73-2	Indigenous	Road

Name of Products	Name of Raw Materials	Physical State of RM	Raw Material consumption in MT/Annum		Mode of Handling	CAS no	Sources of Raw Materials	Mode of Transportation
			Per ton of product	Proposed				
Cypermethric Acid Chloride from DV Ester	Toluene	Liquid	0.067	40	Tanker	108-88-3	Indigenous	Road
	Sulphuric Acid	Liquid	0.273	164	Tanker	7664-93-9	Indigenous	Road
	Thionyl Chloride	Liquid	0.572	343	Tanker	17-19-0907	Indigenous	Road
	N-Methyl-2-pyrrolidinone (NMP)	Liquid	0.0004	0.240	Drums	872-50-4	Indigenous	Road
Acid Chloride Preparation (RTPAC)	RTPA	Liquid	0.947	568	Drums	61914-47-4	Indigenous	Road
	Sodium Hydroxide	Liquid	0.833	500	Tanker	1310-73-2	Indigenous	Road
	Toluene	Liquid	0.028	17	Tanker	108-88-3	Indigenous	Road
	Sulphuric Acid	Liquid	0.2727	164	Tanker	7664-93-9	Indigenous	Road
	Thionyl Chloride (TC)	Liquid	0.607	364	Tanker	17-19-0907	Indigenous	Road
	Dimethyl Formamide (DMF)	Liquid	0.001	1	Tanker	68-12-2	Indigenous	Road
	Soda Ash	Solid	0.027	16	Bag	497-19-8	Indigenous	Road
TCA	High Cis CMA	Solid	1.064	851	FIBC	52314-67-7	Indigenous	Road
	Ethylene Di Chloride (EDC)	Liquid	0.57	456	Tanker	107-06-02	Indigenous/Imported	Road
	Hydrochloric Acid	Liquid	2.25	1800	Tanker	7647-01-034	Indigenous	Road
	Soda Ash	Liquid	0.076	61	Bag	497-19-8	Indigenous	Road
	Sodium Hydroxide	Solid	2.812	2250	Tanker	1310-72-2	Indigenous	Road
	Ephedrine Hydrochloride	Liquid	0.122	98	Drums	24221-86-1	Indigenous	Road
	Hexane	Liquid	0.157	126	Tanker	110-54-3	Indigenous	Road
RTCMA	HCMAC	Liquid	2.677	2142	Drums	52314-67-7	Indigenous	Road
	Ethylene Di Chloride (EDC)	Liquid	0.56	448	Tanker	107-06-02	Indigenous/Imported	Road
	Hydrochloric Acid	Liquid	1.096	877	Tanker	7647-01-034	Indigenous	Road

Name of Products	Name of Raw Materials	Physical State of RM	Raw Material consumption in MT/Annum		Mode of Handling	CAS no	Sources of Raw Materials	Mode of Transportation
			Per ton of product	Proposed				
	Soda Ash	Solid	0.055	44	Bag	497-19-8	Indigenous	Road
	Sodium Hydroxide	Liquid	2.932	2346	Tanker	1310-72-2	Indigenous	Road
	Ephedrine Hydrochloride	Solid	0.143	114	Drums	134-71-4	Indigenous	Road
	TEBA	Solid	0.014	11	Drums	56-37-1	Indigenous	Road
Becisthemic Acid	ODCB/Toluene	Liquid	4.146	3731	Tanker	95-50-1	Indigenous	Road
	Ferric Chloride (FeCl3)	Solid	0.03	27	Bag	7705-08-0	Indigenous	Road
	Ethylene Dichloride (EDC)	Liquid	0.268	241	Tanker	107-06-2	Indigenous	Road
	Toluene	Liquid	0.106	95	Tanker	108-88-3	Indigenous	Road
	Bromine	Liquid	4.319	3887	Tanker	7726-95-6	Indigenous	Road
	Trichloro Acid (TCA)	Solid	0.93	837	Drum	0	Indigenous	Road
	Aluminium Chloride (AlCl3)	Liquid	0.83	747	Tanker	7446-70-0	Indigenous	Road
	Sodium Hydroxide	Liquid	3.35	3015	Tanker	7681-52-9	Indigenous	Road
	Sulphuric Acid (H2So4)	Liquid	0.57	513	Tanker	7664-93-9	Indigenous	Road
	Methanol	Liquid	0.257	231	Tanker	67-56-1	Indigenous	Road
	Soda Ash	Solid	0.096	86	Drum	497-19-8	Indigenous	Road
	Triethyl Benzyl Ammonium chloride	Solid	0.012	11	Tanker	1643-19-2	Indigenous	Road
	Hydrochloric Acid (30 %)	Liquid	0.577	519	Tanker	7647-01-34	Indigenous	Road
Ethiprole	Diethyldisulfide (DEDS)	Liquid	0.222	999	Tanker	110-81-6	Indigenous/Imported	Road
	Chlorine	Liquid	0.118	531	Tanker	7782-50-5	Indigenous	Road
	Methylene Dichloride (MDC)	Liquid	0.420	1890	Tanker	75-09-2	Indigenous	Road
	Pyrazole	Solid	0.910	4095	Bag	120068-79-3	Indigenous/Imported	Road

Name of Products	Name of Raw Materials	Physical State of RM	Raw Material consumption in MT/Annum		Mode of Handling	CAS no	Sources of Raw Materials	Mode of Transportation
			Per ton of product	Proposed				
	Dimethylformamide (DMF)	Liquid	0.175	788	Tanker	68-12-2	Indigenous	Road
	Acetic Acid	Liquid	1.300	5850	Tanker	64-19-7	Indigenous	Road
	Hydrogen Peroxide (50 %)	Liquid	0.228	1026	Tanker	7722-84-1	Indigenous	Road
	Sodium Bisulfite	Solid	0.040	180	Bag	7631-90-5	Indigenous	Road
	Sodium Hydroxide	Liquid	0.230	1035	Tanker	1310-73-2	Indigenous	Road
Pyrazole	DCTFMA (2,6 Dichloro-4-(Trifluromethyl aniline)	Liquid	0.818	3681	Tanker	24279-39-8	Imported	Road
	Hydrochloric Acid	Liquid	0.835	3758	Tanker	7647-01-34	Indigenous	Road
	Ethanol	Liquid	0.218	981	Tanker	64-17-5	Indigenous	Road
	NaNO2 (Sodium Nitrile)	Solid	0.291	1310	Bag	7632-00-0	Indigenous	Road
	Sulphamic Acid	Solid	0.073	329	Bag	5329-14-6	Indigenous	Road
	Sodium Hydroxide	Liquid	0.055	248	Tanker	1310-73-2	Indigenous	Road
	DCPE (Ethyl, 2-3-dicyanopropionate)	Liquid	0.527	2372	Tanker	40497-11-8	Imported	Road
	Ammonia Solution	Liquid	0.368	1656	Tanker	1336-21-6	Indigenous	Road
	Toluene	Liquid	0.259	1166	Tanker	108-88-3	Indigenous	Road
Fluopyram	TFMB Amid	Liquid	0.757	908	Tanker	341-58-2	Indigenous	Road
	Potassium Carbonate (K2C03)	Solid	0.056	67	Bag	107-06-2	Indigenous	Road
	Toluene	Liquid	0.406	487	Tanker	108-88-3	Indigenous	Road
	Potassium Hydroxide (KOH)	Liquid	0.731	877	Tanker	1310-58-3	Indigenous	Road
	Formaldehyde	Solid	0.667	800	FIBC	50-00-0	Indigenous	Road
	Acetic Acid	Liquid	0.134	161	Tanker	64-19-7	Indigenous	Road
	Dimethylacetamide (DMAC)	Liquid	0.174	209	Tanker	127-19-5	Indigenous	Road

Name of Products	Name of Raw Materials	Physical State of RM	Raw Material consumption in MT/Annum		Mode of Handling	CAS no	Sources of Raw Materials	Mode of Transportation
			Per ton of product	Proposed				
	Sodium Acetate (NaOAC)	Liquid	0.078	94	Tanker	127-09-3	Indigenous	Road
	Acetic Anhydride	Liquid	0.490	588	Tanker	108-24-7	Indigenous	Road
	PyCl	Solid	0.725	870	Bag	23295-32-1	Indigenous/Imported	Road
	Dimethyl Malonate (DMM)	Liquid	0.471	565	Tanker	108-59-8	Indigenous	Road
	Methyl Tertiary Butyl Ether (MTBE)	Liquid	0.075	90	Tanker	1634-04-4	Indigenous	Road
	Sodium Hydroxide	Liquid	1.496	1795	Tanker	7681-52-9	Indigenous	Road
	Sulfuric Acid	Liquid	0.001	1	Tanker	7664-93-9	Indigenous	Road
	Methanol	Liquid	0.280	336	Tanker	67-56-1	Indigenous	Road
PYACN	Dimethylacetamide (DMAC)	Liquid	0.125	150	Tanker	127-19-5	Indigenous	Road
	Sodium Hydroxide	Liquid	0.431	517	Tanker	1310-73-2	Indigenous	Road
	Toluene	Liquid	0.075	90	Tanker	108-88-3	Indigenous	Road
	PyCl	Solid	1.010	1212	Bag	23295-32-1	Indigenous	Road
	Methyl Cyanoacetate (MCA)	Liquid	0.538	646	Tanker	105-34-0	Indigenous	Road
	Sulfuric Acid	Liquid	0.330	396	Tanker	7664-93-9	Indigenous	Road
Flumethrin	Bayticol P Acid	Liquid	0.595	36	Drums	78479-03-05	Indigenous	Road
	Thionyl Chloride	Liquid	0.279	17	Tanker	17-19-0907	Indigenous	Road
	Toluene	Liquid	0.206	12	Tanker	108-88-3	Indigenous	Road
	Sodium Hydroxide	Liquid	0.502	30	Tanker	1310-73-2	Indigenous	Road
	N-N Diethyl-m-Toluamide	Solid	0.001	0.1	Drums	134-62-3	Indigenous	Road
	4 Fluro-3-Phenoxy Benzaldehyde (FPBA)	Solid	0.444	27	Drums	68359-57-9	Indigenous	Road
	Sodium Cyanide	Liquid	0.219	13	Drums	143-33-9	Indigenous	Road

Name of Products	Name of Raw Materials	Physical State of RM	Raw Material consumption in MT/Annum		Mode of Handling	CAS no	Sources of Raw Materials	Mode of Transportation
			Per ton of product	Proposed				
	Sodium Bisulphite (NaHSO3)	Liquid	0.111	7	Drums	7631-90-5	Indigenous	Road
	Tetrabutylammonium Bromide (TBAB)	Liquid	0.002	0.1	Drums	1643-19-2	Indigenous	Road
BDCB	Crude BDCB	Liquid	1.65	5775.00	Tanker	0.00	Indigenous	Road
	Metthanol	Liquid	0.04	154.00	Tanker	67-56-1	Indigenous	Road

3.6 Resource optimization/recycling and reuse envisaged in the project, if any, should be briefly outlined.

Bayer Vapi have taken adequate measures for sustainability. Cleaner technologies, improved design features and innovative measures are adopted to conserve resource and minimize pollution. The adoption of more efficient technological processes geared towards greater energy efficiency and production efficiency will help in preventing pollution at source. Adopting innovative measures and process modifications, recovery of valuable products, substitution of toxic and hazardous materials with nontoxic materials, etc. will help in achieving cleaner production. Following are few of the steps already taken in plant/

RESOURCE OPTIMIZATION/RECYCLING & REUSE METHODS

- The concept of utilization of wastes as a by-product to the extent possible i.e., Recycle, Recover, Reuse, Recharge is adopted.
- Solvent is to be recovered to the maximum extent as far as possible.
- Production is scheduled to minimize cleanouts.
- Recycling of water wash whenever possible.
- Use of steam condensate as boiler feed water.
- Automation for controlling cooling tower temperature.
- Wastewater generated from plant is segregated in high & low TDS and further treated in appropriate treatment scheme.
- Housekeeping practices like preventive maintenance on valves is being done.
- Implementation of LDAR Plan.
- Spill cleaning or leaks in outdoor bulk contaminant areas are done to prevent contamination of wastewater.
- There is proper segregation of solid wastes.
- Solvent recovery system is installed for recovery of solvent.

ENERGY CONSERVATION MEASURES

- Energy efficient drives / LED lights are used.
- Reduction of lighting power consumption by optimum use of electrical lights in plants by installing timers.
- Use of variable frequency drive in plant.
- Enough care is taken to prevent/minimize energy losses at each stage.
- Use of Energy Efficient Lighting, Transformers, HVAC system, Use of Energy Efficient Motors, electrical appliances to minimize the energy consumption in addition to Process Planning.
- Energy Efficient Boilers.

3.7 Availability of water its source, energy/power requirement and source should be given

3.7.1 Water Source

Construction Stage: Approx. 17 KLD (Domestic use: 7 KLD + Construction use: 10 KLD) of water shall be required during construction phase. Water required for domestic purpose shall be met by GIDC supply and for construction purpose shall be taken from inhouse treated water.

Operational Phase:

After expansion, total water requirement of the plant will be 2890 KLD. Out if which 2530 KLD freshwater requirement shall be met through GIDC supply and rest 360 KLD from in-house treatment schemes. Details of water requirement and wastewater management have been provided below in ***Table 8 & Table 9.***

Table 8: Backup of Water Consumption

Sr No	Category	Water Consumption (KLD)		
		As per EC	Additional/ Proposed	Total Proposed after Expansion
1	Industrial	685	(-)102	583
2	Boiler	2413	(-) 436	1977
3	Cooling			
4	Gardening	130	0	130
5	Domestics	100	50	150
6	Others	50	0	50
Total		**3378**	**(-) 488**	**2890**
7	Water to be recycled in plants	(-) 478	118	(-) 360
Total		**2900**	**(-) 370**	**2530**

Table 9: Wastewater Management

Sr No	Category	Wastewater Generation (KLD)		
		As per EC	Additional/ Proposed	Total Proposed after Expansion
1	Industrial	666	22	688
2	Boiler	569	(-) 157	412
3	Cooling			
4	Domestics	65	35	100
5	Others	50	0	50
Total		**1350**	(-) 100	**1250**
Water recycled in plants after treatment		**515**	**65**	**450**
6	**Wastewater disposed to CETP**	**835**	**(-) 35**	**800**

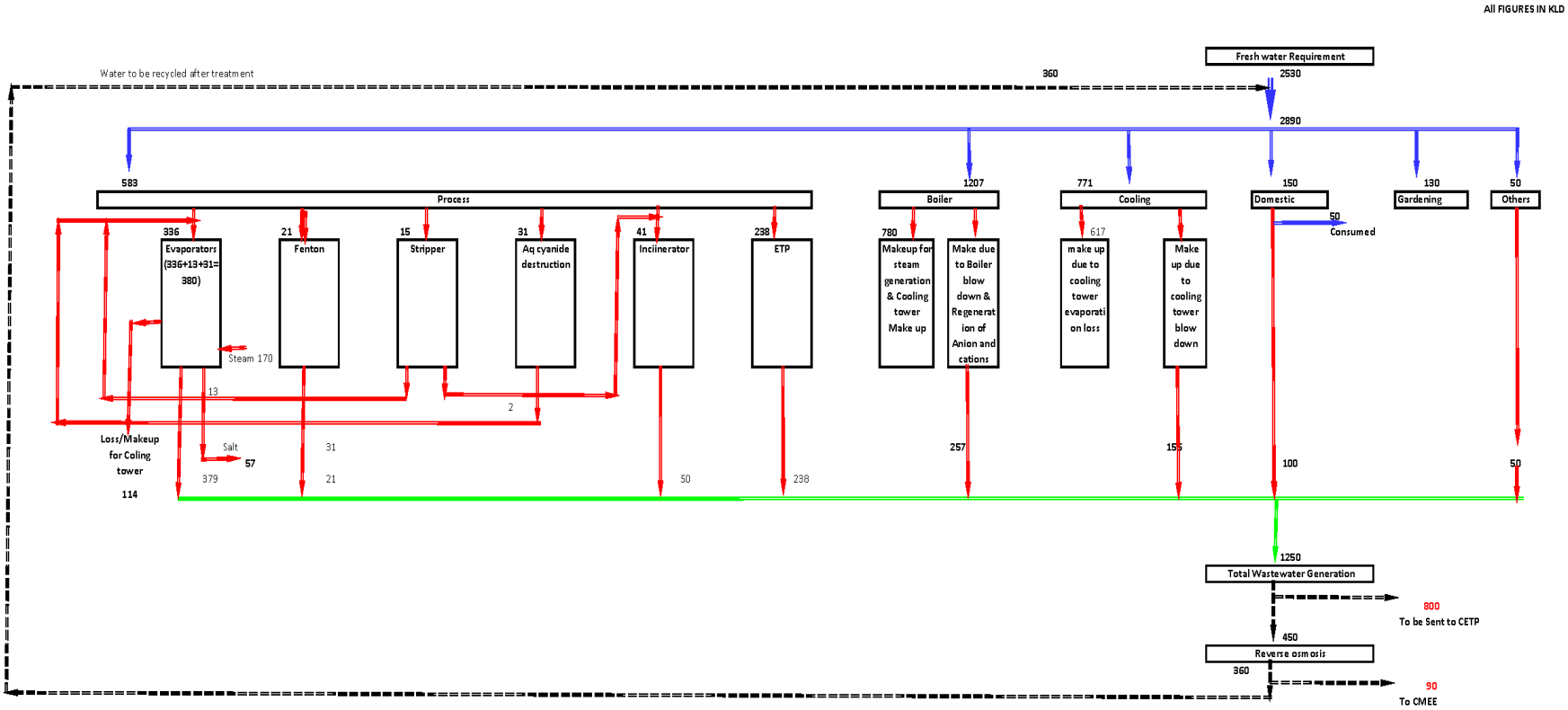


Figure 4: Water Balance Diagram (After Expansion)

3.7.2 Electricity & Fuel Requirements

Construction Phase: During the construction phase, existing power supply will be used i.e., DGVCL.

Operational Phase: After expansion, total power requirement of plant will be 12000 KVA, being sourced through Dakshin Gujarat Vij Company Limited (DGVCL). For Power backup, DG sets of capacity 2x1500 kVA, will be installed in the unit along with existing DG sets of 3 x1500 kVA, 2x750 kVA.

The details of Power requirement and fuel requirement are given in **Table 10 below**:

Table 10: Details of Power and Fuel Requirements

Particular	Unit	As per EC	Proposed	After Expansion
Power Requirement	kVA	33000	(-) 21000	12000
Power Backup-DG Set	kVA	1x1500, 2x 750, 2x 1500*	2x1500	5 x1500, 2x750, 3x325
DG Sets (Fire Hydrant Pumps)	kVA	3x325	–	3x325
FUEL REQUIREMENTS				
Natural Gas	Sm^3/hr	6156	(-) 1133	5023
HSD	Lit/Hr.	1712	750	2462

**** As per CTE 115251 dated 16.11.2021***

3.8 Quantity of waste to be generated (liquid and solid) and scheme for their management /disposal

3.8.1 Wastewater generation & Management Plan

Construction Phase: 6 KLD of domestic sewage will be generated from construction workers and will be disposed into soak pit/septic tank and overflow of it shall be treated in ETP.

Operation Phase: After expansion, total wastewater generation from plant will be 1250 KLD (Domestic: 100 + Industrial: 1250 KLD).

The plant has full-fledged wastewater pre-treatment plant (WWPT) and effluent treatment plants to treat wastewater (Domestic + Industrial) generated from plant. The wastewater is segregated at source and treated based on its characteristics viz COD, TDS and BOD/COD Ratio.

The wastewater pre-treatment plant comprised of Evaporators and Agitated Thin Film Dryer (ATFD) for treatment of high COD and high TDS streams, Fenton oxidation plant to treat streams having low biodegradability, stripper to separate low boiling liquid organic

components in the wastewater and H_2O_2 treatment for streams containing unreacted sodium cyanide.

The ETP plant consists of primary, secondary and tertiary treatment plants. A part of treated wastewater, 800 KLD will be discharged to Common Effluent Treatment Plant operated by Vapi Green Enviro Ltd. (VGEL) and balance 450 KLD will be treated in Reverse Osmosis (RO) plant to recover water for recycling and reuse (360 KLD). Reject from RO/High TDS wastewater will be sent to common MEE. Domestic wastewater will be disposed into soak pit/septic tank and overflow of it shall be treated in ETP.

3.8.1.1 Process Description for Different Wastewater Treatment Schemes

The facility has full-fledged wastewater pre-treatment plant (WWPT) and effluent treatment plants to treat wastewater (Domestic + Industrial) generated from plant. The wastewater is segregated at source and treated based on its characteristics viz COD, TDS and BOD/COD Ratio. The wastewater pre-treatment plant comprised of Evaporators for treatment of high COD and high TDS streams, Fenton oxidation plant to treat streams having low biodegradability, stripper to separate low boiling liquid organic components in the wastewater.

Table 11: Summary of Treatment units for Wastewater Treatment

Treatment Units	Capacity
Evaporator	380 KLD
Fenton Oxidation Plant	120 KLD
Stripper	25 KLD
ETP	1500 KLD
RO	500 KLD & 120 KLD
ATFD	4500 Kg/hr

Table 12: Name and size of Wastewater Treatment Schemes

S. No.	Name of units	Capacity	Nos.	Total Capacity	MOC
1	Oil & Grease Separation Tank	110 m^3	2	220 m3	RCC
2	Equalization Tanks	660 m^3	3	1980 m3	RCC
3	Neutralization tank	15 m^3	3	45 m3	RCC
4	Primary Clarifier-1	396 m^3	1	396 m3	RCC
5	Primary Clarifier-2	636 m^3	1	636 m3	RCC
6	Primary Clarifier-3 (stand by)	340 m^3	1	340 m3	RCC
7	Aeration Tanks	2000 m^3	2	4000 m3	RCC
8	Aeration Tank (stand by)	1000 m^3	1	1000 m3	RCC
9	Aeration Tank (stand by)	2000 m^3	2	4000 m3	RCC
10	Secondary Clarifiers	340 m^3	3	1020 m3	RCC
11	Thickeners	85 m^3	2	170 m3	RCC
12	Intermediate pit	150 m^3	1	150 m3	RCC

S. No.	Name of units	Capacity	Nos.	Total Capacity	MOC
13	Final Pit	180 m^3	1	180 m3	RCC
14	Sludge Drying Bed	60 m^3	1	60 m3	RCC
15	Filter Press	750 Kg/Batch	1	750 Kg/Batch	PP
16	Filter Press (Stand By)	3200 Kg/Batch	1	3200 Kg/Batch	PP
17	PT RO	250 m^3/day	2	500 m^3/day	-
18	HP RO	60 m^3/day	2	120 m^3/day	-
19	Sludge Storage go-down	500 MT	1	500 MT	RCC
20	Salt Storage go-down	3400 MT	1	3400 MT	RCC
21	Stripper	25 m^3/day	1	25 m^3/day	MSGL
22	Evaporators	40 m^3/day	5	200 m^3/day	SS/MS
23	Forced Circulation Evaporators	60 m^3/day	3	180 m^3/day	Titanium
24	Agitated Thin Film Dryer	900 kg/hr	5	4500 kg/hr	Titanium
25	Fenton Oxidation	120 m3/day	1	120 m3/day	PP

Wastewater Pre-treatment Plant (WWPT)

Wastewater of the site is segregated based on COD, TDS and BOD/COD ratio and treated in the Wastewater pre-treatment Treatment Plant (WWPT) followed by conventional effluent treatment plant. The wastewater pre-treatment plant comprises of evaporators, stripper Fenton and treatment of cyanide containing effluent with help of H2O2.

Stripping

The stripping process is a pre-treatment process to separate low boiling liquid organic components in the wastewater. The high COD effluent is transferred to feed Storage tanks installed in wastewater pre-treatment plant.

The stripper system consists of condenser and packed column. Feed effluent is feed to the preheater before being introduced to the packed distillation column. The packed column operates under atmosphere pressure. Stripping is done by purging steam from bottom of packed column. Vapours from top of the packed column are condensed in condensers. Part of condensate is sent back as reflux, remaining condensate taken as distillate out and sent to incinerator for incinerator. The bottom product is feed to Evaporators for further treatment. Vent is connected to Scrubber.

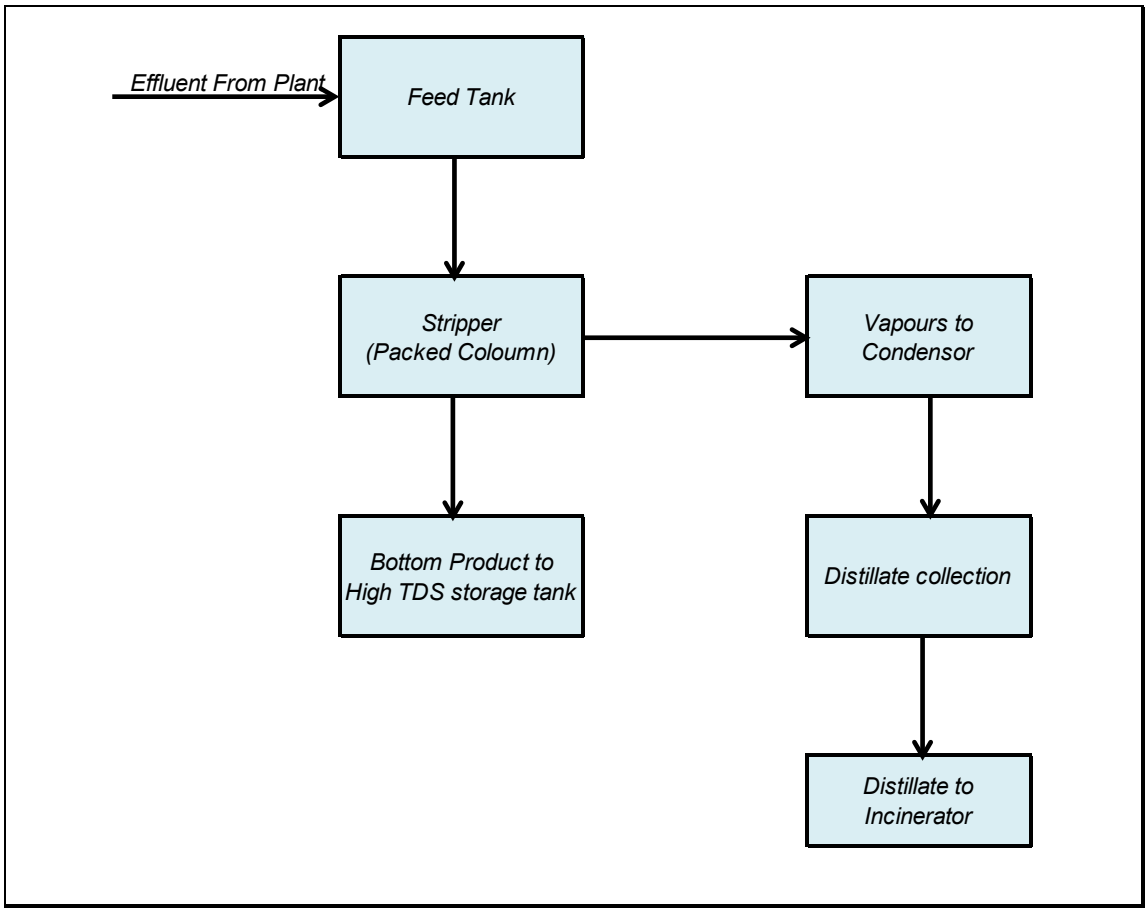


Figure 5: Process Flow Diagram of Stripping

Evaporation

The evaporation process is a pre-treatment process to separate salts from the wastewater. The High TDS from individual plants including RO reject received by pipeline and stored in storage tanks installed in Wastewater Pre-Treatment Plant. In addition, the high TDS effluent from the bottom product of Stripping and detoxified cyanide effluent are also feed to evaporators.

The evaporator system consisting of following operations.

- Neutralization
- Continuous feeding
- Evaporation
- Crystallization
- FCE
- ATFD

Neutralization: Segregated high TDS acidic and alkaline effluent received from plant and stored in separate storage tanks. Segregated high TDS streams are first neutralized by mixing acidic and alkaline streams or acid/caustic soda. Neutral effluent having pH around 7-8 is feed into evaporator.

Continuous feeding: Neutral solution is continuously fed at measured rate in to evaporator by pump. Flow is measured by flow meter installed in the discharge pipe.

Evaporation: Neutral waste is evaporated continuously by multi-tubular vertical thermosiphon reboiler system. Water evaporated in the evaporator is condensed by suitable condenser. The concentrated mass is sent to crystallizer. Process condensate sent to cooling tower and overflow of cooling tower to ETP.

Crystallization: concentrated mass takes in to crystallizer.

FCE: In a forced circulation evaporator, feed is pumped from the bottom the FCE through the heat exchanger, where heat is added, and back into the vapor body where evaporation occurs. The concentrated mass is sent to crystallizer. Process condensate sent to cooling tower and overflow of cooling tower to ETP.

ATFD: The Concentrate from Evaporators is fed to the ATFD to get dry powder.

ATFD is a steam heated vacuum operated jacketed vessel with a rotor inside to continuously wipe the evaporation surface. Feed liquid is introduced on the top disc of the rotor where it is distributed over the heated wall surface and as the liquid falls under gravity, the water (plus trace others) is evaporated, and the solids are collected at bottom. The vapors generated are condensed in the water-cooled condenser collected and send for recycle/ETP.

The dry powder collected from the bottom of ATFD collected in HDPE bags/jumbo bag and send to TSDF.

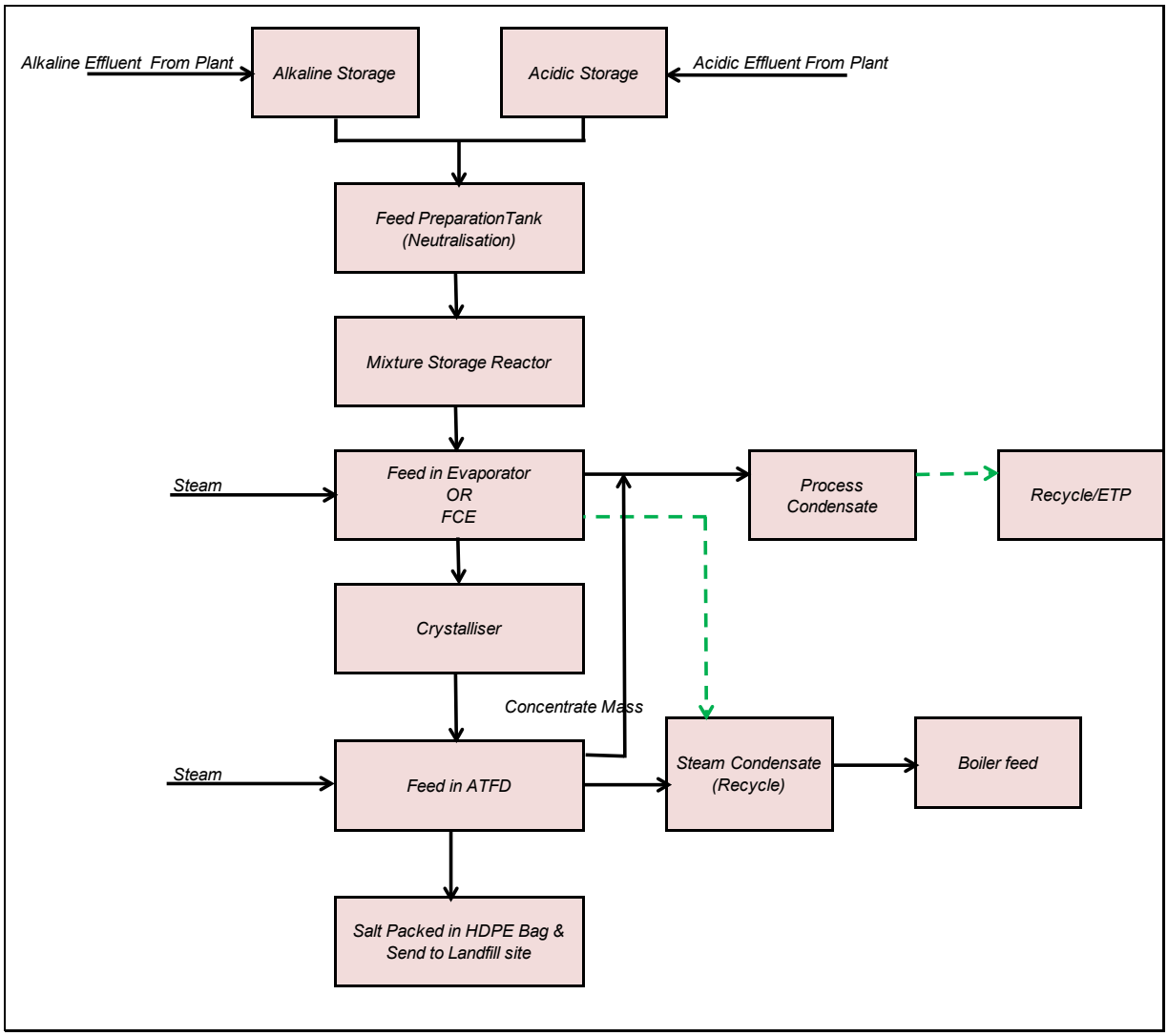


Figure 6: Process Flow Diagram of Evaporator

Fenton Oxidation

The Fenton oxidation process is a pre-treatment process to degrade low-biodegradable organics present in the wastewater.

Fenton's reagent is a mixture of H2O2 and ferrous iron, which generates hydroxyl radicals. The ferrous iron (Fe++) initiates and catalyses the decomposition of H2O2, resulting in the generation of hydroxyl radicals. The generation of these radicals involves a complex reaction sequence in wastewater. H2O2 can act as an OH scavenger as well as an initiator. Generally, Fenton's oxidation process is pH adjustment, oxidation reaction, neutralization and coagulation for precipitation.

The low-biodegradable organic effluent is transferred from different production units by pipeline to Storage tanks installed in wastewater pre-treatment plant prior to treatment.

The feed pH is adjusted by mixing acid and alkali effluent streams and by adding caustic/sulphuric acid. The ferrous sulphate solution is dosed in a static mixer where effluent and ferrous sulphate solution mixed homogeneously and then feed to the Fenton reactors. Hydrogen peroxide (H2O2) is then dosed in the reactor on the basis of COD content in effluent streams and then transferred to the 2nd reactor where hydrogen peroxide fine dosing is performed for 'polishing'. The oxidized effluent is neutralized with caustic/lime and then sent to equalization tank of the conventional effluent treatment plant for subsequent treatment.

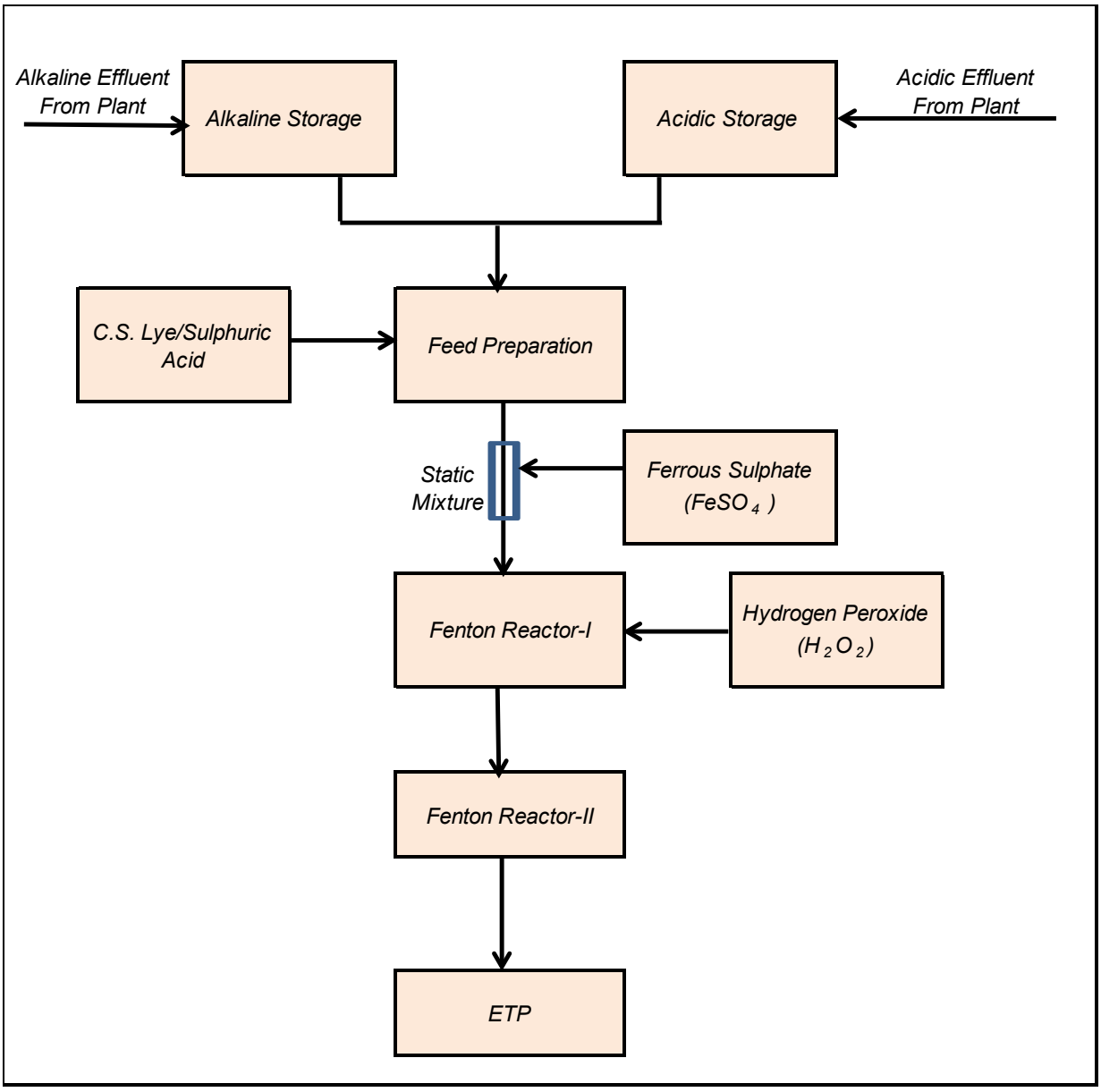


Figure 7: Process Flow Diagram of Fenton Oxidation

Detoxification of Aq. Waste containing Cyanide Content

The Aq. Cyanide effluent from generating plant is transferred to WWPT (Wastewater Preatment Plant) through pipeline and received in a dedicated storage tank. The required volume of aqueous cyanide effluent is transferred into the reactor where PH of mass is maintained above 9. Add slowly Hydrogen Peroxide in above mass and stir for 2- 3 hrs and then analyze sample for cyanide content. Traces of unreacted hydrogen peroxide present in Aq. layer are treated with dilute Sodium Bisulphite solution.

Effluent Treatment Plant (ETP)

The site has full-fledged Effluent Treatment Plant (ETP) to treat wastewater generated from the existing unit. ETP mainly consist of primary treatment, secondary treatment and tertiary treatment. The treated wastewater is discharged to Common Effluent Treatment Plant (CETP) operated by Vapi Green Enviro Ltd. Formerly known as Vapi Waste & Effluent Management Co. Ltd.

The ETP is designed for 1500 KLD to treat domestic and industrial wastes. The Treatment of effluent is carried out as under.

Primary Treatment:

Primary treatment is followed by oil and grease separator trap, Equalization, Neutralization, Flocculation and settling to treat effluent.

Effluent first passed through oil and grease separation trap, separated oil and grease sent to incinerator for incineration and oil and grease free effluent sent to equalization tank. Equalization tank provide adequate mixing by bubbling air/mixers and residence time to achieve uniform characteristics of effluent.

After equalization, effluent passed through neutralization tank. Neutralization of effluent achieved through flash mixer with addition of acid and alkali. Online pH monitoring system installed in neutralization tank for ensuring neutralization of effluent.

After neutralization, effluent passed through flocculation tank. In flocculation tank, flocculants solution added in effluent to create "flocs" formation in effluent.

After flocculation, effluent enters in primary clarifier. Gentle mixing in flocculation zone flocculates the colloidal solids and makes them to settle. The settling zone allows settling the solids. The settled solids are in the form of sludge. Clear effluent overflows from the clarifier and laid for secondary treatment. Sludge collected from the bottom hopper of the primary clarifier. The separated solids are transferred to the sludge thickener.

Secondary Treatment:

Secondary treatment is based on the principal of aerobic biological oxidation. Secondary treatment of effluent is being performed in two stages: 1. Aeration tank 2. Clarifier

Aeration will be carried out in the aeration tank (Bio reactor) using mechanical aeration system such aspirators/diffusers. The effluent from the aeration tank shall over flow to the

secondary clarifier. Settled bio-mass shall be recycled back to aeration tank to maintain the desired MLSS concentration and excess bio-mass will be discharged to the sludge thickener. A part of treated effluent is lead to CETP and balance effluent will be sent to RO, Evaporators and ATFD for recovery of water from effluent.

Reverse Osmosis:

The effluent treated in secondary treatment is being passing through the pre-filtration unit (consists of a multi-layer reversible flow filter system and downstream multiple cartridge filters). The outlet water is further processed in the Plate Tube Reverse Osmosis unit. The Permeate came out from Reverse Osmosis (RO) is collected in intermediate storage tank and is recycled back. The RO reject is sent to Evaporation unit for further treatment .. Finally, part of wastewater treated is discharged to CETP operated by Vapi Green Enviro Ltd. Formerly known as Vapi Waste & Effluent management Co. Ltd. The online analyzers such as TOC, TSS, PH and Flowmeters are installed in treated wastewater discharge line.

Sludge Treatment

Sludge generated from primary & secondary clarifiers is fed to a thickener and then send to the filter press for sludge dewatering. Dewatered sludge sent for disposal to authorized common TSDF site. Filtrate from filter press is being taken back for further treatment.

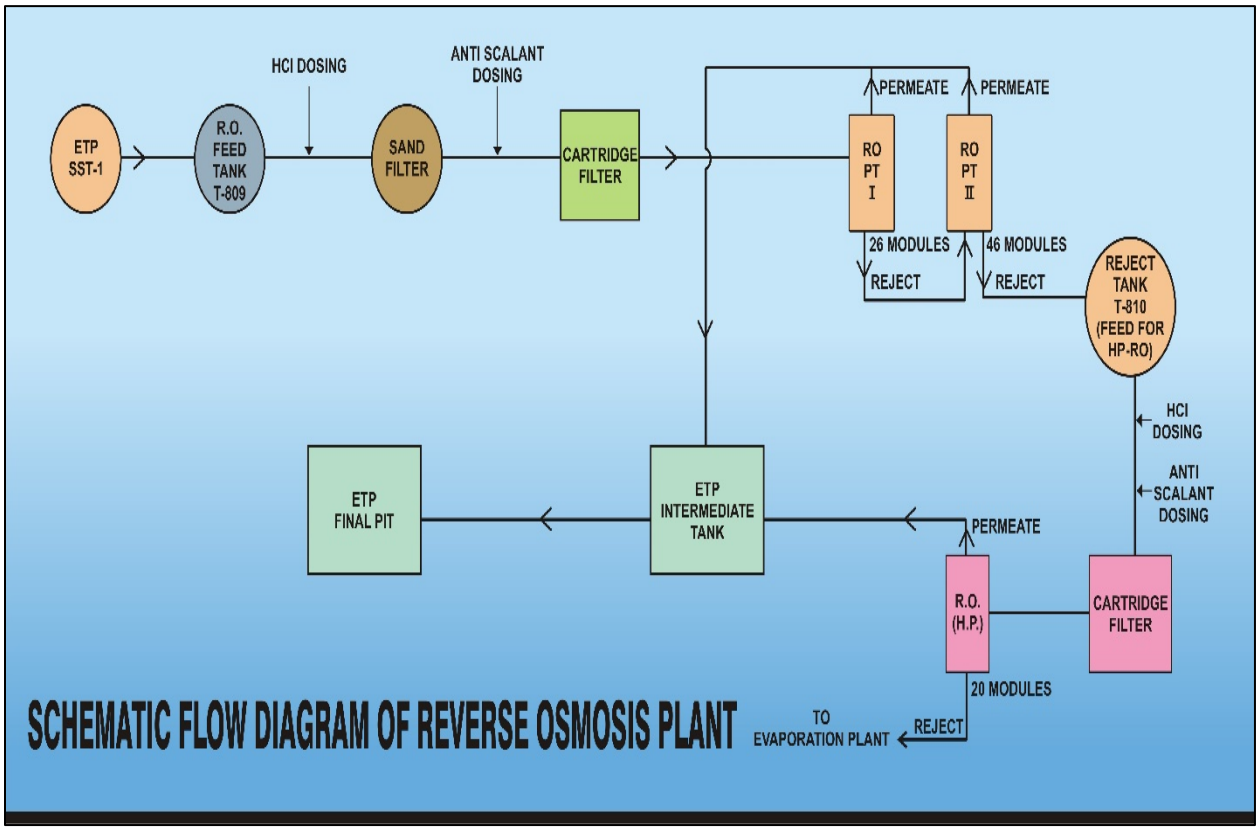
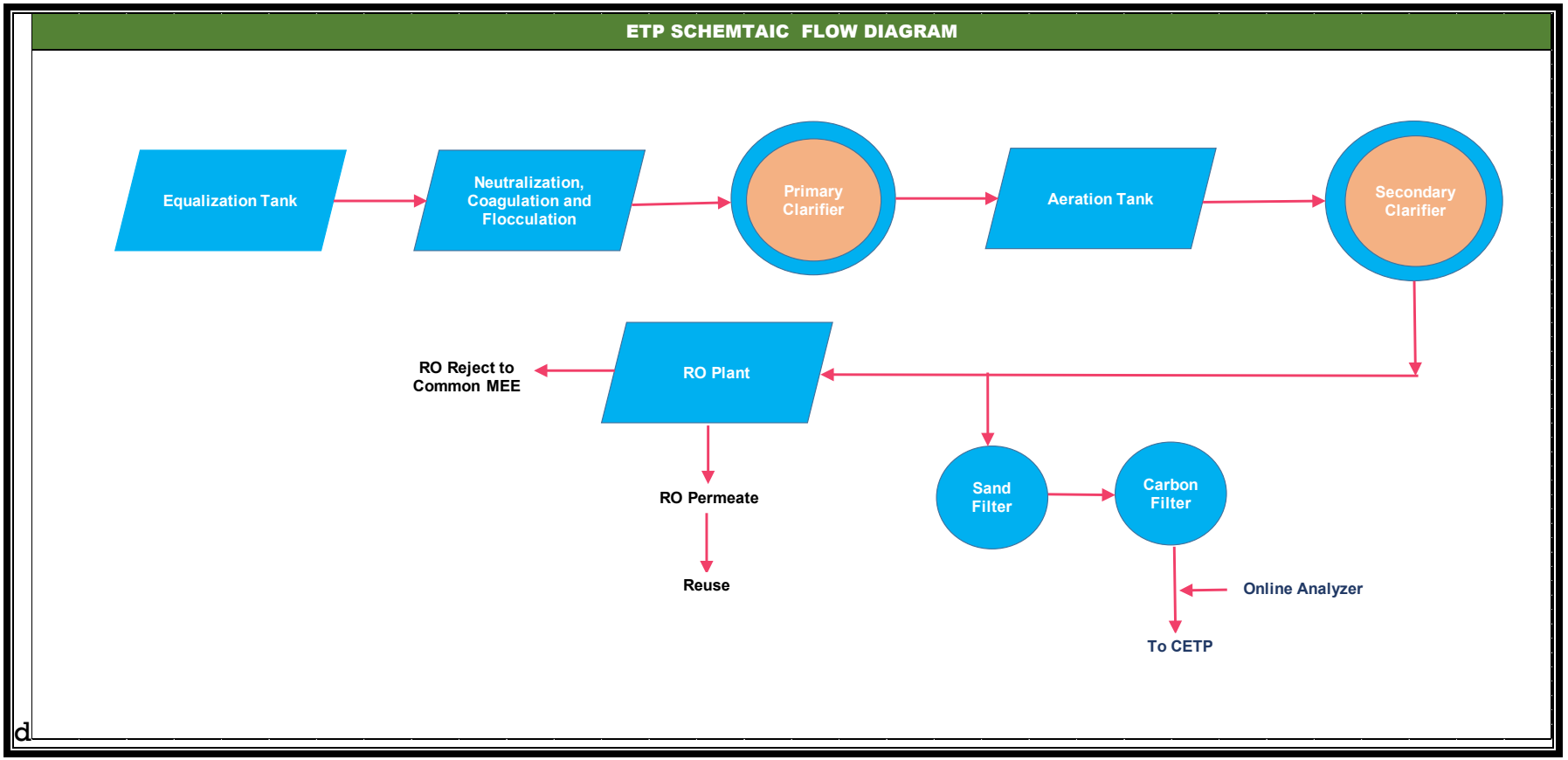


Figure 8: Process Flow Diagram of Effluent Treatment Plant

Figure 9: Process Flow Diagram of Effluent Treatment Plant



3.8.2 Solid & Hazardous Waste Generation & Management Plan

Hazardous Waste Management

There is generation of different kind of Industrial hazardous wastes from production process and other activities. Waste is being segregated in salable and non-salable waste. Salable waste is being sent different recyclers/refiners/cement industries/authorized preprocessing facilities as per waste characteristics while non-salable waste is being disposed through TSDF site/incineration at captive incinerator/ Common Hazardous Wastes Incineration Facility. All waste is disposed as per The Hazardous & Other Waste (Management and Transboundary Movement) Amendment Rules, 2021. After proposed expansion, there shall be increase in waste generation which will be disposed as per existing practices.

Solid Waste Management

Construction Phase: Waste generated from the construction activity shall be disposed as per C&D waste Management Rule. Non-recyclable waste shall be disposed at the nearby C&D waste disposal site. Recyclable waste shall be sold to recyclers. Solid waste will be generated from labours which will be handled by existing facility.

Operational Phase: The municipal solid waste generation at the project site which is being segregated in biodegradable waste and recyclable waste. Recyclable waste is being sold off to different authorized vendors. Biodegradable waste is being treated in Organic waste converter and vermi-composting. After expansion, municipal solid waste generated in the plant area will be disposed as per existing practices

Type, source, mode of storage and treatment and disposal of hazardous waste is shown in **Table 13.**

Table 13: Management of Hazardous & Non-Hazardous Waste

Sr No	Type of waste	Category	Capacity (MT/Annum)			Disposal
			Existing CTO	Proposed	Total Proposed after Expansion	
2	Evaporation residue	37.3	11794	7071	18865	Collection, Storage, Transportation, Disposal by sending to approved and authorized TSDF / at authorized preprocessing and / or Co-processing facilities by use of GPS mounted vehicles and XGN manifest system.
3	Distillation Residues	20.3	8884	7887	16771	Collection, Storage, Transportation and Disposal by sending for co-processing to cement industries or authorized preprocessing facilities or by incineration at captive incineration or by sending to authorized CHWIF sites by use of GPS mounted vehicles and XGN manifest system.
4	Ash from Incinerator and flue gas cleaning residue	37.2	273	77	350	Collection, Storage, Transportation and disposal by sending to approved and authorized TSDF site by use of GPS mounted vehicle and XGN manifest system.
5	Oil and grease skimming	35.4	30	0	30	Collection, Storage, Transportation and Disposal by sending for co-processing to cement industries or authorized preprocessing facilities or by incineration at captive incineration or by sending to authorized CHWIF sites by use of GPS mounted vehicles and XGN manifest system.
6	Used Oil or Spent Oil	5.1	30	0	30	Collection, Storage, Transportation and Disposal by reuse or selling to

Sr No	Type of waste	Category	Capacity (MT/Annum)			Disposal
			Existing CTO	Proposed	Total Proposed after Expansion	
						authorized recycler / refiners / at authorized preprocessing and / or Co-processing facilities or by incineration at captive incineration or by sending to authorized CHWIF sites by use of GPS mounted vehicles and XGN manifest system.
7	Spent Solvents	29.4	1261	995	2256	Collection, Storage, Transportation and Disposal by sending for co-processing to cement industries or authorized preprocessing facilities or by incineration at captive incineration or by sending to authorized CHWIF sites by use of GPS mounted vehicles and XGN manifest system.
8	Empty barrels / Containers / liners contaminated with hazardous chemicals / waste	33.1	597	0	597	Collection, Storage, transportation Decontamination & disposal by selling to authorized recyclers/send to common decontamination Facilities having all required permission of SPCB by use of GPS mounted vehicles and XGN manifest system.
9	Spent Catalyst	29.5	271	(-) 10	261	Collection, Storage, Transportation, Disposal by selling to registered recycler / offsite recovery at units from where catalyst is procured / other units doing recovery / authorized preprocessing and / or Co-processing facilities / incineration at captive incineration / authorized CHWIF sites by

Sr No	Type of waste	Category	Capacity (MT/Annum)			Disposal
			Existing CTO	Proposed	Total Proposed after Expansion	
						use of GPS mounted vehicles and XGN manifest system.
10	Date Expired and off - specification Pesticides	29.3	Generation if any	0	As and when generated	Collection, Storage, Transportation and Disposal by sending for co-processing to cement industries or authorized preprocessing facilities or by incineration at captive incineration or by sending to authorized CHWIF sites by use of GPS mounted vehicles and XGN manifest system.
11	Spent Resin	35.2	12	0	12	Collection, Storage, Transportation and disposal by sending for Co-processing to cement industries or by incineration at captive incineration or by sending authorized CHWIF sites or by selling to end users having all required permissions of SPCB by use of GPS mounted vehicles and XGN manifest system
12	Waste or residue containing oil	5.2	2	0	2	Collection, Storage, Transportation, and disposal by sending for Co-processing to cement industries or by incineration at captive incineration or by sending to authorized CHWIF sites by use of GPS mounted vehicles and XGN manifest system
13	Spent Carbon or filter materials	36.2	83.8	0	84	Collection, Storage, Transportation, and disposal by sending for Co-processing to cement industries or by incineration at captive incineration or by sending to

Sr No	Type of waste	Category	Capacity (MT/Annum)			Disposal
			Existing CTO	Proposed	Total Proposed after Expansion	
						authorized CHWIF sites or by sending to authorized recyclers/re-processors having all require permission of SPCB by use of GPS mounted vehicles and XGN manifest system.
14	Process Waste	29.1	1252	2520	3772	Collection, Storage, Transportation and Disposal by sending for co-processing to cement industries or authorized preprocessing facilities or by incineration at captive incineration or by sending to authorized CHWIF sites by use of GPS mounted vehicles and XGN manifest system
15	Contaminated cotton rags or other cleaning materials	33.2	10	0	10	Collection, Storage, Transportation and disposal by sending for Co-processing to cement industries or by incineration at captive incineration or by sending to authorized CHWIF sites by use of GPS mounted vehicles and XGN manifest system.
16	Process Waste (Waste Insulation Material and Bricks / Refractory)	29.1	160	90	250	Collection, Storage, Transportation and disposal by sending to approved and authorized TSDF site by use of GPS mounted vehicle and XGN manifest system

Sr No	Type of waste	Category	Capacity (MT/Annum)			Disposal
			Existing CTO	Proposed	Total Proposed after Expansion	
17	Process Waste (Used PPEs)	29.1	As and When generated	0	As and when generated	Collection, Storage, Transportation and disposal by sending for Co-processing to cement industries or by incineration at captive incineration or by sending to authorized CHWIF sites by use of GPS mounted vehicles and XGN manifest system
18	Spent HCl	29.6	956	2104	3060	Collection, Storage, Transportation and disposal by selling to authorized end users/captive use having all require permission of SPCB by uses of GPS mounted vehicles and XGN manifest system.
19	Contaminated Soil / Debris	35.3	As and When Generated	0	As and when Generated	Collection, Storage, Transportation and disposal by sending to approved and authorized TSDF site by use of GPS mounted vehicle and XGN manifest system
20	Aluminum Chloride Solution (28%)	B7	11127	-516	10611	Collection, Storage, Transportation and disposal by selling to authorized end users having all require permission of SPCB by uses of GPS mounted vehicles and XGN manifest system.
21	Potassium Bromide (25%) / Sodium Bromide (18%)	B6	5564	2358	7922	Collection, Storage, Transportation and disposal by selling to authorized end users having all require permission of SPCB by uses of GPS mounted vehicles and XGN manifest system.

Sr No	Type of waste	Category	Capacity (MT/Annum)			Disposal
			Existing CTO	Proposed	Total Proposed after Expansion	
22	Insulated Copper wire Scrap or Copper with PVC sheeting including ISRI-Code material namely " Druid"	7	As and When Generated	0	As and when Generated	Collection, Storage, Transportation disposal by selling to authorized recyclers having all require permission of SPCB by uses of GPS mounted vehicles and XGN manifest system.
23	Jelly Filled Copper Cables	8	As and When Generated	0	As and when Generated	Collection, Storage, Transportation disposal by selling to authorized recyclers having all require permission of SPCB by uses of GPS mounted vehicles and XGN manifest system.
24	Lead Scrap	17	As and When Generated	0	As and when Generated	Collection, Storage, Transportation disposal by selling to authorized recyclers having all require permission of SPCB by uses of GPS mounted vehicles and XGN manifest system.
25	Chemical containing residue arising from decontamination	34.1	24	0	24	Collection, Storage, Transportation and disposal by sending for Co-processing to cement industries or by incineration at captive incineration or by sending to authorized CHWIF sites by use of GPS mounted vehicles and XGN manifest system
26	Sludge from Wet Scrubber	37.1	48	0	48	Collection, Storage, Transportation and disposal by sending to approved and authorized TSDF site by use of GPS mounted vehicle and XGN manifest system

Details of Incinerator

Incinerator I:

The function of incinerator is to incinerate liquid and solid hazardous wastes & Vent Gas

Single Drum Pyrolyser: Each of the four Pyrolyser chambers has space to accommodate one drum containing waste. A burner supplied with Furnace Oil/Natural gas heats the chamber. Combustion is done under starved air condition to achieve vaporization and pyrolysis. Temperature increases to 850-1000°C. The flue gases go to Post Combustion Chamber (PCC). The ash left in the drums are collected, stored and disposed to TSDF.

Main Combustion Chamber (MCC): Liquid waste is sprayed in this chamber which is heated with Furnace Oil/Natural gas vaporization and partial oxidation will occur in this chamber at 850 – 900°C. The flue gases are led to PCC.

Post Combustion Chamber (PCC): Pyrolysed gases from single drum Pyrolyser and main combustion chamber are passed to this chamber for complete combustion. Organic liquid waste having burning characteristics is also sprayed to this chamber through burner. As liquid waste is having good burning characteristics (free flowing, non-solids containing), it burns and releases the heat. To achieve complete thermal degradation, heat is simultaneously supplied by Furnace Oil/Natural gas through separate burners. Complete thermal degradation and oxidation will occur at temperature of 1100 – 1150°C under excess air condition. Liquid waste is also incinerated by spraying after achieving required temperature.

Spray Quencher: Flue gases from PCC are cooled to 200–250°C by water spray/dilute caustic soda solution spray.

Cyclone separator: Inside the cyclone separator droplet/particles are separated.

Venturi Scrubber: Cooled gases are led to Venturi where scrubbing occurs by dilute caustic soda solution. All obnoxious gases like SO2, NOx, and HCl etc. get scrubbed into the alkaline liquid.

Induced Draft Fan: The fan pulls gases through the system, keeping the entire system under slight negative pressure. It also draws in excess air for oxidation.

Stack: The flue gas will be dispersed into atmosphere through stack.

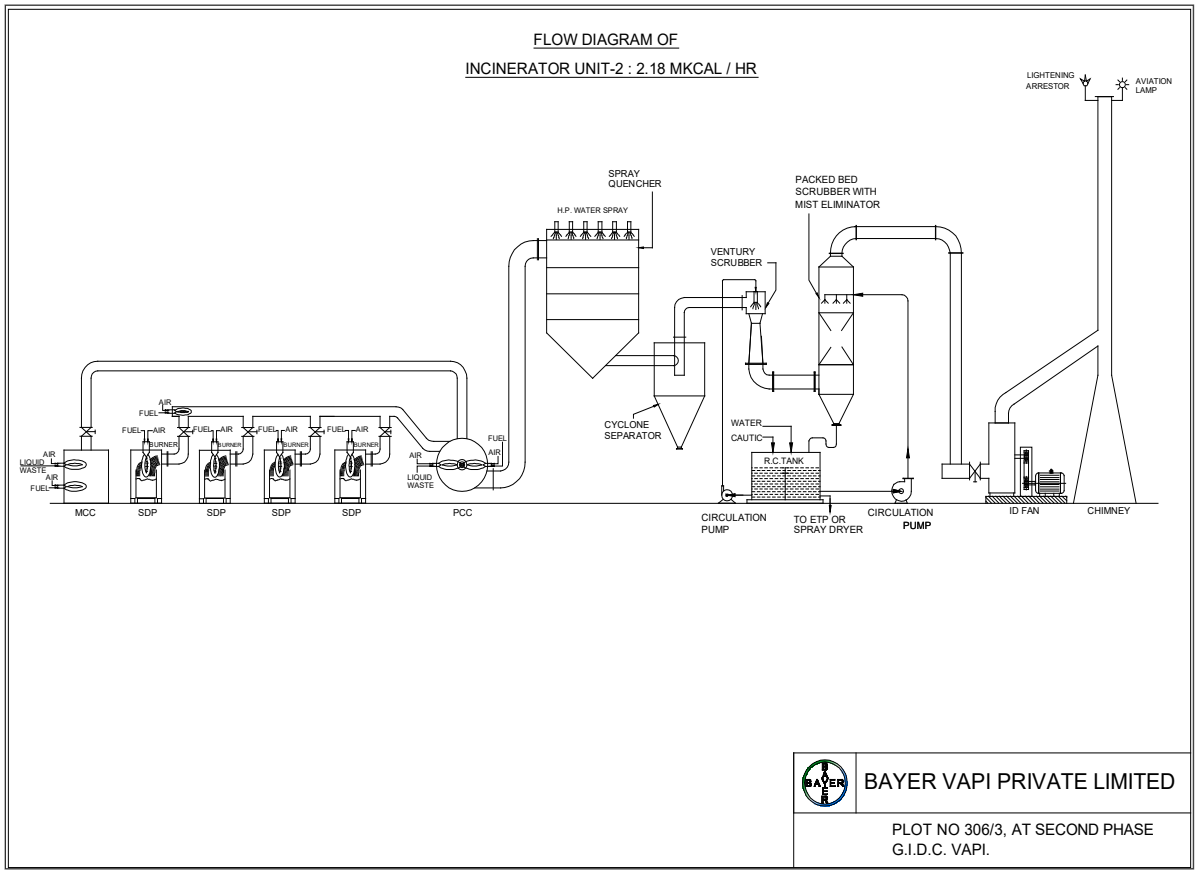


Figure 10: Flow Diagram of HW Incinerator (2.18 MKcal/hr)

Incinerator II: (Rotary Kiln Incinerator)

All hazardous waste as contaminated packing, solidified melt/bottom residue and spent solvent are burned in a rotary kiln incinerator that is equipped with a steam boiler and flue gas scrubbing. The incinerator unit consists of following equipment:

Feeding system in Rotary Kiln:

The solid waste is fed a conveyor from ground floor to a double door feeding mechanism. While charging first door is opened and second door remains closed. Once material is placed in feeding mechanism first door gets closed and second door for charging material to Rotary Kiln opens. The organic liquid waste and the aqueous waste are charged through dedicated automatic waste feeding system with air/steam atomization facility.

Rotary Kiln:

The rotary kiln with 3 meter diameter and 8.8 meter length is provided with burner operating on Natural gas/Furnace Oil for heating and maintaining temperature of 850 °C for combustion under starved air condition to achieve vaporization and pyrolysis. A slight inclination and slow rotation allow material to move from inlet to outlet. During course of tumbling action waste will be Pyrolyzed and inert ash will be discharged from outlet port.

Post Combustion/Secondary Combustion chamber (SCC):

Hot Pyrolysed gases are taken to this chamber for complete combustion. To achieve complete thermal degradation, heat is supplied by burners operating on Natural gas/Furnace Oil. Provision is made to use high calorific waste in place of fuel to conserve natural resources. In addition VOC containing waste gases from individual buildings (plants) vent gas headers are burned in this combustion chamber. Complete oxidation will occur at 1100°C under excess air condition. Residence time of more than 2 seconds is provided for ensuring complete combustion.

Waste Heat Recovery Unit:

To utilize the heat of waste gases coming from SCC a waste heat recovery unit is provided to produce steam at 16 bar pressure. The steam produced is/shall be used in the existing manufacturing plants. Cooled flue gases will be taken for post gas treatment.

Spray Evaporative Cooler:

A co-current type of spray quencher is provided for cooling hot gases from post combustion chamber as alternate to waste heat recovery unit. By injection water at high pressure the hot gases will be cooled to 200-250°C.

Cyclone Separator:

Inside the multi cyclone separator particles are separated and discharge from bottom. Particle free gases will leave from top.

Bag Filter:

Gases from cyclone separator are fed to bag filters. Activated carbon along with lime is dosed to flue gases to remove Dioxin and neutralize acidic gases. Lime and activated carbon are dislodged by reverse jet pulse cleaning and collected through rotary valve. Treated flue gases go to scrubbers.

Packed Bed Scrubber:

In the first stage gases from bag filter enter the scrubber from bottom and water will be sprayed from top. Due to counter current mass transfer action in packed bed, all water-soluble obnoxious gases will be scrubbed.

In the second stage caustic soda scrubber is acting as polishing scrubber. Gases will enter from bottom and dilute caustic soda solution will be sprayed from top. Due to counter current mass transfer action in packed bed, all obnoxious gases will get scrubbed. By the demister droplets are removed.

Induced Draft Fan:

Induced draft fan is designed to suck gases from system to keep the entire system under negative pressure.

Flue Gas Discharge:

The flue gas is vented by through stack of a 40m high to the atmosphere.

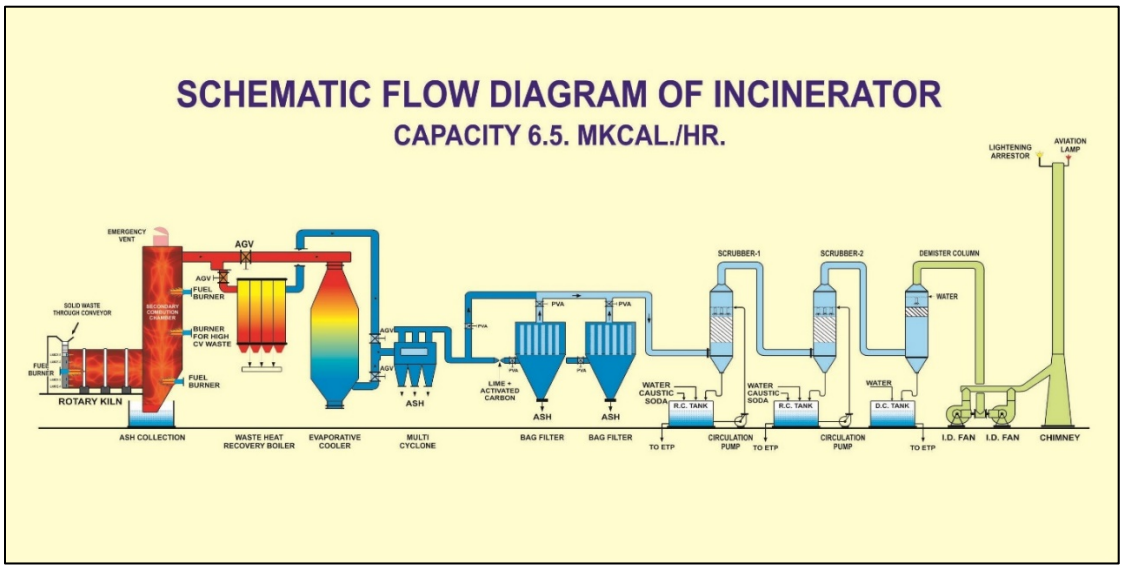


Figure 11: Flow Diagram of Rotary Kiln Incinerator (6.5 MKcal/hr)

3.8.3 Air Emission and Management

***Construction Phase*:** The main sources of air emissions will be construction machinery like drills, cranes, DG sets and vehicular movement. To control air emissions during construction, following measures will be implemented: -

- Barricading will be done around the project boundary to control dust dispersion into the surroundings.
- Construction material vehicles will be covered during transportation.
- Dust suppression will be done by regular water sprinkling in and around the project site.
- Water Sprinkling shall be carried out to reduce the dust emission due to construction activity.
- Construction material movement (vehicular movement) shall be planned and carried out during non-peak hours to avoid traffic congestion.

Operational Phase*:** The main source of air emissions is from process stacks and DG sets. The major pollutants are PM, SO_2, NOx from DG sets and HCl, Cl_2, HBr and SO_2 from process stacks. Natural gas is being used as fuel in Boilers, Thermic fluid heaters and Incinerators, thus flue gas emissions are very less from plant. All air pollution control techniques and systems are already installed in the plant to reduce the emissions. Adequate systems have been provided to capture the emissions from process stacks & maintain the emission quality as per recommended guidelines with central scrubber having caustic solutions, before venting it into the atmosphere. The plant is maintaining all emission norms prescribed by MoEF&CC/GPCB/CPCB. After proposed expansion, only two stacks of DG sets (1500 KVA each) are proposed to be installed. However, eight no. of process stacks shall be removed from plant as per product profile proposed in the plant. The plant will maintain all emission norms prescribed by MoEF&CC/GPCB/CPCB after expansion. List of stacks have been provided below in ***Table 14 below:

Table 14: List of Air Pollution Stacks and their APCM

S.No.	Stack Attached to	Source of emission	Stack Height in m	Stack dia on top (m)	Velocity (m/Sec)	Flue gas flow (m3/s)	Emission	Temperature	Type of Fuel	Fuel Consumption, Sm3/hr	Remarks
1	Boiler -1 (10 TPH)	Flue Gas	20	0.8	7	3.52	PM SO2 Nox	125	NG	713	Existing
2	Boiler -2 (10 TPH)	Flue Gas	20	0.8	7	3.52	PM SO2 Nox	125	NG	713	Existing
3	Boiler -3 (10 TPH)	Flue Gas	20	0.8	7	3.52	PM SO2 Nox	125	NG	713	Existing
4	Boiler -4 (10 TPH)	Flue Gas	20	0.8	7	3.52	PM SO2 Nox	125	NG	713	Existing
5	Boiler -5 (15 TPH)	Flue Gas	20	1	7	5.50	PM SO2 Nox	125	NG	1150	Existing
6	Thermic Fluid Heater 1 (Capacity 0.4 Mkcal/Hr)	Flue Gas	25	0.55	7	1.663	PM SO2 Nox	125	NG	75	Existing
7	Thermic Fluid Heater 2	Flue Gas	25	0.45	7	1.113	PM SO2 Nox	125	NG	49	To be removed
8	Incinerator I-Old (2.18 Mkcal/hr) (Cyclone Separator +Alkali Packed bed scrubber)	Flue Gas	40	0.57	8	2.041	PM,SO2, NOx,HCl,CO, TOC, HF	75	NG	246	Existing

S.No.	Stack Attached to	Source of emission	Stack Height in m	Stack dia on top (m)	Velocity (m/Sec)	Flue gas flow (m3/s)	Emission	Temperature	Type of Fuel	Fuel Consumption, Sm3/hr	Remarks
9	Incinerator II-New (6.5 Mkcal/hr) (Cyclone Separator +Alkali Packed bed scrubber)	Flue Gas	40	1.08	8	7.329	Total Dioxin and Furans, etc.	75	NG	700	Existing
10	DG Set-1 (1500 kVA)	Flue Gas	30	0.25	11	0.54	SPM So2 Nox	450	HSD	375	Existing
11	DG Set-2 (750 kVA)	Flue Gas	13	0.25	9	0.44	SPM So2 Nox	450	HSD	166	Existing
12	DG Set-3 (750 kVA)	Flue Gas	13	0.25	9	0.44	SPM So2 Nox	450	HSD	166	Existing
13	DG Set-4 (325 kVA)	Flue Gas	10	0.25	8	0.39	SPM So2 Nox	450	HSD	85	Existing
14	DG Set-5 (325 kVA)	Flue Gas	10	0.25	8	0.39	SPM So2 Nox	450	HSD	85	Existing
15	DG Set-6 (325 kVA)	Flue Gas	10	0.25	8	0.39	SPM So3 Nox	450	HSD	85	Existing
16	DG Set-7 (1500 kVA)	Flue Gas	30	0.25	11	0.54	SPM So2 Nox	450	HSD	375	Existing
17	DG Set-8 (1500 KVA)	Flue Gas	30	0.25	11	0.54	SPM	450	HSD	375	Existing

S.No.	Stack Attached to	Source of emission	Stack Height in m	Stack dia on top (m)	Velocity (m/Sec)	Flue gas flow (m3/s)	Emission	Temperature	Type of Fuel	Fuel Consumption, Sm3/hr	Remarks
							So2 Nox				
18	DG Set-9 (1500 KVA)	Flue Gas	30	0.25	11	0.54	SPM So2 Nox	450	HSD	375	Proposed
19	DG Set-10 (1500 KVA)	Flue Gas	30	0.25	11	0.54	SPM So2 Nox	450	HSD	375	Proposed
PROCESS VENT DETAILS											
1	MPB reactor drowning vessels & ventilation system	Process Emission	22	0.08	6	0.030	HCl Cl2 Hbr	Ambient	_	Water scrubber followed by caustic scrubber	Existing
2	CMAC Reactors	Process Emission	20	0.08	6	0.030	HCl So2	Ambient	-	Water scrubber followed by caustic scrubber	Existing
3	TBAC Reactors	Process Emission	20	0.08	6	0.030	HCl So2	Ambient	_	Water scrubber followed by caustic scrubber	Existing
4	Bromination reaction reactor in Deltamethrin	Process Emission	22	0.08	6	0.030	HBr HCl	Ambient	-	Water scrubber followed by caustic scrubber	Existing

S.No.	Stack Attached to	Source of emission	Stack Height in m	Stack dia on top (m)	Velocity (m/Sec)	Flue gas flow (m3/s)	Emission	Temperature	Type of Fuel	Fuel Consumption, Sm3/hr	Remarks
5	Acylation reaction reactor in Deltamethrin	Process Emission	22	0.08	6	0.030	HCl So2	Ambient	-	Water scrubber followed by caustic scrubber	Existing
6	Acylation/Esterification reactor of Transfluthrin /Acid chloride preparation /Cypermethric acid chloride from DV Ester	Process Emission	11	0.08	6	0.030	HCl So2	Ambient	_	Water scrubber followed by caustic scrubber	Existing
7	Condensation reactor of Permethrin	Process Emission	20	0.08	6	0.030	HCl	Ambient	_	Water scrubber followed by caustic scrubber	Existing
8	Vent attached to CPPL preparation reactor of Acrinathrin Plant	Process Emission	11	0.08	6	0.030	HCl	Ambient	-	Water scrubber followed by caustic scrubber	To be removed
9	Vent attached to acid chloride preparation Reactor of Acrinathrin	Process Emission	11	0.08	6	0.030	HCl So2	Ambient	-	Water scrubber followed by caustic scrubber	To be removed
10	Acid Chloride preparation Reactor in flumethrin (ECO)	Process Emission	11	0.08	6	0.030	HCl So2	Ambient	_	Water scrubber followed by caustic scrubber	Existing

S.No.	Stack Attached to	Source of emission	Stack Height in m	Stack dia on top (m)	Velocity (m/Sec)	Flue gas flow (m3/s)	Emission	Temperature	Type of Fuel	Fuel Consumption, Sm3/hr	Remarks
11	Vent connected to Process Reactors of Allethrones	Process Emission	20	0.08	6	0.030	HCL	Ambient	_	Caustic Scrubber	To be removed
12	Vent connected to 1st reaction of Triafamone	Process Emission	20	0.08	6	0.03015936	SO2	Ambient	-	Caustic Scrubber	To be removed
13	Vent connected to 2nd stage reaction of Triafamone	Process Emission	20	0.08	6	0.030	SO2	Ambient	_	Caustic Scrubber	To be removed
14	Vent attached to Amidchloride preparation reactor in Amid chloride plant	Process Emission	20	0.08	6	0.030	HCl So2	Ambient	-	Water scrubber followed by caustic scrubber	To be removed
15	Vent connected to CSE & Pyrazole sulfide Formation reactors of Ethiprole	Process Emission	20	0.08	6	0.030	HCl Cl2	Ambient	-	Water scrubber followed by caustic scrubber	Existing
16	Vent attached to acid chloride preparation in Tembotrione	Process Emission	20	0.08	6	0.030	HCl SO2	Ambient	-	Water scrubber followed by caustic scrubber	To be removed
17	Vent connected to chlorination reactor of Pyrasulfotole	Process Emission	20	0.08	6	0.030	HCl So2	Ambient	-	Water scrubber followed by caustic scrubber	To be removed

Gaseous and Fugitive Emission Control:

Gaseous and Fugitive emissions are expected to be generated during construction and operation stages of the proposed project. During construction stage, main source of fugitive emission is dust which is expected mainly due to movement of vehicles carrying construction material and vehicles used for construction.

During operation stage, evaporation from solvent leakage through valves, pumps, emission from open drum containing chemicals, open feeding; storage tanks, poor housekeeping etc. are the major sources of fugitive emissions of organic chemicals and VOCs. Excess use of solvent may also result fugitive emission from the process vessels. Following measures are adopted to prevent and control fugitive emissions:

- Proper selection of material of construction of scrubbing system to eliminate any leakages during the operation.
- All the reactors are provided with mechanical seal which eliminates the possibility of any leakages.
- Closed Charging System.
- Installed 20mbar nitrogen blanketing system.
- 203 nos. detectors installed across the plant to monitor any leakage of HC. Four Cl2 detectors/sensors are installed.
- Solvents are stored in storage tank as per PESO & site-specific process & plant safety guidelines are followed.
- All the heat exchangers used for this operation are provided with primary as well as secondary systems with the provision of cooling water as well as Chilled / Brine circulation.
- All the pumps used for scrubbing systems are provided with mechanical seal which eliminates the possibilities of any leakages.
- Airborne dust at all transfers operations/ points will be controlled either by spraying water or providing enclosures.
- Care will be taken to store construction material properly to prevent fugitive emissions, if any.
- Regular maintenance of valves, pumps and other equipment are done to prevent leakages and thus minimizing the fugitive emissions of VOCs.
- Entire process is carried out in the closed reactors with proper maintenance of pressure and temperature.
- Periodic monitoring of work area is carried out to check the fugitive emission.
- Breather Valves are provided on solvent tanks.
- Solvent tank vents are connected to vent chillers.
- During transfer of material, steps are taken to reduce and prevent splashes and spills. Any liquid or dry material spilled are cleaned as expeditiously as possible.
- Close feeding system are provided for centrifuges. Centrifuge and filtrate tank vents are connected to vent chillers.

- Product filling stations is equipped with vacuum duct hoods.
- All the raw materials are stored in closed containers and sealed bags and handled through closed system to avoid the handling losses.
- Manual Handling of various chemicals are avoided and designed by implementing latest automation technology.
- Work area monitoring carried out regularly for various chemicals used at site.
- Good Housekeeping is maintained in the plant.

Odor Control Measures

- Majority of our operations are in closed system and under 20 mbar nitrogen blanketing system.
- Vents of storage tanks are provided with a water filled trap or Breather Valves to prevent escape of fumes.
- Tree Plantation near Boundary wall is provided to restrict the dispersion of odor & dust from the site.
- Regular Workplace Monitoring, Measurement & Improvement Plan Implementation

3.8.4 Noise Pollution Management

Construction Phase: - The main sources of noise will be construction machinery, DG sets and vehicular movement during establishment of the plant.

Mitigation Measures: -

- Construction machineries will be provided with acoustic pads for noise reduction during operation.
- PPE will be provided to labors.
- The construction activity will be carried out mostly during daytime.
- Proper maintenance of noise generating transport vehicles.

***Operation Phase*:** Generally, noise level of working place is within the limit as specified in the standard of MoEF&CC. Industry has taken adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standards in respect to noise to less than 75 dB(A) during daytime and 70 dB(A) during nighttime. Noise measurement is being carried out periodically. Silencers are provided for all the Vents/ Venting exhaust gases (during startup/shutdown) to effectively curb the noise pollution. In general, from the plant layout stage, sufficient care is taken to restrict noise pollution problem within the standard limits. The equipment like Compressors, blowers, fans, various drums and elevators are provided with Acoustic pad insulation / Acoustic enclosures to limit the noise level as per the standard of MoEF&CC. Noise level at Boundary Fence are controlled by providing green belt throughout the boundary wall of plant. Unit have issued earmuffs / plugs to all the employees and usage of earmuffs / plugs while working in noisy environment is already in practice. Same shall be followed further.

3.9 Schematic representations of the feasibility drawing which give the information of EIA purpose.

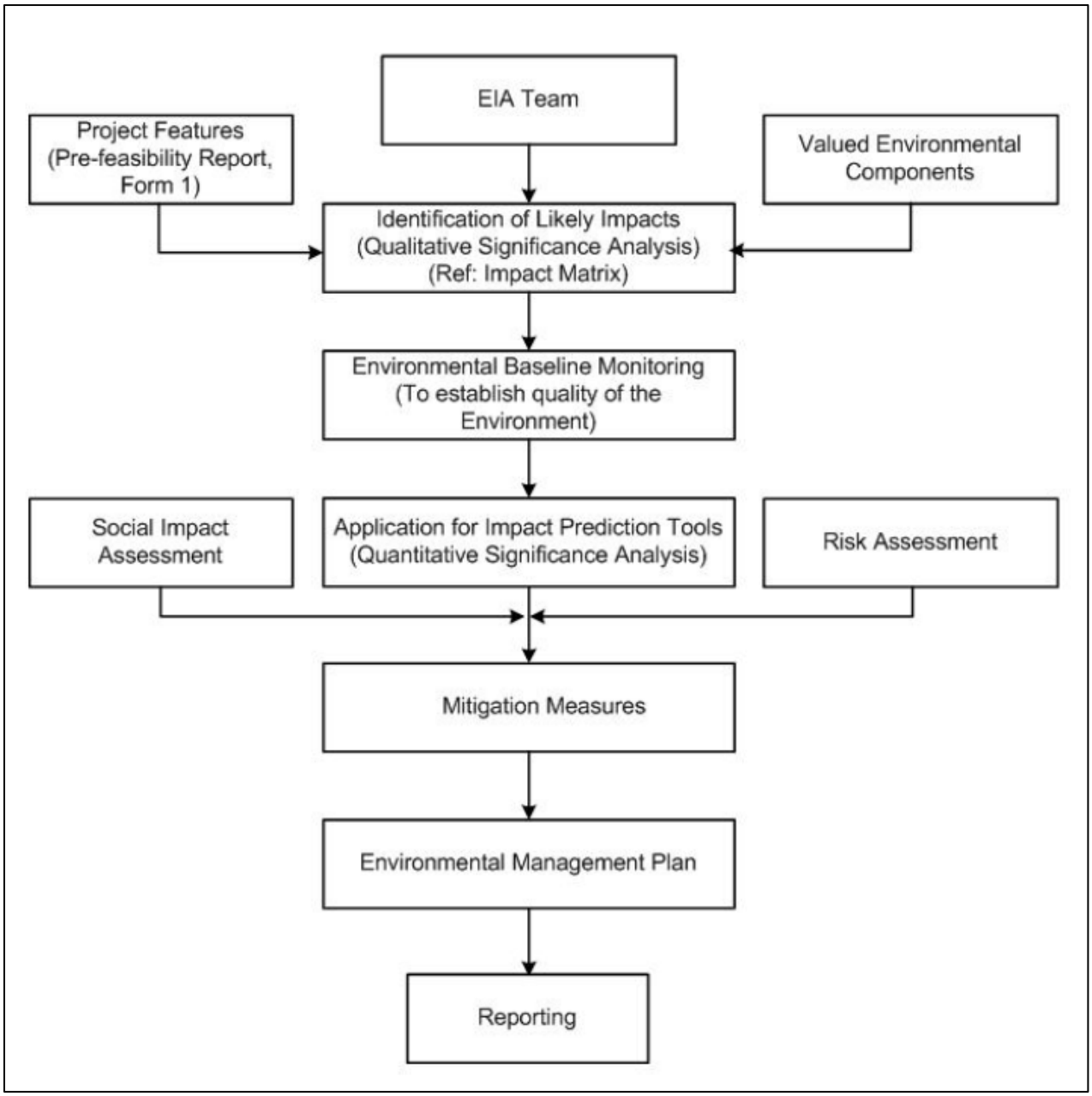


Figure 12: Schematic Representation of Environment Impact Assessment

4 SITE ANALYSIS

4.1 Connectivity

Nearest Railway Station: Vapi Railway Station (2.4 Km, W)
Nearest Highway: NH-48 (1 Km, W)
Nearest Airport: Surat International Airport (84 km, NNW)

4.2 Landform, Land Use and Land Ownership

The Plant is located at Plot No/survey no. 306/3, 306/2, 148, 304/2+305/1+305/2+305/3, 305/5, 300 & 301, 302/1-2-3, 302/4&5P, 302/5/2 & 302/6, 302/7-8, 302/10, 302/11-12, 387 (60/P3), 391 (60/P5), 392 (61/P1), 393 (61/P2), 414 (73/1), 435 (81/2/P1), 441 (85/1/P1), 442 (86/1/P1), 443 (87/2), 444 (91/P1), 446 (92/2/1), 575 (135/1/P), 1049 (143 to 147), Phase II, GIDC Estate,Vapi. District Valsad, Gujarat-396195.

Land Use & Land Cover: The land is located in a Notified Industrial Area i.e., Gujarat Industrial Development Corporation, Vapi. Present Land use of site is industrial. No further change in land use is required.

Land Ownership: The site has been allotted to M/s Bayer Vapi Pvt. Ltd. by Gujarat Industrial Development Corporation.

4.3 Topography

Topographically the area is slightly undulating, and the elevation of the plant site is between 24-28 m above Mean Sea Level. The topographical map showing the project site and the environment sensitivity is shown in **Figure 11.**

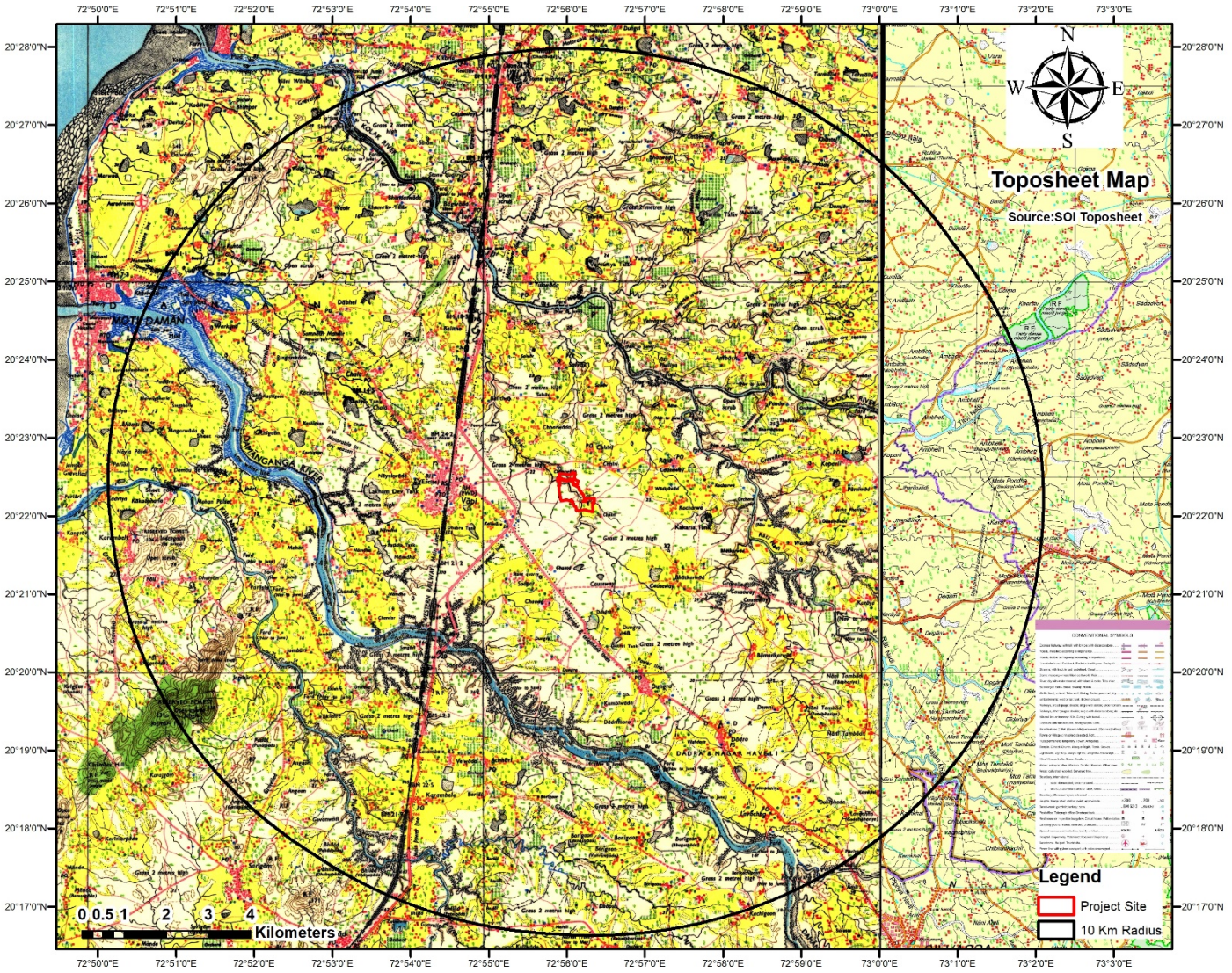


Figure 13: Topography Map

4.4 Existing land use pattern

The existing land use of site is for Industrial use. No further change in land use is required.

4.5 Existing Infrastructure

The site is in GIDC Industrial Area located in district Valsad of Gujarat. All basic facilities are already available in the nearby. The project is connected to National Highway-48 via internal roads of industrial area. NH-48 is located at 1 km, W. The nearest railway station is Vapi Railway Station located at distance of 2.4 km, W. The nearest town is Vapi at 0.5 km, W. Nearest Town is Vapi (0.5 km, W) from the Project site. Internal road and other infrastructure are already developed inside the plant. All basic facilities are available for manufacturing of products. Few other facilities available in site as under:

- Fire pump house
- Waste storage area
- Transformer yard
- Canteen Area
- Hazardous Tank farm
- Plant Area
- Security building area
- Utility Area

Apart from Plant utility and manufacturing area, Canteen, admin, drinking water, Water treatment, etc., facilities are provided within the plant. Several temples, schools and hospitals are located nearby the project site. No other facility is envisaged in the proposed project. Some of the existing onsite facilities in the plant are required to be expanded / modified suitably as covered under proposed project to cater to the additional requirements of the proposed expansion.

4.6 Soil classification

Based upon the works of Soil Survey Organization of State Government, the soils of the district have been classified into four major group such as

i) Bilimora – Bedmal Series of hilly area
ii) Baldha – Vadhawania Series of piedmont slope area
iii) EnaJalalpur – Sisodra Series in the midland and flood plain areas of the district
iv) Jal – AH – Dandi Series of soil along the coastal region

4.7 Climatic data from secondary sources

Historical meteorological data are obtained through climatological data from nearest IMD Station i.e., Bulsar (Valsad). Details of meteorological data have been provided in **Table 16.**

Table 15: Long-term Meteorological Data of IMD, Valsad (1974-1990)

Month	Temperature (deg C) daily		Relative Humidity, %		Rainfall	Wind speed	Pre-dominant wind direction	Cloud cover	Barometric Pressure,
	Max	Min	Max	Min	In mm	Kmph	From	Octas	Hpa
January	28.2	14.3	75	55	0.2	4.3	NW-NE,W	0.8	1013.7
February	29.1	15.3	72	52	0.4	5.1	NW-W	0.9	1012.8
March	31.1	18.7	69	48	0.1	5.2	NW-W	0.9	1011.0
April	32.4	22.7	74	57	0.3	6.6	NW-W	1.2	1008.5
May	33.1	25.8	76	65	2.8	9.0	SW-W-S	2.5	1006.7
June	32.1	26.0	83	75	298.5	9.9	SW-S	3.7	1002.6
July	30.0	24.6	89	82	623.6	9.3	SW-W	4.4	1002.4
August	29.2	24.2	90	83	424.8	8.4	SW-W	4.6	1003.2
September	30.2	23.7	90	77	206.8	5.9	SW-W	4.0	1006.7
October	32.6	21.9	83	66	31.9	4.5	SE-E	1.8	1010.0
November	32.0	18.3	74	56	35.5	4.5	NE-E,W	1.4	1011.9
December	30.0	15.2	73	55	2.1	4.5	NW-NE-W	1.3	1014.0

(Source: IMD, Valsad)

4.8 Social Infrastructure available

The Social infrastructure is available near the site, details are given below in **Table 16.**

Table 16: Social Infrastructure near the Site

Features	Description
Near-by Residential Areas	• Vapi (0.5 km, W) • Ajit Nagar (2.91 km, NW) • Rentlav (9 km, NNW)
Nearest Educational institutes/Schools	• Mother of Hope School: 1.53 km, W • St. Mary's School: 2.68 km, S
Nearest Hospitals	• 21st Century Hospital Vapi: 1 km, W

5 PLANNING BRIEF

5.1 Planning Concept (type of industries, facilities, transportation etc.) Town and Country Planning/Development authority classification.

The proposed project is expansion in existing plant located in Gujarat Industrial Development Corporation (GIDC) Industrial Area. Project conform the T&CP and other authority classification.

5.2 Population Projection

Construction Phase: Total **150 no.** of construction employment will be hired for the construction works of the proposed plant. Labors will be hired from local areas that will provide employment and socio-economic stability to nearby people.

Operation Phase: After expansion, total employment in plant will be 1230 nos. Local workforce/labour will be hired in the plant. In addition to direct employment, indirect employment shall generate ancillary business to some extent for local population.

5.3 Land use Planning (breakup along with green belt etc.)

The land has allotted to Bayer by Gujarat Industrial Development Corporation The land-use bifurcation has been detailed in ***Section 1.1.***

5.4 Assessment of Infrastructure Demand (Physical & Social)

All Common infrastructural facilities have already been provided in the industrial area. Other required infrastructural (physical and social) facilities will be provided within the plant.

5.5 Amenities/Facilities

Proper site services such as Residential area, First Aid with Medical Dispensary, Canteen, Drinking Water, Training Facilities, Bank etc. are provided to the workers.

6 PROPOSED INFRASTRUCTURE

6.1 Industrial Area (processing area)

The plant area is spread over an area of 72,820 Sqm. Details are given in **Section 5.3**

6.2 Residential Area (non-processing area)

No Residential area is provided within the plot boundary

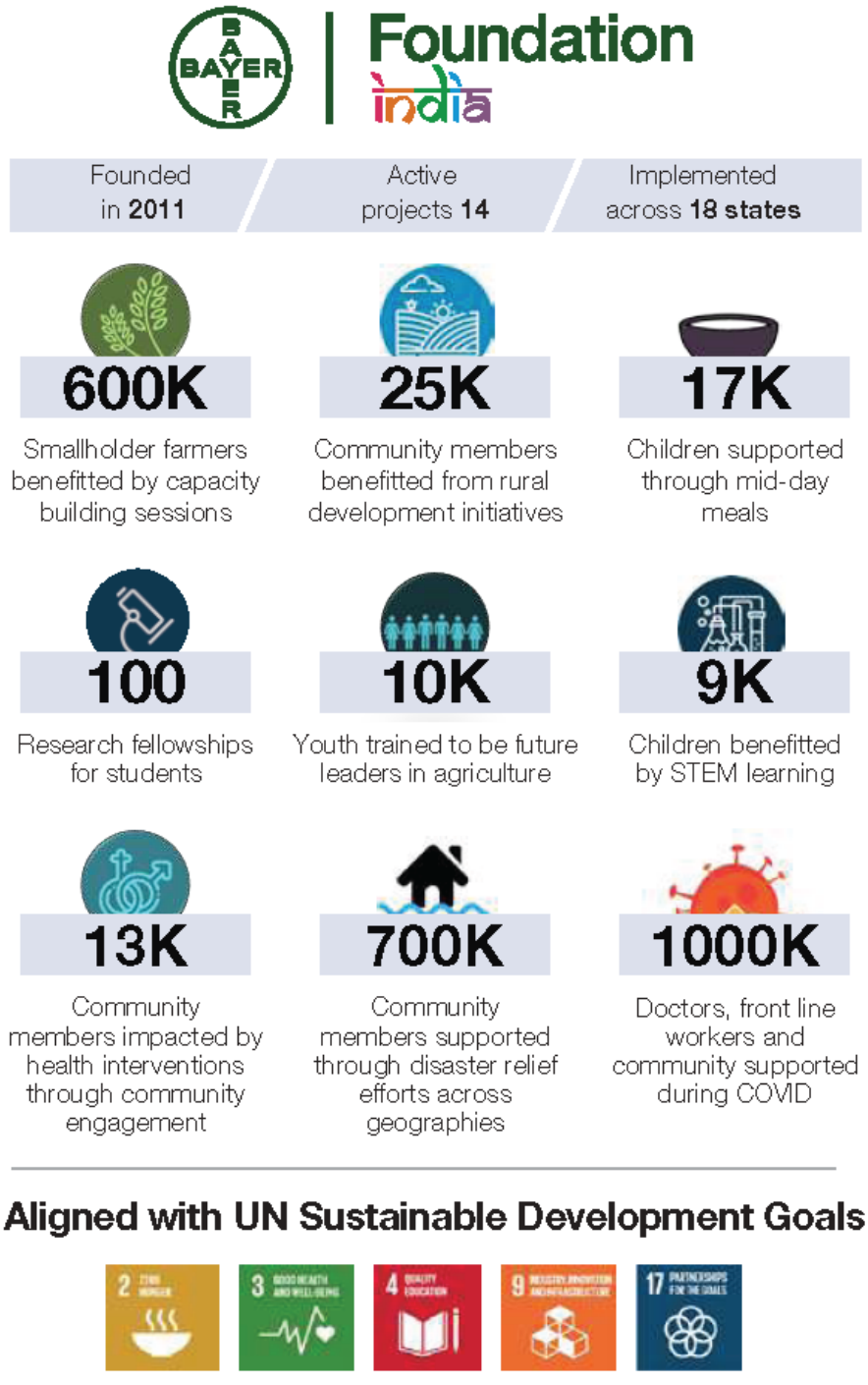
6.3 Green belt

After proposed expansion, green belt area will increase to approx. 1,15,062 m^2 i.e., 39.17 % of total plant area. Wide green belt will be provided all around the boundary wall of project site.

6.4 Social Infrastructure

All basic facilities are available within and nearby the site. Thus, no additional social facilities are proposed within the site. However, after expansion additional infrastructure development and environmental social activities shall be undertaken in the study area after assessment under CER activities.

At Bayer, Corporate Societal Engagement (CSE) activities are aligned to purpose 'Science for a better life' and fuel our vision of "Health for all, Hunger for none". Company seeks to foster and scale meaningful solutions for social health challenges and the food crisis. Bayer work in the thematic areas of Agriculture, Health and Wellness and Community Development help deliver on social commitment to transform communities. In last two years, company programs have positively impacted the lives of children, youth, women and smallholder farmers.


Foundation
india
Founded in 2011
Active projects 14
Implemented across 18 states
600K
Smallholder farmers benefitted by capacity building sessions
25K
Community members benefitted from rural development initiatives
17K
Children supported through mid-day meals
100
Research fellowships for students
10K
Youth trained to be future leaders in agriculture
9K
Children benefitted by STEM learning
13K
Community members impacted by health interventions through community engagement
700K
Community members supported through disaster relief efforts across geographies
1000K
Doctors, front line workers and community supported during COVID
Aligned with UN Sustainable Development Goals

6.5 Connectivity

The project is connected to National Highway-48 via internal roads of industrial area. NH-48 is located at 1 km, W. The nearest railway station is Vapi Railway Station located at distance of 2.4 km, W. Nearest Airport from the project site is Surat International Airport located at 84 km in NNW direction. The nearest town is Vapi at 0.5 km, W.

6.6 Drinking water Management (source & supply of water)

The drinking water supply for the project is sourced from GIDC Supply

6.7 Sewerage System

Domestic wastewater is being disposed into soak pit/septic tank and overflow of it shall be treated in ETP.

6.8 Industrial waste management

There is generation of different kind of Industrial hazardous wastes from production process and other activities. Waste is being segregated in salable and non-salable waste. Salable waste is being sent different recyclers/refiners/cement industries/authorized preprocessing facilities as per waste characteristics while non-salable waste is being disposed through TSDF site/incineration at captive incinerator/ Common Hazardous Wastes Incineration Facility. All waste is disposed as per The Hazardous & Other Waste (Management and Transboundary Movement) Amendment Rules, 2021. After proposed expansion, there shall be increase in waste generation which will be disposed as per existing practices.

6.9 Solid Waste Management

The municipal solid waste generation at the project site which is being segregated in biodegradable waste and recyclable waste. Recyclable waste is being sold off to different authorized vendors. Biodegradable waste is being treated in Organic waste converter and vermi-composting. After expansion, municipal solid waste generated in the plant area will be disposed as per existing practices.

6.10 Power requirement & supply/ source

After expansion, total power requirement of plant will be 12000 kVA, being sourced through Dakshin Gujarat Vij Company Limited (DGVCL). For Power backup, DG sets of capacity 2x1500 kVA, will be installed in the unit along with existing DG sets of 3x1500 kVA, 2x750 kVA.

7 REHABILITATION AND RESETTLEMENTS (R& R) PLAN

7.1 Policy to be adopted (central/state) in respect of the project affected persons including home oustees, land oustees and landless labors (a brief outline to be given)

Plant is spread over an area of **34.80 Hectare** of land. Out of total land, 29.3706 Ha of land has been alloted by GIDC for industrial use and rest 5.4294 Ha land is private land which is developed as green area. The total area of land is in possession of Bayer. The proposed expansion shall be carried out with in plant premises of existing Plant. Hence, any planning with respect to rehabilitation & resettlement is not applicable.

8 PROJECT SCHEDULE AND COST ESTIMATE

8.1 Likely date of start of construction and likely data of completion (time schedule for the project to be given)

Construction will be started after getting all approval from concern department. Construction and installation of machinery will be completed in 1-2 years after start of construction.

8.2 Estimated project cost along with analysis in terms of economic viability of the project.

The estimated cost for proposed expansion is ***Rs 125 Crores.***

9 ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)

9.1 Financial and social benefits with special emphasis on the benefit to be local people including tribal population, if any, in the area.

The project will be beneficial to nearby people. The company management will be committed to improve infrastructural facilities for the local people in field of Environmental, Medical, and Transportation etc.

- Employment would be as per prevailing norms of state government for skilled and unskilled people for the proposed project activity. Unit will give employment to approx. 150 local labors for construction phase.
- Social Welfare
- Cordial relation with the industry shall be established and representation shall be made to villagers for help for creation of facilities related to health, education, etc.
- Establishment and operation of the proposed project will contribute significantly to the revenue of the state and central governments in the form of different types of taxes like sales tax on inputs, outputs and fuel, income tax of employees, excise duty on the product, service tax, etc.

ANNEXURES

ANNEXURE 1: EARLIER ENVIRONMENT CLEARANCE

F.No. J-11011/300/2015-IA II (I)
Government of India
Ministry of Environment, Forest & Climate Change
IA-II Division

Indira Paryavaran Bhawan
Jorbagh Road, New Delhi -3
Dated: 21st February, 2018

To

M/s Bayer Vapi Pvt Ltd,
Plot No.306/3, Phase II,
GIDC Estate
District **Valsad** (Gujarat)

Sub: Expansion of pesticides industry and pesticide specific intermediates (excluding formulations) by M/s Bayer Vapi Pvt Ltd at Plot No.306/3, Phase II, GIDC Estate, District Valsad (Gujarat) - Amendment in EC - reg.

Sir,

This refers to your online proposal No. IA/GJ/IND2/33091/2015 dated 22nd November, 2017 for amendment in the environmental clearance granted by the Ministry vide letter dated 28th March, 2017 for the above project.

2. The proposal was considered by the Expert Appraisal Committee (Industry-2) in the Ministry in its 32nd meeting held on 20-22 December, 2017. The details of the project, as per the documents submitted by the project proponent, and also as informed during the meeting, are reported to be as under: -

(i) The Ministry has granted environmental clearance vide letter No. J-11011/300/2015-IA-II (I) dated 28th March, 2017 to the project 'Expansion of Pesticides industry and pesticide specific intermediates (excluding formulations)' from 17562 MTA to 26572 MTA by M/s Bayer Vapi Pvt Ltd at Plot No.306/3, Phase II, GIDC Estate, District Valsad (Gujarat).

(ii) The amendments have been sought in the EC as per details below: -

S. No.	Para of EC	Details as per the EC	To be revised/ read as
1	Point 2	Total plot area is 29.4 ha, out of which green belt will be developed in the area of 10.6 ha (36%)	Total Plot area is 34.8 ha, out of which green belt will be developed in the area of 10.6 ha (36%).
2	Point 8	Existing unit has 4x10 TPH boiler with 45 m stack height	Existing unit has 4x10 TPH boiler with 30 m stack height
3	Point 9	ETP sludge distillation residue, ash from incineration will be disposed of to TSDF. Process residue will be sent from common incineration. Used/ spent oil will be sent from common incineration. Used/ spent oil will be sold to authorize Recyclers/ Processors. Discarded containers/ bag will be sent to the authorized re-processor.	All waste generated in the unit shall be disposed, strictly in compliance to Hazardous and Other Waste (Management, Handling and Transboundary Movement) Rules 2016.
4	Specific	Acid Scrubber shall be provided to	This sentence – *"Acidic scrubber*

	Condition III	process vent to control process emissions viz. NH_3 and HC	*shall be provided to process vent to control process emissions viz. NH_3 & HC.",* to be removed as we are not generating and shall not be generating NH_3, HC in process emission.
5	Specific condition XV	The company shall obtain authorization for collection, storage and disposal of hazardous waste (management, handling and trans boundary movement rules 2008 and amended as on date for management of Hazardous waste and prior permission from MPCB shall be obtained for disposal of Solid/hazardous waste in the TSDF.	The company shall obtain authorization for collection, storage and disposal of hazardous waste under the Hazardous Waste (Management, Handling and Trans boundary Movement) Rules, 2008 and amended as on date, for management of hazardous wastes and prior permission from GPCB shall be obtained for disposal of solid/hazardous waste in TSDF.
6	Specific condition XXIII	The unit shall adhere to zero liquid discharge (ZLD).	The unit shall ensure zero liquid discharge for the expanded capacity by recycling the treated effluent.
7	General Condition VI	The company shall harvest rainwater from the roof tops of the buildings and storm water drains to recharge the ground water and use to same water for process activities of the project to conserve fresh water	The unit shall explore rain water harvesting system in its non-production building without recharging into ground water.

3. The EAC has recommended the proposed amendments in the environmental clearance dated 28th March, 2017, with the details as under:

(a) Point 2, 8 & 9 to be replaced with, and now read as under: -

2. ..... Total Plot area is 34.8 ha, out of which green belt will be developed in the area of 10.6 ha (36%).....

8. ..... Existing unit has 4x10 TPH boiler with 30 m stack height.....

9. ..... All waste generated in the unit shall be disposed, strictly in compliance to Hazardous and Other Waste (Management, Handling and Transboundary Movement) Rules 2016.

(b) Specific conditions (iii), (xv) & (xxiii) to be now read as under: -

(iii) Two stage water scrubber followed by alkali scrubber shall be provided to process vent to control process emissions viz. HCl, SO_2, Cl_2, NOx, HBr. The scrubbed water should be sent to ETP for further treatment.....

(xv) The company shall obtain authorization for collection, storage and disposal of hazardous waste under the Hazardous Waste (Management, Handling and Trans boundary Movement) Rules, 2008 and amended as on date, for management of hazardous wastes and prior permission from GPCB shall be obtained for disposal of solid/hazardous waste in TSDF.....

(xxiii) The unit shall ensure zero liquid discharge for the expanded capacity by recycling the treated effluent.

(c) General condition (vi) to be read as under: -

(vi) The unit shall explore rain water harvesting system in its non-production building without recharging into ground water.

4. Based on recommendations of the EAC, the Ministry of Environment, Forest and Climate Change hereby accords approval to the proposed amendments in the environmental clearance dated 28th March, 2017 for the project 'Expansion of Pesticides Industry and Pesticide Specific Intermediates (excluding formulations)' from 17562 MTA to 26572 MTA by M/s Bayer Vapi Pvt Ltd at Plot No.306/3, Phase II, GIDC Estate, District Valsad (Gujarat), as stated in para 3 above.

5. All other terms and conditions stipulated in the environmental clearance dated 28th March, 2017 shall remain unchanged.

SKS 21/2/2018

(S. K. Srivastava)
Scientist E

Copy to: -

1. The Additional Principal Chief Conservator of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (WZ), E-5, Kendriya Paryavaran Bhawan, E-5 Arera Colony, Link Road-3, Ravishankar Nagar, **Bhopal** – 462016 (Madhya Pradesh)
2. The Secretary, Forests & Environment department, Government of Gujarat, Sachivalaya, 8th Floor, **Gandhinagar** (Gujarat)
3. The Member Secretary, Central Pollution Control Board Parivesh Bhavan, East Arjun Nagar, **Delhi** - 32
4. The Member Secretary, Gujarat Pollution Control Board, Paryavaran Bhavan, Sector-10 A, **Gandhinagar**-382010 (Gujarat)
5. Monitoring Cell, Ministry of Environment, Forest and Climate Change, **New Delhi**
6. Guard File/Monitoring File/Record File

SKS 21/2/2018

(S. K. Srivastava)
Scientist E

F. No. J-11011/300/2015-IA.II (I)
Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)

Indira Paryavaran Bhawan
Aliganj, Jor Bagh Road,
New Delhi -110 003

Telefax: 011-24695365
E-mail: yogendra78@nic.in

Dated: 28th March, 2017

To,

The Director and Site Manager
M/s Bayer Vapi Private Limited
Plot No. 306/3, Phase II,
GIDC Estate, Vapi, Gujarat

Sub: Expansion of Pesticides industry and pesticide specific intermediates (excluding formulations) from 17562 MTA to 26572 MTA at Plot No. 306/3, Phase II, GIDC Estate, District Valsad, Gujarat by M/s Bayer Vapi Private Limited – Environmental Clearance – reg.

Ref: Online Proposal No. IA/GJ/IND2/33091/2015 dated 30th August, 2016.

Sir,

This has reference to your online proposal no. IA/GJ/IND2/33091/2015 dated 30th August, 2016, along with project documents including Form I, Terms of References, Pre-feasibility Report and EIA/EMP Report regarding the above mentioned project.

2. The Ministry of Environment, Forest and Climate Change has examined the application. It is noted that the proposal is for Expansion of Pesticides industry and pesticide specific intermediates (excluding formulations) from 17562 MTA to 26572 MTA at Plot No. 306/3, Phase II, GIDC Estate, District Valsad, Gujarat by M/s Bayer Vapi Private Limited. As informed and as per the documents submitted by the Project Proponent (PP), the total plot area is 29.4 Ha, out of which green belt will be developed in area of 10.6 ha (36 %). The total cost of the proposed project is Rs. 582.46 Crore. Total capital cost of air pollution and water pollution control measures is Rs. 2,030 Lakhs. It is reported that no Wildlife Sanctuary /National Park/Reserved/Protected Forest is located within 10 km distance from the project site. Daman Ganga River is flowing at a distance of 3.92 km southwest direction of the plant site. Kolak River is flowing at a distance of 2.62 km northeast direction of the plant site. The company proposes to manufacture the following products in the unit:

S. No	Name of Products	Category	Capacity (MT/Annum)		
			Existing	Proposed	Total Production after expansion
1	Cypermethrin	Insecticides	2496	0	2496
2	Alphamethrin	Insecticides	480	0	480
3	Deltamethrin	Insecticides	504	0	504
4	Permethrin	Insecticides	1374(Either	0	1374 (Either
5	Transfluthrin	Insecticides	individual or		individual or

			total production of 2 products)		total production of 2 products)
6	Acrinathrin	Insecticides	45	0	45
7	Imidacloprid	Insecticides	720	0	720
8	Beta Cyfluthrin	Insecticides	982.32 (Either individual or total production of 2 products)	0	982.32 (Either individual or total production of 2 products)
9	Cyfluthrin	Insecticides			
10	Ethofumesate	Herbicide	1560 (Either individual or total production of 2 products)	1740 (Either individual or total production of 2 products)	3300 (Either individual or total production of 3 products)
11	NC 9770	Intermediate			
12	Aclonifen	Herbicide	0		
13	Triafamone	Herbicide	0	180 (Either individual or total production of 2 products)	180 (Either individual or total production of 2 products)
14	Sulphonyl Indole	Intermediate			
15	MetaphenoxyBenzaldehyde	Intermediate	3000	0	3000
16	NaCMTS	Intermediate	1200	0	1200
17	Cypermethric Acid Chloride (CMAC)/ Cypermethric Acid (CMA)	Intermediate	2400	0	2400
18	Cypermethric Acid Chloride from DV Ester	Intermediate	600 (Either individual or total production of 2 products)	0	600 (Either individual or total production of 2 products)
19	Acid Chloride Preparation	Intermediate			
20	Metaphenoxy Benzyl Alcohol	Intermediate	1200	0	1200
21	Becisthemic Acid	Intermediate	180	0	180
22	Chrysanthemic Acid	Intermediate	180 (Either individual or total production of 2 products)	0	180 (Either individual or total production of 2 products)
23	Allethrolones	Intermediate			
24	TCA	Intermediate	410.4 (Either individual or total production of 2 products)	129.6	540 (Either individual or total production of 2 products)
25	RTCMA	Intermediate			
26	DM Base	Intermediate	50.4	0	50.4
27	Fipronil	Insecticides	0	540	540

28	Ethiprole	Insecticides	0	1020	1020
29	Fluopyram	Fungicide	0	3000 (Either individual or total production of 2 products)	3000 (Either individual or total production of 2 products)
30	PYACN	Intermediate			
31	Tembotrione	Herbicide	0	1020	1020
32	Pyrasulfotle	Herbicide	0	300	300
33	Amid Chloride	Intermediate	0	1020	1020
34	Flumethrin	Insecticides	0	60	60
35	R & D Products	Not Specified	0	180	180
B. Product not to be produced after expansion					
1	D. Trans Allethrin	Insecticides	180	(-) 180	0
Total Capacity			**17562.12**	**9009.6**	**26571.72**

S. No	Name of By-products	Capacity (MT/Annum)		
		Existing	Proposed	Total Production after expansion
1.	Aluminum Chloride solution	15768	-7	15761
2.	Recovered Methanol*	1669.2	-858.2	811
3.	Potassium Chloride	543.6	-3.6	540
4.	Potassium bromide/Sodium bromide	6654	-2	6652
5.	Sodium bi-Sulphite*	4076.4	-25.4	4051
6.	Sodium Sulphite solution	1620	-45	1575
7.	Organic Solvent (Mono bromo Toluene)	2095.2	-0.2	2095
8.	Ammonia solution	541.56	-541.56	0
9.	Ammonium Chloride Crystal	1620	-6	1614
10.	Potassium Chloride solution.	3000	-47	2953

3. All Pesticides industry and pesticide specific intermediates (excluding formulations) units producing technical grade pesticides are listed at Sl.No. 5(b) of Schedule of Environmental Impact Assessment (EIA) Notification under Category 'A' and are appraised at Central Level by Expert Appraisal Committee (EAC).

4. The project proposal was considered by the Expert Appraisal Committee (Industry -2) in its 3rd meeting held during 18th-19th January, 2016 and 14th meeting held during 26th-27th October, 2016. The Project Proponent and the accredited consultant M/s EQMS India Pvt. Ltd., Delhi gave a detailed presentation on the salient features of the project and proposed environmental protection measures to be undertaken, as per Terms of References (TORs) awarded in the 3rd meeting of the EAC held during 18th-19th January, 2016 for preparation of EIA-EMP report. The TOR has been issued by Ministry vide letter of even no. dated 05th March, 2016.

5. Public hearing was exempted as per Section 7(i), III. Stage (3), Para (i)(b) of EIA Notification as the project is located in the notified Industrial area/estate.

6. The PP has obtained environmental clearance (EC) for the existing unit vide Ministry's letter no. J-11011/526/2008-IA II(I) dated 22nd September, 2008.

7. The PP informed the EAC that the ambient air quality (AAQ) monitoring was carried out at 8 locations during December, 2015 to February, 2016. The baseline data indicates the ranges of concentrations as:- PM_{10} (70 µg/m³ to 113 µg/m³), $PM_{2.5}$ (26 µg/m³ to 54 µg/m³), SO_2 (11.5 µg/m³ to 24.6 µg/m³) and NOx (15.1 µg/m³ to 33 µg/m³). AAQ modeling study for point source emissions indicates that the maximum incremental ground level concentration (GLCs) after the proposed project would be 4 µg/m³, 2.24 µg/m³ and 1.3 µg/m³ with respect to PM_{10}, SO_2 and NOx respectively. The resultant concentrations are within the National Ambient Air Quality Standards (NAAQS).

8. The total power requirement will increase from 29000 to 33000 KVA after proposed expansion which will be sourced from Dakshin Gujarat Vij Company Limited. Additional 03 Nos of D.G sets having capacity 1500 KVA (01 Nos) and 750 KVA (2 Nos) will be used as standby. 03 Nos of Fire hydrant pumps will be operated on DG coupled set shaving capacity 325 KVA each in case of emergency only. Existing unit has 4 x 10 TPH boilers with 45 m stack height. One additional 15 TPH Natural gas fired boiler will be used for steam generation. Two stage scrubbers will be provided to control Cl2 and HCl with online pH meters. PP has confirmed that Methyl Chloride, Phosphorous Pentoxide, Ammonia will not be generated from proposed expansion.

9. The total water requirement after proposed expansion will reduced from 3220 m³/day to 2964 m³/day due to recycling of water, which will be met from GIDC supply. Total Wastewater generation will be reduced from 949 m³/day to 900 m³/day but EAC suggested PP to further reduce the wastewater quantity by recycling 65 m³/day of wastewater, which will reduce the fresh water and wastewater generation from 2900 m³/day to 835 m³/day. The wastewater will be segregated at source and treated based on its characteristics viz High COD & High TDS and Low COD & Low TDS. High COD & High TDS effluents will be sent to MEE followed by RO while Low COD & Low TDS effluents will be treated in ETP followed by RO. The treated wastewater is discharged to Common Effluent Treatment Plant (CETP) operated by Vapi Green Enviro Ltd (formerly known as Vapi Waste & Effluent Management Co. Ltd). The ETP sludge, distillation residue, ash from incineration will be disposed of to TSDF. Process residue will be sent for common incineration. Used/spent oil will be sold to Authorized Recyclers/Processors. Discarded containers/ bag will be sent to the authorized re-processor.

10. The EAC, in its 14th meeting held during 26th-27th October, 2016, has found that the final EIA/EMP report submitted by the PP is adequate. The EAC after detailed deliberations, on the basis of the information and presentation made by the PP, has recommended the project for environmental clearance with certain conditions.

11. Based on the proposal and information submitted by the Project Proponent, and considering the recommendation of the Expert Appraisal Committee (Industry-2), the Ministry of Environment, Forest and Climate Change hereby accords Environmental Clearance to the above project under the provisions of EIA Notification dated 14th September 2006, subject to the compliance of the following Specific and General Conditions:

A. Specific Conditions:

i) National Emission Standards for Pesticide Manufacturing and Formulation Industry issued by the Ministry vide G.S.R. 46(E) dated 3rd February, 2006 and amended time to time shall be followed by the unit.

ii) Adequate stack height shall be provided to gas fired boiler to control particulate emissions.

iii) Two stage water scrubber followed by alkali scrubber shall be provided to process vent to control process emissions viz. HCl, SO2, Cl2, NOx, HBr. Acidic scrubber shall be provided to process vent to control process emissions viz. NH3 & HC. The scrubbed water should be sent to ETP for further treatment. Efficiency of scrubber shall be monitored regularly and maintained properly. Scrubbers vent shall be provided with on-line detection and alarm system to indicate higher than permissible value of controlled parameters. At no time, the emission levels shall go beyond the prescribed standards. The system should be interlocked with the pollution control equipment so that in case of any increase in pollutants beyond permissible limits, plant should be automatically stopped.

iv) In plant control measures for checking fugitive emissions from all the vulnerable sources shall be provided. Fugitive emissions shall be controlled by providing closed storage, closed handling & conveyance of chemicals/materials, multi cyclone separator and water sprinkling system. Dust suppression system including water sprinkling system shall be provided at loading and unloading areas to control dust emissions. Fugitive emissions in the work zone environment, product, raw materials storage area etc. shall be regularly monitored and records maintained.

v) A proper Leak Detection and Repair (LDAR) Program for pesticide industry shall be prepared and implemented as per CPCB guidelines. Focus shall be given for prevention of fugitive emissions for which preventive maintenance of pumps, valves, pipelines are required. Proper maintenance of mechanical seals of pumps and valves shall be given. A preventive maintenance schedule for each unit shall be prepared and adhered to.

vi) Company shall take all the measures in order to protect the machineries and equipment for pesticide producing unit from ageing.

vii) Continuous monitoring system for chlorine, HCl, Cl2 as well as VOCs shall be installed at all important places/areas. Effective measures shall be taken immediately, when monitoring results indicate above the permissible limits. Alarm for chlorine leakage if any in the liquid chlorine storage area is provided alongwith automatic start of the scrubbing system.

viii) The gaseous emissions from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution.

ix) Solvent management shall be carried out as follows :

(a). Chilled brine circulation system shall be provided to condensate solvent vapors and reduce solvent losses. It shall be ensured that solvent recovery should not be less than 95%.

(b). Reactor and solvent handling pump shall have mechanical seals to prevent leakages.

(c). The condensers shall be provided with sufficient HTA and residence time so as to achieve more than 95% recovery

(d). Solvents shall be stored in a separate space specified with all safety measures.

(e). Proper earthing shall be provided in all the electrical equipment wherever solvent handling is done.

(f). Entire plant shall be flame proof. The solvent storage tanks should be provided with breather valve to prevent losses.

x) Total water requirement from GIDC water supply shall not exceed 2900 m^3/day and prior permission should be obtained from the competent authority.

xi) Industrial effluent generation shall not exceed 900 m3/day. As proposed, wastewater will be segregated at source and treated based on its characteristics viz High COD & High TDS and Low COD & Low TDS. High COD & High TDS effluents will be sent to MEE followed by RO while Low COD & Low TDS effluents will be treated in ETP followed by RO. The treated wastewater shall be discharged to Common Effluent Treatment Plant (CETP) for final treatment.

xii) Process effluent/any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through guard pond.

xiii) Hazardous chemicals shall be stored in tanks in tank farms, drums, carboys etc. Flame arresters shall be provided on tank farm. Solvent transfer shall be by pumps.

xiv) The by-products which fall under the purview of the Hazardous Waste Rules, be handled as per the provisions of the said Rules and necessary permissions shall be obtained under the said Rules.

xv) The company shall obtain Authorization for collection, storage and disposal of hazardous waste under the Hazardous Waste (Management, Handling and Trans-Boundary Movement) Rules, 2008 and amended as on date for management of Hazardous wastes and prior permission from MPCB shall be obtained for disposal of solid / hazardous waste in the TSDF. Measures shall be taken for fire fighting facilities in case of emergency. Membership of TSDF for hazardous waste disposal shall be obtained.

xvi) ETP sludge, inorganic waste shall be sent to TSDF site. High calorific value waste such as spent organic shall be sent to cement factory/incinerated.

xvii) The Company shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989 *as* amended in October, 1994 and January, 2000. All Transportation of Hazardous Chemicals shall be as per the Motor Vehicle Act (MVA), 1989.

xviii) The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Fire fighting system shall be as per the norms.

xix) Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.

xx) Green belt should be developed at least in 10.6 ha area in and around the plant premises to mitigate the effects of fugitive emissions all around the plant as per the CPCB guidelines in consultation with DFO. Selection of plant species should be as per the CPCB guidelines.

xxi) At least 2.5 % of the total cost of the project shall be earmarked towards the Enterprise Social Commitment and item-wise details along with time bound action plan shall be prepared and submitted to the Ministry's Regional Office at Bhopal. Implementation of such program shall be ensured accordingly in a time bound manner

xxii) All the recommendations made in the risk assessment report should be satisfactorily implemented.

xxiii) The unit shall adhere to Zero Liquid Discharge (ZLD).

xxiv) Continuous online (24 x7) monitoring to be installed for flow measurement and measurement of pollutants within the treatment unit. Data to be uploaded on company's website and provided to the respective RO of MEF&CC, CPCB and SPCB.

B. General Conditions:

i. The project authorities must strictly adhere to the stipulations made by the Gujarat State Pollution Control Board, State Government and any other statutory authority.

ii. No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.

iii. The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one stations is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.

iv. The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 shall be followed.

v. The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).

vi. The Company shall harvest rainwater from the roof tops of the buildings and storm water drains to recharge the ground water and use the same water for the process activities of the project to conserve fresh water.

vii. Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.

viii. The company shall also comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management and risk mitigation measures relating to the project shall be implemented.

ix. The company shall undertake all relevant measures for improving the socio-economic conditions of the surrounding area. CSR activities shall be undertaken by involving local villages and administration.

x. The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment.

xi. A separate Environmental Management Cell equipped with full fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.

xii. The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/ pollution control measures shall not be diverted for any other purpose.

xiii. A copy of the clearance letter shall be sent by the project proponent to concerned Panchayat, Zilla Parishad/Municipal Corporation, Urban local Body and the local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal.

xiv. The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF&CC, the respective Zonal Office of CPCB and SPCB. A copy of

Environmental Clearance and six monthly compliance status report shall be posted on the website of the company.

xv. The environmental statement for each financial year ending 31st March in Form-V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of MoEF&CC by e-mail.

xvi. The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry at http://moef.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.

xvii. The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.

12. The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

13. The Ministry reserves the right to stipulate additional conditions, if found necessary. The company in a time bound manner will implement these conditions.

14. The above conditions will be enforced, *inter alia* under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention &. Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008 and the Public Liability Insurance Act, 1991 along with their amendments and rules.

29.3.2

(Yogendra Pal Singh)
Scientist 'D'

Copy to:-

1. The Secretary, Forests and Environment Department, Government of Gujarat, Block 14, 8th floor, Sachivalaya,Gandhinagar-382 010, Gujarat.
2. The Additional Principal Chief Conservator of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (WZ), E-5, Kendriya Paryavaran Bhawan, E-5 Arera Colony, Link Road-3, Ravishankar Nagar, Bhopal – 462016
3. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex East Arjun Nagar, Delhi - 110 032.
4. The Chairman, Gujarat Pollution Control Board, Paryavaran Bhawan, Sector-10A, Gandhinagar-382 010, Gujarat.
5. Monitoring Cell, Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh, New Delhi- 110 003.
6. Guard File/Monitoring File/Website/Record File.

29.3.2011

(Yogendra Pal Singh)
Scientist 'D'

ANNEXURE 2: VALID CONSENT TO OPERATE

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN
Sector-10-A, Gandhinagar-382 010
Phone : (079) 23226295
Fax : (079) 23232156
Website : www.gpcb.gov.in

R.P.A.D.

In exercise of the power conferred under section-25 of the Water (Prevention and Control of Pollution) Act-1974, under section-21 of the Air (Prevention and Control of Pollution)-1981 and Authorization under rule 6(2) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, framed under the Environmental (Protection) Act-1986.

And whereas Board has received CC& A application inward no: 197761 dated 14/07/2021 for the Consolidated Consent and Authorization (CC & A) of this Board under the provisions / rules of the aforesaid Acts Consents & Authorization are hereby granted as under:

CONSENTS AND AUTHORISATION:
(Under the provisions /rules of the aforesaid environmental acts)

To,
M/S. BAYER VAPI PRIVATE LIMITED,
PLOT NO: 306/3, PHASE-II,
GIDC VAPI- 396195,
TAL: PARDI, DIST: VALSAD.

1. Consent Order No.: AWH-115250, Date of issue: 18/10/2021

2. The consents shall be valid up to 30/09/2026 for use of outlet for the discharge of trade effluent & emission due to operation of industrial plant for manufacture of the following items/ products:

S. No.	Product	Qty (MT/Year)
1.	Cypermethrin	3050
2.	Alphamethrin	660
3.	Deltamethrin	600
4.	Permethrin	1600 (Either Individual or total production of 2 products)
5.	Transfluthrin	
6.	Acrinathrin	45
7.	Imidacloprid	720
8.	Beta Cyfluthrin	982 (Either Individual or total production of 2 products)
9.	Cyfluthrin	
10.	Ethofumesate	4500 (Either Individual or total production of 3 products)
11.	NC9770	
12.	Aclonifen	
13.	Triafamone	180 (Either Individual or total production of 3 products)
14.	Sulfonyl indole	
15.	Triazoindolinone	
16.	Metapheroxy Benzaldehyde	1800
17.	NaCMTS	1000

18.	CPDM	175
19.	Cypermethric Acid Chloride (CMAC) / Cypermethric Acid (CMA)	3000
20.	Cypermethric Acid Chloride from DV Ester	600 (Either Individual or total production of 2 products)
21.	Acid Chloride Preparation (RTPAC)	
22.	Metaphenoxy Benzyl Alcohol	1200
23.	Becisthemic Acid	180
24.	Chrysanthemic Acid	180 (Either Individual or total production of 2 products)
25.	Allethrolones	
26.	TCA	720 (Either Individual or total production of 2 products)
27.	RTCMA	
28.	Fipronil	540
29.	Ethiprole	1500 (Either Individual or total production of 2 products)
30.	Pyrazole	
31.	Fluopyram	1200 (Either Individual or total production of 2 products)
32.	PYACN	
33.	Tembotrione	300
34.	Pyrasulfotle	300
35.	Amid chloride	1020
36.	Flumethrin	60
37.	R& D Pilot products	180

3. **CONDITIONS UNDER THE WATER (PREVENTION AND CONTROL OF POLLUTION) ACT 1974:**

3.1 The quantity of total water consumption shall not exceed 3243 KLD (2883 KLD Fresh + 360 Recycle).

a) Industrial: 2783 KLD.
b) Domestic: 100 KLD

3.2 The quantity of trade effluent from the industry shall not exceed 1316 KLD.

a) Industrial: 1251 KLD
b) Domestic: 65 KLD

3.3 Domestic waste water disposes into soak pit/septic tank and overflow of it shall be treat in ETP.

3.4 Hence, out of 1316 KLD waste water, 360 KLD shall be recycle in process after treatment in ETP & RO, 90 KLD shall be segregate and sent to authorized CMEE, and remaining 866 KLD shall be discharge to CETP Vapi after achieving prescribed norms.

3.5 **TRADE EFFLUENT**

3.5.1 The concentrated and toxic effluent streams 19000 Kg / Day or 6935 MT / Annum will be segregated and completely incinerated in Inhouse Incinerator / Common Hazardous Waste Integration Facilities / send to authorized pre-processing and / or co-processing facilities.

3.5.2
a. The incinerator system shall be operated & maintained efficiently so that there shall be no discharge of concentrated & toxic effluent into an environment including land, river, stream etc.
b. The industry shall operate fully & efficiently incineration system/air pollution control equipment for incineration of total quantity (i.e. toxic effluent)of effluent.
c. The pipeline connecting various equipment of sump of incineration system should be minimum in number & shall have permanent connection.
d. The incineration system shall be equipped with flow measuring devices for mother liquor, effluent, fuel, air used for combustion & scrubber outside the incinerator.
e. The applicant shall have to register the unit under the provisions of Factories Act-1948 & shall obtain the factory license.
f. The unit shall make all the requisite arrangements for the safe storage & leachate collection.
g. The printed logbook shall be maintained for
- Energy Consumption
- Wastewater flow at inlet & outlet of incinerator system.
- Quality of sludge generated
- Laboratory analysis reports for each of the specific parameters of liquid effluent

h. The unit shall supply to GPCB, the figures of production & consumption of electricity & water for each day during the period of production on monthly basis. The unit shall provide separate figure for consumption of electricity of each runningincinerator by having separate meter/sub meter.

3.5.3. The non-toxic & non concentrated effluent from the industrial unit shall conform to the CETP, Vapi inlet norms mentioned in Column No.1 below (in case of CETP, Vapi member). The final discharge from CETP shall adhere to prescribed standard for CETP.

3.5.4 In the event, if the effluent from industrial unit is not routed through CETP, the applicant shall provide adequate effluent treatment system in order to achieve the quality of treated effluent as per GPCB norms in mentioned in Column No.3.

PARAMETERS	GPCB NORMS
pH	6.5 TO 8.5
Temperature	40^0 C
Suspended Solids	300 mg/l
Oil and Grease	10 mg/l
Phenolic Compounds	1 mg/l
Cyanides	0.2 mg/l
Fluorides	2 mg/l
Sulphides	2 mg/l
Ammonical Nitrogen	50 mg/l
Arsenic	0.2 mg/l
Total Chromium	2 mg/l
Hexavelent Chromium	0.1 mg/l
Copper	3 mg/l
Lead	0.1 mg/l
Mercury	0.01 mg/l
Nickel	3 mg/l
Zinc	5 mg/l
Cadmium	2 mg/l
Iron	3 mg/l
BOD (5 days at 20^0C)	30 mg/l
COD	100 mg/l
Chlorides	600 mg/l
Sulphates	1000 mg/l
Total dissolved Solids	2100 mg/l
Sodium absorption ratio	26
Sodium Percent	60

3.5.5 The final treated effluent conforming to be the above standard shall be discharged in to GIDC underground drainage system & shall ultimately be conveyed into tidal zone of river Damanganga through CETP.

3.5.6 The applicant shall either stop or curtail their production activities if the effluent is not adequately treated by CETP or CETP is not functional.

4. CONDITIONS UNDER THE AIR (PREVENTION AND CONTROL OF POLLUTION) ACT 1981:

4.1 The following shall be used as fuel:

Sr. No.	Fuel	Quantity
1.	Natural Gas	5072 m^3/Hr
2.	HSD	962 Lits/Hr

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN
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4.2 The flue gas emission through existing stack shall conform to the following standards:

Stack No.	Stack attached to	Stack height in Meter	APCM	Parameter	Permissible Limit
1.	Boiler -1 (10 TPH)	20	--	PM SO_2 NO_x	150 mg/Nm³ 100 ppm 50 ppm
2.	Boiler -2 (10 TPH)	20	--	PM SO_2 NO_x	150 mg/Nm³ 100 ppm 50 ppm
3.	Boiler -3 (10 TPH)	20	--	PM SO_2 NO_x	150 mg/Nm³ 100 ppm 50 ppm
4.	Boiler -4 (10 TPH)	20	--	PM SO_2 NO_x	150 mg/Nm³ 100 ppm 50 ppm
5.	Boiler -5 (15 TPH)	20	--	PM SO_2 NO_x	150 mg/Nm³ 100 ppm 50 ppm
6.	Thermic Fluid Heater 1	25	--	PM SO_2 NO_x	150 mg/Nm³ 100 ppm 50 ppm
7.	Thermic Fluid Heater 2	25	--	PM SO_2 NO_x	150 mg/Nm³ 100 ppm 50 ppm
8.	Incinerator I -Old (2.18 M Kcal/hr.)	40	Cyclone Separator +Alkali Packed bed scrubber & chimney	PM: 50 mg/ Nm³ SO_2 :200 mg/ Nm³ NO_x :400 mg/ Nm³ HCL:50 mg/ Nm³ CO: 100 mg/Nm³ TOC: 20 mg/ Nm³ HF: 4 mg/Nm³ Total Dioxin and Furans: 0.1 ng TEQ/Nm³ Cd + Th+ their compounds: 0.05 mg/Nm³ Hg and its compounds: 0.05 mg/Nm³ Sb + As+ Pb + C + Co+ Cu+ Mn + Ni + V+ their compound: 0.5 mg/Nm³	
9.	Incinerator II- New (6.5 M Kcal/hr.)	40	Cyclone Separator+ Bag filter Alkali Packed bed scrubber & chimney		
10.	DG Set-1 (1500 KVA)	30	--	PM SO_2 NO_x	150 mg/Nm³ 100 ppm 50 ppm
11.	DG Set-2 (750 KVA)	13	--	PM SO_2	150 mg/Nm³ 100 ppm

				NO_x	50 ppm
12.	DG Set-3 (750 KVA)	13	--	PM SO_2 NO_x	150 mg/Nm³ 100 ppm 50 ppm
13.	DG Set-4 (325 KVA)	10	--	PM SO_2 NO_x	150 mg/Nm³ 100 ppm 50 ppm
14.	DG Set-5 (325 KVA)	10	--	PM SO_2 NO_x	150 mg/Nm³ 100 ppm 50 ppm
15.	DG Set-6 (325 KVA)	10	--	PM SO_2 NO_x	150 mg/Nm³ 100 ppm 50 ppm

4.3 The process emission through various stacks/vent of reactors, process, vessel shall conform to the following standards:

Stack No.	Stack attached to	Stack height in Meter	Air Pollution Control System	Parameter	Permissible Limit
1.	MPB reactor drowning Vessel & ventilation system	22 m	Water scrubber followed by caustic scrubber	HCl Cl_2 HBr	20 mg/Nm³ 09 mg/Nm³ 05 mg/Nm³
2.	CMAC Reactors	20 m	Water scrubber followed by caustic scrubber	SO_2 HCl	40 mg/Nm³ 20 mg/Nm³
3.	TBAC Reactors	20 m	Water scrubber followed by caustic scrubber	SO_2 HCl	40 mg/Nm³ 20 mg/Nm³
4.	Bromination reaction reactor in Deltamethrin (Stage-I)	22 m	Caustic Scrubber	HBr HCl	05 mg/Nm³ 20 mg/Nm³
5.	Acylation reaction reactor in Deltamethrin (stage-II)	22 m	Water scrubber followed by caustic scrubber	SO_2 HCl	40 mg/Nm³ 20 mg/Nm³
6.	Acylation reactor of Transfluthrin/ Acid chloride preparation	11 m	Water scrubber followed by caustic scrubber	HCl	20 mg/Nm³
7.	Condensation reactor of Permethrin	20 m	Water scrubber	HCl	20 mg/Nm³

8.	Acrinathrin Plant (CPPL preparation rector)	11 m	Water scrubber	HCl	20 mg/Nm^3
9.	Acrinathrin Plant (acid chloride preparation reactor)	11 m	Water scrubber followed by caustic scrubber	SO_2 HCl	40 mg/Nm^3 20 mg/Nm^3
10.	I & II stage reactor of Imidacloprid plant (ECO Plant)	11 m	Water scrubber	HCl Cl_2	20 mg/Nm^3 09 mg/Nm^3
11.	IV-stage reactors of Imidacloprid plant (ECO Plant)	11 m	Water scrubber followed by acid Trap	NH_3	175 mg/Nm^3
12.	Process Reactors of Allethrones	20 m	Water scrubber	HCl	20 mg/Nm^3
13.	1st reaction of Triafamone	20 m	Caustic scrubber	SO_2	40 mg/Nm^3
14.	2nd stage reaction of Trifamone	20 m	Caustic scrubber	SO_2	40 mg/Nm^3
15.	Amid chloride preparation reactor in Amid Chloride plant	20 m	Water scrubber followed by caustic scrubber.	SO_2 HCl	40 mg/Nm^3 20 mg/Nm^3
16.	CSE & Pyrazole sulfide Formation reactors of Ethiprole	20 m	Water scrubber followed by caustic scrubber.	HCl Cl_2	20 mg/Nm^3 09 mg/Nm^3
17.	Acid chloride preparation in Tembotrione	20 m	Water scrubber followed by caustic scrubber.	SO_2 HCl	40 mg/Nm^3 20 mg/Nm^3
18.	Chlorination reactor of Pyrasulfotole	20 m	Water scrubber followed by caustic scrubber	SO_2 HCl	40 mg/Nm^3 20 mg/Nm^3

4.4 The concentration of the following substances in the ambient air within the premises of the industry and at a distance of 10 meters from the source (other than the stack / vent with height of more than 9 meters from the ground level) shall not exceed the following levels:

Sr. No.	Pollutant	Time Weighted Average	Concentration in Ambient air in µg/NM³
1.	Sulphur Dioxide (SO_2)	Annual 24 Hours	50 80
2.	Nitrogen Dioxide (NO_2)	Annual 24 Hours	40 80
3.	Particulate Matter (Size less than 10 µm) OR PM_{10}	Annual 24 Hours	60 100
4.	Particulate Matter (Size less than 2.5 µm) OR $PM_{2.5}$	Annual 24 Hours	40 60
5.	Carbon Monoxide (CO) mg/m³	8 Hours 1 Hour	02 04

4.5 The applicant shall provide portholes, ladder, platform etc at chimney(s) for monitoring the air emissions and the same shall be open for inspection to/and for use of Board's staff. The chimney(s) vents attached to various sources of emission shall be designed by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.

4.6 The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standards in respect of noise to less than 75 dB (a) during day time and 70 dB (A) during night time. Daytime is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.

5. GENERAL CONDITIONS:

5.1 Any change in personnel, equipment or working conditions as mentioned in the consents form/order should immediately be intimated to this Board.

5.2 Management of Solid Waste generated from industrial activities shall be as per Solid Waste Management Rules-2016 (solid waste as defined in Rule-3(46).

6. Authorization under Hazardous and Other Waste (Management and Transboundary Movement) Rules-2016, Form-2 (See rule 6(2))

6.1 Number of authorization: **AWH-115250, Date of issue: 18/10/2021.**

6.2 Reference of application **No. 197761 and date: 14/07/2021.**

6.3 **M/S. BAYER VAPI PRIVATE LIMITED,** is hereby granted an authorization based on the enclosed signed inspection report for generation, collection, reception, storage, transport, reuse, recycling, recovery, pre-processing, co-processing, utilization, treatment, disposal or any other use of hazardous or other wastes or both on the premises situated at **PLOT NO: 306/3, PHASE-II, GIDC VAPI- 396195, TAL: PARDI, DIST: VALSAD.**

GPCB

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN
Sector-10-A, Gandhinagar-382 010
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Details of authorization:

Sr. No	Name of hazardous waste	Category	Quantity TPA	Disposal mode
1.	Chemical Sludge from Wastewater Treatment	35.3	2436	Collection, Storage, Transportation, and Disposal by sending to approved and authorized TSDF sites by use of GPS mounted vehicles and XGN manifest system.
2.	Evaporation residue	37.3	11794	Collection, Storage, Transportation, and Disposal by sending to approved and authorized TSDF sites by use of GPS mounted vehicles and XGN manifest system.
3.	Distillation Residues	20.3	6463	Collection, storage, transportation and disposal by sending for co-processing to cement industries or by incineration at captive incineration or by sending to authorized CHWIF sites by use of GPS mounted vehicles and XGN manifest system.
4.	Ash from Incinerator and flue gas cleaning residue	37.2	258	Collection, Storage, Transportation, and Disposal by sending to approved and authorized TSDF sites by use of GPS mounted vehicles and XGN manifest system.
5.	Oil and grease skimming	35.4	30	Collection, storage, transportation and disposal by sending for co-processing to cement industries or by incineration at captive incineration or by sending to authorized CHWIF sites by use of GPS mounted vehicles and XGN manifest system.
6.	Used Oil or Spent Oil	5.1	30	Collection, Storage, Transportation disposal by reuse or selling to authorized recycler/ refiners or by incineration at captive incineration or by sending to authorized CHWIF sites by use of GPS mounted vehicles and XGN manifest system.
7.	Spent Solvents	29.4	1261	Collection, storage, transportation and disposal by sending for co-processing to cement industries or by incineration at captive incineration or by sending to authorized CHWIF sites by use of GPS mounted vehicles and XGN manifest system.

8.	Empty barrels / Containers / liners contaminated with hazardous chemicals / waste	33.1	597	Collection, Storage, Transportation, decontamination and disposal by selling to authorized recycler having all required permissions of SPCB by use of GPS mounted vehicles and XGN manifest system.
9.	Spent Catalyst	29.5	14	Collection, storage, transportation and disposal by sending for co-processing to cement industries or by sending to authorized CHWIF sites by use of GPS mounted vehicles and XGN manifest system.
10.	Date Expired and off - specification Pesticides	29.3	Generation if any	Collection, storage, transportation and disposal by sending for co-processing to cement industries or by sending to authorized CHWIF sites or by incineration at captive incineration by use of GPS mounted vehicles and XGN manifest system.
11.	Spent Resin	35.2	12	Collection, storage, transportation and disposal by sending for co-processing to cement industries or by sending to authorized CHWIF sites or by incineration at captive incineration or by selling to end users having all require permissions of SPCB by use of GPS mounted vehicles and XGN manifest system.
12.	Waste or residue containing oil	5.2	2	Collection, storage, transportation and disposal by sending for co-processing to cement industries or by sending to authorized CHWIF sites or by incineration at captive incineration by use of GPS mounted vehicles and XGN manifest system.
13.	Spent Carbon or filter materials	36.2	83.8	Collection, storage, transportation and disposal by sending for co-processing to cement industries or by sending to authorized CHWIF sites or by incineration at captive incineration or by sending to authorized recyclers/ re-processors having all require permissions of SPCB by use of GPS mounted vehicles and XGN manifest system.
14.	Process Waste (Aq. waste)	29.1	1252	Collection, storage, transportation and disposal by sending for co-

				processing to cement industries or by sending to authorized CHWIF sites or by incineration at captive incineration by use of GPS mounted vehicles and XGN manifest system.
15.	Contaminated cotton rags or other cleaning materials	33.2	10	Collection, storage, transportation and disposal by sending for co-processing to cement industries or by sending to authorized CHWIF sites or by incineration at captive incineration by use of GPS mounted vehicles and XGN manifest system.
16.	Process Waste (Waste Insulation Material and Bricks / Refractory)	29.1	160	Collection, Storage, Transportation, and Disposal by sending to approved and authorized TSDF sites by use of GPS mounted vehicles and XGN manifest system.
17.	Process Waste (Used PPE's)	29.1	As and When Generated	Collection, storage, transportation and disposal by sending for co-processing to cement industries or by sending to authorized CHWIF sites or by incineration at captive incineration by use of GPS mounted vehicles and XGN manifest system.
18.	Spent Acid (HCl)	29.6	956	Collection, storage, transportation and disposal by selling to authorized end users having all require permissions of SPCB by use of GPS mounted vehicles and XGN manifest system.
19.	Contaminated Soil / Debris	35.3	Generation if any	Collection, Storage, Transportation, and Disposal by sending to approved and authorized TSDF sites by use of GPS mounted vehicles and XGN manifest system.
20.	Aluminum Chloride Solution (28%)	B7	11127	Collection, storage, transportation and disposal by selling to Authorized end users having all require permissions of SPCB by use of GPS mounted vehicles and XGN manifest system.
21.	Potassium Bromide (25%) / Sodium Bromide (18%)	B6	5564	Collection, storage, transportation and disposal by selling to Authorized end users having all require permissions of SPCB by use of GPS mounted vehicles and XGN manifest system.

22.	Potassium Chloride Solution (20%)	B7	2953	Collection, storage, transportation and disposal by selling to Authorized end users having all require permissions of SPCB by use of GPS mounted vehicles and XGN manifest system.
23.	Insulated Copper wire Scrap or Copper with PVC sheeting including ISRI-Code material namely " Druid"	7	As and when Generated	Collection, Storage, Transportation disposal by selling to authorized recycler having all required permissions of SPCB by use of GPS mounted vehicles and XGN manifest system.
24.	Jelly Filled Copper Cables	8	As and when Generated	Collection, Storage, Transportation disposal by selling to authorized recycler having all required permissions of SPCB by use of GPS mounted vehicles and XGN manifest system.
25.	Lead Scrap	17	As and when Generated	Collection, Storage, Transportation disposal by selling to authorized recycler having all required permissions of SPCB by use of GPS mounted vehicles and XGN manifest system.
26.	Chemical containing residue arising from decontamination	34.1	24	Collection, storage, transportation and disposal by sending for co-processing to cement industries or by sending to authorized CHWIF sites or by incineration at captive incineration by use of GPS mounted vehicles and XGN manifest system.
27.	Sludge from Wet Scrubber	37.1	48	Collection, Storage, Transportation, and Disposal by sending to approved and authorized TSDF sites by use of GPS mounted vehicles and XGN manifest system.
28.	Recovered Methanol		675	Collection, storage, transportation and disposal by selling to Authorized end users having all require permissions of SPCB by use of GPS mounted vehicles and XGN manifest system.
29.	Potassium Chloride		673	Collection, storage, transportation and disposal by selling to Authorized end users having all require permissions of SPCB by use of GPS mounted vehicles and XGN manifest

				system.
30.	Sodium bisulphite		5064	Collection, storage, transportation and disposal by selling to Authorized end users having all require permissions of SPCB by use of GPS mounted vehicles and XGN manifest system.
31.	Sodium Sulphite Solution / Sodium Bi-Sulphite Solution		1875	Collection, storage, transportation and disposal by selling to Authorized end users having all require permissions of SPCB by use of GPS mounted vehicles and XGN manifest system.
32.	Mono Bromo Toluene (MBT) / PBrODCB / Sodium bi-sulphate Solution (40-42%)		2319	Collection, storage, transportation and disposal by selling to Authorized end users having all require permissions of SPCB by use of GPS mounted vehicles and XGN manifest system.
33.	Ammonium Chloride Crystal		2017	Collection, storage, transportation and disposal by selling to Authorized end users having all require permissions of SPCB by use of GPS mounted vehicles and XGN manifest system.

6.4 The authorization shall be valid for a period of 30/09/2026.

6.5 The authorization is subject to the following general and specific conditions:

A. General Conditions under Hazardous and other Wastes (Management and Transboundary Movement) Rules-2016;

1. The authorized person shall comply with the provisions of the Environment (Protection) Act, 1986, and the rules made there under.
2. The authorization or its renewal shall be produced for inspection at the request of an officer authorized by the State Pollution Control Board.
3. The person authorized shall not rent, lend, sell, transfer or otherwise transport the hazardous and other wastes except what is permitted through this authorization.
4. Any unauthorized change in personnel, equipment or working conditions as mentioned in the application by the person authorized shall constitute a breach of his authorization.
5. The person authorized shall implement Emergency Response Procedure (ERP) for which this authorization is being granted considering all site specific possible scenarios such as spillages, leakages, fire etc. and their possible impacts and also carry out mock drill in this regard at regular interval of time;
6. The person authorized shall comply with the provisions outlined in the Central Pollution Control Board guidelines on "Implementing Liabilities for Environmental Damages due to Handling and Disposal of Hazardous Waste and Penalty"
7. It is the duty of the authorized person to take prior permission of the State Pollution Control Board to close down the facility.

8. The imported hazardous and other wastes shall be fully insured for transit as well as for any accidental occurrence and its clean-up operation.
9. The record of consumption and fate of the imported hazardous and other wastes shall be maintained.
10. The hazardous and other waste which gets generated during recycling or reuse or recovery or pre-processing or utilization of imported hazardous or other wastes shall be treated and disposed of as per specific conditions of authorization.
11. The importer or exporter shall bear the cost of import or export and mitigation of damages if any.
12. An application for the renewal of an authorization shall be made as laid down under these Rules.
13. Any other conditions for compliance as per the Guidelines issued by the Ministry of Environment, Forest and Climate Change or Central Pollution Control Board from time to time.
14. Annual return shall be filed by June 30th for the period ensuring 31st March of the year.

B. Specific Conditions:

1. The authorized actual user of hazardous and other wastes shall maintain records of hazardous and other wastes purchased in a passbook issued by the State Pollution Control Board along with the authorization.
2. Handing over of the hazardous and other wastes to the authorized actual user shall be only after making the entry into the passbook of the actual user.
3. In case of renewal of authorization, a self-certified compliance report in respect of effluent, emission standards and the conditions specified in the authorization for hazardous and other wastes shall be submitted to SPCB.
4. The occupier of the facility shall comply Standard operating procedure/ guidelines published by MoEF&CC or CPCB or GPCB from time to time.
5. Unit shall comply provisions of E-Waste (Management) Rules-2016.

For and on behalf of
Gujarat Pollution Control Board

(M. V. Patel)
Environment Engineer

NO: GPCB/CCA-VSD-5(10)/ID: 23225/606297 **Date:** 16/11/2021

Issued to:
M/S. BAYER VAPI PRIVATE LIMITED,
PLOT NO: 306/3, PHASE-II,
GIDC VAPI- 396195,
TAL: PARDI, DIST: VALSAD.

ANNEXURE 3: LAND DOCUMENTS & GAZETTE NOTIFICATION OF INDUSTRIAL AREA

GUJARAT INDUSTRIAL DEVELOPMENT CORPORATION

OFFICE OF THE REGIONAL MANAGER
GIDC Administrative Office Building,
Plot No. C-5/101, Char Rasta,
G.I.D.C., Vapi - 396 195. Dist. - Valsad.
☎ (Ph.) 0260- 2432667 / 2432670 🖷 (FAX) 0260 – 2420502
e-mail : rmvapi@gidcgujarat.org.

No/GIDC/RM/VPI/ALT/PLT/FTO/ 3093 Date : 12 SEP 2016

/ OFFICE ORDER /

SUB : Change in constitution/company's name & transfer of Plot No.306/3 at Vapi Industrial Estate.

A Plot of land (No.306/3), having plot area admeasuring about 35000 Sq.mtrs. was transferred on 17/05/2002 to M/s. Bilag Industries Pvt. Ltd., in Vapi Indl.Area/Estate of the Corporation. The Lease Deed has been executed on 14/07/1995 & Un-Registered Deed of Assignment executed on dtd.15/05/2002. The Lessee had applied to the Corporation for Change in constitution/ company's name transfer of the said plot in favour of M/s. Bayer Vapi Private Limited, for manufacturing of Agrochemicals & Intermediates. Certain terms & Condition have been stipulated by the Regional Manager, Vapi as per letter No.2690, dtd.10/08/2016.

The Lessee has paid all dues of the Corporation upto date. He has also paid the Corporation's Share in "Transfer fees" amounting to Rs.1,89,00,000/- calculated @ 15% & Administrative charges Rs.1124/-. The Deed of Rectification Registered on 03/09/2016. The Plot now therefore stands transferred in the name of M/s. Bayer Vapi Private Limited, with effect from 09/09/2016. This transfer permission shall not to be considered as valid under the building bye-laws of the Corporation, if any unauthorized construction is carried out by Transferee. The same shall not be considered that Corporation has regularized the same, Transferee shall have to remove/ demolish, non-violative construction or shall have to be got approved from the Corporation. The Water requirement as per transfer application for 1st year : 2nd year : & 3rd year : Existing.

Transferee shall have to contact to Deputy Executive Engineer(W/s.), GIDC, Vapi regarding change of name of water supply connection.

REGIONAL MANAGER,
GIDC, VAPI.

To,

1) M/s. Bayer Vapi Private Limited,
Plot No. 306/3,
GIDC, Vapi - 396 195

2) M/s. Bilag Industries Private Limited,
Plot No.306/3,
GIDC, Vapi – 396 195

Copy to : [1] The Executive Engineer, GIDC, Vapi.
[2] Dy. Engineer(O&M), DGVCL, GIDC, Vapi.
[3] The Dy. Chief Accounts Officer, GIDC, Vapi.
[4] The Deputy Executive Engineer(W/s. DRG./R&B), GIDC, Vapi.
[5] The Chief Officer, Notified Area, GIDC, Vapi.
[6] V.I.A. / C.E.T.P., Plot No.135, GIDC, Vapi.
[7] The Computer Branch, D.M./R.M. Office, GIDC, Vapi....for data entry purpose.

Extra No. 365 REGISTERED NO. G/GNR/2

The Gujarat Government Gazette

EXTRAORDINARY

PUBLISHED BY AUTHORITY

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Separate paging is given to this Part in order that it may be filed as a Separate Compilation.

PART IV-B

Rules and Orders (Other than those published in Part I, I-A and I-L) made by the Government of Gujarat under the Gujarat Acts.

INDUSTRIES AND MINES DEPARTMENT,

Notification

Sachivalaya, Gandhinagar. 17th December, 2003.

Gujarat Municipalities Act, 1963

WHEREAS, the State Government, in exercise of the powers conferred by section 16 of the Gujarat Industrial Development Act, 1962 has declared under the Notification, Industries, Mines and Power Department No. GHU / 75/ 45/ GID/ 1974/ 4084 - (X) CH Dated 06 - 05 - 1975 that the provisions relating to the notified area contained in Chapter XVI – A and certain other provisions of the Gujarat Municipalities Act, 1963 shall extend to and brought into force in the Vapi industrial Area.

AND WHEREAS, under the aforesaid notification it has been provided that the powers to make rules under clause (l) and (m) of section 271 of the Gujarat Municipalities Act, 1963 shall be exercised by the State Government under section 277 of that Act.

ANNEXURE - A
(see rule 3)

Rates of Consolidated Tax for Industrial and Commercial Properties for Vapi Notified Area.

Name of Notified Area (1)	Rate of Consolidated Tax (2)
VapiNotified Area (Taluka Pardi) (District.Valsad)	(i) 12% on net rateable value not exceeding Rs.16,199/- (for properties valued up to rupees three lacs).
	(ii) 12.5% on net rateable value exceeding Rs.16,199/- but not exceeding Rs. 27,000/- (for properties valued above rupees three lacs and up to Rupees five lacs)
	(iii) 13.5% on net rateable value exceeding Rs.27,000/- (for properties valued above rupees five lacs).

ANNEXURE - B
(see rule 3)

Rates of Consolidated Tax for residential properties and properties belonging to schools, colleges, social and Charitable institutions yielding any revenue or rent for Vapi Notified Area.

Type of Residential Properties (1)	Rates of Consolidated Tax (2)
For properties not exceeding 30 square metres built up area	5% of net rateable value.
For properties exceeding 30 square metres but not exceeding 50 square metres built up area	7% of net rateable value
For properties exceeding 50 square metres but not exceeding 100 sqdare metres built up area	8% of net rateable value
For properties exceeding 100 square metres built up area	10 % of net rateable value

Note: When owner or occupier of the residential property or of a property having low tax rate converts the property or part thereof in to a use having higher tax rate, the portion of property so converted shall be assessed according to its changed use.

ANNEXURE 4: LAYOUT PLAN

Plan North

Magnetic North

Scale :- 1 Cm = 9.00 M.

REF.

G.I.D.C. ROAD

H.T.LINE

GATE

BRIDGE

CREEK

NEW CREEK

G. I. D. C. PUMPING STATION

OPEN LAND
GREEN BELT AREA

CRICKET GROUND

FOOTBALL GROUND

SIM WIDE ROAD

ADJ. HUBER INKS LTD.

ADJ. VAPI PAPER MILL

ADJ. NIKUNJ FAB

R. M. STORE

UNLOADING PLATFORM

CYFO PLANT

UTILITY-X1

M.C.C. ROOM

ARCO PLANT BLDG.

SPACE FOR FUTURE EXPANSION

BDCS PLANT

NaCMTS PLANT

TECO PLANT

HICO-II PLANT

HICO-I PLANT

FINISHED GOODS STORE

NEW CMA PLANT

UTILITY-03B

UTILITY-03A

EQUIPMENT YARD

STORM WATER POND OUTLET NO.1

NEW WAREHOUSE

SPARE PARTS STORE

INCINERATOR-III

INCINERATOR

M.C.C. OFFICE

D. G. ROOM

MICO PLANT

OLD BOILER HOUSE

DIBO

UTILITY-01 & MCC

TRAINING CENTER

TWO WHEELER PARKING SHED

SEC. CABIN

MAIN ENTRANCE

OLD BSR FOR CHANGE ROOM & INSTRUMENTATION LAB & WRS

NEW ADMIN BLDG.

CAR PARKING

GARDEN

TF

SALT STORAGE SHED

LIME STORAGE

BIO REACTOR

RO PLANT

ETP LAB

WWPT PLANT

EFSO PLANT

UTILITY-04

MCC

GMP PLANT

SHED

CT

STORM WATER POND OUTLET NO.2

CULVERT

ETP
PRIMARY, SECONDARY, TERTIARY TREATMENT

WWPT
EVAPORATOR
STRIPPER
FENTON

AREA TABLE

SR. NO	COLOUR CODE	DESCRIPTION	AS BUILT BASE AREA (TOTAL) IN SQ. MT.	TOTAL SUM BASE AREA IN SQ. MT.
1	1	PRODUCTION AREA	29934	66126
		WAREHOUSE STORAGE GODOWNS	15426	
		UTILITIES AREA	16585	
		WATER STORAGE AREA	2980	
	1A	EXPANSION BASE AREA	1201	
2	2	ADMINISTRATION	1974	14322
		AIMI LAB & PILOT plant (QA, QC, R & D)	2279	
		PARKING	5458	
		HSE	955	
		CANTEEN	1809	
		WORKER'S AMENITIES	1257	
		SECURITY'S	490	
3	3	ROAD AREA (R.C.C. TOTAL)	53940	72334
		ROAD AREA (COAL-STAR)	8924	
	3	PATHWAY	9470	
4	4	CENTRAL STORAGE TANKFARMS	6150	6150
5	5	INCINERATOR	4705	16087
		HAZ. SOLID WASTE	2655	
		ETP	8727	
5A	5A	STORM & FIRE WATER RETENTION POND-1 & 2	3000	4121
		STORM & FIRE WATER RETENTION POND-3&4	1121	
6	6	EQUIPMENT YARD	7864	13955
		SCRAP YARD	1851	
		WORK SHOP & MAINTANANCE	4240	
7	7	GREEN BELT AREA	60768	60768
8	8	SPACE FOR FUTURE EXPANSION	6694	6694
9	9	AUXILLARY AREA	33149	33149

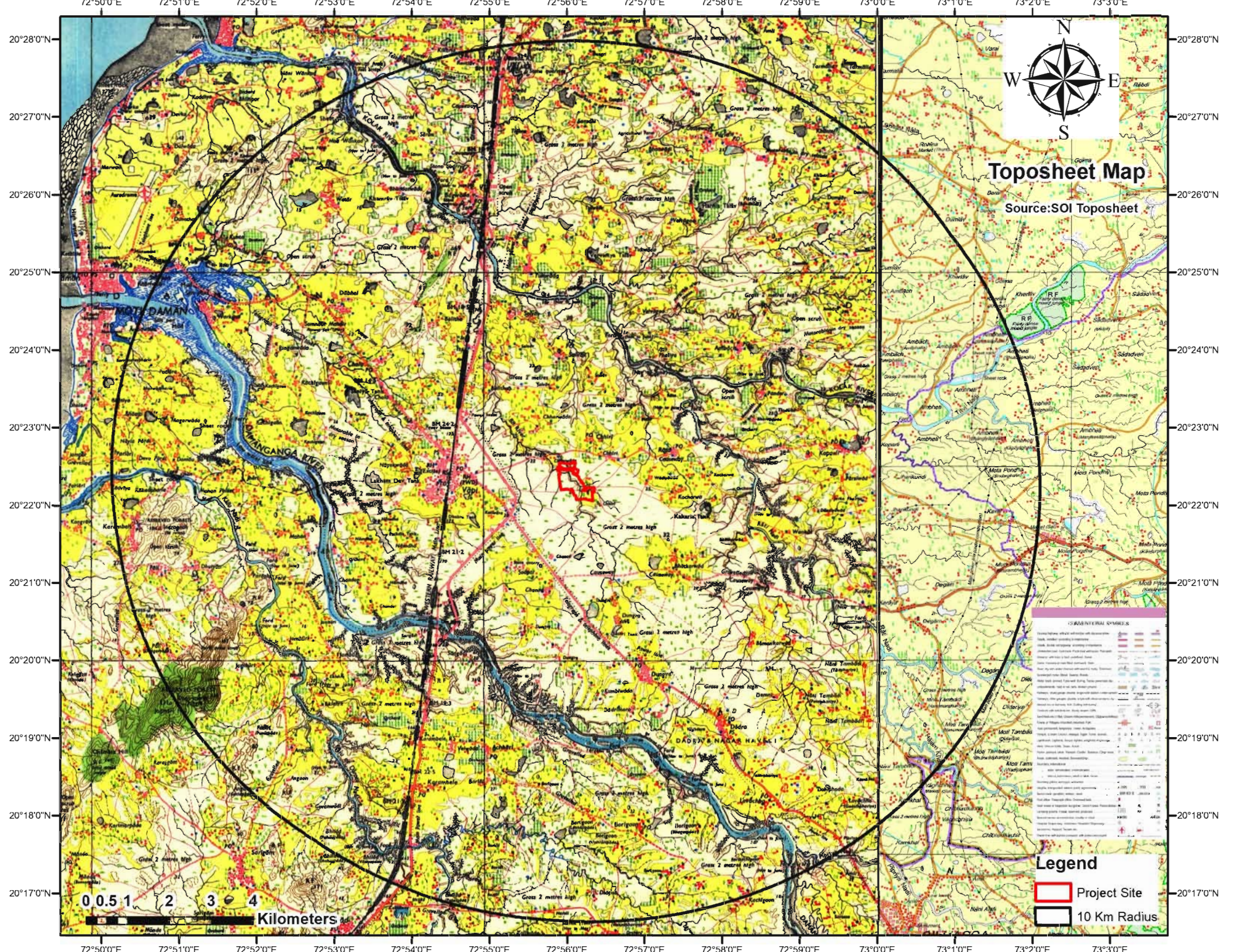
PREVIOUS PLOT AREA (TOTAL)	29.4 HECTARES
NEW LAND PLOT AREA FOR GREEN BELT	54294 m2

BAYER VAPI PRIVATE LIMITED.

306/3, G.I.D.C., VAPI

PLANT : SITE LAYOUT PLAN		DRN	IVP
TITLE : LAYOUT PLAN SHOWING CONSTRUCTED & USED AREA		CHD	
		APPD	
DRG. NO.	SCALE :1:1000	DATE	20/06/22
BVPL/SITE PLAN/EN/AREA/L1	SHEET NO. 1	REV	4 5 6 7 8 9

ANNEXURE 5: TOPOGRAPHICAL MAP


Toposheet Map
Source:SOI Toposheet
N
S
E
W
Legend
Project Site
10 Km Radius
0 0.5 1 2 3 4
Kilometers
72°50'0"E
72°51'0"E
72°52'0"E
72°53'0"E
72°54'0"E
72°55'0"E
72°56'0"E
72°57'0"E
72°58'0"E
72°59'0"E
73°0'0"E
73°1'0"E
73°2'0"E
73°3'0"E
20°28'0"N
20°27'0"N
20°26'0"N
20°25'0"N
20°24'0"N
20°23'0"N
20°22'0"N
20°21'0"N
20°20'0"N
20°19'0"N
20°18'0"N
20°17'0"N